ANALYSIS OF THE CAPABILITY OF LOCAL COMPANIES FOR LOCAL CONTENT PARTICIPATION IN UGANDA'S OIL AND GAS INDUSTRY

BY

Atim Florence Lora

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DECLARATION

I, Atim Florence Lora, hereby declare that this dissertation is my work and it has not been submitted before to any other institution of higher learning for fulfillment of any academic award.

Signed.....

Date…….

APPROVAL

This is to certify that this dissertation entitled “Analysis of the capability of local companies for local content participation in Uganda’s oil and gas industry” has been done under my supervision and now it is ready for submission.

Signature…….

Prof. Bruno L. Yawe

Date …….

DEDICATION

This research work is dedicated to my mother Mrs Maria Goretti Lagum, for supporting and encouraging me to take this course.

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I am grateful to God for granting me the resources and wisdom to accomplish my master's degree and this research. I also thank for my supervisor Prof. Bruno L.Yawe for his excellent supervision, professional advice and support during the writing of this dissertation. Because of his guidance I can now confidently conduct any research henceforth. Thank you so much Professor, God bless you. I cannot forget to thank my peer reviewer Nathan Osinde for his contribution in peer reviewing the first draft of my report and my research assistants for all the hard work they put in to ensure that this dissertation was accomplished. I extend my heartfelt gratitude to my mother Mrs Maria Goretti Lagum for her encouragement that I undertake this course and her emotional and spiritual support with prayers throughout the course. To my friends Himbaza Godfrey, Caleb Alaka, Stanley Baine, Nathan Osinde, Agnes Wazemwa and all my classmates, I am grateful to you all for the hard times, celebrations and discussions we shared during the course. I could not have done it without you. Lastly to my family especially Nabil and Edna as well as my colleagues at International Justice Mission, I am so grateful for the prayers and every support you rendered to me while I studied. God bless you all.

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LIST OF ACRONYMS

CNOOC	:	China North Offshore Oil Company
NEMA	:	National environment management authority
UBOS	:	Uganda Bureau of Statistics
LCPs	:	Local Content Plans
PAU	:	Petroleum Authority of Uganda
UNOC	:	Uganda National Oil Company
PDPs	:	Productive Development Policies
PSA's	:	Production Sharing Agreements
PEDP Act	:	Petroleum (Exploration, Development &Production) Act 2013
PRCTMS Act	:	Petroleum (Refining, Conversion, Transmission and Midstream Storage) Act 2013
PEDP NC Regs	:	Petroleum (Exploration, Development & Production) National Content Regulations 2016
PRCTMS NC Regs	:	Petroleum (Refining, Conversion, Transmission and Midstream Storage) National Content Regulations 2016
MEMD	:	Ministry of Energy and Mineral Development
JV	:	Joint Ventures
NSD	:	National Supplier Database
TIN	:	Tax Identification Number
VAT	:	Value Added Tax
PSAIs	:	Private Sector Apex Institutions.
SPSS	:	Statistical Package for Social Scientists

ABSTRACT

The study examined the capability of local Ugandan companies to participate in the oil and gas industry in Uganda as a factor affecting local content development in the industry. A mixed method, cross-sectional case study design was adopted to study the research objectives. Using data collected from 120 participants constituting of local firms in Uganda, it was found that significant gaps in local capacity were limiting the participation of local companies in the oil and gas industry. A descriptive analysis of the variables indicated a relationship between local content participation and capability of local firms. Participants regretted the inability of Ugandans to fully participate in the industry, as such the study among other things highly recommended that local companies 'capabilities be enhanced, local skills, knowledge and expertise in the industry be enriched, technological infrastructure be improved, and that local content policies be complied with and enforced by the responsible government institutions and international oil companies.

GLOSSARY OF TERMS

National Content: (a) the level of use of Ugandan local expertise, goods and services, Ugandan companies, Ugandan citizens, registered entities, businesses and financing in petroleum activities; and (b) the substantial combined value added or created in the Ugandan in the Ugandan economy through the utilization of Ugandan human and material resources for the provision of goods and services to the petroleum industry in Uganda.

Registered entity: a business owned by Ugandan citizens registered under the Business Names Registration Act, the Companies Act 2012 or the Partnership Act 2010.

Ugandan Company: a company incorporated under the companies Act,2012 and which (a) provides value addition to Uganda; (b) uses available local raw materials;(c) employs at least 70% and (d) is approved by the Petroleum Authority under regulation 9(4).

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This study focused on analyzing the capability of local companies for local content participation in the oil and gas industry in Uganda. This chapter presents the study background, problem statement, study purpose, objectives, research questions, scope, justification, significance and conceptual framework.

1.2 Background to the study

1.2.1 Historical Background

Local content is part of a broader category of policy interventions called Productive Development Policies (PDPs), (Melo & Rodriguez-Clare 2006). Historically local content policies date as far back as the period after the World War II when countries began to diversify their policies and many adopted the local content policy. There were different reasons for this trend. In Latin America, the trend was because the region had specialized in natural resources. In 1950 Raul Prebisch advised resource-rich Latin American countries to diversify their economies lest they developed slowly since commodity prices had reduced. In Asia the reason was different, they argued that they had a comparative advantage to develop their labor-intensive sectors and also had a high level of education (Tordo et., al,2013).

This period saw a rise in protectionism and use of complex systems of policies including local content policies, intended to foster development of the productive sectors. In Asia for example foreign firms were required to license technology to local suppliers, which was critical for its development. In 1944 República Bolivariana de Venezuela passed a law which forced oil companies to refine oil in Venezuela. Further, in 1953 the Brazilian President made a proclamation that the National Oil company Petrobas should only use Brazilian capital, workers and know-how (Tordo et al.,2013).

Developed countries were also not excluded from local content development during this period. Nordes, Vatne and Heum (2003) noted that while "Norway did not have specific requirements for local content but oil companies acknowledged that the Norwegian government would appreciate the use of local firms to supply goods and services to the industry and would honor this gesture in future negotiations. Because of this in the late 1970's and early 1980's local firms were selected despite not being the most cost effective."

In 1980s however, some governments reversed their course for using PDPs and there was a shift to trade liberalization which saw the creation of World Trade Organisation (WTO) and new priorities like securing property rights, fiscal discipline and expenditure policies.

However, due to the disappointing results and the Asian financial crisis of 1990, there was renewed interest in target policy interventions. In 2008, after the financial crisis, there was a rise in local content policies globally. These discriminatory measures were introduced to benefit domestic firms at the expense of foreign firms, because after the Uruguay round, governments could not use tariffs for protectionists and resorted to non-tariff barriers. (Devinger, et al,2018). To date the trend has continued with countries like Uganda adopting the same approach.

1.2.2 Contextual background

The discovery of commercial deposits of Oil and Gas in Uganda in 2006, has in addition to attracting international oil companies to invest in Uganda, sparked national interest for Ugandans to participate in the sector, to maximise the benefits from the burgeoning industry (Ritwika,2018). To achieve this participation, the government of Uganda resolved to implement local content in the oil and gas sector, to retain as much revenue as possible from the sector and to create conditions to extend the benefits of the resources to other sectors.

Local content is a relatively new concept in the oil and gas industry which many oil producing countries have embraced. Uganda as a new oil producer has also adopted the local content approach for its industry. Local content is defined as the value brought by an oil and gas extraction project to the local, national or regional economy, beyond the revenue from the resources. It involves a country ensuring that international oil companies engage local labour and services and

utilize local goods and services from the host country (National Resource Governance Institute,2015).

The main objective of introducing local content in Uganda is to maximize the benefits from the oil and gas industry (Kazzazi & Nouri,2012).This is because local content promotes industrialization and economic growth as it creates and develops value added activities and competitiveness by international standards. Experiences of developed resource rich countries show that connections between the oil sector and other sectors significantly impacts economic growth. When linkages are solid enough that inputs are supplied locally, the economy becomes diversified gradually (Heum et al.,2011). Further local content promotes inclusion of local labour force and labour absorption since most resources are located in remote areas lacking socio-economic and technological infrastructure. Without local content policies the local population can be left out because oil and gas production is capital intensive and demands highly specialized skills and advanced technology which usually demands outsourcing of labour and technology from foreign companies (Matsiko,2017).

The desire to promote local content development in Uganda's oil and gas industry, motivated the issuing of the National Oil and Gas Policy 2008, whose primary goal is to use the oil and gas resources to contribute to the early achievement of poverty eradication (National Oil and Gas Policy, Republic of Uganda, 2008). The policy recognizes that benefits to be derived from the sector, would largely depend on the direct and indirect participation of Ugandans in the Petroleum sector as well as its auxiliary sources (National Content Policy, Republic of Uganda, 2017). The National Oil and Gas Policy provides the basis for the legal framework on local content through the Petroleum (Exploration, Development and Production) Act 2013, the Petroleum (Refining, Conversion, Transmission and Midstream Storage) Act 2013 and the Petroleum (Exploration, Development and Production) (National Content) Regulations 2016, among others. These laws mandate oil and gas operators to train and employ Ugandans and transfer technology to Uganda; impose a preference for Ugandan goods and services and emphasize that where required goods and services cannot be found locally, they should be provided through joint ventures with Ugandan companies (National Content Policy, Republic of Uganda,2017).

Local content in Uganda's context requires international oil companies to utilize local labour, products and services in oil and gas operations. The local content requirement is embedded in the Uganda National Oil and Gas policy of 2008 and all the subsequent oil and gas laws which were passed by the parliament of Uganda to actualize the policy.

The government of Uganda has shown commitment in facilitating national participation in the oil and gas sub-sector, through issuing local content policies, passing local content laws and establishing institutions like the Petroleum Authority of Uganda (PAU) and Uganda National Oil Company (UNOC), to implement local content. Further, international oil companies namely Tullow which exited in 2020, China North Offshore Oil Company (CNOOC) and Total have been licensed to undertake exploration, development and production of oil and gas in Uganda. These are mandated to skill Ugandans and employ Ugandan services and supplies in the sub-sector.

While the government of Uganda has made concerted efforts towards local content development in the sub-sector, there is still limited use of local content in the sub-sector (National Content Policy, Republic of Uganda, 2017). This is due to the fact that local content development in Uganda's oil and gas industry is highly dependent on the capability of citizens and local firms to participate in the industry.

The development of local content depends on the relationship between the factors of local capability, local policies, local infrastructure and local environment and local content eventually promotes economic growth, industrial growth and spillover effects.

Local policies both public and industrial play an important role in local content development. This is because policies ensure a macroeconomic environment which is more forecasted, increase reliability of the legal system and institutions, provide incentives needed for good business practices, ensure enabling infrastructure for business development and enhance social structures for the promotion of participation and inclusion (Norwegian Oil and Gas Partners (INTSOK), 2003). Nordas et al. (2003) investigated oil and gas projects in 6 countries and found that if local content policies that promote local content are not properly enforced, it can affect economic development of host countries.

Local environment is the factor on which the rest of the factors of local capabilities, local policies and local infrastructure interact. The macro environment is decisive for investment decisions to be made and includes the domestic prices, the exchange rate for local currencies, interest rates and government policies. A harsh environment affects local content development because it affects the capacity of local firms and citizens to participate in the industry (Kazzazi &Nouri,2012).

Local infrastructure includes conditions like information technology, local company needs, standards, education and social infrastructure. Availability of these conditions is key for the petroleum industry because it is essential for local suppliers to be more competitive and have a substantial impact on local content development (Kazzazi &Nouri, 2012).

Local capability refers to the capacity of local suppliers to meet the quality and quantity requirements of the oil and gas industry (Natural Resource Governance Institute,2015). Industrial growth is a result of an interplay between existing and emerging industrial capabilities. Development of local content is usually based on existing capabilities in the manufacturing, fabricating and services sectors. However, many countries have a weak industrial base and rely on local policies which provide measures for preferential treatment of domestic suppliers (Kazzazi &Nouri,2015).

Uganda's oil and gas industry faces limitations in the capacity of local firms, which is affecting local content development. Experience of established oil producing countries shows that young and developing resource rich countries like Uganda face a lot of challenges in implementing local content, because they have to build their production networks from scratch (Natural Resource Governance Institute,2015).

The oil and gas industry like other extractives industries has a high capital to labor ratio and this means that it can only employ few technical employees per investment dollar (Natural Resource Governance Institute,2015). Consequentially extraction site jobs can only employee a few Ugandans. Even the non-technical jobs like food supply in the sector require a high level of capacity which local food producers may not have since the quality of food required to be supplied to the oil and gas industry is of high quality (Natural Resource Governance Institute,2015). This makes it pertinent to analyze the capacity of local firms to participate in the oil and gas industry.

1.2.3 Theoretical Background

This study is guided by the theory of Marshallian externalities; this theory was developed by Marshall Alfred in 1920. The argument for local content development is based on the idea that some sectors exhibit Marshallian externalities and these sectors can be enhanced through policy interventions like local content (Tordo et al,2013). The theory supposes that close proximity of firms in a sector through clustering or agglomeration allows for exchange of the externalities of inputs, skilled labour and know-how, which contribute to the success of the sector. According to Marshall (1920) "People following the same skilled trade get from neighboring each other 3 different types of agglomeration externalities which are: the benefit of a large pool of skilled labor force, easy access to local customers and suppliers and local knowledge spillovers." These externalities increase with the size of the industry and arise from different channels including localized knowledge spillovers at industry level (Tordo et al, 2013). To encourage these industries to emerge there is usually need for policy interventions. Policy interventions like local content are introduced as responses to perceived market needs like promoting specific sectors or market failures. Therefore, governments that are interested in developing externalities and certain goods and services would support specific sectors by applying local content, for instance in the oil and gas sector. Several economists agree that these policy interventions have the potential of solving specific sector or cluster problems in a focused way but are prone to government failure. In Uganda local content is being used as a policy intervention however capacity gaps are challenging implementation of the policy and has resulted to limited local participation hence the need to explore local capability.

1.3 Problem statement

By adopting local content in the oil and gas sub-sector, the goal of the government was to ensure maximum participation of Ugandans in the sub-sector. This is to facilitate the realization of the primary goal of the National Oil and Gas policy, which is to utilize the oil and gas resources to contribute to early eradication of poverty. National participation in the sub-sector is estimated at 80% by 2040 (National Content Policy, Republic of Uganda 2018). However, participation of Ugandans in the sector has fallen short of the policy ambitions due to the incapacity of local firms

among other reasons. Notably, the apparent incapacity in the transport sector has resulted into local companies being priced out of transportation in the sector due to the heavy and highly specialized material requirements (Matsiko,2017). There are also identified skills gaps for instance, there are limited qualified civil craftspersons, drivers, and mechanical technicians among others skills (China North Offshore Oil Company, Tullow oil and Total oil, 2014).Further, Alinda, Agaba and Nduhura (2018) revealed that 66% of the companies they studied lacked adequate knowledge on the bidding process for supplies tenders and 66-71% had gaps in preparing financial and technical proposals, meeting technical and financial requirements, and those on administrative documents .This low absorption of Ugandans is evidenced by the low estimates of local participation in the sub-sector which between 2010-2013, was estimated at 28% (National Content Policy, Republic Of Uganda,2017). This is despite the interventions of the government to enhance local participation. The ultimate result is that currently the sub-sector is being serviced by foreigners and the desired level of local participation is not being achieved, which will cost the country the anticipated economic development. Previous studies on local content have mostly looked at the regulatory framework on local content and only a few have examined local capabilities. Further, most of the studies on local capability have been based on secondary and not primary data and do not measure the extent of the capacity limitations; published studies in the Ugandan context have been conducted at least 3 years back; field studies like Ritwika only researched local capability in terms of what local companies currently supply; and Alinda, Agaba and Nduhura (2018) limited their study to the capability of SMEs in terms of their sizes as well as knowledge and experience in bidding. Given the scope of existing studies on local capability, it is unclear what capacity local firms have in terms of local capabilities, technological capacity and education, skills and expertise development in the oil and gas industry. Perhaps an empirical study on the capability of local companies in Kampala to contribute to local content development in Uganda could help to remedy the problem.

1.4 Purpose of the study

The purpose of the study is to produce empirical knowledge about the capability of local companies to participate in the oil and gas industry, in order to determine the factors affecting local content development in Uganda's oil and gas industry.

1.5 Objectives

1.5.1 General objective

The general objective of this study is to explore the capability of local companies in Kampala to participate in the oil and gas industry.

1.5.2 Specific objectives

1. To examine the gaps in the competence of local companies in Kampala, hindering local content participation in the oil and gas industry.
2. To explore the limitations in technological capacity and know-how of local companies in Kampala, affecting local content participation in the oil and gas industry.
3. To establish the gaps in education, skills and expertise development of local companies in Kampala, affecting local content participation in the oil and gas industry. (Kazzazi & Nouri, 2012).

1.6 Questions

1. What are the gaps in the competence of local companies in Kampala, affecting local content participation in the oil and gas industry?
2. What are the gaps in the technological capacity and know-how of local companies in Kampala, affecting local content participation in the oil and gas industry?
3. What are the gaps in education, skills and expertise development of local companies in Kampala, hindering local content participation in the oil and gas industry? (Kazzazi & Nouri,2012).

1.7 Scope of the study

1.7.1 Content

The study focused on examining the capability of local companies to participate in the oil and gas industry, as one of the factors affecting local content participation in Uganda. In particular, the study examined the gaps in the competence of local companies, the technological capacity and know-how of local companies and education, skills and expertise development of local companies, which are hindering participation of Ugandan citizens and companies in the oil and gas sector.

Previous studies on local content have concentrated majorly on local policies as a key factor affecting local content participation, however other studies that have conceptualized local content have demonstrated that other factors including local capabilities, local infrastructure and local environment all play significant roles in influencing local content development and these factors relate with each other to promote local participation and create value for the host country (Kazzazi & Nouri,2012).

1.7.2 Geographical

The study was conducted in Kampala, Uganda. Kampala is the capital city of Uganda and home to most of the local firms that supply the oil and gas industry. Kampala being the capital, most local companies there have access to information about the oil and gas industry and it would be expected that some companies are participating in the oil and gas sector. This was intended to ensure representative of the sample which included both companies that have transacted in the oil and gas sector and those that have not.

1.7.3 Time

The study was carried out within a duration of 3 months and covered a time span of eight years, from 2013 to 2020. This is the period when the government of Uganda, guided by the oil and gas policy of 2008, adopted the local content policy and passed the local content laws and policy, to promote participation of Ugandans in the oil and gas sector, to ensure maximum value for the economy from the oil and gas resources.

1.8 Justification

The basis for this study is the constitutional policy statement under Article 244, which provides that the entire property and control of all minerals and petroleum in Uganda is vested in the government of Uganda on behalf of the Republic of Uganda (The Constitution of Uganda,1995). This is supported by the National Oil and Gas policy of Uganda, whose primary goal is to contribute to early achievement of poverty eradication and recognizes that the benefits of the oil and gas resources to the economy will depend on active direct and indirect participation of citizens (National Oil and Gas Policy, Republic of Uganda,2008). These provided the basis for other local content laws including the Petroleum (Exploration, Development and Production) Act 2013, the Petroleum (Refining, Conversion, Transmission and Midstream Storage Act) 2013 and their regulations, as well as the National Content Policy of 2017 and National Content Act 2020, which seek to guide the nation in positioning citizens to take advantage of the opportunities in the oil and gas sub-sector.

Despite these policy ambitions, only a few Ugandan companies are able to participate in the oil and gas sub-sector, due to the gaps in local capabilities in addition to those in local policies, infrastructure and environment. Consequently, goods and services supplied to the oil and gas industry are still largely supplied by foreigners. This is a worrying concern because it undermines the policy aspirations of creating value through citizen participation.

1.9 Significance

The study draws attention to the gaps in the capacity of local firms in Uganda and the findings will be communicated to policy makers of Uganda, to help inform their decision making in terms of planning, implementation, evaluation and prioritization of local content. Further the empirical knowledge created by the study shall be used to educate and inform local firms, communities, development partners, experts, professionals and academicians in the oil and gas sub-sector, who can in turn utilize the empirical knowledge to address the capacity gaps.

1.10 The Conceptual framework

The model conceptualizes local capability as a key factor affecting local content participation in the petroleum industry. Local capability interacts with other factors to promote local content participation and create value for Uganda. The performance and inter-relationship among these enabling factors contribute to the degree of promotion of local content. The model specifically looks at the capability of local firms to participate in the oil and gas industry. The study conceptualizes that local content depends on the existing capabilities within local manufacturing, fabrication and services firms, which interplay with emerging capabilities (Kazzazi & Nouri,2012).

In this model the existence of local capabilities within the manufacturing, fabrication and services sector is measured by the variables of competence of local companies; their technological capacity and know-how; and their levels of education, skills and expertise development (Kazzazi & Nouri, 2012). In this conceptual framework, the variable of competence of local companies is measured by the familiarity of companies with tender & bidding processes, their size of investment capital & financing and their ability to comply with industry standards. The variable of technological capacity and know-how of local firms is measured by; their specialization in technologically sophisticated core exploration & production operations; their specialization in technologically sophisticated non-core ancillary operations and their absorption of advanced technology. While the variable of education, skills and expertise development capacity of local firms is determined by existing & emerging supplier capabilities in non-core ancillary operations; existing &emerging supplier capabilities in core exploration and production operations; and Collaboration with foreign firms. Further the study conceptualizes that existence of these capabilities results into increased participation of local companies in the sub-sector, as well as increased supply of local goods hence promoting local participation, while gaps in capacity encourage participation of foreign companies and results into limited local participation.

As shown in the model below, the dependent variable local content participation and it's constructs is at the far right, while the independent variable local capability and its constructs are listed on the left. The causal paths between the independent and dependent variables are linked using the

arrow in the middle. This conceptualization has been based on previous studies and an understanding of local content in the oil and gas industry.

THE CONCEPTUAL MODEL

THE INDEPENDENT VARIABLE **THE DEPENDENT VARIABLE**

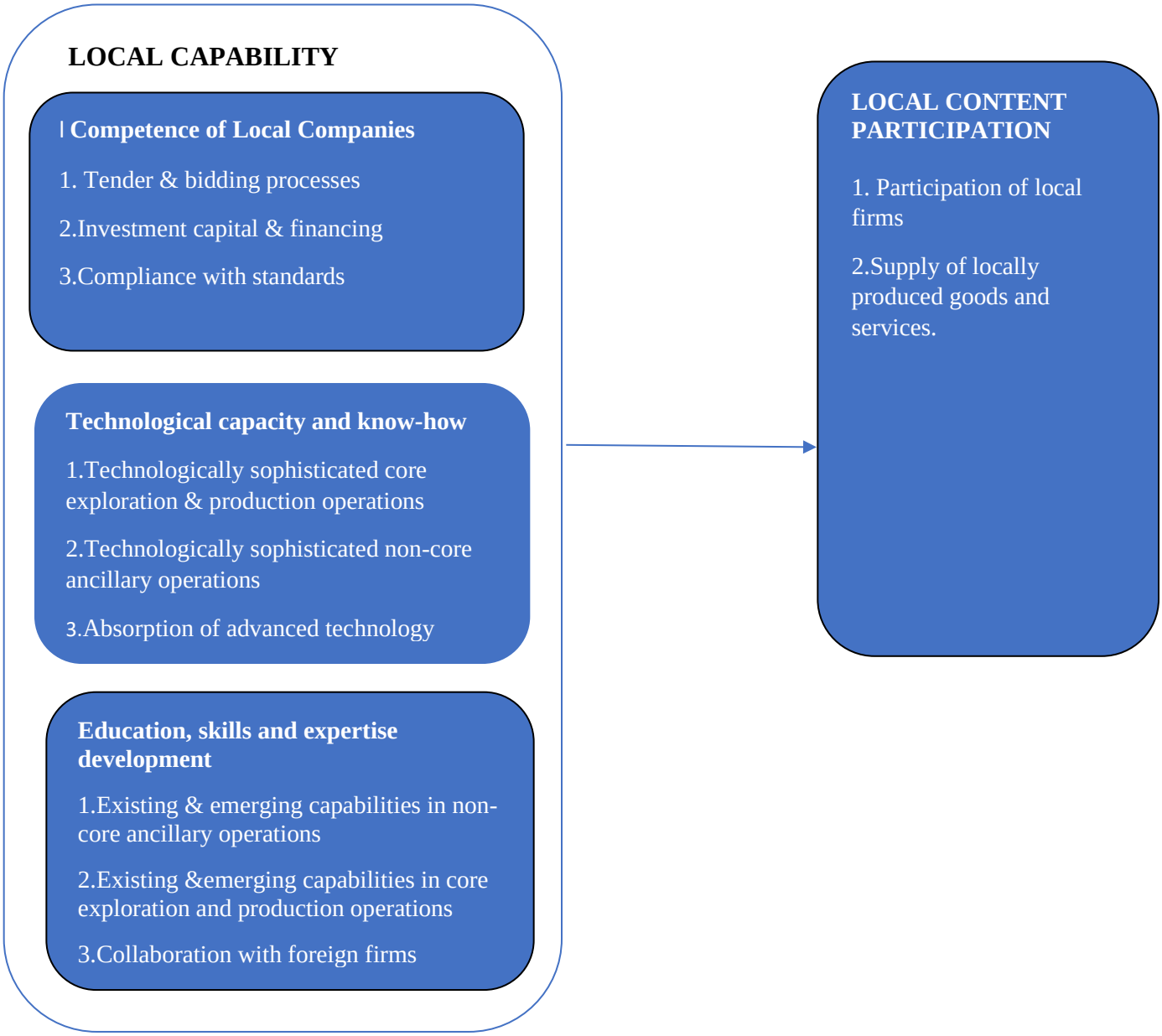

Figure 1: Conceptual model for the capability of local firms in Uganda
Source: Kazzazi & Nouri (2012)

Note: The independent variables were conceptualized based on the model by Kazzazi & Nouri (2012),while the constructs were conceptualized based on our understanding of local content in the petroleum industry.

Table 2.1: Description of variables

DEPENDENT VARIABLE DESCRIPTION **Local content development**	**INDEPENDENT VARIABLE DESCRIPTION** **Local capability**
1.Participation of Local companies 2. Supply of locally produced goods and services.	**Competence of local companies** 1.Familiarity with tender & bidding processes 2.size of investment capital & financing 3.Compliance with standards
	Technological know-how and transfer 1.Specialization in technologically sophisticated core exploration & production operations 2.Specialization in technologically sophisticated non-core ancillary operations 3.Absorption of advanced technology
	Education, skills, and expertise development 1.Existing & emerging supplier capabilities in non-core ancillary operations 2.Existing &emerging supplier capabilities in core exploration and production operations 3.Collaboration with foreign firms

In conclusion, this chapter reviewed the concepts of local capability and local content participation in the oil and gas industry in Uganda. The chapter discussed the study background, problem statement, study aim, objectives, research questions, scope, justification, significance and conceptual framework. The next chapter provides an overview of literature on local capability and local content participation.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter critically discusses literature from the existing body of knowledge on local capability and local content participation. The chapter presents the literature review of related literature which is presented based on each study objective. The purpose of the literature review is to help familiarize this study with findings from other studies, about the topic under investigation, as well as identify any gaps in the literature.

2.2 Objective 1: Competence of Local Companies

Global experience shows that assertive and not aspirational goal setting approaches to local content development are more likely to succeed where there is pre-existing local capacity of companies and individuals to supply the industry. For Uganda to develop local content it needs to focus on the outcomes in the legal requirements which are implementable and invest in supplier development initiatives in order to achieve positive results (Ritwika, 2018). While some focus has been made on certain local content requirements in Uganda, many have not implemented sufficiently for example some ringfenced services do not have local capabilities hence the need for reconsidering some of the industry requirements. Also, while supplier development initiatives have benefitted some local companies, many have been left out, which calls for more inclusive approaches.

It is believed that local content development is highly dependent upon the competitive level of local firms and citizens as compared to foreigners to deliver in the petroleum sector (Hausmann & Rodrick,2006). It is assumed that even though local regulations prescribe local content requirements, oil companies will only prefer local firms and citizens if they have the competence and meet the industry standards. Considering that foreign firms have competitive advantage over local firms in terms of experience in the sector, this preference of foreign firms undermines local participation in the sector but also prompts the government to prioritize enhancement of local capability.

Competitiveness of local firms is determined by a number of factors which include the macroeconomic stability and predictability; adequacy of local infrastructure for business development including; public utilities like transport, electricity, telecommunications; and supportiveness of institutions in terms of incentives like taxes, interest rates, and foreign exchange rates (Kazzazi & Nouri,2012).

Local infrastructure is a key enabler of local participation and includes conditions like information technology; structures to support local company needs; structures to promote standards; social infrastructures like healthcare systems; educational facilities like schools and universities; and transport systems. Having these infrastructures promotes social welfare of the citizens which is essential for local suppliers to be competitive (Kazzazi & Nouri, 2012). In Uganda's context, there is inadequate infrastructure to support local participation in the sector and while the IOC's have invested heavily in infrastructural development in areas with oil, many parts of the country remain with poor infrastructure despite that the local content is intended for national participation.

Despite the high expectations and interest in national participation there is little evidence of domestic capability to service the oil and gas industry. Information on local suppliers can be found in the Industry Baseline Survey (2013) which was conducted by the International Oil companies (IOCs) and the National Supplier Database which has basic information on all registered suppliers. As of 28th February 2019, there were 1277 registered suppliers, out of which 75% were companies incorporated in Uganda however there was no information on their capabilities (Rwitka,2018). This lack of information misleads the sector on existing capabilities in the sector, because some companies on the NSD have been engaged in the sector by the IOCs and have developed capabilities for the sector. The NSD would offer better guidance on the industry capabilities if the company descriptions included a summarized narration of the companies' capabilities.

According to the Industry Baseline Survey commissioned by China Northshore Offshore Oil Company, Total E&P and Tullow Oil (2013), Ugandan oil and gas suppliers interviewed indicated that the key challenges affecting their capacity to compete included; their visibility over demand; inadequate infrastructure which needed improvement; high borrowing costs; skills deficit; and high-quality standards of the industry which was undermined by the lack of supplier capabilities. It is noted that this survey was conducted 9 years ago and while some of the conditions may have

changed due to the numerous supplier development initiatives to build capacity, these challenges still remain evident even today. For example, inadequate infrastructure, high interest rates, high industry standards and inadequate skills still remain prominent challenges for local companies.

Ritwika (2018) further argues that although concerted policy efforts were being made or planned to address gaps relating clarity of local content provisions and reporting mechanisms, little intervention was being made towards supplier development and supplier credit facilitation.

Capacity of SMES for instance is linked to financial soundness of SMEs and existence of institutional framework however in Uganda Small and Medium Enterprises (SMEs) are faced with inadequacy of institutions and regulations (Byaruhanga,2011); lack of investment capital (Kakembo,2020); limited financing which limits their working capital and insufficient equity due to high and expensive credit costs and these have contributed highly to the incapability of local firms (Kakembo,2020). The outcomes of these studies and reports between 2011 to 2020, agree with the argument in Ritwika (2018), that not enough effort is being made to support supplier development and credit facilitation, hence there is need for more effort in that regard.

Alinda, Nduhura & Agaba (2018), in their study found that in addition to size of firms, knowledge gaps, and inadequate experience, the capacity of firms to integrate into the supply chain in the petroleum sector was also compromised by the unfavourable business environment as observed by 83% of the respondents and that this is characterized by high costs of production due to the high utility costs of fuel, electricity and high taxes among others. They aver that the high costs impact negatively on the price quotations for the supplies to the industry. They further add that the price quotations are also affected by high exchange and inflation rates which also increase the costs of production hence affecting the capacity of local firms to have access to supplies tenders. They also aver that this kind of environment limits competiveness of local firms and therefore limits the capacity of local firms to exploit the business opportunities in the sector.

Alinda, Nduhura &Agaba (2018), citing Heum et al. (2011), further aver that SMEs in Uganda also lack international quality certifications, that the procurement processes especially for transport and logistics are complex and the cost of production is high. They however acknowledge that SME's face different challenges depending on their age, size and investment capital. These conclusions are specific to SME's however undoubtedly even larger companies face similar

challenges for instance the high costs of production, interest rates and infrastructural limitations cut across all companies regardless of size although they have an advantage because of their size.

Ritwika (2018) conducted an analysis on the level of integration of local firms in the natural resource value chain, by examining value added tax (VAT) declarations of companies in the natural resource sector, according to their tax identification (TIN). The companies selected were those whose annual threshold was 50,000,000, being companies considered with potential to supply the industry, for the period of 2010-2014. The findings were that there was a population of firms supplying the sector and it was dominated by trade retail and wholesale, which accounted for almost half of the supply connections but traded largely in imported goods like vehicles, accessories, parts etc. Manufacturing ranked 2nd (10%) among those who dominate the network of suppliers with supplies mainly in plastic, metal fabrication, batteries, accumulators, cement, etc. Construction had 6% with no evidence of dominant suppliers. Transport and storage also supplied services to the industry through cargo handling, ware housing storage, freight, and land but transport and cargo firms were the most connected to the supply chain. Information technology (IT), water supply, electrical, and gas, were found to be the less connected sectors. The study noted a concern that there was limited purchase of domestically available products and that there was low direct purchases linkages.

Ritwika (2018) also studied direct supplier linkages and analyzed input-supplier relationships across industries in Uganda for the year 2014/15.Results indicated that Uganda being in the exploration and appraisal phase purchased mainly from wholesale and retail trade, transport, storage, electricity generation, transmission and distribution as well as information communication sectors. The study found that the oil and gas industry was not making significant domestic purchases, and therefore there was no direct supply linkages but it was anticipated to increase at the development, engineering, procuring and construction phase. The study also noted that the extent of increase in the direct supply linkages would be limited by capabilities of local suppliers relative to barriers to entry. The fact that the findings revealed limited domestic supply is not uncommon for new oil and gas countries and since Uganda is a new oil producing country, this is expected because of the high standards of the industry. Since industry standards cannot be compromised it means the government and local suppliers must make effort to match these standards or the situation will remain the same.

In terms of indirect supply linkages of firms selling inputs to firms directly supplying the industry, Ritwika (2018) used actual purchase records and concluded that indirect suppliers would be affected by increase in demand from the sector due to incapacity. These included accommodation, plastics, metal manufacturing and fabrication and construction. The study furthermore suggests that analysis of linkages through purchase has important implications for local content interventions to support local preparedness and suggests that government can use the invaluable resource of VAT records and industry consultations.

Alinda, Nduhura & Agaba (2018), also studied the capacity of SMEs to participate in the oil and gas sector and collected data from 80 SMEs that previously obtained tenders from Tullow and those that were unsuccessful. These were selected using stratified sampling to categorize the companies into 2 and the managers of these companies who formed the primary respondents were selected using simple random sampling. Questionnaires were administered to collect data on capacity of SMEs and challenges faced by them. Their findings were that 69% of companies, the majority that had access to supplies tenders had investment capital of more than 360 million while those that were not successful had investment capital below 360 million, hence the size of the companies mattered.

The study further revealed that majority of companies (66%) lacked adequate knowledge on the bidding process for supplies tenders. And there were other specific gaps in preparing financial and technical proposals, meeting technical and financial requirements, and meeting the requirement on administrative documents according to 66-71% of respondents. The study concluded that there were significant gaps which affect access to supplies tenders (Ritwika,2018). Adequate knowledge of bidding processes in the oil and gas sector is a key skill because to participate in the sector, companies must bid and be registered on the NSD. Hence these findings definitely call for involvement of more local companies in industry focused skill building programmes.

In the context of this study, we believe that addressing the gaps in the competence of local firms would have a positive impact on local content participation as this would increase the number of local firms supplying the oil and gas industry.

2.3 Objective 2: Technological capacity and know-how

Specialization in technologically sophisticated core exploration and production operations.
According to the industry baseline survey, oil and gas operations in the Albertine Graben would generate thousands of both direct and indirect jobs for Ugandans with a peak of 13,000 direct jobs during the construction phase plateauing to 3000 jobs during the operational phase.

Oil and gas operations like permit negotiations, acquisition of real estate, drilling wells, setting up of proper storage facilities, waste management and oil and gas supply chains are technical ventures which are also capital intensive (Matsiko,2017). Further, Information technology infrastructure also has a substantial impact on local content development as it helps in dissemination of information, a key policy principle in promoting local content participation in the industry ((Norwegian Oil and Gas Partners, 2003).In Uganda's context, not many firms were able to participate in these exploration activities however the government is now making efforts to build capacity and promote information technology, although with the high internet costs, a section of the country has been left out. This means information will only reach citizens who can afford.

Uganda is in the upstream stage, however, some of these upstream activities are one-offs and instead of investing in them, most local companies outsource them to the highly specialized international firms (Matsiko,2017). This is due to several factors but majorly due to the lack of technical specialization in these operations. Matsiko (2017), argues that it would not be wise for Ugandan companies to specialize in products or services which exist only as a stint in the oil and gas production life cycle. He emphasizes that the production, mid-stream and downstream sectors afford more realistic choices for local skills for example in small medium enterprise engineering, supply chains, legal, environmental specialist, hydrocarbon retailing and human resource management firms. This argument makes sense considering that upstream activities are more capital intensive and novelle. Therefore, it would not make sense to invest in a venture that does not make business sense however this also calls for skilling interventions so that eventually local firms are able to take over.

Because of the lack of government structures to harness local skills there is currently very little chance for skilled Ugandans to participate in the extremely capital intensive and technical

upstream activities. As a result, Ugandans have missed opportunities to maximize value from the upstream sector and yet the government should have been in position to capture a substantial rent for every shilling so far exchanged in the oil and gas industry (Matsiko,2017). Hence it is important for Ugandans to address the capacity gaps in technologically sophisticated core oil and gas operations, so that future upstream activities can be dominated by local firms.

Where capacity is lacking, Government is working with the licensees, development partners and the private sector to build the relevant capacity of Ugandan citizens and companies to benefit from the available opportunities in the sector. This is being undertaken in line with the workforce skills development strategy and plan and the industrial baseline study (Ministry of Energy and Mineral Development,2017). Some of the efforts include, regulating in-flow of expatriates into the country; supporting national enterprises to acquire contracts for provision of goods and services; emphasizing capacity building and enhancing the capacity of Ugandan institutions to provide training at all levels; dissemination of information on the oil and gas industry requirements such as manpower and services among others; establishing an Enterprise Enhancement Center to raise the standards of businesses and entrepreneurs; development of a National Suppliers' Database and a National Talent Register;development of standards for goods and services reserved for Ugandans among other measures; Planning for an Agriculture Support Development Programme among others (Ministry of Energy and Mineral Development,2017). It is pertinent to note that many of these efforts are being implemented, however some remain on paper for instance no enhancement center has been established and not many Ugandans receive information about the sector. This is evident by the number of companies registered on the NSD and the number of Ugandans registered on the Talent registry. Most of these are companies in Kampala where people have access to information, while those upcountry are not informed.

According to Mwakali &Byaruhanga (2018), Uganda Petroleum Institute Kigumba (UPIK) was in the process of developing and delivering certificate and diploma courses for skilled technicians in petroleum upstream operations including mechanical, electrical, and instrumentation maintenance and other disciplines required for IOCs, the National Oil company, the petroleum industry service companies and refinery operations. By 2018/19, UPIK was to start graduating approximately 224 students yearly in these disciplines. The course content for the two-year

diploma in upstream operations petroleum engineering was to include petroleum industry service companies' and exploration and production companies' field production techniques and equipment reservoir engineering including enhanced recovery, gas processing, drilling, petroleum chemistry, technical communications, petroleum engineering geosciences, petroleum safety fundamentals and geology. This is in accordance with the Skilling Uganda - BTVET Strategic Plan 2012/3-2021/22. It is however unclear whether this has been implemented and there are still complaints about the capacity of graduates from UPIK and other, BTVET institutions.

Further, from 1999, the Department of Geology and Petroleum Studies at Makerere University has been teaching a master's degree in Geology by coursework and thesis. However, the master's programme was started before the discovery of commercial petroleum and was not adequate. Therefore, the Department of Geology and Petroleum Studies in 2012, introduced a Master of Science in Petroleum Geosciences by course work and thesis which emphasizes various aspects of petroleum geology. In 2010, Makerere also commenced an undergraduate programme (Bachelor of Science in Petroleum Geosciences and Production) which takes four years (Ministry of Energy and Mineral Development,2017). These courses are taught by existing staff members and external sources from the Directorate of Petroleum and expatriates from Universities in Norway, Bergen and other universities (Mwakali &Byaruhanga,2018).However since this courses were only introduced at Makerere, students from other parts of the country who cannot afford to come to Makerere are missing out, therefore government needs to work with other institutions in different parts of the country to introduce the course at an affordable tuition across the country.

Furthermore, Mbarara University of Science and Technology under its Faculty of Applied Sciences and Technology established the Department of Energy, Mineral and Petroleum Studies to offer Bachelor of Chemical Engineering, Bachelor of Petroleum Engineering, Bachelor of Energy in Petroleum Studies and Bachelor of Mineral and Mining Engineering. Ndejje University also teaches basic engineering skills, while Makerere University Business School (MUBS) BTVET Department offers certificate, diploma, and degree programmes (Mwakali & Byaruhanga,2018). Private institutions like the Institute of Petroleum Studies Kampala have also introduced the degree in Petroleum Geosciences however being a private institution, not many

Ugandans can afford the course. At the current level of oil and gas industry development in Uganda, the industry players have advised that practical skills are more vital than undergraduate/graduate university engineering and other programmes which focus on design and are not being absorbed by the industry (Mwakali & Byaruhanga,2018).This makes sense considering that the industry baseline survey revealed significant gaps in terms of skilled craftspersons, drivers and mechanical technicians and also, the 25 listed critical industries or sectors with potential for local content participation are mostly hands-on sectors. These are; civil construction, site safety and security, road construction, bulk material, cement supplies, catering, domestic airline service, facility management, food supply, fuel wholesale, furniture manufacturing, generic waste management, general maintenance, hazardous waste management, light equipment, manpower consultancy, mechanical construction, production operations, structural/flat steel, technical consulting,transport & logistics (Goods), transportation (People),vendors, work safety products, reinforcement steel manufacturing(Ministry of Energy and Mineral Development,2017).Therefore, degree courses need to be tailored to more practical skilling.

It remains to be seen whether these interventions will equip Ugandans with the technological skills required for core oil and gas operations and encourage local firms to specialize in core exploration and production operations.

Specialization in technologically sophisticated non-core ancillary operations

The National Content Regulations lists fifteen categories of goods and services reserved or ringfenced for Ugandan suppliers namely; transportation, security, foods and beverages, hotel accommodation and catering, human resource management, office supplies, fuel supply, land surveying, clearing and forwarding, crane hire, locally available construction materials, civil works,environment studies and impact assessments,communications and information technology services,waste management, (National Content Regulations,2016).

In Uganda, even for non-core oil and gas operations like transportation of materials, Ugandan firms have been priced out because of the requirement for heavy and specialized equipment (Matsiko,2017). Further, there has not been enough work in the oil and gas supply chain in terms of capital absorption to enable the local suppliers in the support sector to diversify their portfolios hence with the highly specialized equipment requirements local firms are incapacitated (Matsiko, 2017). Ritwika (2018) Surveyed the NSD on 28th February to determine the number of local firms among the top 5% most productive firms and found that foreign suppliers outnumbered locals in the manufacturing and mining sectors and dominated sub-sectors that are more technologically complex like manufacture of electrical equipment, special-purpose machines and chemical products, confirming that local firms have limited capabilities.

To close this gap, under the Skilling Uganda - BTVET Strategic Plan 2012/3-2021/22, UPIK developed certificate and diploma courses for skilled technicians in downstream operations, mechanical, electrical and instrumentation maintenance as well as other disciplines that may be required for IOCs, NOC and petroleum industry service companies and refinery operations. These was to start in 2018 alongside the upstream courses. The two-year diploma either in chemical or engineering technology is to cover most downstream equipment or processes which turn raw petroleum resources into final products, gas processing, refining and petroleum production programmes among others. Other BTVET institutions other than UPIK like Makerere Business School BTVET Department and Nakawa Vocational Training Institute are equally delivering courses (Mwakali & Byaruhanga,2018).

Also, the Norwegian Petroleum Academy (NPA) launched training programs at Makerere University aimed at beefing up services to support the oil and gas industry when production starts.

In 2015, Makerere University in association with New College at Nottingham University, United Kingdom, established the Cormac Vocational Training Institute to produce as many as 2000 artisans and craftsmen annually (Mwakali &Byaruhanga,2018). This is good however it should be modelled in other government Universities in various regions of the country in order to ensure inclusiveness.

With these interventions it is expected that the support sectors will be able to supply the industry to the required standards. However, these skills need to be absorbed in the various support sectors servicing the industry otherwise the training will be in vain. Also, many support sectors are still not being engaged in the sector hence are not taking advantage of the opportunities in the ringfenced sectors.

Technological advancement

It is widely advised that third world oil and gas countries like Uganda should develop their technological capacities however their abilities are usually limited by their low levels of absorption of technology (Kumar et al.,1999). Notwithstanding that, the capacity of local companies is key for their competiveness in the industry (Escribano et al.,2009). This is because the absorption capacity of local companies plays a big role in transfer of technology.

Technological adoption is essential for oil and gas producers because inputs from the host country like Uganda may not be what the industry equipment are designed for hence it is important for the host country to be able to maintain the equipment and operations. However, the ability of local firms to absorb advanced technology depends on their organizational and technical capabilities (Cusumano & Elenkuv,1994). In order to improve local skills and capabilities and narrow the technological gap between local companies and foreign companies, there must be an industrial infrastructure to build on (INTSOK,2003).

In Uganda however, while there has been some level of intervention in terms of capacity building, there is little information on whether the government and industry players have taken any initiatives to support local technological advancement. This means some of these skills may be rendered redundant at some point. Additionally, there has not been sufficient investment in training

institutions for development of technological skills to the levels required by the industry, both for core and non-core oil and gas operations.

2.4 Education, skills and expertise development.

Existing and emerging skills in core oil and gas operations and non-core operations

According to Industrial Base Line Survey findings, the Lake Albert Basin Development projects will generate thousands of direct jobs in Uganda, with a peak of about 13,000 workers in the construction phase and a plateau at 3,000 people in the operation phase. Out of the total manpower required 15% are engineers and managers, 60% are technicians and craftsmen and 25% are people without any educational background ('unskilled'). Therefore, that education focus should be on civil construction, electrical and mechanical fields. Further that the sector would also generate 100,000 to 150,000 indirect jobs. Out of the total new jobs, 80% will be short-term for the peak of construction and will have to be transferred to other sectors of the industry or to the neighbouring countries to remain sustainable (CNOOC, Tullow & Total,2013).

Oil and gas producing nations usually use several policies to improve the quality and quantity of local labour force. These policies are designed to increase the relative or absolute number of locals employed in the industry. Skills enhancement can also be through policies that are meant for the development of managerial and higher technical skills for the national labour force (Matsiko, 2017). However, it is not enough to have policies, these policies must be implemented, in order to achieve the intent for which they are issued, otherwise they will be in vain.

It cannot be overemphasized that Ugandans will only benefit from local content if their capacity to contribute to the skills' pool in the oil and gas industry is harnessed. The training should expand beyond the straight jacket extractives training to include support industries which will be required at various stages of oil and gas production (Matsiko, 2017). This position seems to be the most appropriate in Uganda's context because in addition to limited capabilities in the oil and gas sector, the country faces capacity limitations in the support sectors as well.

Objective 7 of the National Oil and Gas policy of Uganda provides for the need to ensure maximum national participation in the oil and gas industry. Objective 8 provides for the need to support strategies for development and maintaining of national expertise in the oil and gas sector. Some of the strategies include: promoting participation of the state in production sharing agreements to allow the state to understand the basis for decisions in exploration, development and production and acquiring of skills for commercial management of the sector; promoting public private partnerships whose benefits outweigh costs; encouraging civil society participation in the building of a productive and vibrant sector; promoting employment of Ugandans in the sector; promoting the transfer of skills and technology in the industry; identifying required skills for the sector and planning for their development through formal and industrial training; using oil and gas activities to support provision of necessary training; providing appropriate training to government personnel in relevant fields to allow them have professional dialogue with oil companies; and broaden the education curricula to prepare the necessary workforce for the industry. The government has made strides in implementing a lot of these strategies however, when it comes to skilling and technology, a lot more still has to be done by the government to close the skills gap.

Further, the upstream and midstream Acts and their regulations require prospective licensees to provide a plan for training and employing Ugandans in the sector. These laws require oil companies to submit to the Petroleum Authority (PAU) a detailed plan for recruitment and training of Ugandans every year. The law requires the details of activity training requirements and attempts to streamline quotas for inclusion of citizens at different levels of the licensees' operations (Reg 17 of the National Content Regulations 2016). Since this information has not been shared with the public, it seems unclear how far the IOCs have implemented this and the extent of enforcement of compliance by national oil and gas institutions. It remains to be seen if after Uganda becoming a member of the Extractives Industry Transparency Initiative (EITI), this information will be made public.

Implementation of these training requirements is however likely to be problematic as the requirements require licensees to train their staff without considering the continuity of day to day running of business. Further the training requirements suggest that licensees can recruit personnel without relevant skills then train and deploy them. This places technical departments of the sector

at the risk of being turned into human resource laboratories in order to keep up with national content requirements (Matsiko,2017).

Heum et al. (2011) suggests that the collaboration between the government and major industry players should be focused on how to involve local companies with local labour in the industry. Further that attention must be placed on facilitating their participation in domestic petroleum activities in the sector without compromising quality, health and safety standard. This is definitely an important consideration since the oil sector does not usually compromise on standards.

Government has taken some initiatives to enhance capacity of local firms for example through the BTVET Policy and Strategic Plan 2011-2020, government sought to enhance capacity of Ugandans for local content participation (Gwayaka,2014). Further, Uganda's Vision 2025 and the National Development Plan (NDP) 2010/11 – 2014/15 identified gaps in the BTVET skills and on the basis of this, the BTVET (2012/3 to 2021/22) Strategic Plan for Skilling Uganda was developed and is being implemented by different BTVET institutions (Mwakali & Byaruhanga, 2018). The 2021/22 plan incorporates activities of the BTVET Department and Department of Information Technology (DIT) under the Ministry of Education, Science, Technology and Sports (MoESTS) and its strategies are far beyond the traditional formal BTVET system under the education sector, to include development interests of other sectors like agriculture, health, trade, tourism and industry. The Strategic Plan provides for establishment of a Skills Development Authority (SDA) and the BTVET system will be transformed from an educational sub-sector into a comprehensive system of skills enhancement for employment, increased productivity, and growth to create employable skills and competencies which are relevant in the labour market instead of educational certificates (Mwakali & Byaruhanga,2018).

Many private sector Apex Institutions have also responded to various capacity building needs by educating local businesses on best practices, business skills, calculating costs, accounting and certification of skills (Byaruhanga et al.,2011). The IOCs namely Tullow, Total and CNOOC, also took the lead in undertaking interventions to promote local content by focusing on building a dynamic supplier base which can take part in the supply chain of Oil and Gas. This is through their Corporate Social Responsibility policies and strategies and in compliance with local content obligations. The interventions include sponsorship for BTVET, graduate and postgraduate

training, scholarships to Ugandans from all backgrounds for training locally and abroad in order to build the capacity of relevant government departments to handle oil and gas issues.

However recent studies still indicate gaps in the capacity of local companies for local content participation. Matsiko (2017) argues that despite the government's intervention to train local Ugandans in oil and gas activities since 1986, there has been very little absorption of these skillsets into the structures of foreign companies, which he attributes to the fact that the majority of prospecting work has been done outside the context of local content. Further that the low absorption is also attributed to the fact that it took Uganda a while to establish a strong national oil company operating independently with its own financial structures to enable it effectively harness local skills.

Mwakali & Byaruhanga (2018) suggest that the education system in Uganda is not practically modelled and the BTVET system as currently oriented does not provide the relevant present and future skillsets of the economy. They attribute this to the fact that most BTVET institutions do not provide students with the necessary skillsets as the training constitutes of more theory than hands-on training. They further aver that no policy has been issued to revise the curriculum and the attempts to review it by the Curriculum Development Centre and the former Uganda Polytechnic Kyambogo, did not yield results as no changes were made and the institutions continue to teach based on their outdated curricula. They however note that the government has a twofold strategy to improve the BTVET system, namely through the skilling Uganda Programme and developing the Uganda Petroleum Institute Kigumba (UPIK) as a benchmark for other vocational institutes.

In regard to UPIK, govt passed the UPIK Institutional Development Plan(IDP) 2014/2019 which outlined strategies to address the institution's weaknesses. Following that, UPIK established relations with Rogaland Training and Education Center (RKK) and Stavanger Offshore Technical College of Norway to support them in curriculum, management and staff skills development, to offer two-year diplomas in petroleum studies in drilling, electrical installation, instrumentation and welding. Further, upon completion of the diploma at UPIK, students are to undertake an additional six months' apprenticeship programme at Kenson School of Production Technology in Trinidad and Tobago which equips graduates with City and Guilds of London international vocational

qualification in electrical installation, instrumentation, welding and pipe fitting and fabrication (Mwakali & Byaruhanga,2018). Further, Mwakali & Byaruhanga (2018) suggest that UPIK should also support other BTVET institutions to deliver basic trainings in the same disciplines they teach. Lastly that UPIK was in the process of developing and delivering certificate and diploma courses for skilled technicians in petroleum upstream and downstream operations in mechanical, electrical and instrumentation maintenance and other disciplines. As to how far these strategies have been implemented remains unclear because there have not been any recent publications on the status of UPIK following this study of 2018.In regard to the Uganda Skilling Programme, Mwakali & Byaruhanga (2018) suggest that the oil and gas sector will create jobs in the support sector which supply low risk low technology and high risk low technology to the sector and the programme is intended to skill Ugandans through various means including formal training, informal skills development, private skills education and training institutions,internship training, corporate investment in employee skills development and Private sector associations training programmes. Some of these skilling options are being implemented however it is not clear how effective these trainings are and the criteria for inclusion of Ugandans.

Ritwika (2018) further noted that while there has been concerted efforts to address policy gaps as well as gaps on performance reporting, no interventions had been made towards addressing capability development and supplier credit-facilitation gaps. In this regard the study recommended that it was critical for the government to expedite its plans for an Industry Enhancement Centre to offer training, matching and financial advisory services to local suppliers.

Collaboration with foreign firms

Industrial development is a learning process where capabilities and capacities grow through solving challenging tasks in collaboration with leading international companies (Heum et al.,2011).

Local policies should encourage local companies to collaborate with foreign firms as this creates positive dynamics which can have a positive influence on the development of local firms (Nordas,2003). In Uganda, the local content laws give priority to Ugandan goods and services however where they are unavailable or below the required standards, the laws allow Joint ventures with a Ugandan company holding at least 48% shareholding to supply the goods and services (S.125 PEDP Act,2013; Reg 9 of the PEDP NC Regs, 2016; S.53 PRCTMS Act, 2013; Reg 10(1) PRCTMS NC Regs, 2016). To promote this collaboration, Klueh et al. (2007) recommends establishing a public outreach and analysis office to; develop a registry of competent and qualified suppliers; advise citizens and local firms on the possibility of joint ventures and other ways of cooperating with foreign firms; support programmes for capacity building, training and R&D. From my observation of the current situation, it appears that most companies that are collaborating with foreign firms are doing it privately. Collaboration through government intervention would work best and offer far better skills development since it is more intentional than private arrangements which may not prioritize skilling but profit making.

2.5 Gaps in the Literature

From the literature reviewed in this chapter, the study identified a few gaps, notably; the literature consists mostly of studies conducted upto 2018 and no recent studies have been published to reflect the current situation, possibly due to covid 19. Therefore, findings from earlier studies are similar to the more recent ones indicated here. Also from the literature, there was not much information on the status of technological advancement in Uganda's oil and gas sector as most of the studies focused on skilling. Further some of the studies are based on secondary and not primary data and focused more on regulatory gaps instead of capability gaps.

2.6 The law relating to Local Content in Uganda

Since Uganda announced the existence of commercially viable deposits of oil and gas in 2006, the government has made a lot of effort in regulating the sub-sector to ensure maximization of the benefits from the oil and gas resources. Local content is one way in which the government envisages to create maximum value from the resources, through policy requirements. The achievement of local content is directly dependent on the legal framework in place. In recognizing this need, the government of Uganda has put in place a number of policies, legislations and regulations structured to allow maximum opportunities for Ugandan citizens and enterprises in order to promote local content.

The basis for local content is the Constitution of Uganda (1995), which places control of petroleum and mineral resources in the hands of the government on behalf of the people of Uganda (Article 244). The oil and gas sub-sector is guided by the National Oil and Gas Policy (2008), whose goal is to utilize the oil and gas resources to contribute to the achievement of early poverty eradication in addition to creating lasting value to the society. The Policy emphasizes the implementation of national participation in objectives 7 and 8. Objective 7 aims at ensuring optimum national participation through strategies like promoting national participation in PSAs, promoting use of local materials, goods, services and enterprises and employing Ugandans in the sector. Objective 8 aims to support, develop and maintain national expertise through strategies like provision of goods and services by Ugandans and broadening the education curricular.

In addition, the National Local Content policy 2017 lays down guidelines for local content development which are elaborated in the petroleum laws and regulations including the Petroleum (Exploration, Development and Production) Act No.3/2013; the Petroleum (Refining, Conversion Transmission and Midstream Storage) Act No.4/2013(PRCTMS Act);the National Local Content Act 2020; the Petroleum Exploration, Development and Production Regulations 2016;the Petroleum Exploration, Development and Production, National Content Regulations 2016 (PEDP NC Reg); the Petroleum Refining, Conversion Transmission and Midstream Storage Regulations 2016; and the Petroleum Refining, Conversion Transmission and Midstream Storage National Content Regulations 2016 (PRCTMS NC Reg).

These regulations are supported by the binding provisions of the Production Sharing Agreements (PSAs) signed by the government and Licensees. The PSAs provide for local purchases, employment and training of citizens in addition payment of annual training fees to the government. According to Ritwika (2018), the challenge with the PSAs is that they have not been publicly made available to the sector operators.

The PEDP Act (2013) and the PRCTMS Act (2013) provide for the institutional framework for the governance of the oil and gas sub-sector. Under these laws the Directorate of Petroleum under the Ministry of Energy and Mineral Development (MEMD) is responsible for formulating policies and Licensing; the Petroleum Authority of Uganda (PAU) established in 2013 is the sector regulator charged with monitoring compliance with industry requirements. The Uganda National Oil Company (UNOC) also established in 2013 manages the State's commercial interest in oil and gas. PAU and the directorate of petroleum both have National Content Units, the one of PAU leads on monitoring compliance while the directorate's leads on formulation of policy, training and business development. According to Ritwika (2018), industry interviews have revealed that these two units sometimes overlap in their local content functions and it is necessary to clarify on their functions.

The local content policies, laws, and regulations promote local content by stipulating local content requirements and these are generally prescribed in four broad categories namely;

2.6.1 Local Content Plans

The Local content regulations require companies prospecting, exploring, developing or producing oil and gas to submit to PAU within 12 months of licensing, their local plans (LCPs),detailing prioritization of goods and services locally available, subject to quality standards and timeline requirements (Reg 8 PEDP NC Regs 2016; Reg 8 PRCTMS NC Regs,2016);(Kakembo,2020); (Ritwika, 2018).Under these requirements, PAU would only approve a local content plan if it satisfies the conditions in the regulations.

2.6.2 Preferential treatment of Goods and services

Local content also requires Licensees to give first priority to Ugandan goods and services unless they are unavailable or below required standards (S.125 PEDP Act; Reg 9 of the PEDP NC Regs; S.53 PRCTMS Act; Reg 10(1) PRCTMS NC Regs; Kakembo,2020; Ritwika,2018).

Incase local goods and services are unavailable, a joint venture (JV) with a Ugandan company holding at least 48% shares in the Joint Venture can supply with PAU's approval of the Ugandan company, based on financial and technical competence, experience and active participation (Reg 9(2-4) PEDP NC Regs; Reg 10(2-3) PRCTMS NC Regs).

Where Ugandan companies and citizens cannot meet the required quality or competence a licensee may use another company with permission from PAU (Reg 9 (-7) PEDP NC Regs; Reg 10(4) PRCTMS NC Regs).

The definition of a local company under the regulations is not a company owned by a majority of Ugandan citizens but a company which is incorporated in Uganda, employs 70% Ugandan citizens uses local raw materials and is approved by PAU (PEDP NC Regs). There are some goods and services whose supply has been ring fenced and reserved exclusively for Ugandan companies and citizens. These include; transportation, security, foods and beverages, accommodation and catering, human resource management, office supplies, fuel supply, land surveying, clearing and forwarding, crane hire, local construction materials, civil works, local drilling and production materials, environmental studies and impact assessment, communications and information technology and waste management (Reg 11(1-4) PEDP NC Regs; Reg 10 (4) PRCTMS NC Regs; Kakembo, 2020). To this end licensee may develop a supplier development plan to support local companies and citizens to supply goods and services which are of required standards. And where Ugandan companies and citizens do not meet the required standards for ringfenced goods and services a licensee may procure from another company (Reg 10 (4) PRCTMS NC Regs).

The regulations also require vendors and suppliers to licensees and sub-contractors to be registered on the National Supplier Database established by PAU to enhance their linkages. PAU and licensees are mandated to develop a qualification criterion and undertake qualification annually.

Further, licensees are to establish tender offices for dissemination of information (Reg 12-13 PEDP NC regs; Reg 30 PRCTMS NC Regs).

The local content regulations further stipulate local content requirements in the procurement process which mandate the inclusion of national content in the bid evaluation criteria including that contracts valued in excess of 1,000,000 USD to include a labour clause making it mandatory to use Ugandan labour in specific categories (Reg 12-13 PEDP NC Regs; Reg 12-13 PRCTMS NC Regs).

2.6.3 Training and Employment

From the beginning of operations, licensees are required to employ at least 30% Ugandans in management roles and within 5 years increase progressively to 70%; 40% in technical positions and increase to 60% in 5 years and 90% in 10 years; and at least 95% of the support staff must be Ugandans. This explains why work permits for expatriates in the sector must be recommended by PAU. Contractors and subcontractors to the licensees are also mandated to employ a designated number of Ugandans as PAU may prescribe to execute contracts in excess of $1 million. These are to be trained in accordance with local content plans.

2.6.4 Transfer of Technology

Licensees are also mandated to submit to the Petroleum Authority of Uganda, their annual plans detailing their plans for transfer of technology, skills and know-how; annual plans of accomplishments; encouraging joint ventures; and organize in-country events to connect Ugandan companies, cities and international companies (S.23 PEDP NC Regs and PRCTMS Regs).

2.6.5 Reporting Requirements

Licensees must also submit annual performance reports indicating: national expenditure levels; employment of Ugandans or foreigners based on hours or days worked; training and employment of Ugandans; procurement both local and imported goods; details of Ugandan companies, citizens and registered entities contracted; technological transfer, R& D and trainings conducted (Reg 25 PEDP NC Regs; Reg 25 PRCTMS NC Regs).

According to Matsiko (2017), the PEDP NC Regulations have tried to fill the gaps left by the PEDP Act 2013, PRCTMS Act 2013 and the PSAs by defining what a local company and registered entity is, and what technological transfer and active local participation means. They also elaborate on measures for monitoring local content; the National Supplier Database; plans for preferential procurement; unbundling of transactions; bid criteria including national content; training and succession plans. Further, that ring fencing certain services for Ugandan companies and citizens has eliminated competition from international investors.

In conclusion, the various literature reviewed confirm that earlier studies have been conducted on the relationship between local capability and local content participation. The literature agree that local capability is a key factor affecting local participation in the oil and gas industry and that it plays a significant role in that regard. Further they acknowledge that Uganda as a country faces capacity gaps which is affecting local participation in the sector. However, there are gaps in the literature which make this study pertinent for instance, the most recent studies are as of 2018, since no recent studies have been published by government, development partners and scholars, most of the studies are based on secondary data, focus more on regulatory gaps and do not explore the local capability gaps in depth.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter generally describes the processes and procedures through which the study was conducted, for each specific research objective and specifically describes the rationale for the choice and application of the specific procedures used in collecting and analyzing the data in order to gain a better understanding of the research problem. It encompasses the study design, study population size and sampling, data collection methods, data quality control, ethical considerations, data management and analysis, and the plan for dissemination of findings.

3.2 Study area

The study was conducted in Kampala, Uganda.

3.3 Research design

The study was conducted using a cross-sectional case study research design. A cross-sectional design involves collecting data at a single point from a cross-section of respondents. The study adopted this design because it is cheap and simple since it allows collection of data from a cross-section of people at a single point in time (Amin,2005). Since this is an academic research, the study found it most suitable to investigate and get accurate and better understanding of the capability of local companies in Kampala to participate in the oil and gas industry, since local content is a contemporary phenomenon.

3.4 Research method

The study used a mixed method approach involving both quantitative and qualitative methods. This is because this approach makes the data and study findings more comprehensive as the strengths of one method can be used to overcome the weaknesses of another method. Thus, this resulted into a complete study of the research problem from different perspectives and offered a

more complete picture of the phenomena. Above all, a mixed method approach made it validly reliable for the researcher to generalize findings from the qualitative research.

The qualitative method primarily helped to gain a deeper understanding of the underlying reasons, experience and opinions of local firms on their capability to contribute to local content development and this played a significant role in squarely discerning the challenges in implementing the policy. On the other hand, the quantitative method was very useful in generating numerical data that helped to quantify and principally establish the magnitude of the problem under investigation.

3.5 Research study population

The study population consisted of local companies in Kampala. The target group of respondents included managers, supervisors, heads of departments and employees of local companies engaged in core oil and gas operations and those engaged in non-core ancilliary operations (including those that have never transacted with the oil and gas industry). The study made use of the National Supplier Database and the internet to select the companies. However, it is important to emphasize that the information from the study population was collected from accessible respondents and the choice of divergent sources was to emphasize the principle of triangulation and to ensure comprehensiveness of the data.

3.6 Sampling techniques

3.6.1 Sample size determination

The study used a stratified sampling technique to ensure that the various categories of the population are properly captured. The sample population of firms was drawn from data on the National Supplier Database (NSD) and some from the internet. The sample population included firms involved in core oil and gas operations and those involved in non-core ancilliary oil and gas operations, from different sectors. The sample population drawn from the NSD and internet was 245 companies in total. Using this population, a sample size was determined using the formular by Yamane (1967), as follows:

$n = N/1+ N (e)^2$

Where:

n = Sample size in the study

N = Population size (total population of local companies=245)

e^2 = the level of precision/sampling error (taking e= 0.05)

In computing the sample size, a 95% confidence level and a 5% precision level is assumed.

$n=245/1+245\ (0.05)^2$

n=150

3.6.2 Sampling methods

The study used a stratified random sampling technique. The study divided the study population into two stratas of companies that are involved core oil and gas operations and those involved in non-core ancilliary oil and gas operations. After creating the stratas, the study adopted a simple random sampling method to select respondents from the two different stratas. Questionnaires and interviews were then administered to the respondents to collect data. The study used this two staged sampling technique to ensure that views, opinions and ideas are collected from all the various categories of the population in the study, thereby ensuring representativeness of the sample and reducing sampling errors.

3.7 Data Collection Sources

The study entirely collected data from primary sources by administering questionnaires and individual key informant interviews directly with the respondents.

3.8 Data Collection Tools

3.8.1 Questionnaire

The study used a structured questionnaire as one of the tools for data collection, to aid the collection of quantitative data. The study used a multiple response and Yes/No type of questions in the questionnaire and ensured that the questions are standardized so that all respondents are asked exactly the same questions in the same order. Structured questionnaires allow the respondents to easily understand and answer the questions correctly and it is an effective means of measuring the attitudes, opinions and perception of relatively large numbers of subjects more cheaply and quickly compared to other methods.

3.8.2 Interview

The study also conducted key informant interviews with local firms in Kampala. This was done with the aid of an interview guide as a tool to collect information from people who were considered highly informed and knowledgeable about the problem. The interview was administered to two categories of respondents. Firstly, the key informants who constituted managers and employees of local firms engaged in core exploration and production operations secondly, managers and employees of local firms engaged in non-core ancilliary operations. All this aimed at ensuring that comprehensive data about the study problem is captured.

3.9 Data Quality Control

The study adopted relevant data quality control techniques and tested the instruments to ensure that data collected is valid and reliable.

3.9.1 Validity

Validity is the extent to which an instrument measures what it is supposed to measure. The study outlined several of the study variable attributes and thereafter prioritized the most relevant constructs of the study variables under investigation. In this study, face and content validity of the information collected and of the tools and instruments used in collecting the information was

guaranteed by ensuring that the questions in both the questionnaire and interview guide were aligned with the research questions. The two instruments were checked and approved by the study supervisor. Then the tools were pretested and some vague and ambiguous questions were identified and correctly aligned to the research questions to ensure solicitation of the correct information necessary to answer the research questions.

3.9.2 Reliability

The study used the test-retest method for establishing reliability of the questionnaire used to collect the study data. Amin (2005) suggests that a pre-test is used to measure the extent to which an instrument produces consistent results when it is repeatedly administered to the same group of individuals under the same conditions. The test -retest method was used because the questionnaire used multiple-choice type of unordered two to five options and Yes/No questions, which are categorical in nature. This made the use of the **Cronbach's alpha** inapplicable as it suits rated or scaled questions like the **Likert Scale**. The use of test-retest method was done by administering fifteen questionnaires to the same respondents twice after a period of 7 days' interval and thereafter the results were compared.

There was a consistent result from the two successive pretests with very minimal variations in the findings. After obtaining the findings of the pretests, the questions that indicated variations in response were corrected before data collection took place. No statistical test was performed to establish reliability statistically. This is because the study variables were measured using the nominal scale, and nominal scales of measurement cannot perform statistical correlation analysis to establish reliability (Babbie, 2013).

3.10 Data management

The study followed all the ethical considerations involved in data management during each session of data collection, after which the used questionnaires and interview guides were collected and kept in a safe place so that no data gets lost in the process of information collection. All this was possible through careful planning and timely collection of data according to planned schedules.

The research assistants were also carefully selected and trained to support the process of data collection.

3.11 Data analysis

The study adopted both quantitative and qualitative methods of analysis of data.

3.11.1 Quantitative Analysis

Quantitative analysis is the analysis of data which can be measured numerically as well as categorical data and it makes use of mathematical and statistical models for measurement of data. The study adopted descriptive statistics in form of frequency, percentage and mean to analyze its quantitative data. The advantage of descriptive statistics is that it gives useful information into the data set and helps to spot potential errors which can be corrected, and also helps to determine which inferential methods to use, where a study intends to use inferential statistics. The disadvantage is that conclusions cannot be made on the entire population but only on the sample (Gradcoach,2021).

3.11.2 Qualitative Analysis

Qualitative Analysis is the analysis of data which is non numerical and is not measured using a fixed scale or complex statistics. This study used both Content and Thematic Analyses to analyze its qualitative data. Using Content Analysis, data was cleaned, coded and entered into the statistical data analysis package known as the Statistics Package for Social Sciences (SPSS) and using the SPSS packages, the study run a series of descriptive analyses to obtain percentage, frequency and mean. Using Thematic Analysis data was grouped into themes that frequently came up, after which a statistical analysis was also conducted using SPSS. The advantage of using content analysis is that it provides abit of qualitative thinking within qualitative. The disadvantage is that it requires a lot of time and since it focuses on both qualitative and quantitative measurements, it is blamed for losing focus. The Advantage of Thematic Analysis on the other hand is that it helps to understand views and opinions from large data sets and the disadvantage is that research questions may change and data may be re-reviewed (GradCoach, 2021)

3.12 Measurement of data and scales of measurement

3.12.1 Measurements of variables

In this study, the variables were measured by identifying their key attributes and making meaning out of them in relation to the study purpose. The study identified several attributes of each key variable (competence of local companies, technological capacity of local companies, and education, skills and expertise development), thereafter the several attributes of each variables was prioritized with the most significant attributes that define the three key variables in the study. For instance, the independent variable of competence of local companies was measured using (familiarity with tender and bidding processes; size of investment capital and compliance with standards) and this was studied in relation to the dependent variable of local content development. The independent variable of technological capacity of local companies was measured using the attributes of (specialization in technologically sophisticated core exploration and production operations; specialization in technologically sophisticated non-core ancilliary operations and use of advanced technology). While the independent variable of education, skills and expertise development was measured using the attributes of (existing and emerging supplier capabilities in core exploration and production activities; existing and emerging supplier capabilities in non-core ancilliary operations and collaboration with foreign firms). The measurement of the variables above is clearly explained in chapter one in the conceptual framework.

3.12.2 Scales of measurement

The three key study variables were measured at the nominal scale. The nominal scale was used to categorize variables and differentiate data. This is evident from the nature of the questions in the questionnaire, where we used YES/NO and multiple answer choice questions without any ordered sequence, as well as the open-ended questions in the questionnaire and interview guide. Hence even the quantitative data was non numerical but categorical. Babbie (2013), explains that where there is a need to change the scales of measurement of variables for a particular focused analysis, then the researcher is at liberty to manipulate the scale to meet the need for the specific analysis. However, in this study we used only descriptive statistics, no inferential statistics was used for purposes of establishing relationships between and among the variables in order to answer the

objectives of this study. Therefore, there was no need to manipulate and convert the nominal variables into ratio variables for the statistical analysis that was performed in chapter four of this study report.

3.13 Ethical consideration

The study was conducted with close supervision by the research supervisor appointed by the University Faculty and the proposal and tools for data collection were approved by the said supervisor. The proposal for the study was also defended before the faculty panel and approved by the University before the study was carried out. To the respondents, we disclosed the purpose of the study and also explained the risks and benefits of participating in the study.

3.14 Methodological limitations

The possible limitations to the methodology may include;

Since the study used only descriptive statistics to present the quantitative data, the conclusions may be limited to only the study sample and may not be drawn on the entire population of local companies in Uganda. This is because no inferential statistics was presented for purposes of establishing relationships between or among the variables. However, the main focus of the study was to determine capability of the companies studied.

The sample size may also be insufficient to represent the entire population of local companies in Kampala, since there are thousands of them. However, this was unavoidable since studying the entire population of local companies in Kampala would require a substantial amount of funding which was not available for this academic research which is not sponsored.

Further, due to the use of unstructured interview guides, there is a possibility of subjectivity of the respondents. This is because the qualitative data was based on self-reported data from opinions, experience and behaviors of respondents. However, the study triangulated the information provided by cross checking with the views of other respondents and information from other sources. This was coupled with the challenge of unwillingness of respondents to participate in the study.

Lastly since qualitative tools like interview guides collect large datasets, it is possible that during content and thematic analyses, some relevant codes or themes may have been overlooked due to the large volumes of data. However, to overcome this the study ensured that all the key themes and codes were captured.

In conclusion, this chapter presented the methods through which the study was conducted, for each specific research objective and explained why the specific methods were chosen. It detailed the study design, research methods, study population size and sampling, data collection methods, data quality control methods, ethical considerations, data management and analysis, and the methodological limitations.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.1 Introduction

This chapter contains the presentation, analysis and interpretation of the findings on each specific objective on the capability of local companies to participate in the oil and gas industry in Uganda. The findings chronologically follow the three specific objectives stated in Chapter one namely: to examine the gaps in the competence of local companies hindering local content participation in the oil and gas industry in Uganda, to explore the limitations in technological capacity and know-how of local companies affecting local content participation in the oil and gas industry in Uganda and to establish the gaps in education, skills and expertise development of local companies affecting local content participation in the oil and gas industry in Uganda. Findings from the surveys, interviews are used to demonstrate the capability of local companies to foster local participation in the oil and gas industry. The presentation of findings is preceded by a discussion of the response rate and the background characteristics of the respondents. The information on the background characteristics of the study respondents was obtained from the background section of the questionnaires and interview guides. The results are presented using descriptive statistics in form of percentage, frequency and mean for each of the study objectives.

The quantitative results are presented and interpreted based on the quantitative analysis of the independent and dependent study variables using descriptive statistics. The study used descriptive statistics because the data obtained from the questionnaires was categorical and non-numerical, hence it was measured at the nominal scale which made descriptive statistics the most suitable for interpreting the study findings. The qualitative results are also presented and interpreted based on the qualitative analysis of the data inform of descriptive statistics concurrently with the quantitative data for the same reasons. The study used descriptive statistics because the study objectives were not intended to establish any relationships between or among the study variables which made inferential statistics inform of correlation or regression analyses unnecessary. The chapter largely presents, analyzes and interprets results from both the data collection sources concurrently in order

to give a comparative perspective in demonstrating how the capability of local companies affects local content participation in the oil and gas industry.

4.2 Response Rate

Kviz (1977) defines response rate as the proportion of all sample members who are eligible to participate in the survey from whom a complete and usable set of data is collected. It is therefore the percentage of the total number of usable questionnaires/interviews returned by the respondents. There is no standard response rate for all studies and therefore different studies and bodies have different standards. Baruch (1999) suggests that for academic studies, it is sufficient if any extreme response rate is explained by the scholar. For most surveys, a response rate of 50 percent or higher is adequate, one of 60 percent or higher is good and one of more than 70 percent is very good (Ezeani, 2009). The internationally accepted response rate for survey studies is a minimum of 50 percent however a high response rate from a small random sample is preferable to a low response rate from a large sample (Evans,1991). In any given study, there will always be non-respondents. According to Kothari (2004) a study should explain the active response rate, which it differentiates from the total response rate.

The response rate is computed by dividing the number of completed interviews/questionnaires by the number of eligible sample members, expressed as RR= C/E (Kviz,1977). Kothari (2004) further recommends that the ineligible respondents and those who were unreachable should be excluded in computing the active response rate. In this study, the total number of expected respondents was 150 and a total of 120 respondents actually returned usable survey instruments. The response rate for each of the study objectives was computed based on the above formula, and found to be 80%, which is higher than the recommended 50 percent.

In terms of representativeness of the sample, Ragin (2011) notes that it is important that a probability sample represents the population and a perfectly representative sample is one which exactly represents the population from which it is taken.

4.3 Background Characteristics

This section presents the demographic attributes of the respondents, namely; age, gender, education, working experience and company registration status. This information was considered necessary for purposes of categorising the respondents to ensure representativeness of ideas on local content capability.

4.4 Gender of the Respondents

The study analysed the gender distribution of the respondents using frequency and percentage distribution. Gender is a statistical distribution of how many males or females are there in a population (Ezeani,2009). Gender is a key variable in any given circumstance and it is affected variously by different social and economic phenomena. The gender distribution of the respondents for all the study objectives was investigated, and the related data is presented in Table 4.1.

Table 4.1: Gender distribution of the respondents.

Gender	**Frequency**	**Percentage**
Female	55	45
Male	65	55
Total	**120**	**100**

Source: Primary Data (2021) *N=120*

The findings in Table 4.1 above show that for all the study objectives, the majority of the respondents constituting (55%) were male and the female respondents constituted (45%). These results indicate a small variation in gender representation between the male and female respondents, with a difference of 10%. There were more male participants than female in this survey and this may be attributed to the sampling technique used in the selection of respondents, or the fact that local companies employ more male employees than females. The significance of balancing both male and female respondents is to ensure that the perceptions and experiences of both genders are captured. Since the variation in the representation of the two sexes was not significant, both males and females provided their views which are representative of the two

gender groups. Although the distribution of males was more than that of females, the study indicates that there was equitable participation of both men and women. This enabled us to interact and discuss different views under each of the study objectives with both men and women at different levels. Gender representativeness was an important aspect of the study because the attitude of women towards the capability of local companies for local content participation in the oil and gas industry was found to vary in some ways from that of men.

4.5 Age of the Respondents

The study examined the age distribution of the respondents for all the study objectives using frequency and percentage distribution. The results obtained are presented in the table 4.2.

Table 4.2: Age distribution of the respondents.

Age in years	**Frequency**	**Percentage**
20-29	15	12.5
30-39	45	37.5
40-49	50	41.7
50 and above	10	8.3
Total	**120**	**100**

Source: Primary Data (2021) *N=120*

The study examined the age of the respondents according to their age groups. The results in the above table, indicate that the respondents who participated in the study, aged between 20-29 were 15, constituting (12.5%); those between the age of 30-39 years were 45, constituting 37.5%; those between the age of 40-49 years were 50 constituting 41.7% and those who were 50 years and above were 10, constituting 8.3%. The representation of the different age groups was important for the study because differences in age indicate differences in opinions and it helped to provide varied opinions about the study problem.

Important to emphasize is that all the respondents were aged between 20 and 70 years. Majority of the respondents were between the age of 30-49 years hence were mature enough and competent

to analyze issues related to local content in the oil and gas industry. The respondents therefore adequately responded to the questions asked and their responses were sound, relevant and enabled generation of adequate data.

4.6 Level of Education and Job Experience of the respondents

The study also looked at the distribution of the level of education and job experience of the respondents for all the study objectives using frequency and percentage distribution. The educational qualifications of the study respondents were ascertained to establish whether there were substantial differences in the responses on the capability of local companies for local content participation in the oil and gas industry. On the other hand, the job experience of the respondents who participated in the study was also analyzed to ascertain the skills and experience of the respondents and the findings for both are summarized in Table 4.3.

Table 4.3: Distribution of Respondents by Level of Education and Job Experience

LEVEL OF EDUCATION		
Highest Level of Education	**Frequency**	**Percentage**
Diploma	21	17.5
Bachelor's degree	75	62.5
Master's degree	24	20
Total	**120**	**100**
JOB EXPERIENCE		
Job experience	**Frequency**	**Percent**
Less than 1 year	**20**	**16.7**
1 - 5 years	**70**	**58.3**
6 - 10 years	**09**	**7.5**
11 - 15 years	**11**	**9.2**
Over 15 years	**10**	**8.3**
Total	**120**	**100**

Source: Primary Data (2021) *N=120*

According to the findings on level of education, 21 respondents constituting 17.5% had diploma certificates; 75 respondents constituting 62.5% had bachelor's degrees, and 24 respondents

constituting 20% had master's degrees. The majority of the respondents were bachelors' degree holders, totaling to 62.5% and the results indicated that all the respondents had reasonably attained formal education. This could be due to the fact the study was conducted in Kampala where there is easier access to schools and institutions of higher learning or that most companies employ staff with some level of formal education. Therefore, the high level of education of the respondents signifies that the respondents were adequately able to understand the questions posed to them and had the capacity to give appropriate responses to the questions, hence the validity of the information collected.

From the findings on job experience, 20 respondents constituting 16.7% had job experiences of less than 1 year, 70 respondents constituting 58.3% had job experiences of 1-5 years, 9 respondents constituting 7.5% had worked for 6-10 years, 11 respondents constituting 9.2% had worked for 11-15 years and 10 respondents constituting 8.3% had worked for over 15 years. Most of the respondents (58.3%) had worked for 1-5 years. This justifies that the companies look up to good performance and the companies have been able to retain most of their managers and supervisors because of good performance. The fact that most of the respondents had worked for 1-5 years also signifies that the respondents had sufficient skills and experience to respond to the study questions.

4.7 Company Registration status

The study also examined the registration status of the firms studied and the results are presented in table 4.4.

Table 4.4: Registration status

Variable	**Variable Frequency x**	**Variable Frequency Percent**
(n=120)	**(n=120)**	**(n=120)**
Business registration Status		
• Registered	120	100
• Unregistered	0	0
Business ownership		
Partnership	6	5

Sole Proprietorship	18	15
Limited Company	96	80
Business age*		
1-10 years	70	58.33
>10-20 years	45	37.5
> 20 years	5	4.167

Source: Primary Data (2021)

Table 4.4 illustrates that all of the companies studied for all of the study objectives were legally registered with permanent (or semi-permanent) physical addresses. This could be due to economic stability of the enterprises and adequate business knowledge, being in the capital city.

4.8 Empirical Findings on the study Objectives

The descriptive results in form of mean scores, and percentage distribution of the respondents who said yes and no to each of the statements in the study instruments are presented below.

4.9 Objective one: Gaps in the competence of local companies

Under this objective, respondents were asked to describe their experiences and practices to determine their industry competence. Findings on this objective were obtained through analysis of the questionnaire which had a list of items intended to measure the competence of local companies, and the in-depth interviews. The questions on competence of local companies upon which responses were sought from the respondents captured the following areas: experiences in transacting in the oil and gas; familiarity with tender bidding processes; familiarity with preparation of financial and technical proposals; compliance with bidding processes, investment capital; the nature of goods supplied; quality standards; domestic and international certifications; production costs and possibility of forming joint ventures. The results in form of mean and percentages are summarized in table 4.5.

Table 4.5: Responses on competence of local companies

Items	Mean	Yes%	No%

Transactions with the oil and gas sector	3.93	41	59
Experience in applying for tenders in the oil and gas sector	3.70	48	52
Familiarity with tender bidding processes in the oil and gas sector	3.41	42	58
Skills and competence for preparing financial and technical proposals.	2.14	30	70
Meeting technical and financial requirements for bidding	2.00	26	74
Meeting requirements on administrative documents	3.66	67	33
Investment capital above 20m	3.55	63	37
Acquisition of investment capital through equity financing	2.16	26	74
Reasonable borrowing rates	2.03	24	76
Locally Produced goods and services	3.77	71	29
Mostly supply the trade sector	3.99	81	19
Meeting the quality requirements	4.11	16	84
Meeting the quantity requirements	3.01	48	52
International quality certifications	2.02	19	81
Local products are NBS Certified	4.01	10	91
Local products meet international standards	2.02	19	81
Low production costs	4.55	87	13
Possibility of joint venture with a foreign company	4.66	89	11
Capacity for joint venture with foreign companies	3.77	29	71
Existing joint ventures with foreign Companies	2.03	24	76

The details below contain an analysis and interpretation of the above results.

From the results in table 4.5, on the question whether the companies have ever transacted in the oil and gas sector, the findings indicated that cumulatively, the larger percentage (59%) of the respondents with a mean of 3.93 disagreed and (41%) agreed. As to whether the companies have ever applied for any tender in the oil and gas sector, the findings cumulatively indicated that the larger percentage (52%) of the respondents with a mean of 3.70 disagreed and 48% agreed. In relation to whether the companies were familiar with tender bidding processes in the oil and gas sector, the majority of the respondents (58%) disagreed and (42%) with a mean of 3.41 agreed. In relation to the item that interrogated whether the companies have the skills and competence for preparing financial and technical proposals for the sector, (70%) disagreed and (30%) agreed with a mean of 2.14, showing that majority of the companies do not have the skills and competence for preparing financial and technical proposals for the sector. It was also observed in relation to the item that interrogated whether the companies often meet the technical and financial requirements for bidding in the sector that the mean of 2.00 representing (26%) indicated agreement while (74%) disagreed. The findings indicated that the companies often meet requirements on administrative documents and in response (67%) agreed with a mean of 3.66, while (33%) disagreed. The majority of the respondents (66%) with a mean of 3.66 indicated that their investment capital is above 20 million and of these, all the companies that had transacted in the sector were medium and large companies. Further, from the findings, very few companies (26%) with a mean of 2.16 acquired investment capital through equity financing while (74%) disagreed to equity financing. Most of the companies financed their businesses through other means for example debt financing. A respondent interviewed on the question said, "*The most reliable source of business capital for our company is bank loans, which we invest and pay back the banks, however interest rates are too high.*"

Findings also indicated that the products supplied by the companies do not often meet the quality requirements of the sector, therefore (84%) with a mean of 4.11 disagreed with the item on whether the companies often meet the sector quality requirements, while (16%) agreed.

The study also observed that the locally produced products do not often meet international quality standards as (81%) disagreed and only (19%) with a mean of 2.02 agreed. Further, majority of the companies (91%) with a mean of 4.01, disagreed that their locally produced goods are certified by UNBS, given that some companies operate on a small scale.

Relatedly, a respondent pointed out *"we have not been supported by the government to produce for the international market. If the government enacted policies that favour our operations, we would be able to compete internationally".*

Another respondent noted on this issue that "*the poor local infrastructure and the unfavourable business environment has limited our capacity to produce quality goods and services, the cost of quality production is too high".*

However, a majority of the companies (89%) with a mean of 4.66 expressed interest in having joint ventures with foreign firms, but considering the business environment in Uganda, most of the respondents (71%) indicated that they do not have the capacity to enter into Joint ventures with foreign companies. Findings however revealed that 24% of the respondents with a mean of 2.04 in the hospitality and services sector had joint ventures with foreign companies for purposes of getting business.

A respondent from a law firm pointed out "*Oil companies are hesitant to contract local firms to offer legal services since oil and gas is a relatively new concept in Uganda. In that regard we had to enter into joint ventures with foreign law firms in order to leverage their experience in the sector and get business.*"

4.10 Objective two: Limitations in technological capacity

Under this objective, respondents were asked to express their knowledge, experiences and practices to determine their technological capacity. Findings on this objective were obtained through analysis of the questionnaire which had a list of items intended to measure technological capacity of local companies, and the in-depth interviews. The questions on technological capacity on which responses were sought from the respondents captured these areas: specialization in technologically sophisticated core exploration and production operations and non-core ancilliary operations; employment of advanced technology or usage of the right equipment during operations; manning of technology by Ugandan citizens; transfer of technology; and possession of the skills to operate the equipment. The results in form of mean and percentages are summarized in table 4.6.

Table 4.6: Responses on limitations in technological capability

Items	Mean		Yes%	No%
Specialization in technologically sophisticated core exploration and production operations	1.91		11	89
Employment of advanced technology	2.08		18	82
Manning of technology by Ugandan Citizens	4.41		88	12
Program of transfer of technology	2.11		28	72
Right equipment to produce the required standards	2.06		17	83
Skills to operate the equipment	1.90		10	90

The details below analyze and interprete the results presented above.

4.10.1 Specialization in technologically sophisticated core exploration and production operations

According to the results in Table 4.6, in regard to the question whether the company specialize in any technologically sophisticated core exploration and production operations, the majority of the respondents 89% disagreed indicating that the companies still do not specialize in any sophisticated technology used in core exploration and production operations. According to most of the respondents, local companies are not ready for sophisticated exploration and production operations because it is impossible for most of them currently to meet the industry standards without joint ventures. They complained of the high costs of acquiring the sophisticated equipment required for core exploration and production activities as well as operations, which even the large local companies are struggle with. Therefore, only few companies like Bemuga Forwarders with International standards certifications have been engaged in the sector. For example, Bemuga Forwarders Ltd has been offering crane and lifting services and other transportation services to the oil companies.

The operations director of Bemuga Forwarders pointed out "*We have been offering crane and lifting as well as transportation services to oil companies during exploration and development phase, however this requires huge capital investments since the machines must meet the industry standards*."

Another interviewed respondent noted "*the technology used in core oil exploration and production is too sophisticated and require very huge capital investments which we cannot afford as local companies. In addition to that maintenance costs are very high*."

4.10.2 Employment of advanced technology and the right equipment.

As to whether the companies employ advanced technology in their operations or have the right equipment to produce to the required industry standards, 89% of the respondents disagreed to using advanced technology in their operations and only 11% with a mean of 1.91 agreed, indicating that very few companies employ advanced technology in their operations. On the question whether the respondents have the right equipment to produce to the required standards, 83% of the respondents disagreed to using the right technology and 18% with a mean of 2.08 agreed. The 11% that agreed to employing advanced technology and the 18% that agreed to having the right equipment composed of companies that are or have been engaged by the oil companies in the upstream activities.These included construction and engineering companies engaged in construction of oil wells, calibration of oil well heads and maintenance of oil fields; transportation; clearing and forwarding companies; crane and lifting services; and manufacturing companies especially those dealing in construction materials, among others. For example, Bemuga Forwarders has international certification to supply transport services and has been supplying crane and lifting equipment manned by their own staff to oil companies for upstream activities. Samka construction Ltd which has been engaged in construction of oil wells has had to comply with the sector requirements although they complained of the high standards of the industry like the requirement to utilize equipment for not more than 5 years.

Findings from interviewed respondents also indicated that oil and gas extraction technology is highly specialized, with high entry barriers and few applications outside the industry itself. This

to them is contrary to their expectations that technology should have 'dual purpose' and lower entry barriers.

An oil and gas expert in one of the companies noted "*Most companies have been advised to adopt a graduation process from being agents for equipment suppliers to taking up repairs and maintenance, manufacturing spare parts, and supplying the equipment themselves*." He however also pointed out that "*It is unlikely that Ugandan companies can afford the graduation process due to the sophisticated nature of oil and gas technology*."

4.10.3 Manning of technology by Ugandan citizens

According to the results, most of the companies (88%) with a mean of 4.41 indicated that their technology is manned by Ugandan citizens. Both the companies that are engaged in the sector and those that are not, agreed that their technological operations are managed by Ugandan citizens. Even the few companies employed by the industry in core exploration and production activities, using sophisticated equipment confirmed that their equipment are manned by their own staff, some of whom are citizens who have been trained to operate them. For example, one respondent is quoted saying: "*when we invested in these equipment, we had to train our people to operate them because it is part of the requirements to get the contracts and it is cheaper to use local people."*

However, 12% of the companies revealed that they did not use Ugandan citizens to operate their equipment and these included companies with international standards certification that are engaged in core exploration and production activities.

4.10.4 Transfer of technology

On the question of technological transfer, study findings indicated that technology transfer is still poor amongst the local companies. 72% of the respondents revealed that they did not have a program for transfer of technology at their companies, while 28% admitted to having one, with a mean of 2.11. According to the respondents, given that most of the companies have not built technological capacity, there is slow transfer of technology at most of the local companies, and even some of the companies that have invested in equipment and training of their staff do not have a program for transfer of technology because it is costly and complicated. Further, most of the

companies indicated they do not have the right equipment to produce the required standards, hence there the aspect of transfer of technology does not arise. A respondent said that the *"the equipment are very expensive to acquire hence we don't have such a program."*

4.10.5 Skills to operate equipment

In response to whether the companies have the skills to operate equipment used in their operations, only 10% of the respondents agreed with a mean of 1.90 that they have the right skills to operate their equipment, while 90% disagreed. Of the 10% that agreed however, there are skills from foreigners who have been employed by local companies to man their equipment hence the need for technology transfer.

4.11 Objective three: Gaps in education, skills and expertise development

Under this objective, respondents were asked to describe their knowledge, experiences and practices to determine their industry knowledge, skills and expertise. Findings on this objective were obtained through analysis of the questionnaire which had a list of items intended to measure their levels of education, skills and expertise development, as well as the in-depth interviews. The questions on local companies' education, skills and expertise development upon which responses were sought from the respondents captured the following areas: existing skills in core exploration and production operations and non-core ancilliary operations; emerging skills in core exploration and production operations and non-core operations; technological skills; training and certifications in oil and gas; and skills to supply goods and services to the industry standard. The results in form of mean and percentages are summarized in table 4.7.

Table 4.7: showing responses on gaps in education, skills and expertise development

Items	Mean	Yes%	No%

Existing skills in core exploration and production operations	1.93	16	84
Existing skills in non-core ancilliary operations	2.01	19	81
Emerging skills in core exploration and production operations	2.00	21	79
Emerging skills in non-core ancilliary operations	3.00	51	49
Skills for technological operations	2.14	30	70
Oil and gas training of staff	3.33	63	37
International certifications in oil and gas studies (staff)	2.03	11	89
National certifications in oil and gas qualifications	2.10	15	85
Skills to supply goods and services to international standards	2.16	26	74
Joint ventures with foreign firms	2.16	26	74

The details below contain an analysis and interpretation of the above results.

4.11.1 Existing skills in core exploration and production operations and non-core ancilliary operations

On the question whether the respondents have existing skills in core exploration and production operations, 16% of the respondents agreed with a mean of 1.93, while 84% disagreed, indicating that their staff do not have sufficient skills in core exploration and production operations. As to whether the respondents have existing skills in non-core ancilliary operations, to the industry standards, cumulatively the larger percentage (81%) of the respondents disagreed and only 19% with a mean of 2.01 agreed. The findings revealed an overwhelming lack of existing skills in non-core ancilliary operations, to the standards required by the industry. It is for this reason that 74% of the respondents also indicated that they do not have skills to produce goods to international standards, and only 26% with a mean of 2.16 indicated having the said skills. Overall, the findings confirmed a significant skills gap both in core exploration and production operations as well as the non-core ancilliary operations that support the industry, to the required standards.

One interviewed respondent pointed out that:

"Since most of the core exploration and production activities are being undertaken by foreign firms, we have not had an opportunity to develop local skillsets in that area except for the few locals who took advantage of the earlier oil and gas scholarships to study abroad."

4.11.2 Emerging skills in core exploration and production operations and non-core ancilliary operations

In response to the question on emerging skills in both core and non-core ancilliary operations, only 21% of the respondents agreed that they have emerging skills in core exploration and production activities and only 51% of the respondents indicated that they have emerging skills in non-core ancilliary operations. According to the findings most companies are not able to send their staff abroad for professional development in core exploration and production courses and the trainings offered here do not enable students to qualify for international certifications. One respondent noted "*the only way for our staff to get skills in core oil and gas operations is if the government can fully support citizens to get hands-on training from international oil companies (IOCs) and get certifications."*

The findings indicated that the few local companies that are able to send their staff for training abroad are large companies engaged in core exploration and production operations. In terms of non-core ancilliary operations, the study found that many Ugandans have taken interest in the sector and are making effort to acquire skills in ancilliary support operations and therefore the companies that reported having some emerging skills are supporting their staff to get training in oil and gas studies locally.

4.11.3 Training and certifications in oil and gas

In response to the question whether any of the respondents' staff had attended any oil and gas trainings, the majority of the managers (63%) with a mean of 3.33 indicated that their staff have ever attended oil and gas trainings. As to whether the respondents had staff with international certifications in oil and gas studies, the minority (11%) indicated that they had staff with international certifications in oil and gas studies implying that 89% of the respondents are yet to acquire international certifications in oil and gas studies.

The respondents indicated the need for government support in terms of training and certifications in oil and gas skills both locally and internationally.
A respondent pointed out that:

"The reason why we still have limited certifications in oil and gas studies is because oil and gas courses have not been sufficiently introduced in government and private institutions save for Kigumba Institute of petroleum studies, which offers only vocational skills and a few others. Also, the private institutions that teach oil and gas courses are unaffordable and do not provide international certifications."

The respondent further noted:

"Local content policies have not focused sufficiently on building the capacity of local businesses and investing in human capital. As a result, local businesses do not understand how to do business with international oil companies or the need to supply goods and services to the required quality and safety standards, hence there is need for government and industry players to invest more in both national and international certifications."

4.11.4 Collaboration with foreign firms

In response to the question whether the respondents have any joint ventures with foreign firms, 24% reported having joint venture collaborations with a mean of 2.16 while 74% indicated that they did not have. Therefore, a small percentage of local companies have started collaborating with foreign companies.

4.12 The dependent variable: Local Content Participation

Findings on the dependent variable were obtained through analysis of the questionnaire which had a list of items intended to measure participation of local companies in the oil and gas industry, and the in-depth interviews.
On the question whether there is a sufficient number of Ugandan companies supplying goods and services to the oil and gas industry, 91% disagreed with a mean of 4.45 while 9% agreed. Findings indicated that the industry was not being serviced by a sufficient number of Ugandan firms. In this regard an interviewed respondent noted:

"*Due to lack of capacity to meet the industry requirements we are unable to fully participate in the industry*."

As to whether the local content policy has promoted supply of local goods and services in the oil and gas industry, findings indicated that 89% with a mean of 4.33 disagreed while 11% agreed, signifying that majority did not believe that the local content policy has sufficiently promoted supply of local goods and services.

One respondent noted:

"*We do not feel that the policy has in any way promoted local participation in terms of supply of locally produced goods and services. This is because most of our goods and services do not meet the industry standards hence foreign companies are the ones benefitting largely from the sector*."

Another respondent also noted:

Government should facilitate multi-stakeholder deliberations in setting shared local content priorities and provision of funding, capacity building and technical assistance to local governments to support citizen participation in the oil and gas sector from the grassroots."

In conclusion, this chapter presented the findings on the three study objectives namely; competence of local companies, technological capacity of local companies and education, skills and expertise development of local companies. The findings were interpreted using descriptive statistics and the results indicated significant gaps in all the three objectives among the companies studied.

CHAPTER FIVE

SUMMARY OF FINDINGS AND DISCUSSION

5.1 Introduction

This chapter presents the summary and discussion of the study findings presented in chapter four.

5.2 Summary of findings

5.2.1 Gaps in the competence of local companies

According to the findings, there was evidence of significant gaps in the competence of local companies.70% of the respondents did not have the competence to prepare financial and technical proposals,74% indicated that they did not often meet the technical and financial requirements of the sector,81% did not have international certifications,81% noted that their goods and services were locally supplied,63% had their investment capital above 20m however those that had accessed tenders had investment capital of 100m and above and surprisingly 89% indicated that they would consider forming joint ventures with foreign companies that have the industry competence. Hence the firms studied had significant gaps in their capabilities, affecting their participation in Uganda's oil and gas industry.

5.2.2 Limitations in technological capacity

The findings in regard to this objective revealed major gaps in the technological capacity of local companies. The results of the study indicated that 89% of the respondent companies did not specialize in core exploration and production operations,82% did not employ advanced technology given that very few local companies in the country are using sophisticated technology in their operations,72 % did not have a program for transfer of technology,83% did not have equipment to produce the right standards required by the industry and 90% did not have skills to operate the equipment required by the industry. Accordingly, there were major gaps in the technological capacity of the companies studied, limiting their participation in the oil and gas industry.

5.2.3 Gaps in education, skills and expertise development.

The study findings on this objective, revealed that there were significant gaps in education, skills and expertise development of the companies studied. 84% of the respondents did not have existing skills in core exploration and production operations and 81% did not have skills in ancilliary non-core oil and gas operations to the industry standards. In terms of emerging skills in the industry,79% of the respondents did not have emerging skills in core exploration and production operations however surprisingly 51% had emerging skills in non-core ancilliary operations. Further, 63% of the respondents had staff that have attended oil and gas trainings but only 15% had staff with national oil and gas certifications and 89% reported not having international certifications. 74% indicated that they did not have the skills to supply goods and services to international standards and 76% reported not having any collaborations with foreign firms. Consequently, the companies studied had major gaps in education, skills and expertise development, hindering local content participation.

5.3 Discussion

The findings from this study suggest that local companies have significant capacity limitations which are affecting the implementation of local content in Uganda's oil and gas industry. The study aimed to determine the gaps in the competence of local companies; their technological limitations as well as the gaps in education, skills and expertise development, in order to determine the factors affecting local content development in Uganda's oil and gas industry. Below is a discussion of the findings.

5.3.1 Gaps in the competence of local companies.

The findings from the study revealed significant gaps in the capabilities of the local companies which affect local content participation in Uganda's oil and gas industry.

Research shows that industrial growth is not something decided politically but is a result of the interplay between existing and emerging capabilities (Heum et al.,2011). According to Tordo et

al. (2011) development of local content should be based on existing capabilties in the manufacturing fabrication and services sectors. Therefore, there is positive relationship between local content participation and local companies' capabilties. However as observed from the findings of this study, many countries maintain weak industry capabilities and rely on local policies to ensure participation of local firms (Tordo et al.,2011). To close this gap, Nordas (2003) contends that local policies should encourage local firms to collaborate with foreign firms in order to create dynamics which can have a positive impact on the capacity of local firms.

From the findings, one major reason for the gaps in the competence of local companies as observed by the respondents, is the unfavorable business environment which is characterized by high costs of production due to high utility costs for example electricity and water; high taxes; high borrowing rates; and inflation, yet most of the companies obtain funding through debt financing. This makes the overall operational costs of local companies very high and this kind of environment limits the capacity of local firms to compete in the oil and gas sector with foreign firms who are able to borrow at a lower rate from their countries. This is supported by Alinda, Nduhura & Agaba (2018) who note that the high cost of production results into higher price quotations by local companies compared to foreign firms and this affects their access to supplies contracts**.** Alinda, Nduhura & Agaba (2018) had a similar pattern of findings on the capabilties of local companies in their study of the capacity of Small and Medium sized Enterprises (SMEs).

The study findings also indicated significant knowledge gaps on bidding processes in the oil and gas sector. This is consistent with findings in Alinda, Nduhura & Agaba (2018), where 67.5% of the respondents did not have adequate experience in the bidding processes as well as earlier studies by Nalumu et al. (2014) and Tullow Oil (2014). In all these studies, experience with the bidding processes was based on the ability to prepare quality and competitive bidding documents. Similarly, Alinda, Nduhura & Agaba (2018), indicated that 66% of the SMEs investigated did not have adequate knowledge of the bidding processes for tenders in the oil and gas industry, with specific knowledge limitations in the preparation of financial and technical proposals and could not easily meet requirements on administrative documents.

Additionally, the findings indicated that the small size of local companies affects their capacity to compete with larger companies. Companies with large capital investments have an advantage over

small companies. This is also supported by Alinda, Nduhura and Agaba (2018) who suggest that larger companies enjoy bigger discounts and operate more efficiently because of their minimal costs of production and this enables them to supply their goods and services at a lower cost. They further note that large companies are more credible and are easily trusted by their suppliers and therefore easily obtain supplies on credit. That they also easily attract technical expertise and can use their strong business connections to build stronger technical and financial proposals than small companies. (Alinda, Nduhura and Agaba,2018). This argument is similar to the position in Kasekende and Opondo (2018); Abuka (2003) and Uganda Investment Authority (2010), on the effect of size on the capacity and competitiveness of local firms.

According to the interview findings, the evidently lacking infrastructure, such as power, water, or transport facilities, which are critical for business development is a key factor affecting the capability of local would-be suppliers to compete in the sector. The respondents revealed that the lack of reliable power results into additional operating costs from using back-up petrol or diesel generators, because unreliable power supply has adverse impacts on the ability to maintain consistent quality standards. Further, the interview findings suggested that transport infrastructure challenges including poor quality roads and railway lines, lack of quick linkages between suppliers and ports, and high transport costs complicate importation and transportation of equipment and materials, hence negatively affecting local companies' competitiveness.

The above findings are consistent with the argument by Norwegian Oil and Gas Partners (2003) that availability of some conditions such as information technology, local companies' needs, standards, social and educational needs etc, in the local petroleum industry is determined by local infrastructure. They argued that providing and ensuring the necessary infrastructure improves social welfare and is essential for the local supply industry to be more competitive, hence promoting local content. For example, they contend that IT infrastructure is an important variable, which has a substantial impact on local content development. That it is necessary for information dissemination, which is one of the key policy principles, to foster local content in the oil industry (Norwegian Oil and Gas Partners, 2003).

The findings further revealed that the limitations in the competence of local companies have affected local content development by limiting the participation of local firms in the oil and sub-

sector. This is especially due to limitations relating to size of investment capital and unfamiliarity with bidding processes which often make firms not qualify for tenders. This is supported by the National Content Policy (2017) which acknowledges that participation of Ugandan firms in the oil and gas sector has been constrained by factors like information asymmetry, inadequate infrastructure, quality standards by the international oil companies, limited access to finances and business knowledge as well as a challenging business environment. The Policy notes that out of USD 1,171.8million spent on purchase of goods and services between 2010-2013, only USD 329.9 million was paid to local service providers and this represented 28% of the total expenditure by the licensees.

These challenges therefore pose the need to study the factors that are compromising the competence of local companies to harness opportunities in the sub-sector, in order to promote local content.

5.3.2 Limitations in technological capacity and know-how

The findings on this objective revealed that the local companies had major technological capacity limitations. This corresponds with the findings of the Industry Baseline Survey by CNOOC, Total E&P &Tullow Oil (2013) which found a significant gap in the technological capacity of Ugandans. According to the Industry Baseline Survey (2013), 33 companies were interviewed and out of a fleet of 2500 trucks, only 200 trucks met the oil sector land transportation recommended safety practices and quality management practices. These gaps were attributed to the expensive cost of acquiring international certifications and the sub-standard quality of local products

Findings in this study indicated a gap in specialization in technologically sophisticated exploration and production operations and employment of advanced technology. Cusumano & Elenkov (1994) contend that the ability of local companies to absorb advanced technology depends on the technical and organizational capabilities of the company. They further suggest that technological adoption is important because inputs from the host country is usually not the same as those for which industry equipment are designed. This is consistent with the study findings that the equipment being used by most of the companies did not meet the industry standards. Hence there is need for adoption of technology which meets the standards and the required skillsets. In order to improve

local skills and narrow the technology gap between local and foreign companies, Norwegian Oil and Gas Partners (2003) suggests there must be an industrial infrastructure to be built on.For example in Ghana, the technical and training institutions are supported by the government and oil companies to train citizens to develop the required capabilities for the sector, for instance in drilling and other support services like supplies, catering, housekeeping, marine and others (Ministry of energy of Republic of Ghana, 2010).

From the findings, the argument for the low adoption of technology among local firms is the huge capital investment required. This is supported by Matsiko (2017) who suggests that oil and gas production is capital intensive and technical skill based and that the initial upstream activities that have been taking place for example the aero magnetic surveys, seismic studies, data interpretation among others require very specialized skills and advanced technology. Further, Matsiko (2017) contends that some of the upstream activities are one-time operations and instead of investing in them, local companies outsource services of highly specialized international companies. He argues that it is not wise for Ugandan citizens and companies to specialize in the supply of products or services which exist only as a stint in the oil and gas production life cycle. He contends that the production midstream and downstream sectors provide more realistic options for the absorption of local skillsets in small and medium engineering, supply chain, legal services, hydrocarbon trade, environmental specialist services and human resource management.

Further, findings also revealed gaps in the skillsets required to operate the industry equipment. This is consistent with Matsiko (2017) who argues that in a new oil state like Uganda, it usually takes time to develop the required skillsets in technical aspects of oil and gas extraction and because foreign companies have injected large sums of money into oil and gas production, it is reasonable to have technical people from these companies deployed in the interim to undertake disbursement and assimilation of extractive projects and to ensure proper utilization of resources. However, according to Mwakali & Byaruhanga (2018),to close this gap, under the Skilling Uganda - BTVET Strategic Plan 2012/3-2021/22, Uganda Petroleum Institute Kigumba (UPIK) was in the process of developing and delivering certificate and diploma courses for skilled technicians in petroleum upstream operations including mechanical, electrical, and instrumentation maintenance and other disciplines required for IOCs,the National Oil company, the petroleum industry service companies and refinery operations. By 2018/19, UPIK was to start graduating approximately 224

students yearly in these disciplines. Further that the institute was also developing certificate and diploma courses for skilled technicians in downstream operations, mechanical, electrical and instrumentation maintenance as well as other disciplines that may be required by industry players and These were to start in 2018 alongside the upstream courses. They also suggest that Universities like Makerere University, Ndejje University, Makerere University Business school and other BTVET institutions were equally being supported by the government and development partners to teach courses in Petroleum Geology.

From the findings, these technology gaps have had major effects on local content development, as they have limited the participation of local companies and Ugandan citizens in the oil and gas industry which is currently infiltrated by foreign companies. This is consistent with the National Content Policy statement (2017) that participation of Ugandan enterprises and citizens was only at 28% at the time and the policy was intended to improve participation to 80% by 2040.

It is therefore important for the IOCs, government oil and gas institutions, the private sector and development partners to collaborate in order to enhance technological advancement and knowledge transfer among local companies. This will go a long way to promote local content participation. Again, this calls into question the need to study the factors limiting the technological capacity of local companies in order to address this gap.

5.3.3 Gaps in education, skills and expertise development of local companies

The study findings revealed significant gaps in education, skills and expertise development in both core oil and gas operations and non-core ancilliary oil and gas operations. This is consistent with the findings of the Industry Baseline survey that there were capacity gaps in the sector in terms of civil craftspersons, drivers, mechanical technicians and others and that due to the few numbers of skilled persons, other sectors would be deprived. The study recommended focus on training in electrical, construction and mechanical fields and the need to focus on sectors that support the industry (Total E&P, Tullow Oil & CNOOC,2014).

Further, the findings indicated that there has been limited support from government in terms of skilling to the industry standards. Matsiko (2017) suggests that oil and gas producing countries use policy interventions to improve the quality and quantity of local good and services. These policies

are usually designed to increase the number of nationals employed in the sector and to promote the development of technical and managerial skills to the required industry standards. Further he argues that Uganda will only benefit from the local content policy if local skills are improved and harnessed for locals to be able to contribute to the petroleum sector. He emphasizes that the trainings must expand beyond the straight jacket extractives training and include training of support sectors that are required at the different stages of oil and gas production.

One argument for the lacking knowledge, skills and expertise in the sector, as noted by the respondents is the lack of an industrial infrastructure to harness skills. This is supported by Matsiko (2017) who argues that due to overlapping of the functions of the Ministry of Education and Sports and the Petroleum Authority, the idea of creating centers of excellence for both formal and vocation training within the petroleum sector, to address the skills gaps under the Business Technical Vocational and Education Training (BTVET) Policy and Strategic plan 2011-2020 has failed. The plan was based on the BTVET policy which proposed to provide to the petroleum sector, skills and competences which are demand responsive and employable (Matsiko,2017).
We are cognizant of the existence of BTVET institutions however their training does not meet the industry standards. For example, Government took a positive step by transforming the Cooperative Institute in Kigumba into the Petroleum institute which is one of the BTVET institutions however the institute is still below the standards required to produce the kind of skills required by the sector. Hence there is need for the National Curriculum Development Center to develop training curriculums that are tailored for the petroleum sector and outside the usual focus of the Ministry of Education.

To close the gaps in the BTVET institutions, the BTVET (2012/3 to 2021/22) Strategic Plan for Skilling Uganda was developed and is being implemented by different BTVET institutions.The 2021/22 plan incorporates activities of the BTVET Department and Department of Information Technology (DIT) under the Ministry of Education, Science, Technology and Sports (MoESTS) and its strategies are far beyond the traditional formal BTVET system under the education sector, to include development interests of other sectors like agriculture, health, trade, tourism and

industry. It is however unclear the extent to which this has been implemented since there are no recently published reports on this.

In addition, Klueh, et al. (2007), recommended the establishment of a public outreach and analysis office to (i) develop a registry of competent and qualified local suppliers, (ii) advise locals on joint ventures and other ways of collaborating with foreign companies, and (iii) support plans for building local capacity, training, and Research &Development.

Another argument according to the findings is that the trainings that the oil companies have been rendering to the local companies have not been effective. Similarly, Alinda, Nduhura & Agaba (2018) indicated that the trainings have been focusing mainly on business skills, costs calculation, accounts record keeping and certification of these skills yet local companies need more pressing skillsets like exposure to bidding processes, hence the need to bridge these gaps. In addition to the knowledge gaps in terms of bidding, Alinda, Nduhura & Agaba (2018) noted that the bidding processes were complex due to many lengthy procedures right from the preparation of bids to contract award, and there was a lack of trust in transparency which was considered prone to corrupt tendencies.

To harness local skills Nordås et al. (2003) recommends that local companies skills development has to be appreciated and foreign firms should be encouraged to collaborate with local companies. In turn, this should be expected to give impulses and create dynamics, which would have positive influence on the development of indigenous firms. They further suggest that implementation of local skills development in both the petroleum and support sectors will encourage economic diversification and the development of reliable backward linkages.

According to the findings, these gaps in education, skills and expertise development have equally hindered the participation of local firms in the oil and gas industry hence affecting local content development. This is supported by the National Content Policy (2017) which recognizes that the petroleum industry creates employment opportunities which require highly specialized skills and which are currently benefitting foreigners largely. The policy notes that there is a big gap in the wages earned by nationals and expatriates because of the skills gaps. For example, between 2012 - 2014, out of the 23,025,761,082 Ugx spent by the international Oil companies in Uganda, only

6,723,554 Ugx (29%) was paid to Ugandans because expatriates earn between 5-10 times more than Ugandans. Further, the policy recognizes that due to the inadequate participation of Ugandans, there has not been job creation and no value has been added economically because local raw materials have not been used in the sector. This calls for the need to study the factors affecting skills development in detail, in order to address the capacity gaps in terms of education, skills and expertise development.

In conclusion, this chapter presented a discussion of the findings on the study objectives and according to the discussion, most of the findings still resonate with findings of earlier studies conducted on similar objectives. This calls for more effort from the government and industry players in terms of enhancing local skills and implementing the recommendations of previous studies.

CHAPTER SIX

CONCLUSION AND RECCOMMENDATIONS

6.1 Introduction

This chapter presents the conclusion, recommendations, study limitations and areas for further research.

6.2 Conclusion

The study was motivated by the growing concern about the participation of Ugandans in the oil and gas sector, despite the policy interventions that the government has implemented. To this end, the study envisioned that the slow pace of local content development could be due to capacity gaps among local companies and Ugandan citizens.

In this regard, the study aimed at analysing the capability of local companies in Kampala, to participate in the oil and gas sector in order to determine the factors affecting local content development in Uganda. The study through the three objectives sought to examine the gaps in the competence of local companies, the limitations in their technological capacity and know-how and the gaps in their education, skills and expertise development.

The study adopted a mixed method research approach to achieve the three study objectives namely; To examine the gaps in the competence of local companies in Kampala, hindering local content participation in the oil and gas industry; to explore the limitations in technological capacity and know-how of local companies in Kampala ,affecting local content participation in the oil and gas industry; and to establish the gaps in education, skills and expertise development of local companies in Kampala, affecting local content participation in the oil and gas industry

The study adopted a stratified sampling method to select the companies of interest for the study. Specifically, the focus was on both companies that have experience with the oil and gas industry and those that do not have any experience and have never had transactions with the industry.

A total of 120 companies participated directly in the study, and the respondents included managers and staff of the various companies that participated. The study utilized qualitative and quantitative analysis, and descriptive statistics using mean, percentage and frequency to interpret the results from the three specific objectives of the studies.

The first objective of the study was to examine the gaps in the competence of local companies, affecting local content participation the oil and gas industry. The findings on the first objective generally indicated significant gaps in the competence of local companies to participate in the oil and gas sector. Findings revealed that majority of the companies did not have the competence to prepare financial and technical proposals or meet the technical and financial requirements of the sector. Further a significant number of the companies did not possess international and national standards certifications, and neither did they meet the quality and quantity requirements of the sector. Findings also indicated that majority of the companies were small and medium sized with investment capital below 100 million shillings and were not well resourced to invest in the sector. As a result, the findings showed that these factors have independently or combined affected the participation of local companies in the oil and gas industry.

The second objective of the study was to explore the limitations in the technological capacity and know-how of local companies, affecting local content participation in the oil and gas industry. Study findings on the second objective revealed remarkable gaps in the technological capacity of local companies. Notably findings indicated that majority of the respondents did not specialize in core exploration and production operations, and neither did they employ advanced technology in their operations. Further a large number of the companies did not have a program for transfer of technology since they did not employ advanced technology. Findings also revealed that the companies did not have equipment to produce goods and services to the standards required by the industry and did not have skills to operate the equipment required by the industry. Consequently, findings revealed that these technological incapacities of local companies have greatly affected local content participation in the oil and gas industry.

The third objective of the study was to establish the gaps in education, skills and expertise development of local companies, that are affecting local content participation in the oil and gas industry. Study findings on this objective also revealed major gaps in education, skills and

expertise development of local companies. The findings revealed that most of the respondents did not have existing skills in core exploration and production operations and non-core ancilliary oil and gas operations. Findings further revealed that majority of the respondents did not have emerging skills in core exploration and production operations however about half of them had emerging skills in non-core ancilliary operations. Furthermore, findings indicated that a good number of the companies had staff that had attended oil and gas trainings, however only a small number had staff with national and international certifications in oil and gas studies and a large number indicated that they did not have the skills to supply goods and services to international standards. Findings revealed that these gaps on education, skills and expertise development have hindered participation of local firms in the oil and gas industry.

Although the promotion of local content is an important priority for Uganda and a unique way to foster economic development, these gaps raise several concerns about its implementation in practice. These gaps will have to be addressed by all the actors involved in the sector, in order for the benefits of the local content policy to extend to all local suppliers of goods and services in Uganda.

6.3 Recommendations

Based on the study findings, the following recommendations are made on how to address the capacity gaps of local companies in order to promote local content participation in Uganda's oil and gas industry.

6.3.1 Competence of Local Companies

There is need for the government to promote a favourable business environment for local companies through policy interventions that alleviate targeted constraints to business and promote business development by providing incentives that enhance sound business practices. The major constraints according to findings were high interest rates, taxes, exchange rates and utility costs as well as access to international certifications. These can be addressed through tax holidays, policies which prohibit the importation of locally available materials and products, asset financing support and real estate assistance.

There is also need for government to invest in more enabling infrastructures for business development, and to enhance social structures, which contribute to inclusion and participation of all businesses. For example, transport systems should be improved for faster and reliable transportation of goods and services, reliable power and water supply should be prioritized to ensure effectiveness in operations and the costs of these services and utilities should be subsidized for local firms for more efficient operations. To implement this, the government of Uganda should among other things encourage private participation in infrastructure development through policies and fiscal incentives that attract and compliment private investment in infrastructure.

There is also need for the business development training programmes for the local companies to be scaled up to focus on relevant skills for the local companies including preparation of technical and financial proposals and generally bid management. Coupled with this, the government should ensure information sharing and transparency in awarding tenders, through public disclosure of the contracts award criteria and the reasons for rejecting bids.

6.3.2 Technological capacity and know-how

Since the findings indicated limited employment of advanced technology and a lack of technological skillsets by a majority of the local companies, the oil and gas institutions including Petroleum Authority of Uganda, Ministry of Energy and Mineral Development and Uganda National Oil Company should support Ugandans and local companies to adopt the technology that is required by the sector, and to build the capacity of local companies to acquire the relevant technological skillsets that the sector requires. This can be through asset financing assistance and other forms of support to local companies, instead of requiring them to meet industry standards without any support.

6.3.3 Education, skills and expertise development.

Since there is no industrial structure for local content development in Uganda, there is need for the sector players to establish an Industry Enhancement Centre separate from the local content unit within PAU and the Directorate of Petroleum, which is jointly managed by the government and the IOCs, to skill local companies with industry skillsets that are lacking locally.The centre would

among other things manage the National Supplier Database constituting of qualified and competent local suppliers with detailed information on each supplier instead of it being managed by PAU; advise local companies and locals on joint ventures and other ways of collaboration with foreign companies; and implement plans for building local capacity, training, and research & development.

In addition to having an Industry Enhancement Centre, the government and IOCs should put more effort in building the capacity of BTVET institutions and other institutions of higher learning, to train citizens to develop the required capabilities for the sector both for core exploration and production operations as well as noncore ancilliary support services like catering, housekeeping and food supplies. This is because the training being delivered by the BTVET institutions including Kigumba Institute of Petroleum which is the benchmark, and other local institutions are still blow the industry standards. There is need to implement strategies to redesign their training curriculums to ensure that they focus on both the petroleum sector and other support sectors and build skills that can increase productivity of the wider economy, even after petroleum resources have been depleted, for example through certification systems that increase the portability of skills. In addition, the roles of the Ministry of Education, Petroleum Authority and the National Curriculum Center in terms of capacity building needs to be harmonized.

Findings indicated the need for joint ventures and collaboration of local firms with foreign firms. It is therefore recommended that local policies and industry players should encourage local firms to collaborate with foreign firms in order to create dynamics which can positively impact on the capacity of local firms. Through such collaborations local firms can acquire skillsets that are require by the industry and can encourage technology transfer to firms that are engaged in technologically specialized ventures.

It is also recommended that the sector local content policy places clear and enforceable legal obligations on oil companies and the responsible institutions enforce compliance by oil companies with these obligations, in order for the policy to have the force of the law. This is especially in regard to the training requirements and prioritization of local goods and services.

6.4 Study Limitations

The empirical results reported herein should be considered in light of some limitations which future studies may correct and these include;

The study used simple descriptive statistics without inferential statistics to present the study findings, therefore the conclusions may be limited only to the study sample and may not be drawn on the entire population of local companies in Uganda. The choice of descriptive statistics was due to the fact that the data from the questionnaire and interview guide was non-numerical and categorical.

The sample size may also be insufficient to represent the entire population of local companies in Kampala, since there are thousands of them. However, this was unavoidable since studying the entire population of local companies in Kampala would require a substantial amount of funding which was not available for this academic research.

Further, due to the use of unstructured interview guides, there is a possibility of subjectivity of the respondents. This is because the qualitative data was based on self-reported data from opinions, experience and behaviors of respondents, which depend on respondent's mood. However, the study triangulated the information provided by cross checking with the views of other respondents and information from other sources.

6.5 Further Research

Based on the various study findings, it is highly important that the other factors affecting local content participation in Uganda, namely local policies, local infrastructure and local environment be studied, as these have a strong bearing on the capability of local companies.

In conclusion, this chapter presented the conclusions and recommendations on the study for each specific objective, the study limitations and areas for further research.

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APPENDICES

Appendix I: Questionnaire for Local companies

Dear Sir/Madam,

My name is Atim Florence Lora, a student at Uganda Christian University. I am conducting my MBA research on the topic "Analysis of the capability of local companies for local content participation in Uganda's oil and gas industry".

You have been chosen to take part in this study by answering a few questions. The information you will provide will be used for academic purposes only. I kindly request you to give me some of your time and answer a few questions. The study will take only about 15 minutes and your responses will be kept confidential.

Thank you.

Demographic information

1. Name of Respondent.....
2. Name of the company/Business.....
3. Position in the company/Business.....
4. Is your company/Business registered? YES /NO
5. Is the business registered as? (a) Company (b) Partnership (c) Sole Proprietorship
6. Is your firm engaged in core exploration and production operations? (a) YES (b) NO
7. Is your firm engaged in non-core ancilliary operations? (a) YES (b) NO
8. Nature of business of the company.....

9. How long has your company been in existence? (a) 1- 5 years (b) 6-10 years (c) above 10 years.
10. Is your company registered on the National Supplier Database? (a) YES (b) NO

11. If No, are you aware that to participate in the Oil and gas sector you must register?
    (a) YES (b) NO

Local Companies capabilities

12. Has your company ever transacted in the oil and gas sector? (a) YES (b) NO

13. Has your company ever applied for any tender in the oil and gas sector?

(a) YES (b) NO

14. If Yes, was the application successful? (a) YES (b) NO

15. If No, what was reason for it being unsuccessful?.....

.....

.....

.....

16. Is your company familiar with tender bidding processes in the oil and gas sector?
    (a) YES (b) NO

17. Does the company have the skills and competence for preparing financial and technical proposals for the sector? (a) YES (b) NO

18. Does the company often meet the technical and financial requirements for bidding in the sector? (a) YES (b) NO

19. Does your company often meet requirements on administrative documents?

(a) YES (b) NO

20. What is your investment capital ? (a) 10m - 20m (b) 30m-50m (c) 50m-100m (d) 101m-150m (e) 150m-200m (f) 200-250m (g) 250- 300m (e) 300m -350m (h) 350m – 400m (j) 400m and above

21. What is your annual VAT threshold? (a) 1m-50m (b) 50m-100m (c) 100m-150m (e) 150-200m (f) 200m-250m (g) 250m – 300m (e) 300m-350m (h) 350m – 400m (j) 400m and above.

22. Do you acquire investment capital through equity financing? (a) YES (b) NO

23. If No, how do you get the investment capital?.....
.....

24. If Yes, would you say the borrowing rates (interest rates) are reasonable? (a) YES (b) NO

25. Are your goods or services locally produced? (a) YES (b) NO

26. What percentage of your goods or services are locally supplied?.....

27. Which sector do you supply? (a) Trade (b) Manufacturing (C) Fabrication (d) Services

28. Do you supply ? (a) Retail (b) Wholesale (c) Both

29. Do your products often meet the quality requirements of the sector?
(a) YES (b) No

30. Do you often meet the quantity requirements of the sector? (a) YES (b) NO

31. Does your company have international quality certifications? (a) YES (b) NO

32. Are your local products certified by the National Bureau of Statistics? (a) YES (b) NO

33. Do your local products meet international standards? (a) YES (b) NO

34. How do you rate your production costs (utility, Fuel, Electricity Costs & Taxes)?
(a) High (b) Reasonable (c) Low

35. Would you consider having a joint venture with a foreign company? (a) YES (b) NO

Technological capacity and know-how

36. Does your company specialize in any technologically sophisticated core exploration and production operations? (a) YES (b) NO (c) Not Applicable

37. Does your company specialize in any technologically sophisticated non-core operations? (a) YES (b) NO (c) Not Applicable

38. Do you employ advanced technology in your operations or have the right equipment to produce to the required standards? (a) YES (b) NO

39. What Kind?.....
.....
.....

40. Is the technology manned by Ugandan Citizens? (a) YES (b) NO

41. Is there a program to ensure transfer of technology at the company? (a) YES (b) NO

Education, skills and expertise development

42. Do your staff have existing skills in core exploration and production operations? (a) YES (b) NO (c) NOT APPLICABLE
43. If Yes, specify the disciplines.....
44. Do your staff have existing skills in non-core ancilliary operations?
    (a) YES (b) NO (c) NOT APPLICABLE
45. If Yes, specify the disciplines.....
46. Does your company have emerging skills in core exploration and production operations?
    (a) YES (b) NO (c) NOT APPLICABLE
47. Does your company have emerging skills in non-core ancilliary operations?
    (a) YES (b) NO (c) NOT APPLICABLE
48. Does your company have skills for technological operations? (a) YES (b) No
49. Have you or any of your staff ever attended any oil and gas trainings? If No why?.....
    .....
50. Do you have staff with international certifications in oil and gas studies?
    (a) YES (b) NO
51. Do you have staff with national certifications in Oil and gas qualifications?
    (a) YES (b) NO
52. Do you have the skills to supply goods and services of international standards?
    (a) YES (b) No
53. Do you have any Joint Ventures with foreign Companies? (a) YES (b) NO
54. Considering the business environment in Uganda e.g high interest rates do you have the capacity to enter into Joint ventures with foreign companies? (a) YES (b) NO
55. Do you believe that a good number of Ugandan companies are currently servicing the oil and gas industry? (a) YES (b) NO
56. If NO,why?.....

Thank you for your participation.

Appendix II: Interview guide for key informant interviews (Local companies)

Dear Sir/Madam,

My name is Atim Florence Lora, a student at Uganda Christian University. I am conducting my MBA research on the topic "Analysis of the capability of local companies for local content participation in the oil and gas industry in Uganda". By virtue of your position, you have been chosen to take part in this study by answering a few questions. The information you will provide will be used for academic purposes only. I kindly request you to give me some of your time and answer a few questions. The study will take about 30 minutes only and all your responses will be kept confidential.

Key guiding questions

1. Name.....
2. Title/Position.....
3. Company.....
4. How long have you worked in this position?.....
5. Do you think the local content policy has promoted the participation of local companies in the oil and gas industry?
   If YES why?
   If No why?

Probing questions centered on;

a) Local companies 'competence
b) Technological Capacity
c) Skills and expertise development

6. Generally describe your experience as a company in as far as participation in the oil and gas sector is concerned.

Probing questions centered on;

a) Have you successfully acquired tenders?
b) Ease in Acquisition of investment capital (interest rates).
c) Do you supply locally produced goods or imported?

d) Are production costs high or low? Do they increase price quotations?

7. Basing on your experience, what is your opinion on the gaps in the capability of your firm?

Probing questions centered on;

- Do their goods and services meet quality and quantity standards?
- Familiarity with tender processes.
- Size of investment capital.
- Credit Financing interest rates.
- Production costs and how they influence ability to obtain tenders.
- Barriers to entry in the supply chain.

8. What are some of the limitations in technological capacity of local companies to deliver goods and services in the oil and gas sector?

Probing question centered on;

- Do you have the right equipment to produce to the required standards?
- Do you have the skills to operate this equipment?
- What are the barriers to technological advancement and transfer of technology?

9. What are some of the gaps in the education, skills and expertise development in your firm?

a) Skills in core exploration and production operations.
b) Skills in non-core ancilliary operations e.g transport, hospitality.
c) Skills to operate sophisticated technological equipment and transfer technology.
d) Hindrances to participation in joint ventures for skills transfer.

10. How can government address these gaps?

a) How government can support technological advancement.
b) Government programmes to support skilling of citizens.
c) Supplier development programmes by licensees.
d) Laws supporting supplier development.
e) Enhancement of standard of goods produced locally.

e) Social Infrastructure.

f) Government incentives to local companies e.g access to cheap credit, taxes, utility costs

g) Public outreach office for advisory services/Industry enhancement Centre.

Finally, thank you for your time and participation.

Do you have any questions that you would like to ask of me?