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Original Article

The Moderating Role of Government Regulations Compliance in the Relationship between Capacity Building, Firm Capabilities and Local Content Consumption in Uganda's Oil and Gas Sector

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Keywords:

*Government Regulations
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Capacity Building,
Firm Capabilities,
Local content consumption,
Uganda,
Oil and Gas Sector.*

Purpose: This study examined the moderating role of government regulations compliance in the relationship between capacity building, firm capabilities, and local content consumption among firms operating in Uganda's oil and gas sector. The study adopted a mixed-methods cross-sectional research design. Data was collected from 280 firms registered on the National Supplier Database of the Petroleum Authority of Uganda. Data was obtained from Procurement Officers, Accountants, and National Content Officers using questionnaires. Data were analysed using descriptive statistics, Pearson correlation, hierarchical regression, and Structural Equation Modelling (SEM). The findings revealed that capacity building ($\beta = 0.444$, $p < 0.001$) and firm capabilities ($\beta = 0.343$, $p < 0.001$) have positive and statistically significant effects on local content consumption. Hierarchical regression results indicated that capacity building and firm capabilities jointly explained 36.1% of the variation in local content consumption (Adjusted $R^2 = 0.361$). The findings further revealed that government regulations compliance positively and significantly moderates the relationship between capacity building and local content consumption ($\beta = 0.273$, $p < 0.001$), while negatively and significantly moderating the relationship between firm capabilities and local content consumption ($\beta = -0.128$, $p = 0.008$). The study recommends strengthening capacity-building programmes through training, knowledge transfer, supplier development initiatives, and improved access to finance for local firms. Regulatory institutions should also enhance monitoring and enforcement of local content requirements to increase the participation of Ugandan firms in oil and gas supply chains. The findings highlight the importance of investing in capacity building, strengthening firm capabilities, and ensuring compliance with local content regulations to enhance the participation of domestic firms in oil and gas procurement activities and increase local content consumption.

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INTRODUCTION

Local content has become a major policy instrument through which petroleum-producing countries seek to maximise the developmental benefits derived from extractive industry investments (Tordo et al., 2021). Globally, countries such as Norway, Brazil, and Malaysia have adopted local content policies to increase domestic participation in petroleum value chains, facilitate technology transfer, promote industrial development, and strengthen national economic growth (Hilson & Ovadia, 2020). Across Africa, countries including Nigeria, Angola, Ghana, and Mozambique have implemented local content frameworks aimed at increasing the participation of indigenous firms in petroleum sector activities and ensuring that resource extraction contributes to domestic economic transformation (Ackah & Mohammed, 2020). Within East Africa, recent oil and gas discoveries have accelerated efforts to promote local participation through supplier development programmes, local procurement requirements, and capacity-building initiatives intended to strengthen domestic firms and increase local content consumption within petroleum supply chains (Kinyondo & Villanger, 2021).

In Uganda, local content promotion has been pursued through the National Content Regulations (2016), the National Content Policy (2018), supplier development programmes, joint venture arrangements, and the establishment of the National Supplier Database (Alinda et al., 2022). These interventions were intended to strengthen the participation of Ugandan firms in petroleum sector activities and increase local content consumption through the procurement of locally supplied goods and services (Petroleum Authority of Uganda, 2024). Increased local content consumption is expected to contribute to enterprise development, employment creation, technology transfer, value addition, and retention of petroleum sector expenditure within the domestic economy (Republic of Uganda, 2018). Consequently, local content consumption remains a critical mechanism through which Uganda seeks to derive sustainable economic benefits from its emerging oil and gas industry (Mushemeza & Okiira, 2016).

Despite these policy and institutional interventions, local content consumption remains below national expectations (Petroleum Authority of Uganda, 2024). Between 2017 and 2024, Ugandan firms received contracts worth only US\$2.1 billion, representing 29% of the total

US\$7.3 billion in contracts awarded within the sector (Petroleum Authority of Uganda, 2024). Similarly, only 938 firms out of 2,444 companies registered on the National Supplier Database had actively supplied goods and services to the petroleum sector (Petroleum Authority of Uganda, 2024). These participation levels remain below the government's aspiration of retaining a substantial proportion of petroleum sector expenditure within the domestic economy and achieving long-term national content targets (Republic of Uganda, 2018). Continued low levels of local content consumption limit opportunities for domestic enterprise growth, industrial development, technology transfer, employment creation, and the utilisation of locally available resources within Uganda's oil and gas sector (Hilson et al., 2023).

Existing studies have largely explained local content outcomes from the perspective of regulatory frameworks, policy implementation, and institutional arrangements (Hilson & Ovadia, 2020). While these studies provide valuable insights regarding the importance of local content policies, they provide limited empirical evidence on how organisational factors influence local content consumption among domestic firms (Alinda et al., 2018). In particular, limited empirical attention has been given to the combined influence of capacity building, firm capabilities, and government regulations compliance on local content consumption within emerging petroleum economies (Mushemeza & Okiira, 2016). Consequently, it remains unclear whether low levels of local content consumption are associated with limitations in capacity

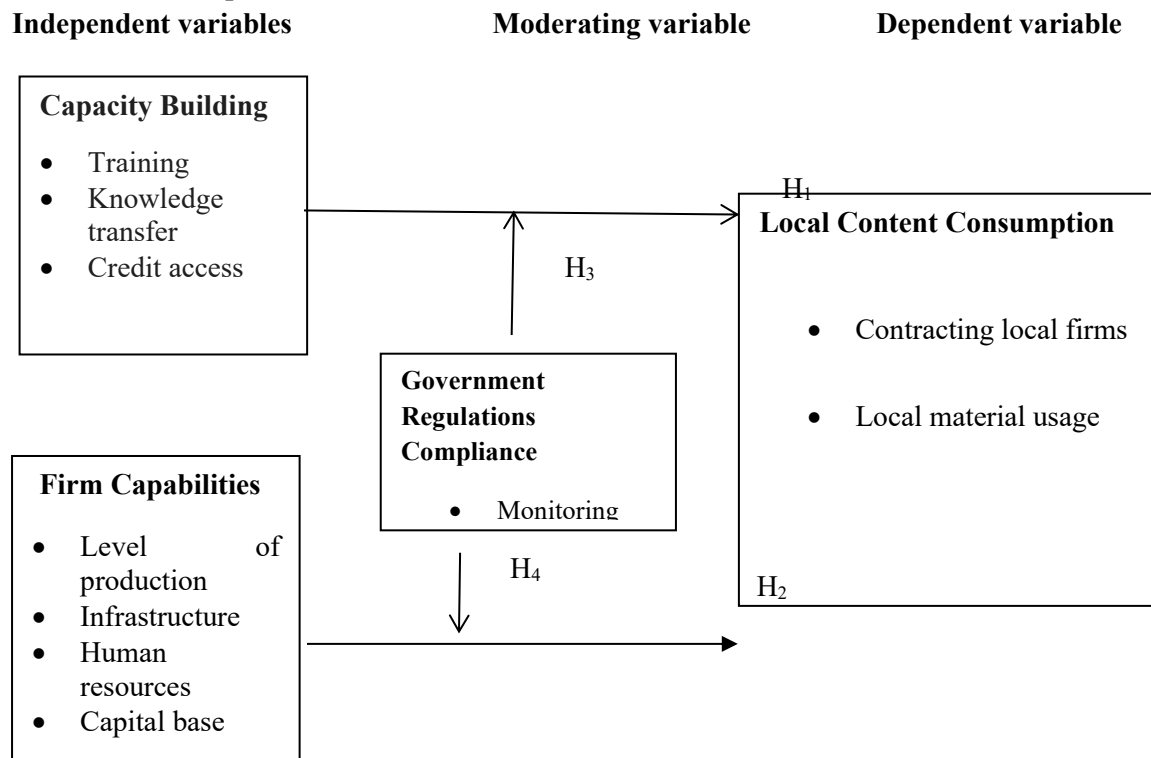
building, deficiencies in firm capabilities, variations in government regulations compliance, or the interaction among these factors (Alinda et al., 2018).

The study was based on the argument that local content consumption cannot be explained by regulatory frameworks alone (Hilson & Ovadia, 2020). Rather, the extent to which domestic firms participate in petroleum supply chains depends on their ability to acquire knowledge, skills, financial resources, and operational competencies required to compete within the sector (Madhok & Li, 2013). Government regulations compliance may therefore not only directly influence local content consumption but may also alter the extent to which capacity building and firm capabilities translate into local content outcomes (Franco & Franco, 2022). Understanding these relationships is essential to inform policies aimed at increasing domestic participation in Uganda's oil and gas sector (Petroleum Authority of Uganda, 2024). Accordingly, this study examined the moderating role of government regulations compliance in the relationship between capacity building, firm capabilities, and local content consumption among firms operating in Uganda's oil and gas sector.

Aim of the Study

To examine the moderating role of government regulations compliance in the relationship between capacity building, firm capabilities, and local content consumption among firms operating in Uganda's oil and gas sector.

Conceptual Framework

Figure 1: Capacity Building, Firm Capabilities, Government Regulations Compliance and Local Content Consumption

Source: Adapted from Literature Review of (Barney et al., 2021; Kasahara, 2020; Lema & Rabellotti, 2023; Ovadia, 2021; Teece, 2023; Tordo, 2023)

Theoretical Foundation

This study was primarily informed by Institutional Theory, which was initially developed by Meyer and Rowan (1977) and later advanced by DiMaggio and Powell (1983). The theory explains that organisational behaviour is shaped by institutional pressures arising from regulations, policies, social norms, and expectations within the environment in which organisations operate. Organisations often adopt structures, practices, and strategies that conform to institutional expectations to gain legitimacy and access valuable resources (Berthod, 2020). Similarly, Franco and Franco (2022) argued that organisations respond to institutional pressures because compliance enhances their ability to secure opportunities, support, and acceptance from key stakeholders. Institutional Theory was particularly relevant to the present study because government regulations compliance constituted the central mechanism through which capacity building and firm capabilities influenced local content consumption. Uganda's oil and gas sector

operates within a regulatory environment characterised by local content policies, procurement requirements, monitoring systems, and compliance obligations established to increase domestic participation. The theory therefore provided an appropriate lens for explaining how government regulations compliance influenced the extent to which organisational resources were translated into local content outcomes.

The study was further supported by Resource-Based Theory, which was developed by Wernerfelt (1984) and subsequently advanced by Barney (1991). The theory explains that firms achieve superior performance through the effective utilisation of valuable organisational resources and capabilities. According to Madhok and Li (2013), resources such as knowledge, technical expertise, infrastructure, human skills, and financial capacity determine the ability of firms to compete and exploit available opportunities. Capacity building contributes to the

development of these resources through training, knowledge transfer, and access to financial support, while firm capabilities reflect the operational strengths required for effective participation in petroleum sector activities. Resource-Based Theory therefore explained why firms possessing stronger capacities and capabilities were more likely to participate in local content activities and increase local content consumption. The integration of Institutional Theory and Resource-Based Theory provided a comprehensive explanation of how external regulatory pressures and internal organisational resources jointly influenced local content consumption among firms operating in Uganda's oil and gas sector.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Government regulations compliance has become a central mechanism through which governments seek to influence local content outcomes within extractive industries. Local content regulations are intended to increase domestic participation in petroleum value chains by encouraging the utilisation of local suppliers, promoting technology transfer, supporting enterprise development, and increasing the consumption of locally supplied goods and services (Hilson & Ovadia, 2020). Compliance with these regulations creates an institutional environment that shapes procurement decisions and determines the extent to which domestic firms benefit from investments within the petroleum sector (Ackah & Mohammed, 2020). Consequently, the effectiveness of local content policies depends not only on the existence of regulatory frameworks but also on the degree to which firms and industry operators comply with established requirements.

Capacity building and firm capabilities have frequently been identified as important organisational factors influencing participation within petroleum supply chains. Capacity building enables firms to acquire the knowledge, competencies, and financial resources necessary to meet industry requirements through training, knowledge transfer, and access to finance

(Medani, 2022). Firm capabilities, on the other hand, reflect the production capacity, infrastructure, human resources, and financial strength required to perform activities effectively and compete for procurement opportunities within the petroleum sector (Madhok & Li, 2013). Previous studies suggest that firms possessing stronger capacities and capabilities are generally better positioned to participate in local content activities and increase the utilisation of locally supplied goods and services (Ahmed, 2022; Wang & Ahmed, 2021).

However, the influence of capacity building and firm capabilities on local content consumption may depend on the regulatory environment within which firms operate. Institutional Theory suggests that organisational outcomes are shaped by regulatory pressures arising from laws, policies, monitoring mechanisms, and compliance requirements established by governments and regulatory authorities (Franco & Franco, 2022). Within the petroleum sector, local content regulations require operators to prioritise domestic suppliers and create opportunities for local firms to participate in procurement activities (Tordo et al., 2021). Consequently, firms that possess the necessary knowledge, skills, resources, and operational capabilities may only be able to translate these attributes into local content outcomes when regulatory compliance mechanisms are effectively implemented and enforced.

Where compliance with local content regulations is high, petroleum operators are more likely to provide opportunities for domestic firms to participate in supply chain activities, thereby increasing the likelihood that investments in capacity building and organisational capabilities translate into local content consumption (Hilson et al., 2023). Conversely, where compliance is weak, the benefits of capacity building and firm capabilities may not fully translate into participation opportunities because domestic firms may continue to face barriers in accessing petroleum supply chains regardless of their preparedness and operational strengths (Ovadia,

2022). Government regulations compliance may therefore influence the extent to which capacity building and firm capabilities contribute to local content consumption among firms operating in the petroleum sector.

Although previous studies have examined local content regulations, organisational capabilities, and supplier participation within extractive industries, limited empirical evidence exists regarding the extent to which government regulations compliance alters the relationship between capacity building, firm capabilities, and local content consumption, particularly within emerging petroleum economies such as Uganda (Mushemeza & Okiira, 2016; Alinda et al., 2018). This study therefore examined the moderating role of government regulations compliance in the relationship between capacity building, firm capabilities, and local content consumption among firms operating in Uganda's oil and gas sector.

H1: *Government regulations compliance significantly moderates the relationship between capacity building, firm capabilities, and local content consumption among firms operating in Uganda's oil and gas sector.*

METHODOLOGY

This study adopted a cross-sectional research design within a pragmatist philosophical orientation. The design was considered appropriate because it enabled the examination of the moderating role of government regulations compliance in the relationship between capacity building, firm capabilities, and local content consumption among firms operating in Uganda's oil and gas sector. A quantitative approach was considered in this study.

The study population comprised 1,274 Ugandan private companies registered on the National Supplier Database maintained by the Petroleum Authority of Uganda. Using the Taro Yamane (1967) formula, a minimum sample size of 304 firms was obtained and subsequently increased to 346 firms to account for potential non-response.

Three respondents, namely Procurement Officers, Accountants, and National Content Officers, were selected from each sampled firm, resulting in 1,038 respondents.

Data was aggregated and analysed at the firm level because the unit of analysis was the firm rather than individual respondents. Before analysis, the data was screened for missing values, outliers, normality, and multicollinearity. The results indicated no significant missing values or extreme outliers, and all observations were retained for further analysis. Reliability and validity were assessed using Cronbach's alpha, Composite Reliability, Average Variance Extracted, and Confirmatory Factor Analysis. The results confirmed that the measurement scales satisfied the recommended reliability and validity thresholds.

Data was analysed using IBM SPSS Statistics v.26 and AMOS. Descriptive statistics were used to summarise the characteristics of the study variables, as well as inferential statistics of the Pearson Correlation Coefficient and Regression Analysis. Structural Equation Modelling (SEM) was employed to examine the moderating effect of government regulations compliance on the relationship between capacity building, firm capabilities, and local content consumption. The study constructs were measured as composite scores derived from their respective questionnaire items. Standardised composite scores were generated, and interaction terms were created by multiplying capacity building with government regulations compliance and firm capabilities with government regulations compliance. These interaction terms were incorporated into the structural model, and their path coefficients were examined to determine whether government regulations compliance significantly influenced the relationships between capacity building, firm capabilities, and local content consumption.

FINDINGS AND DISCUSSIONS

Response Rate

The study targeted 346 Ugandan firms registered on the National Supplier Database of the Petroleum Authority of Uganda. Of these, 280 firms participated, representing a firm response rate of 81%. Since firms constituted the unit of analysis, this level of participation was considered adequate for the study. A total of 1,038 questionnaires were distributed to Procurement Officers, Accountants, and National Content Officers within the targeted firms. Of these, 841 questionnaires were completed and returned,

representing a questionnaire response rate of 81%. In addition, 21 Chief Executive Officers were targeted for interviews to provide deeper insights into local content participation. Data saturation was achieved after 18 interviews, representing an interview response rate of 85.7%.

Characteristics of Firms

The analysis presented in this section is based on the 280 firms that responded to the survey, representing 81% of the total firms targeted in the study. The results are shown in Table 1.

Table 1: Demographic Characteristics of Firms

Characteristic	Category	Frequency	Percentage (%)
Location of the firm	Central Region	235	83.9
	Albertine Region	39	13.9
	North/West Nile Region	6	2.1
Year the firm started operations	Less than 5 years ago	69	24.6
	5–10 years ago	97	34.6
	11–15 years ago	65	23.2
	16–20 years ago	33	11.8
	Over 20 years ago	16	5.7
Main line of business	Goods supply	94	33.6
	Services provision	121	43.2
	Both goods and services	65	23.2
Size of the firm	Micro (Less than 10 employees)	32	11.4
	Small (10–49 employees)	122	43.6
	Medium (50–99 employees)	83	29.6
	Large (100 employees and above)	43	15.4
Ownership structure	Sole proprietorship	51	18.2
	Partnership	29	10.4
	Private limited company	176	62.9
	Public limited company	24	8.6
Years supplying oil and gas sector	Never supplied	98	35.0
	Less than 2 years	72	25.7
	2–4 years	60	21.4
	5–7 years	37	13.2
	Over 7 years	13	4.6

The majority of firms were located in the Central Region, 235 (83.9%), while 39 (13.9%) were located in the Albertine Region and 6 (2.1%) in the North/West Nile Region. Most firms had operated for 5–10 years, 97 (34.6%), followed by those that had operated for less than 5 years, 69 (24.6%), and 11–15 years, 65 (23.2%). Regarding the main line of business, 121 (43.2%) firms were engaged in service provision, 94 (33.6%) in goods supply, and 65 (23.2%) in both goods and services. The majority of firms were small enterprises employing 10–49 employees, 122 (43.6%), while 83 (29.6%) were medium-sized, 43 (15.4%) were large firms, and 32 (11.4%) were micro enterprises. In terms of ownership structure, most firms were private limited companies, 176 (62.9%), followed by sole proprietorships, 51 (18.2%), public limited companies, 24 (8.6%), and partnerships, 29 (10.4%). The findings further revealed that 98 (35.0%) firms had never supplied goods or services to the oil and gas sector, while 72 (25.7%) had supplied for less than two years, 60 (21.4%) for 2–4 years, 37 (13.2%) for 5–7 years, and 13 (4.6%) for more than seven years. These findings suggest that Uganda's oil and gas supply chain is dominated by relatively young, small-to-medium-sized private firms, many of which are still developing the experience required to participate effectively in local content activities.

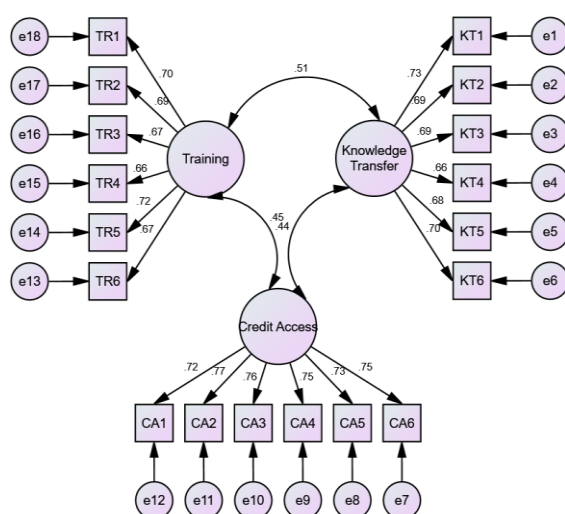
Structural Equation Modelling (SEM)

Structural Equation Modelling (SEM) was employed to assess the measurement and structural relationships among capacity building, firm capabilities, government regulations compliance, and local content consumption. Following the two-step approach, Confirmatory Factor Analysis (CFA) was first conducted to assess the measurement properties of the constructs before estimating the structural model. Model adequacy was evaluated using goodness-of-fit indices including CMIN/DF, RMSEA, CFI, IFI, and TLI. The measurement and structural models satisfied the recommended thresholds and were therefore considered suitable for further analysis.

Capacity Building Measurement Model

Capacity building was measured using training, knowledge transfer, and credit access. All indicators loaded significantly onto their respective dimensions and were retained in the final model. Standardised factor loadings ranged from 0.663 to 0.765, indicating satisfactory convergent validity. Positive relationships were observed among the dimensions, suggesting that training, knowledge transfer, and credit access jointly contribute to organisational capacity development. The model achieved excellent fit and was retained for subsequent analysis.

Figure 2: Confirmatory Factor Analysis Measurement Model for Capacity Building

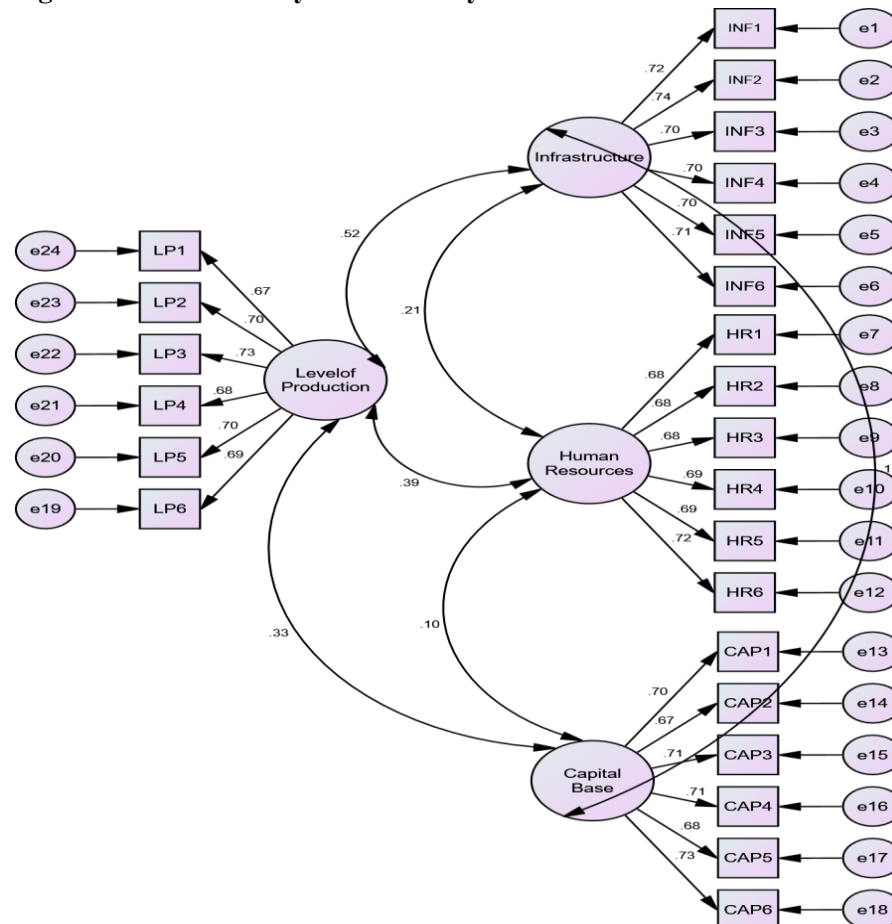


Firm Capabilities Measurement Model

Firm capabilities were measured using infrastructure, human resources, capital base, and level of production. All indicators loaded significantly onto their respective dimensions and were retained in the final model. Standardised factor loadings ranged from 0.674 to 0.745,

indicating acceptable construct validity. Positive relationships were observed among the dimensions, demonstrating that infrastructure, workforce competence, financial resources, and production capability collectively explain firm capabilities within Uganda's oil and gas sector. The model demonstrated satisfactory fit and was retained for structural model estimation.

Figure 3: Confirmatory Factor Analysis Measurement Model for Firm Capabilities

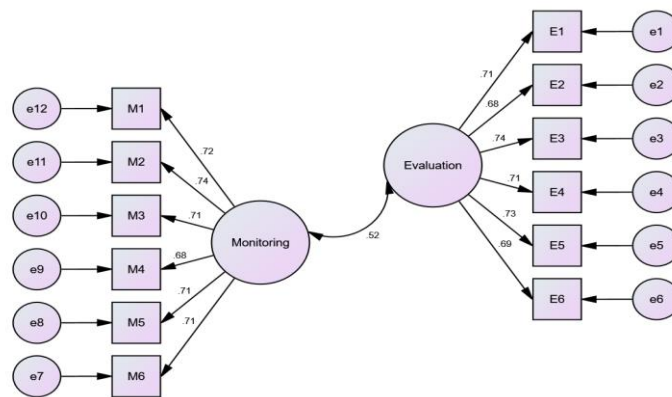


Government Regulations Compliance Measurement Model

Government regulations compliance was measured using monitoring and compliance dimensions. All indicators loaded significantly onto their respective dimensions, with

standardised factor loadings ranging from 0.679 to 0.741. Monitoring and compliance were positively related, indicating that effective regulatory oversight is associated with greater adherence to local content requirements. The model demonstrated excellent fit and was considered suitable for subsequent analysis.

Figure 4: Confirmatory Factor Analysis Measurement Model for Government Regulations Compliance



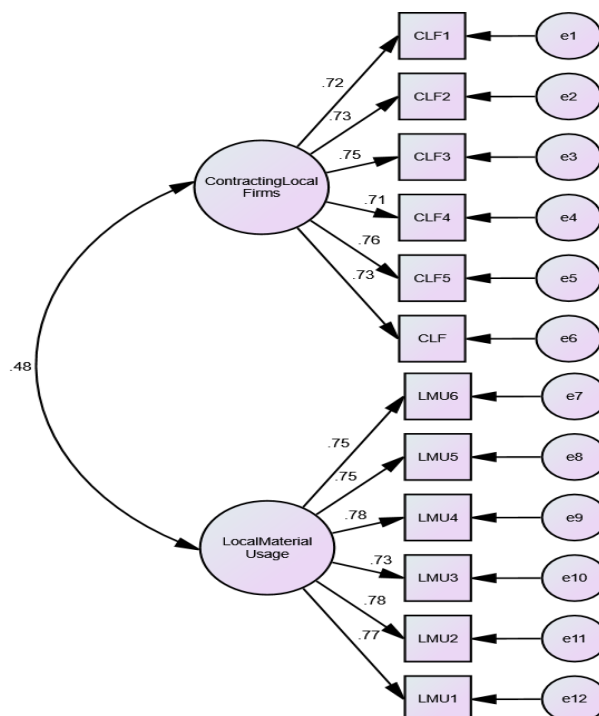
Source: AMOS Output (2026)

Local Content Consumption Measurement Model

Local content consumption was measured using contracting local firms and local material usage. All indicators loaded significantly onto their respective dimensions, with standardised factor

loadings ranging from 0.709 to 0.781. The two dimensions were positively related, indicating that increased participation of local firms is associated with greater utilisation of locally available goods and services. The model achieved satisfactory fit and was retained for structural analysis.

Figure 5: Confirmatory Factor Analysis Measurement Model for Local Content Consumption



Source: AMOS Output (2026)

Assessment of Normality

Normality was assessed using histogram analysis, Normal P-P plots, and skewness and kurtosis statistics. The histogram approximated a normal distribution, while the Normal P-P plot showed observations closely following the diagonal

reference line. The skewness and kurtosis values fell within acceptable limits, and the multivariate kurtosis critical ratio of 3.384 was below the recommended threshold. These findings confirmed that the data satisfied the assumptions of univariate and multivariate normality required for SEM analysis.

Figure 6: Histogram of Regression Standardised Residuals

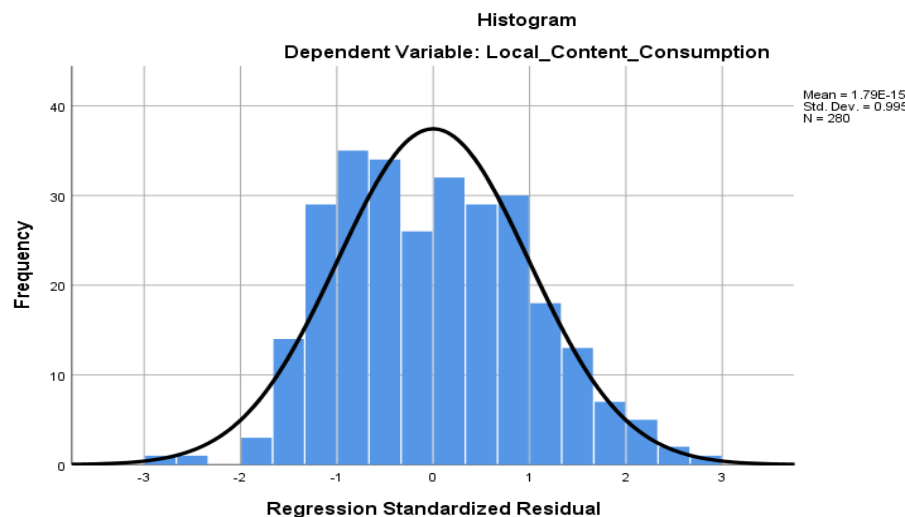
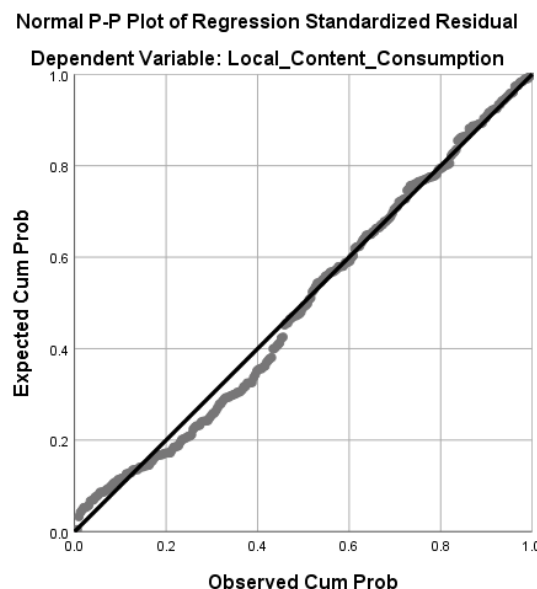


Figure 7: Normal P-P Plot of Regression Standardised Residuals



Assessment of Multicollinearity and Outliers

The collinearity diagnostics indicated condition index values ranging from 1.000 to 12.882, suggesting the absence of serious multicollinearity among the study variables. The variance proportions further demonstrated that the

predictor variables could be included simultaneously in the model without estimation problems. The results also showed that all standardised values fell within the acceptable threshold of ± 3.29 , indicating the absence of extreme outliers. Consequently, neither

multicollinearity nor outliers posed a threat to the validity of the study findings.

Correlation Analysis

Pearson correlation analysis was conducted to establish the existence, strength, and direction of

the relationships among the study variables prior to moderation testing using Structural Equation Modelling. Establishing significant associations among the variables was important in determining whether the proposed relationships warranted further examination through moderation analysis.

Table 2: Pearson Correlation Matrix (N = 280)

Items	1	2	3	4	5	6	7	8	9	10	11
Capacity Building-1	1										
Training-2	.878*	1									
Knowledge Transfer-3	.832*	.662*	1								
Credit Access-4	.806*	.550*	.455*	1							
Firm Capabilities-5	.166*	.150*	.143*	.126*	1						
Production-6	.170*	.153*	.162*	.115*	.895*	1					
Infrastructure-7	.129*	.120*	.095	.108*	.883*	.736*	1				
Human Resources-8	.125*	.107*	.110*	.097	.882*	.712*	.709*	1			
Local content consumption-9	.501*	.467*	.452*	.345*	.417*	.354*	.380*	.365*	1		
Contracting Local Firms-10	.454*	.429*	.424*	.294*	.425*	.363*	.387*	.372*	.940*	1	
Local Material Usage-11	.489*	.451*	.427*	.356*	.360*	.303*	.328*	.315*	.941*	.769*	1

** Correlation is significant at the 0.01 level (1-tailed)

* Correlation is significant at the 0.05 level (1-tailed)

The correlation results indicate that capacity building has a positive and statistically significant relationship with local content consumption ($r = .501^{**}$, $p < 0.01$). The findings suggest that firms that invest in training, knowledge transfer, and access to finance are more likely to participate in local content activities within Uganda's oil and gas sector. This implies that the ability of firms to utilise opportunities created through local content policies depends partly on their access to knowledge, skills, and financial resources. Firms

that possess these attributes are better positioned to satisfy procurement requirements and participate in oil and gas supply chains. The findings are consistent with (Medani, 2022; Ahmed, 2022), who observed that capacity building strengthens organisational knowledge, skills, and institutional competencies required for effective performance. Similarly, Ihua (2021) argued that the participation of domestic firms in oil and gas activities depends largely on their ability to acquire the technical knowledge and

competencies required by the industry. The findings therefore suggest that investments in training, knowledge transfer, and access to finance contribute to increased local content consumption by improving the readiness of firms to participate in sector activities.

The results further indicate that firm capabilities have a positive and statistically significant relationship with local content consumption ($r = .417^{**}$, $p < 0.01$). This suggests that firms possessing stronger production capacity, infrastructure, human resources, and financial resources are more likely to participate in local content activities. The findings imply that participation within oil and gas supply chains is influenced by the extent to which firms possess the operational capabilities required to meet industry standards and deliver goods and services competitively. The findings are consistent with Jaworska (2023), who argued that firm capabilities are important determinants of competitiveness and organisational effectiveness.

Similarly, Wang et al. (2021) observed that firms require capabilities that enable them to effectively deploy available resources and respond to market opportunities. The positive relationship observed in this study therefore suggests that firms with stronger operational capabilities are more likely to benefit from opportunities created through local content policies and participate in Uganda's oil and gas value chain. The significant positive correlations among the study variables provided preliminary support for the proposed relationships and justified the subsequent testing of the moderating role of government regulations compliance using Structural Equation Modelling.

Regression Analysis

Hierarchical regression analysis was conducted to determine the predictive influence of capacity building and firm capabilities on local content consumption. Capacity building was entered in Model 1, followed by firm capabilities in Model 2. The results are presented in Table 3.

Table 3: Model Summary

Model Summary ^c									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			
						F Change	df1	df2	Sig. F Change
1	.501 ^a	.251	.248	.791340505	.251	93.253	1	278	.000
2	.605 ^b	.366	.361	.72959795	.115	50.043	1	277	.000

a. Predictors: (Constant), Capacity Building

b. Predictors: (Constant), Capacity Building, Firm Capabilities

c. Dependent Variable: Local content consumption

The model summary results show the extent to which capacity building and firm capabilities explain variation in local content consumption. In Model 1, capacity building produced an Adjusted R^2 value of .248, indicating that it explains 24.8% of the variation in local content consumption, while 75.2% is attributable to factors outside the model. Following the introduction of firm capabilities in Model 2, the Adjusted R^2 increased to .361, indicating that the two variables jointly explain 36.1% of the variation in local content consumption, while 63.9% remains unexplained. The R^2 Change value of .115 further indicates that

firm capabilities contributed an additional 11.5% towards explaining local content consumption.

The findings suggest that both capacity building and firm capabilities are important determinants of local content consumption among firms operating in Uganda's oil and gas sector. The increase in explanatory power following the introduction of firm capabilities demonstrates that local content participation is influenced not only by investments in training, knowledge transfer, and access to finance but also by the operational capabilities possessed by firms. The findings

support the Resource Based Theory, which argues that organisational outcomes are influenced by the availability and effective utilisation of valuable resources and capabilities (Madhok & Li, 2013).

The ANOVA results are presented in Table 4, indicating whether the regression models are

Table 4: ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	58.397	1	58.397	93.253	.000 ^b
	Residual	174.089	278	.626		
	Total	232.486	279			
2	Regression	85.035	2	42.518	79.873	.000 ^c
	Residual	147.451	277	.532		
	Total	232.486	279			

a. Dependent Variable: Local content consumption

b. Predictors: (Constant), Capacity Building

c. Predictors: (Constant), Capacity Building, Firm Capabilities

The ANOVA results indicate that both regression models were statistically significant. Model 1 was significant ($F = 93.253$, $p < 0.001$), showing that capacity building significantly predicts local content consumption. Similarly, Model 2 remained statistically significant ($F = 79.873$, $p < 0.001$), indicating that the combined effect of capacity building and firm capabilities significantly predicts local content consumption among firms operating in Uganda's oil and gas sector.

The findings suggest that local content participation is significantly influenced by firm-level factors. The significance of both models

statistically significant. The F-statistic and corresponding significance values show whether the independent variables, when considered together, are associated with local content consumption.

demonstrates that investments in capacity building and the development of firm capabilities contribute to explaining variations in local content consumption. These findings are consistent with Medani (2022), Ahmed (2022) and Jaworska (2023), who argued that organisational competencies and capabilities are important determinants of performance and participation in competitive industries.

The coefficient results are presented in Table 5, showing the direction and strength of the relationship between capacity building, firm capabilities and local content consumption.

Table 5: Coefficients

Coefficients ^a						
Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.124	.200		5.621	.000
	Capacity_Building	.625	.065	.501	9.657	.000
2	(Constant)	.186	.227		.820	.413
	Capacity_Building	.554	.061	.444	9.152	.000
	Firm_Capabilities	.384	.054	.343	7.074	.000

a. Dependent Variable: Local content consumption

The coefficient results show that capacity building has a positive and statistically significant effect on local content consumption in Model 1 ($\beta = .501$, $p < 0.001$). After introducing firm capabilities in Model 2, capacity building remained positive and significant ($\beta = .444$, $p < 0.001$). Firm capabilities also had a positive and statistically significant effect on local content consumption ($\beta = .343$, $p < 0.001$). The findings indicate that both capacity building and firm capabilities contribute significantly to local content consumption, although capacity building exerts a relatively stronger influence.

The findings suggest that firms that invest in training, knowledge transfer, and access to finance are more likely to participate in local content activities than firms that do not make similar investments. The results are consistent with Medani (2022) and Ahmed (2022), who observed that capacity building strengthens organisational knowledge and competencies required for effective performance. The findings also support Jaworska (2023) and Wang et al. (2021), who argued that firm capabilities enhance competitiveness and enable organisations to respond effectively to industry requirements.

However, Ihua (2021), Hausmann and Rodrik (2022), and Kakembo (2020) noted that financial constraints, inadequate infrastructure, and technological limitations may restrict the ability of domestic firms to fully benefit from available opportunities. The findings therefore suggest that both capacity building and firm capabilities are necessary for increasing local content consumption among firms operating in Uganda's oil and gas sector.

Moderation Testing

Moderation testing was conducted using Structural Equation Modelling (SEM) to examine whether government regulations compliance moderates the relationship between capacity building, firm capabilities, and local content consumption among firms operating in Uganda's oil and gas sector. Interaction terms were created between capacity building and government regulations compliance, and between firm capabilities and government regulations compliance. The model demonstrated satisfactory fit (CMIN/DF = 1.651, CFI = 0.976, IFI = 0.976, TLI = 0.970, RMSEA = 0.048), indicating its suitability for moderation analysis.

Table 6: SEM Structural Model Results for Moderation Testing

Path	B	β	C.R.	P
Capacity Building → Local content consumption	0.461	0.469	7.641	***
Firm Capabilities → Local content consumption	0.298	0.314	5.860	***
Government Regulations Compliance → Local content consumption	0.412	0.438	7.038	***
Capacity Building × GRC → Local content consumption	0.303	0.273	5.478	***
Firm Capabilities × GRC → Local content consumption	-	-	-	0.008
	0.143	0.128	2.634	

The results indicate that capacity building ($\beta = 0.469$, $p < 0.001$), firm capabilities ($\beta = 0.314$, $p < 0.001$), and government regulations compliance ($\beta = 0.438$, $p < 0.001$) each have a positive and statistically significant effect on local content consumption. The findings suggest that firms with stronger capacity-building initiatives, greater operational capabilities, and higher levels of compliance with government regulations are more

likely to participate in local content activities within Uganda's oil and gas sector.

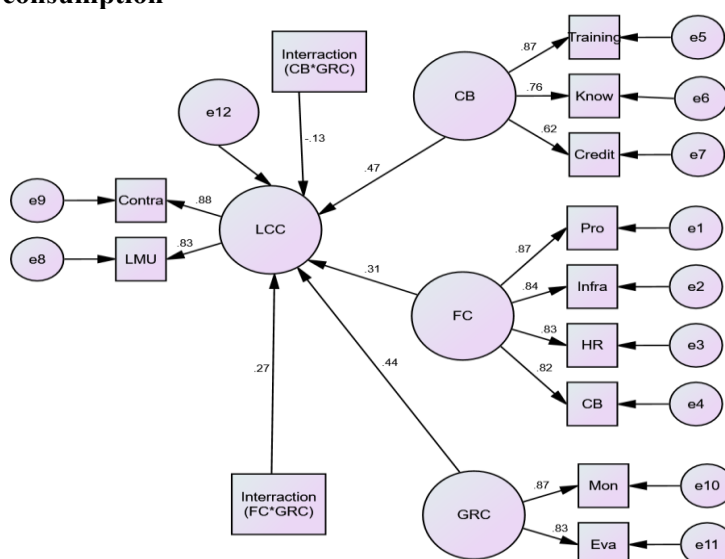
The interaction between capacity building and government regulations compliance was positive and statistically significant ($\beta = 0.273$, $p < 0.001$), indicating that government regulations compliance strengthens the positive relationship between capacity building and local content consumption. This finding suggests that the benefits derived from training, knowledge

transfer, and access to finance are more likely to translate into actual participation when firms operate within an environment characterised by effective regulatory monitoring and enforcement. The findings are consistent with Hilson and Ovadia (2020) and Tordo et al. (2021), who argued that local content regulations create conditions that enable capacity-development initiatives to generate meaningful participation outcomes. The findings further support Institutional Theory, which posits that organisational behaviour is shaped by regulatory pressures and institutional expectations (Franco & Franco, 2022).

Conversely, the interaction between firm capabilities and government regulations compliance was negative and statistically significant ($\beta = -0.128$, $p = 0.008$), indicating that government regulations compliance weakens the

positive relationship between firm capabilities and local content consumption. This suggests that under conditions of stronger regulatory compliance, differences in firm capabilities become less important in determining participation in local content activities. The findings partially support the arguments of Hilson et al. (2023) and Tordo et al. (2021), who observed that local content regulations broaden participation opportunities for domestic firms. The results imply that regulatory compliance creates a more structured environment in which participation is influenced not only by firm capabilities but also by adherence to local content requirements. These findings therefore confirm that government regulations compliance plays a significant moderating role in the relationship between capacity building, firm capabilities, and local content consumption among firms operating in Uganda's oil and gas sector.

Figure 8: Structural Equation Model Showing the Moderating Role of Government Regulations Compliance on the Relationship between Capacity Building, Firm Capabilities and Local content consumption



CONCLUSION

The study examined the moderating role of government regulations compliance in the relationship between capacity building, firm capabilities, and local content consumption among firms operating in Uganda's oil and gas sector. The findings revealed that capacity building and firm capabilities positively and

significantly influence local content consumption. The study further established that government regulations compliance positively moderates the relationship between capacity building and local content consumption while negatively moderating the relationship between firm capabilities and local content consumption. The study concludes that local content consumption is influenced by both internal firm factors and external regulatory

mechanisms. Effective capacity building, strong firm capabilities, and compliance with local content regulations are therefore essential for increasing the participation of Ugandan firms in the oil and gas value chain.

Recommendations

The Petroleum Authority of Uganda, the Ministry of Energy and Mineral Development, and licensed oil and gas operators should strengthen capacity-building initiatives through regular training, supplier development programmes, mentorship arrangements, and technology transfer initiatives targeting Ugandan firms. Regulatory institutions should also strengthen monitoring and enforcement of local content requirements to ensure that compliance mechanisms create opportunities for local firms to participate in procurement activities. In addition, firms should invest in strengthening production capacity, infrastructure, human resources, and financial capacity in order to improve their competitiveness and ability to meet industry requirements within the oil and gas sector.

Areas for Further Research

Future studies should examine additional dimensions of capacity building, such as technology transfer systems, supplier mentorship programmes, innovation capabilities, and research and development activities, to determine their influence on local content consumption. Further research should also investigate other firm capabilities, including technological capability, quality certification systems, and supply chain management practices that may influence participation in oil and gas supply chains. In addition, future studies should examine the effectiveness of regulatory enforcement systems, compliance monitoring mechanisms, and procurement transparency frameworks in promoting local content participation within Uganda's oil and gas sector.

Study Limitations

The study was limited by its cross-sectional design, which restricted the ability to examine

changes in the study variables over time and establish causal relationships. The study also relied on self-reported information obtained from respondents, which may have been affected by response bias despite measures taken to assure anonymity and confidentiality. In addition, the study employed researcher-developed instruments, which may have been subject to measurement limitations. However, these limitations were minimised through instrument pretesting, pilot testing, and the use of established theoretical and empirical foundations to guide the study.

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Competing Interests

The authors declare that there are no competing interests regarding the publication of this paper.

Authors' Contributions

SM conceived and designed the study, collected and analysed the data, interpreted the findings, and prepared the original manuscript as the Principal Investigator. TM and BV supervised the research, provided academic guidance throughout the study, contributed to the interpretation of the findings, and critically reviewed the manuscript for important intellectual content. TI provided editorial support by reviewing, editing, and refining the manuscript for clarity, coherence, and publication readiness. All authors read and approved the final version of the manuscript.

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