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EXAMINING THE MODERATING INFLUENCE OF REGULATORY ENVIRONMENT ON THE RELATIONSHIP BETWEEN PARTICIPATORY MONITORING AND EVALUATION AND PERFORMANCE OF PETROLEUM PROJECTS IN SOUTH SUDAN

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EXAMINING THE MODERATING INFLUENCE OF REGULATORY ENVIRONMENT ON THE RELATIONSHIP BETWEEN PARTICIPATORY MONITORING AND EVALUATION AND PERFORMANCE OF PETROLEUM PROJECTS IN SOUTH SUDAN

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Abstract

Existing project management literature generally assumes that a robust regulatory environment reinforces accountability and improves project outcomes but this is not always the case in institutionally fragile contexts like South Sudan. This study examines whether South Sudan's petroleum regulatory environment moderates the relationship between Participatory Monitoring and Evaluation and performance of the petroleum projects. An explanatory research design was employed. Probability sampling procedure, specifically stratified random sampling, was used to derive 278 projects from the population of 911 using Yamane's formula (1967). Primary data were collected from the senior management in three private petroleum operating companies and the Ministry of Petroleum in South Sudan. Multiple linear regression models were used to analyze the moderating influence of regulatory environment on the relationship between Participatory Monitoring and Evaluation and project performance in South Sudan's petroleum industry. Descriptive statistics show neural perceptions, signaling ambivalence amid institutional fragility. Hierarchical regression reveals that Participatory Monitoring and Evaluation has positive and statistically significant effect on project performance, highlighting its important role in enhancing stakeholder engagement, learning and accountability. The Regulatory Environment also demonstrates significant influence on the performance of petroleum projects confirming regulations' additive role. However, contrary to prevailing theoretical expectations, Participatory Monitoring and Evaluation and regulatory environment interaction yields insignificant moderation, meaning that regulations bolster but do not amplify Participatory Monitoring and Evaluation effect on performance. The findings of this study caution policy makers against equating presence of petroleum regulations with effective governance capacity. Regulatory reforms in fragile and post-conflict contexts thus need to prioritize institutional coordination, enforcement credibility and implementation capacity and not establishment of new laws alone. For petroleum operators, the findings of this study underscore the need for these operators to simultaneously strengthen internal governance mechanisms like Participatory Monitoring and Evaluation practices and participatory accountability systems rather than exclusively relying on external regulatory oversight.

Keywords: participatory monitoring and evaluation, regulatory environment, performance, petroleum industry projects, South Sudan.

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Introduction

The taken for granted assumption within project governance literature is that robust regulatory systems strengthens internal management practices like Participatory Monitoring and Evaluation, and thereby automatically improve project outcomes. Such systems impose external compliance standards, provide legal authority for enforcement and establish the institutional credibility that makes stakeholder participation meaningful rather than performative (Turner, 2007; Kumar & Markesets, 2007; Scott, 2014). This is particularly the case in highly stable, institutionalized petroleum economies, such as Norway, the UK and parts of North America, where regulatory institutions often operate not as mere background conditions, but also as active governance architectures that reinforce transparency and disciplined organizational behavior (Wang, Liu, Xiong & Song, 2019; Wanjau, Namusonge & Lango, 2024).

Consequently, existing governance literature largely assumes that robust regulations amplify the effectiveness of internal participatory governance mechanisms. However, this assumption, while largely true in mature institutional contexts, is theoretically problematic when transferred to institutionally fragile environments where regulatory institutions may exist formally but lack enough enforcement capacity. PM&E, meant to foster transparency and inclusivity (Boadu and Ile, 2019), may continue functioning at the organizational level, but the broader regulatory landscape still condition its effectiveness. PM&E is defined differently in project management literature, but a consensus among various authorities is that it is a structured, stakeholder-inclusive process that tracks and assesses project progress, while emphasizing shared control, transparency and accountability (Chambers, 1997; World Bank, 2013). Rather than treating project beneficiaries as passive receipts of information, PM&E puts the first last (Chambers, 1997), meaning that its starts with the knowledge of ordinary and often traditionally marginalized peoples as the grounds for planning and change.

Empirical studies often operationalize PM&E using indicators like institutional quality, stakeholder engagement and feedback integration (Estrella and Gaventa, 1998; Kansheba and Marobhe, 2022), collaborative planning and training (Too, Kidombo and Gakuu, 2021; Heim, Kalyuzhnova & Ghobadian, 2023). This study thus measures it using institutional quality, stakeholder engagement, training and development and collaborative planning, supported by their well-established role in influencing project performance (Chandurkar et al., 2017) and use in previous studies such as (Coleman, Schultz, Parker, Manyindo & Mukuru, 2023). Despite its normative appeal, participatory governance alone may be insufficient to guarantee greater project improvements especially in complex extractive industries characterized by competitive interests, asymmetric power relations and high risks, unless supported by broader governance environment within which projects operates (Tutdel, 2021). This consequently brings into context an important question regarding whether external regulatory systems consistently strengthen participatory governance or whether their influence varies across institutional settings.

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Traditional project management literature widely conceptualizes regulatory environment as systems of laws, policies, ethical standards, compliance requirements and enforcement mechanisms shaping project implementations, risk management and governance. This literature, often assumes robust regulatory framework is an external control institutional mechanism that automatically reduces opportunism, enhance predictability, and strengthen accountability mechanisms during project implementation (Thurber, Hults and Heller 2011; Scott 2014; PMBOK 2021). Consequently, regulatory environment has previously been operationalized through regulatory quality, institutional capacity, policy consistency, legal compliance, oversight structures and enforcement effectiveness, and corporate governance norms, regulatory enforcement mechanisms. For instance, while Scott (2014) used both formal regulations and informal barriers, the PMBOK Guide (2021) placed high premium on regulatory quality and institutional enforcement.

Project management regulations are particularly relevant in the extractive industries because projects are capital-intensive, politically sensitive and socially consequential. In highly stable, institutionalized petroleum economies, such as Norway, the UK and parts of North America, regulatory systems generally operate not just as mere background conditions, but also as active governance architectures that reinforce transparency, discipline organizational behavior and align project stakeholders round enforceable accountability and performance standards (Wang et al., 2019; Wanjau et al., 2024). Despite this dominant perspective, scholars such as Ruei (2018) and Makeny (2024) argue that regulatory influence may not be uniform across different institutional contexts, as regulations may interact with contextual and organizational conditions in ways that either weaken or strengthen governance processes.

Project performance, the ultimate outcome of interest, has evolved in existing project management literature beyond the narrow efficiency-based measures to now broader assessment of stakeholder, organizational and development outcomes. For instance, while earlier definition of performance focused on the "iron triangle" of cost, time and scope (DeCotiis & Dyer's 1979; Jha and Iyer's 2007), other scholars emphasize broader performance criteria, including stakeholder satisfaction, quality, environmental stewardship and long-term sustainability (Zada Khan et al., 2024). Different researchers and practitioners have employed various methods to operationalize the project performance. Pinto and Slevin (1988) used cost, time, and quality and stakeholder satisfaction. In almost a similar fashion, Tsiga, Emes and Smith (2017) used schedule adherence, safety records, production volumes, and project goal achievement to operationalize project performance. Awow, Muguthu and Njoka (2025), like Shenhar et al. (2001), used short-efficiency, stakeholder satisfaction, environmental impact, organizational success and future preparedness to operationalize project success. In petroleum-sector studies, researchers such as Asaolu (2021); and Sletten, Wangen Jonasmo and Solheim (2023), often assessed project performance through indicators like operational efficiency, cost control, environmental compliance, stakeholder satisfaction and goal achievement.

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Present study operationalizes project performance through quality (technical performance), reflecting both adherence to project standards and stakeholder satisfaction with project outcome. This conceptualization aptly aligns with the study's theoretical contribution because PM&E is primarily intended to captures project realities and stakeholder needs, while regulatory institutions are designed to ensure compliance to governance and technical standards. Quality in this sense provides an appropriate project outcome to examine whether regulatory systems weaken or strengthen the transformation of insights from PM&E processes into meaningful project results. Consequently, this study sought to establish how the concepts of project monitoring and evaluation, regulatory environment and petroleum projects performance manifest and in particular their relationships in the context of the Petroleum Industry in South Sudan. It measures the regulatory environment through three core dimensions: legal frameworks, compliance standards and enforcement mechanisms. Previous studies, including Mkalama (2021) and Bakare, Aziza, Uzougbo & Oduro (2024), support this operationalization, which reflects the important role of regulatory pressures in influencing petroleum projects in fragile states like South Sudan. To this end, therefore, the current study contributes to growing calls within project management scholarship to have a more context-sensitive theorization that can distinguish between formal institutional design and practical regulatory effectiveness in institutionally fragile states.

Research Problem

Despite the widespread assumption that regulation strengthens participatory governance, important conceptual and theoretical questions remain unresolved. Most studies of examine participatory governance and performance as a direct relationship (Muriungi, 2015; Mayanja, 2020), implicitly assuming that stakeholder participation and feedback loops automatically translates into improved outcomes. Similarly, strong regulatory institutions and enforcement mechanisms have been found to uniformly enhance sectorial performance in mature regulatory environments, such as the United States of America (Asaolu, 2021) and Norway (Kumar & Markesets, 2007; Thurber, Hults & Heller, 2011). However, project governance scholars like Patey (2014); Ruei (2018) and Tutdel (2021) argue that the influence regulatory systems on internal management systems like PM&E processes may be based on broader institutional factors rather than universally applicable. The implication is that the relationship between PM&E and project performance may not be homogenous but context sensitive. These studies, while important, leave a significant gap because they predominantly conceptualize regulation as a direct force behind performance rather than a contextual driver conditioning the effectiveness of participatory project governance mechanism. The relationship between participatory governance and project outcomes may be determined by regulatory environments rather than conditioned solely by participation or regulation in isolation.

Contextually, much of past research is grounded in institutionally stable and developed settings like Gulf of Mexico and Alaska (Lin and Leighty, 2007); Norway (Kumar and Markesets, 2007; Thurber et al., 2011; Sletten et al., 2023); and the United States (Asaolu, 2021),where regulatory

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systems are relatively stable with high enforcement capacity, consistency and a well-established institutional trust. Findings derived from such highly institutionalized contexts with well-designed regulations may not be transferable to fragile and post-conflict settings, where political instability, enforcement gaps, corruption risks and fragmented institutions undermine effectiveness regulatory institutions. The contextual gap thus lies in the limited understanding how regulatory environments in institutionally fragile contexts, and whether they weaken, strengthen the effectiveness of participatory governance in shaping project outcomes.

Emerging empirical evidence from sub-Saharan Africa have expanded understanding of governance challenges in resource-dependent economies, suggesting that the relationship between regulation and project outcomes in far less straightforward in practice. In Nigeria, for instance, Udo (2014) and more recently, Gbadebo (2025), highlight that despite extensive legal and institutional reforms in the petroleum industry, including the 2021 Petroleum Act and the Nigerian Extractive Industries Transparency Initiative, regulatory fragmentation, implementation gaps, enforcement weaknesses, rent-seeking behavior and regulatory inconsistencies are still undermining institutional accountability and project performance. Similar patterns have been observed in Ghana, where Okpanachi and Andrews (2012); and Asare, Burton and Dunne (2021), show that efforts to strengthen resource governance and accountability have improved formal oversight structures, but are yet to fully resolve concerns regarding transparency and institutional effectiveness. Substantial oil revenues and elaborate state institutions have also been found to coexist with governance outcomes often associated with the failure of many resource-rich countries to benefit fully from their natural resources, a phenomena generally referred to as resource curse (Amundsen, 2014). This finding suggests that formal institutional structures alone may not be sufficient to influence development outcomes. In Uganda's petroleum industry, Hickey and Izama (2020) demonstrated that effectiveness of regulatory reforms is significantly conditioned by underlying institutional realities and political settlements rather than by regulatory design itself.

Empirically, Ruei's (2018) study in South Sudan concentrates on macro-level challenges of governance, revenue management and conflict, overlooking the need to systematically examine how specific regulatory dimensions moderate the relationship between PM&E and project performance. PM&E's influence on the performance of petroleum industry projects under varying conditions is as a result yet to be understood comprehensively. Methodologically, previous studies have heavily relied on cross-sectional designs (Thurber et al., 2011), qualitative analyses (Kemp and Owen, 2013; Huni, 2017; Akoon, 2023), or examined governance mechanisms independently (Wang et al., 2019; Haris and Yang, 2023; Wanjau et al., 2024), or strengthens them through compliance structures, which limits their ability to establish causal relationships between study variables. Addressing these gaps requires quantitative research approaches capable of testing moderating effects and providing evidence on how regulatory presence interacts with

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participatory governance in institutionally fragile petroleum contexts.

Objective of the study

Therefore, in view of the above gaps the objective of this study was to evaluate the influence of regulatory environment on the relationship between participatory monitoring and evaluation and the performance of petroleum projects in South Sudan.

Literature Review

Theoretical Review

This study is primarily premised on the stakeholder theory, given that projects in the petroleum industry involve complex networks of actors whose interests, expectations significantly influence governance outcomes. Stakeholder theory, seminally articulated by Professor R. Edward Freeman in 1984, posits that for a project to be successful, it must create value for all stakeholders, not just shareholders (Freeman, 1984). This rejects the traditional shareholder-centric view of project management, which prioritizes profit-maximization (Friedman & Miles, 2006). However, present stakeholder theory primarily assumes relatively stable institutional conditions where project actors participate within properly functioning governance systems. Such assumptions may not apply in South Sudan's fragile project environments characterized by weak enforcement, mistrust and political instability. This study thus seeks to extend stakeholder theory in the sense that it examines how participatory governance practices operate under institutional fragility, not institutional stability.

The study also extends institutional theory. Associated with the works of Meyer and Rowan (1977); Powell and DiMaggio (1991), the theory posits that organizations must conform to the external institutional pressures within which they operate not only for technical efficiency, but also, more crucially, resources, legitimacy and survival, often adopting formal structures, not as purely functional mechanisms, but myths and ceremonies. It presents the concept decoupling to argue that under certain circumstances, organizations will only superficially abide by formal policies, rules or societal norms to appease societal pressures and maintain external legitimacy, while their internal core operations fundamentally continue as usual (Meyer & Rowan, 1977). Owusu et al. (2022), who found that personality traits and tax morale are primary drivers of evasion intentions, further underpin the idea that external governance mechanisms are often secondary to the individual motivations of project stakeholders. Institutional theory is critical for the study because it highlights how the regulatory environment, comprising normative, coercive and mimetic pressures, moderates project success (DiMaggio & Powell, 1983). This study extends decoupling concept of traditional institutional theory by introducing the idea of decoupled regulation beyond organizational structures to the regulatory environment itself. It seeks to examine whether regulation systems themselves may also become decoupled in the sense that they are formally elaborate yet operationally weak.

Furthermore, the study draws upon the theory of change. Widely associated with Harvard researcher Carol Weiss in 1995, the theory of change posits that actions taken within an

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intervention such as a project, program, or policy create a series of results that ultimately result in desired or observed impacts. It thus provides the causal framework, which suggests that collaborative planning and other participatory inputs lead to intermediate outcomes like better data and enhanced trust, and ultimately, project efficiency as the long-term impact. In this study, the theory addresses the *black box* syndrome whose focus on inputs and outputs overlooks the need to understand the underlying drivers of change (Sadik-Zada & Gatto, 2021). South Sudan's petroleum industry has long suffered from a 'black box' syndrome, associated with traditional M&E methods (Sadik-Zada and Gatto, 2021), which involves inputs going into petroleum projects but outcomes remain unclear. With a well-articulated theory of change, project managers, including those handling petroleum-related projects, can have a roadmap for interventions, identify critical junctures and ultimately, allow ongoing learning and adaptation. The theory thus address the black box syndrome by making explicit assumptions and external factors, like regulatory stability, which are required for project activities to lead to long-term impacts.

Empirical Review

Participatory Monitoring & Evaluation and Project Performance

Research examining the relationship between participatory management practices and project performance has expanded over the last two decades, providing important insights into this relationship. Kumar and Markesets (2007) examined project governance in Norway's oil and gas industry and found that collaborative governance systems, structured monitoring processes and clear stakeholder roles contributed to improved delivery and operational efficiency. Similar findings were reported in another related study by Xue, Turner, Lecoeuvre and Anbari (2013), who while investigating the effectiveness of result-based M&E in achieving designed project outcomes in China found that active stakeholder involvement and systematic monitoring improved decision quality and facilitate adaptive project management. In these sense, these two studies from mature petroleum economies collectively suggest that participation generates information that supports timely corrective action and performance improvements, but largely assume that participatory processes automatically translate into improved results. They consequently pay limited attention to the internal organizational mechanisms through which participation is converted into project outcomes.

A similar pattern is evident across sub-Saharan Africa. For instance, Maweu's (2015) and Too et al.'s (2021) studies underscore the idea that meaningful and direct stakeholder engagement and planning, a core dimension of PM&E, can proactively address project-related issues, and by implication, positively influence project performance by preventing cost overruns and project delays often associated with unmanaged risks. However, while important, the two studies treated participatory governance as a mere monitoring tool, rather than a governance mechanism capable of reconciling socially grounded participation and technical performance, a research gap addressed in the current study. Akoon's (2023) study highlights pervasive challenges that organizations face in

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fragile contexts like South Sudan, including issues with institutional for monitoring and evaluation such as limited financial and human capacity, lack of clear M&E policies and weak systems for accountability. These findings complement Xue et al.'s (2013) line of thought argument that institutional quality is fundamental to effective monitoring and evaluation systems. However, Akoon, while highly relevant to the current study due to its South Sudanese context and discussion on institutional quality challenges of M&E, it presents conceptual and contextual research gaps due to its primary sectorial focus. Thus, previous studies, while important, provide limited explanation regarding the governance mechanisms through which participation insights are translated into improved project outcomes. This conceptual gap leaves unresolved important question of whether participatory governance alone is insufficient to enhance project performance in institutionally fragile contexts.

Participatory Monitoring & Evaluation, Regulatory Environment and Project Performance

Research on mature petroleum-producing economies provides particularly insights into how participation is transformed into performance. Thurber et al.'s (2011) comprehensive analysis of Norway's administrative design, which separates policy, regulation, and commerce through robust legal frameworks and enforcement, directly improved sector performance, more so in terms of operational efficiency, cost control, safety standards and environmental protection. Sletten, Wangen Jonasmo and Solheim (2023), like institutional theory through institutional pressures, highlight the role of policy-driven compliance standards in catalyzing strategic change and industry adaptation in Norway's petroleum industry, striking a connection between legal frameworks with organizational performance. However, these studies present a conceptual research gap in the sense that the researchers assume that formal institutional structures naturally translate into regulatory power. The studies paid limited attention to whether regulatory frameworks operationally strengthen the performance effects of internal participatory governance practices like PM&E. The current study argues that the mere presence of regulatory systems does not necessarily produce governance authority to influence organizational behavior in institutionally fragile states.

Emerging evidence in the Sub-Saharan Africa region increasingly provide contrasting perspective from the ones in mature economies. In Nigeria, for example, Udo (2014) found that implementation weaknesses, limited enforcement capacity and overlapping mandates continue to constrain governance outcomes in extractives despite extensive petroleum legislation and regulatory institutions. Similarly, Gbadebo (2025) has more recently corroborated these findings, arguing that political-economic interests and accountability challenges often weaken the ability of regulatory structures to produce sustainable resource governance outcomes. The studies suggests that where enforcement mechanisms are weak, regulatory designed alone may not be sufficient enough to influence performance in the petroleum industry. Evidence from Angola also suggests that institutional systems may possess formal authority without necessarily exerting effective control over processes of resource governance, as Amundsen (2014) demonstrated that extensive state institutions and substantial oil wealth could coexist with governance challenges

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commonly linked to resource curse. The situation is no different evidence from Ghana, where evidence further complicates the assumption regarding the relationship between regulations and sector performance. Drawing lessons from Nigerian, Okpanachi and Andrews (2012) show that for Ghana to avoid resource curse, it must go beyond the mere adoption of formal governance frameworks to focus on how such frameworks are implemented and monitored because it is what ultimately determine institutional effectiveness. This finding find support in Asare, Burton and Dunne (2021) who demonstrated that accountability structures within the oil and gas sector in Ghana often work to serve legitimacy purposes while in practice producing uneven governance outcomes. The studies imply that formal accountability do not naturally translate to improve sectoral performance. Eaton's (2018) study in North Africa, while not situated in sub-Saharan Africa, reinforces institutional context, demonstrating that prolonged state weaknesses and political fragmentation have undermined the petroleum governance institutions' ability to exercise regulatory control despite the strategic importance of the oil sector.

Comparable patterns emerge in Zimbabwe, where Huni (2017) examined the influence of country's mining regulatory mechanism on beneficiation, or local value addition. The study highlights the power of inconsistent enforcement mechanisms and absence of complementary policies in undermining regulatory effectiveness. This study, while offering important insights within the African context, narrowly focuses on beneficiation as a regulatory objective. This creates a conceptual gap, as researchers fail to examine comprehensive project performance metrics, quality, time and cost. Its generalizability to petroleum projects is further constrained by sector focus on the mining sector, a gap addressed in this study. In Uganda, Hickey and Izama (2017) illustrated that oil governance reforms often diverge from globally prescribed models because they are largely filtered through local political settlements. Hickey and Izama (2020) built on this work to further show that even the internationally recognized 'best-practice' forms produce uneven results when confronted with institutional constraints and local power structures. Likewise, Hickey et al.'s (2015) comparative analysis of two new oil-rich states in Africa, Uganda and Ghana, concluded that political incentives and state capacity, rather than formal regulatory design alone, heavily conditioned governance effectiveness.

A similar disconnects between regulatory intent and regulatory effectiveness also emerges within South Sudan. Tiitmamer (2015) indicated that persistent shortcomings expressed in enforcing environmental provisions contained in the 2012 Petroleum Act, implying regulatory compliance is yet to be achieved despite the presence of legal standards. Expounding this line of thought, Tiitmamer (2019) observed ongoing challenges in regulatory compliance with accountability and transparency requirements, while Mayai (2022) reported broader institutional weaknesses affecting accountability and anti-corruption initiatives within South Sudan. Ruei's (2018) study in South Sudanese context critically examined the nexus between oil governance, conflict and institutional weakness. Its evidences show deficiencies in legal frameworks, regulatory capacity and enforcement, linking all these to governance failures and poor sectoral outcomes.

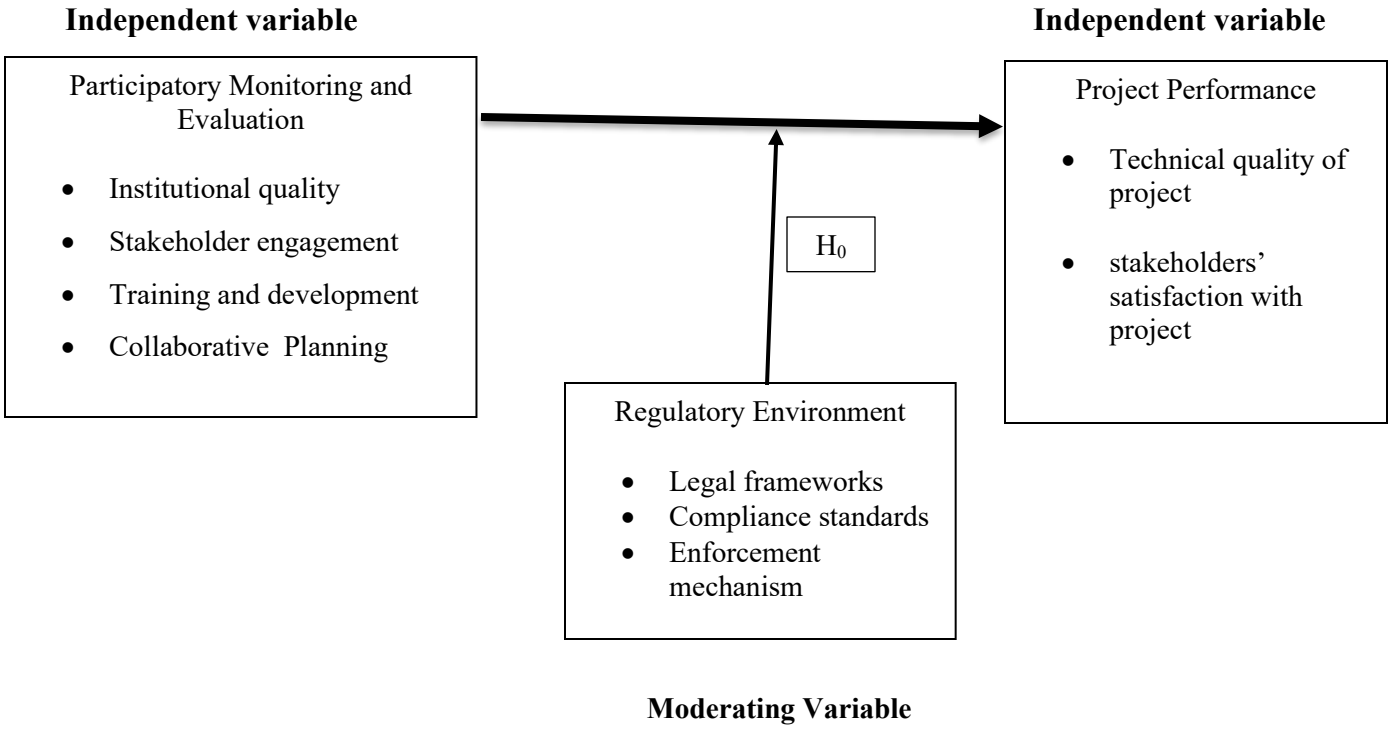
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Ruei's analysis, while highly relevant contextually, remains largely macro-level with its focus on national conflict dynamics and governance rather than micro-level project performance. It also generally assumes that stronger regulations would automatically enhance participatory accountability processes with little regard to whether weak institutions neutralize such effects. This weakness represents a significant empirical gap in that mechanisms through which the regulatory environment shapes implementation of petroleum project remain underexplored.

Conceptual Framework

Figure 1 below is the conceptual framework of the study, which illustrates the hypothesized relationship among study variables. Participatory Monitoring and Evaluation, measured through institutional quality, stakeholder engagement, training and development and collaborative planning, constitutes the independent variable. Regulatory Environment, which acts as the moderating variable, is measured through legal frameworks, compliance standards and enforcement mechanism. Lastly, project performance, conceptualized in terms of quality, which comprises technical quality and stakeholder satisfaction, is the dependent variable.

Figure 1 Conceptual Framework



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Research Hypothesis

Based on the study objective and the relationship depicted in the conceptual framework above, the following hypothesis is formulated:

> H_0: The regulatory environment has no significant moderating influence on the relationship between participatory monitoring & evaluation and the performance of petroleum projects in South Sudan.

Research Methodology

Research philosophy

This study adopted a positivist research philosophy. This research paradigm enabled the collection and analysis of quantitative primary data and the testing of the above stated research hypothesis using a deductive process (Saunders, Lewis & Thornhill, 2016). Additionally, the philosophy enabled the study to make inferences and generalizations regarding the population of study (Bryman & Bell, 2015). Since the goal was to provide evidence that can inform policy and by implication, institutional reform in South Sudan petroleum projects, a positivist philosophy was deemed appropriate to generate results that are replicable, suitable for evidence-based decision-making and generalizable (Saunders et al, 2016).

Research design

The study employed correlational explanatory research design to examine whether the regulatory environment (moderating variable) weakens, fails or strengths the influence of participatory monitoring and evaluation (independent variable) on the performance of petroleum projects in South Sudan (dependent variable). Unlike descriptive designs which provide mere description of phenomena without exploring relationships (Gronmo, 2020), or experimental designs that manipulate variables (Loiselle et al., 2011), a correlational explanatory research design allows researchers to identify statistical associations without necessarily establishing causation, providing insights into real-world phenomena (Creswell & Clark, 2011). Since the study focused on investigating naturally occurring governance practices within South Sudan's petroleum institutions, experimental manipulation was neither desirable nor feasible. In this sense, therefore, explanatory design provided an appropriate framework for examining regulatory environment's influence on the relationship between PM&E and project performance. This design enabled the study to examine whether the regulatory environment significantly enhances or weakens the influence of participatory monitoring and evaluation on project performance (Saunders et al., 20). The design has also been successfully used in several other related studies, such as González, Alarcón and Mundaca (2008); Ika, Diallo and Thuillier (2010); and Ika Diallo and Thuillier (2012).

Population of the Study

The population of this study comprised of all operational petroleum projects in South Sudan. According to records from the Ministry of Petroleum (2026), there are total of 911 operational petroleum projects in South Sudan managed by three major oil companies namely, Dar Petroleum Operating Companies (DPOC), Greater Pioneer Operating Company (GPOC) and

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SUDD Petroleum Operating Company (SPOC). The projects are distributed across the three companies as shown in Table 1 below: DPOC with 601 projects, GPOC and SPOC with 255 and 55 projects, respectively. The three companies operate under the strategic policy, regulatory and oversight mandate of South Sudan's Ministry of Petroleum. The ministry does not implement petroleum projects directly but formulates policy, license, and monitor, regulate and supervise functions over petroleum operations. Thus, its inclusion was deemed fit because the study investigated regulatory environment's moderating influence, a construct that is largely shaped by regulatory institutions and actors. Since the study examines this moderating influence on the relationship PM&E and project performance, the 911 petroleum projects collectively constituted the population of the study. As such, the petroleum project was explicitly defined as the unit of analysis, while data was collected from regulatory officials and seniors project managers directly involved in project governance.

Table 1: Population Distribution and Proportionate Sample

Operating Blocks/ operating companies	Petroleum Industry Projects		Barrels per Day
	Oilfields	Wells	
Block 3E & 7E - Dar Operating Company Limited (DPOC)	Moleeta Paloch Adar Gassab, Gumry	601	130,000
Block 1,2, & 4S - Greater Pioneer Operating Company Limited (GPOC)	Greater Unity, Greater Munga El-Toor EL-Har El-Nar Toma South, Kaikang	255	50,000
Block 5A - SUDD Operating Company Limited (SPOC)	Tharjath Mala	55	15,000
Total		911	195,000

Source: Ministry of Petroleum, Republic of South Sudan. https://mop.gov.ss/partners

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Sampling Procedure

Probability sampling was employed to determine a representative sample from the population of 911 petroleum projects. Given the quantitative, explanatory design adopted in this study, probability sampling was appropriate to ensure generalizability of the study findings (Mugenda & Mugenda, 2019). More specifically, stratified random sampling was used to better capture variations across the three petroleum-operating companies and the Ministry of Petroleum. This sampling procedure enhances representativeness by dividing the population into relatively homogeneous subgroups before randomly selecting samples from each subgroup or stratum (Saunders et al., 2016). Consequently, the population of 911 projects was first divided into three institutional strata corresponding to the operating companies distributed as follows: DPOC, GPOC and SPOC, 601, 255 and 55 projects, respectively. Within each stratum, operational petroleum projects were randomly selected proportionate to their share of the total population. This approach, Saunders et al. (2016) assert, ensured that the diversity of petroleum projects across companies was adequately reflected in the sample. Yamane's (1967) formula was applied to determine the sample size as follows:

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

Where;

n = sample size.

N = population size (911 petroleum projects).

e =margin of error. In this study, 95 percent confidence level is assumed, meaning that the margin of error or level of precision is 0.05.

Therefore, the statistically determined sample sized based on this formula is 278 petroleum projects. These 278 projects were then proportionately distributed across the three joint operating companies (DPOC, GPOC and SPOC) according to their share of the total 911 projects as shown below:

DPOC: (601/911 × 278) ≈183 projects

GPOC: (255/911 × 278) ≈ 78 projects

SPOC: (55/911 × 278) ≈ 17 projects

Total = 278 projects.

Once the sample size for each stratum was determined, a simple random selection was applied with each stratum to identify specific projects included in the study. This procedure enhances representativeness, minimizes sampling bias and ensures that the 278 sample reflected the operational diversity of South Sudan's petroleum industry (Mugenda & Mugenda, 2019).

Respondents

The respondents of the study were individuals working in the three oil companies that manage the petroleum oil projects together with representatives from the Ministry of Petroleum Government of South Sudan. They comprised all senior personnel occupying technical, managerial, regulatory and supervisory positions with the four institutions. According to organizational records obtained from the respective entities, total populations of ninety-four (94) senior actors distributed as shown in Appendix 1 were purposively selected. Owing to the expertise and specificity required for individuals participating within the petroleum industry, purposive

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sampling procedure was considered appropriate to identify and select only knowledgeable, relevant and high-ranking individuals with direct involvement in petroleum projects to take part in the study (Saunders et al, 2016). These respondents were considered best placed to respond to the questionnaire because their direct involvement with daily project governance processes, including planning, implementation, regulatory compliance, monitoring and evaluation, and performance assessment. As such, although the unit of analysis was petroleum projects, the unit of observation that provided project-level information were knowledgeable organizational actors directly involved in project planning, implementation, monitoring, regulation and oversight. These included senior managers, regulatory officials and technical specialists working within the principal petroleum institutions.

Respondents were asked to evaluate the performance of the specific petroleum projects under their direct professional oversight, not the general performance of their parent organization. As such, although study respondents were drawn from four different entities, their assessments were anchored to the projects they directly regulate or manage. This distinction is particularly important because projects in South Sudan's petroleum industry operate under distinct operational environments and constraints. In this sense, with the performance construct centered on the project rather than organizational level the study ensured that the unit of analysis remained consistent across the three study variables. Although data was collected from the four institutions, the study did not asses the organizational performance of the institutions. It rather had the respondents evaluate the performance of petroleum industry projects implemented and overseen by their respective institutions. As a result, the dependent variable in the study is the performance of petroleum projects across South Sudanese petroleum industry, with the four institutions providing project level information. The decision to conclude multiple respondents from each of the four institutions is not only deliberate, but also theoretically justified. A single respondent cannot adequately represent multidimensional organizational phenomenon characterizing participatory monitoring & evaluation, regulatory environment, and project performance. Different senior officials at the institutions possess unique knowledge about stakeholder engagement, regulatory compliance, planning processes, monitoring systems and project outcomes. Depending on a single informant would increase the likelihood of individual respondent bias.

Data Collection Instrument

A structured questionnaire was used as the data collecting instrument. The study is quantitative in nature, but the diversity of respondents necessitates a structured, standardized questionnaire with both core questions and role-specific items (Creswell & Creswell, 2018; Mugenda & Mugenda, 2019). Questionnaires were designed so that questions cover several dimensions that were used to represent each study variable. Although the current study is quantitative in nature, the diversity of respondents necessitate a structured, standardized questionnaire with both core questions and role-specific items. Questionnaires were designed so that questions cover several dimensions that were used to represent each study variable. Akin to the

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skip logic used in surveys (Saunders et al., 2016), core questions like views on PM&E effectiveness, regulatory impact, leadership responsiveness and project outcomes were applicable to all respondents, while filtered sections designed in line with study variables have questions only applicable depending on respondent's role. For instance, while project managers answer implementation questions, regulators were expected to answer items related to oversight. In so doing, the study ensured that all data remained quantifiable and comparable while simultaneously preserving relevance for different categories of respondents. The comprehensive questionnaire was disseminated by email or drops and picks method and depending on the structure of the organization, the study respondents were from either senior management or leadership. The questionnaire was in three sections, with the section one focusing on PM&E, while sections two and three focusing on regulatory environment and performance, respectively.

The data was collected using a five-point structured, closed-ended Likert scale responses across all groups because it would capture study variables. These perceptions were done in a structured, quantifiable way, which is important for a correlational explanatory study (Creswell & Clark, 2011). The Likert-scale items and the role-based filtering logic helped maintain statistical integrity, while also reducing survey fatigue and response error due to role mismatch (Mugenda & Mugenda, 2019). Since the plan was to sample 94 respondents, and considering that the unit of analysis is the petroleum projects in South Sudan, the study ensured that each respondent spoke to one or more specific petroleum projects depending on their role. For example, a GPOC project manager or section head would provide information on effectiveness of PM&E and project performance for Projects A and B, while a ministry official provided strategic insights across Projects C, D, E and F. However, it is important to note here that although data collection instruments were distributed to all the 94, only 87 completed and returned the instruments. The inclusion of all the 87 respondents captured the insights from highly knowledgeable, relevant, and senior respondents with direct involvement in the project governance in the subject under investigation.

Validity and Reliability of Measurement Instrument

The validity of research instrument was established through expert review. Content validity was assessed by aligning questionnaire items with the established dimensions of PM&E, Regulatory Environment and Project Performance as identified in past similar studies. Subject-matter experts from both petroleum industry and academia reviewed the data collection instrument to confirm that items adequately represented the intended constructs. The recommendations from these experts informed revisions that improved the wording, eliminated ambiguities and ensured adequate coverage of all study variables. Reliability, which describes the consistency and stability of measurement instruments (Saunders et al., 2009), ensures that such instruments produce consistent results under the same conditions. In this study, the researcher assessed reliability using Cronbach's Alpha coefficient, which measures, with values ranging from 0 to 1, how close a set of items are related as a group. Cronbach's Alpha of 0.70 or above is considered generally as acceptable, meaning that items within each construct, say the four PM&E dimensions, are

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consistently measuring underlying concept (Cooper & Schindler, 2014; Saunders, Thornhill & Lewis, 2016). This was calculated for each dimension of the study variables to ensure their internal consistency. This cut-off point of 0.70 and above was used and adopted to verify the reliability of research study instrument. To this end, thereafter, any adjustments required were made to the questionnaire accordingly, as Bryman and Bell (2015) suggest. All study variables exceeded the recommended 0.70 threshold, indicating strong reliability. More specifically, PM&E yielded $\alpha = .878$, regulatory environment items $\alpha = .915$, and project performance items $\alpha = .862$. Taken together, therefore, these findings confirm that the data collection instrument (questionnaire) consistently measured the intended concepts across respondents.

Data Analysis

Both descriptive and inferential statistics were used to analyze the collected data. To examine the relationships among the study variables and determine their explanatory power and significance, linear regression analysis was performed (Creswell & Clark, 2011). Multiple linear regression model $PER = \beta_0 + \beta_1 PME + \beta_2 RE + \beta_3(PME * RE) + \varepsilon$; where RE is the regulatory framework, was specified. The regression analysis was done using responses from all the nighty-four individual respondents rather than the four institutions. Multiple regressions are thus statistically appropriate given that the effective target sample size comprised 94 observations. To test the moderating influence of RE on the relationship between PM&E and project performance, the hierarchical multiple regression was employed. In Model 1, PM&E was entered to determine its direct influence on project performance. Regulatory Environment was introduced in Model 2 to establish its independent contribution to project performance. In Model 3, an interaction term was entered into the regression model. This interaction term was created by multiplying the standardized scores of PM&E and Regulatory Environment (PM&E x Regulatory Environment). If the interaction term produced a statistically significant change in the coefficient of determination (ΔR^2) and yielded a statistically significant regression coefficient (β_3) at $p \leq 0.05$ moderation was considered to exist. A significant interaction effect was interpreted to indicate that the direction or strength of the relationship between PM&E and project performance varies across different levels of the Regulatory Environment. Since the study involved human participants, all the necessary research ethics were observed to ensure their rights; well-being and dignity are protected throughout the study."

Findings And Discussion

Descriptive statistics for Participatory Monitoring & Evaluation, and Project Performance

The respondents were asked to rate participatory monitoring and evaluation using a scale of 1 to 5, where (1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree). The descriptive results show that respondents generally expressed neutral performance of its effectiveness in petroleum projects in South Sudan. The overall mean score stood at M=2.78, suggesting ambivalence toward participatory practices. Among the four PM&E dimensions, training received the highest support (mean was 3.07, standard deviation was 0.62), with relatively low coefficient of variation

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(CV=20.2%), a finding that indicates consensus among study respondents that training and development programs are easier to implement and applied more consistently. Conversely, institutional quality dimensions received the lowest rate (mean was =2.65, standard deviation was 0.72), with a higher variability (CV = 27.2%), reflecting respondents' skepticism about regulatory coordination and accountability structures. Across PM&E dimensions, the maximum coefficient of variation was 29.2%, while the minimum was 20.2%, showing that while some practices are contested, others remain agreed upon. These findings are theoretically significant, as they indicate that participatory governance mechanisms in a fragile petroleum environment often evolve in uneven manner across organizational dimensions. They suggest that participatory monitoring and evaluation practices in the petroleum industry in South Sudan functions less as a fully embedded institutional system and more as a transitional governance arrangement. Procedurally, participatory mechanisms appear to be present in the industry, but are not yet fully integrated into broader governance structures. This distinction is particularly important because it is a direct challenge to idealized assumption within participatory governance literature that participatory practices automatically translate into institutional transformation. On the contrary, participation within a fragile project context seems constrained by general governance conditions shaping operationalization of participatory systems.

Descriptive Statistics for Regulatory Environment

The respondents were asked to rate the regulatory environment using a scale of 1-5, where (1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree). The regulatory environment, like participatory monitoring and evaluation, was generally rated neutral, with an overall mean score of M=2.83. Study respondents acknowledge the existence of legal frameworks, enforcement mechanisms and compliance standards, but expressed doubts about their consistency and adequacy. All the variables score lower overall coefficient of correlation of 17.0%, which shows the data is more consistent and with minimal variance. Among these regulatory environment items, compliance standards scored slightly higher rate (M=3.02, standard deviation=.49), with relatively low variation (CV= 16.2%), suggesting that although formal compliance standards are recognized, they are not always enforced. By contrast, enforcement mechanism item scored the lowest score (M=2.53, standard deviation=.62309), with a relatively high variability (CV= 24.5%), further highlighting concerns about fragmented authority and weak oversight. Coefficients of variation across individuals items fell between 16.2% and 24.5%, indicating considerable disagreements among study respondents about effectiveness of South Sudan's petroleum regulatory institutions in the petroleum industry. These findings are theoretically significant as it shows that petroleum industry actors generally acknowledge the existence of regulatory structures, but agree that they lack sufficient governance power to meaningfully influence organizational behavior. Respondents mostly perceive the regulatory

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environment, as operationalized through compliance standards, legal frameworks and enforcement mechanisms, to be inconsistently applied or unstable, reflecting how both institutional weaknesses and overlapping mandates among the various agencies in South Sudan's petroleum industry undermine confidence in institutional authority. To this end, it is deducible that the findings support the broader argument advanced in the research article that regulations are present institutionally, but lack sufficient governance power to meaningfully shape organizational behavior.

Descriptive Statistics for Project Performance

The respondents were asked to rate the project performance using a scale of 1-5, where (1=Strongly Disagree, 2=Disagree, 3=Neither Disagree nor Agree, 4=Agree, 5=Strongly Agree). Project performance was assessed with an overall mean score of M= 2.97 with a coefficient of variation of 26.6%, reflecting respondents' neutral evaluation of petroleum project outcomes. This neutral assessment of project performance suggests that while some aspects of petroleum project delivery meet expectations, significant areas, such as stakeholder relations and operational efficiency, face systematic constraints. Project outcomes are often realized, but outcomes and sustainable impacts fall short of expectations, most probably due to weak leadership, coordination and regulatory inconsistencies, thereby reinforcing the broader argument that institutional fragility limits the effectiveness of participatory governance and regulatory oversight in shaping project success.

Regression Results

Table 2 below summarizes the results of the multiple linear regression analysis:

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Table 2: Regression of Regulatory Environment, Participatory Monitoring and Evaluation on the Performance

Model Summary			
Model	**R**	**R Square**	**Adjusted R Square**
1	.665[a]	.442	.435
2	.702[b]	.493	.480
3	.708[c]	.501	.482

Analysis of Variance (ANOVA)						
Model		**Sum of Squares**	**Degrees of Freedom**	**Mean Square**	**F-Value**	**P-Value**
1	Regression	22.271	1	22.271	62.703	.000[b]
	Residual	28.060	85	.355		
	Total	50.331	86			
2	Regression	24.818	2	12.409	37.938	.000[c]
	Residual	25.513	84	.327		
	Total	50.331	86			
3	Regression	25.222	3	8.407	25.782	.000[d]
	Residual	25.109	83	.326		
	Total	50.331	86			

Coefficient					
Model		**Unstandardized Coefficients**	**Standardized Coefficients**	**T-Value**	**P-Value**
		B	**Beta**		
1	(Constant)	.653		2.172	.033
	PM&E	.833	.665	7.919	.000
2	(Constant)	-.045		-.117	.907
	PM&E	.512	.409	3.344	.001
	Regulatory environment	.561	.341	2.790	.007
3	(Constant)	-1.849		-1.110	.270
	PM&E	1.105	.882	1.993	.050
	Regulatory environment	1.180	.717	1.996	.049
	PM&E*RE	-.197	-.800	-1.113	.269

a. Predictors: (Constant), PM&E

b. Predictors: (Constant), PM&E, regulatory environment

c. Predictors: (Constant), PM&E, regulatory environment, P&ME*RE

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Table 2 above presents the results of model 1 (regulatory environment as moderating variable), model 2 (inclusion of regulatory environment variable) and model 3 (the interaction term of regulatory environment and PM&E). Under the model summary in Table 2 above, the coefficient of determination (R Square) of model 3 indicates that the moderating effect of regulatory environment on PM&E explained 50.1% (moderate explanatory power) of the relationship between PM&E and the performance of petroleum industry projects in South Sudan. The remaining 49.9% was explained by other variables not considered in this study. Comparison of model 1 and model 3 shows regulatory environment interaction with P&ME positively moderates the relationship between PM&E and the performance of petroleum industry by increasing the explanatory power by 50.9 percent. The moderating effect is determined by the statistical significance of the interaction term (PM&E*RE), which in the current study was found to be non-significant.

Table 3 above under ANOVA model 3 shows that the overall model was significant since the p-value (0.000) was less than level of significant of 0.05 (0.000 < 0.05). This means the null hypothesis was rejected at $\alpha = 0.05$ and concluded that, regulatory environment moderates the relationship between PM&E and the performance of petroleum industry projects in South Sudan.

Discussion Of The Findings

Based on the findings above, it is inferable that this study fundamentally contributes project management literature by challenging the implicit assumption of the institutional theory that stronger regulatory environments invariably

Notably, ANOVA results only show the robustness of the regression model (i.e. R^2). The decision to reject or fail to reject a hypothesis is based on the p value of the regression coefficients (Beta). Table 2 indicates that PM&E has a significantly positive effects on project performance ($\beta = 1.105$, t= 1.993, p=.050). Similarly, RE has a significantly positive effects on project performance ($\beta = 1.180$, t= 1.996, p=.049). However, the interaction term of PM&E*RE was not statistically significant ($\beta = -.197$, t= 1.113, p=.269). Therefore, since the null hypothesis was true the study failed to reject H_0. The results show that although the regulatory environment moderated the relationship between PM&E and the performance of petroleum oil projects the mediation was not statistically significant.

The resultant predictive equation was PER = -I.849 + 1.105PM&E + 1.180RE. The findings suggest that while regulatory mechanisms exist and are generally perceived to have some relevance, they do not statistically alter the direction or strength of PM&E's effectiveness in project outcomes. This challenges conventional assumptions in project management literature that regulatory strength amplifies monitoring or managerial interventions universally, and points instead to structural weaknesses in institutional ecosystem of South Sudan, particularly in the petroleum industry.

strengthen the efficacy of participatory governance. Both PM&E and regulatory environment independently exerted significant positive effect on the performance of petroleum projects. However, the interaction effect between participatory governance practices and regulatory environment was statistically insignificant,

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contrary to conventional assumptions within project governance literature (Humphreys, Sachs and Stiglitz, 2007; Appiah-Adu, 2016). This finding suggests that regulatory institutors do not inherently act a catalyst for participatory systems; their influence is rather conditional. The mere presence of formal regulations does not guarantee regulatory effect on participatory governance practices. Rather, regulation only moderates governance outcomes when political legitimacy, regulatory coherence and institutional enforcement capacity are developed sufficiently to translate formal rules into behavioral constraints.

Drawing from studies in similar institutionally fragile contexts, such as Huni's (2017) analysis of Zimbabwe's mining regulations and, more recently, Upadhyay's (2023) research on Indian mining sector, it is evident that fragmented institutional mandates and inconsistent enforcement often prevent formal regulatory institutions from shaping project outcomes. Unlike in institutionally mature and high-performance contexts, such as Norway where regulatory coherence and specialized enforcement create behavioral constraints (Thurber, et al., 2011), South Sudan's regulations suffers from weak implementation and political contestation (Ruei, 2018). Individual personality traits of project actors significantly influence how project actors in South Sudan engage with structured behavior behavioral models like petroleum regulations (Rhodes and Courneya, 2003), suggesting that project success is a s much as a matter of individual agency as it is of system design (Conner & Armitage, 1998). As a result, petroleum regulations in the country, such as the Petroleum Act of 2012, serve as a background condition and not a mechanism that directly modulates the success of participatory processes, confirming that without enforcement credibility and political legitimacy, formal legal frameworks remain aspirational rather than functional.

The divergence between successful institutional models and South Sudan's context highlights boundary condition for institutional theory. Empirical evidence from US oil and gas sector (Asaolu, 2021); Norway's oil and gas industry (Kumar and Markeset, 2007); and even Malaysia mining industry (Marwani et al., 2024), demonstrate that regulations effectively influence industry performance only when accompanied by industry-wide norms, credible monitoring and consistent sanctions. Drawing on the Singaporean success story, Mills et al.'s (2020) prescriptive work further asserts that while better choices made in the interest of the majority matter, regulatory policy has to be continuously reinforced by "strong leadership and strong institutions" (p.298). By contrast, the decoupling thesis of the institutional theory becomes highly relevant in fragile political environments. In particular, organizations may adopt formal policies to satisfy external pressures, but operationalization of internal participatory governance systems like PM&E are driven by internal needs rather than state-led conceive pressure. This challenges the implicit assumption in traditional institutional theory that organizations conform to regulations because institutions possess stability, legitimacy and enforcement power. Lukovszki et al., (2025) also add that individual behavioral tendencies often override the coercive pressure of external institutional frameworks. The current study thus extends traditional institutional theory by

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demonstrating that coercive institutional mechanisms depend fundamentally on governance credibility. Regulatory environment, without implementation power, produces symbolic rather than substantive compliance. As such, when institutional frameworks are inconsistently upheld or ambiguous, project actors rely on internal organizational instruments rather than regulatory cues, highlighting the need for strong leadership and strong institutions to better transform policy into project performance.

Conclusion

This study confirms PM&E has a positive and statistically significant predictor of project performance, underscoring its important role as not just a participatory mechanism, but also an accountability tool. Crucially, it reveals that regulatory institutions fail to act as a significant moderator in the institutionally fragile South Sudanese context. This suggests an implementation gap where the formal presence of petroleum legislations like the Petroleum Act of 2012, does not translate into functional regulatory power. As a result, while participatory practices operate as a pivotal organizational tool for accountability, national regulatory systems currently lack the institutional maturity to systematically strengthen such governance practices.

Theoretical and Practical Implications

From a theoretical perspective, this study advances traditional theory by establishing institutional fragility as a boundary condition for coercive. Unlike existing project management literature generally assumed that organizations automatically conform to regulatory pressures, the current study demonstrates that institutional authority is pegged on political autonomy and enforcement credibility. Regulations may exist formally, but lack sufficient authority to shape organizational behavior. By conceptualizing regulatory power as distinct from regulatory presence, it provided a more detailed understanding of governance failure in fragile and post-conflict context. From a practical perspective, the study findings carry important implications for petroleum operators, policymakers and governance practitioners operating within post-conflict and fragile states like South Sudan and beyond. First, they highlight the need for petroleum companies that operate in such states to strengthen their internal governance mechanisms and mechanisms for participatory accountability rather than depending exclusively on external regulatory oversight. Second, the findings caution policymakers against equating the proliferation of formal petroleum legislation with effective governance capacity. Establishing new petroleum legislation alone is insufficient to guarantee effective governance reform if institutions lack enforcement credibility and implementation capacity. Along the same vein, the findings suggest that petroleum regulatory reforms should prioritize enforcement consistency, institutional coordination, administrative capacity building, political autonomy of regulatory agencies and systems of transparency and accountability. Finally, the study underscores the need for international governance partners and development agencies to recognize that strengthening institutions requires more than formal policy transfer from more stable and developed petroleum economies. As such, government reforms must address deeply

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entrenched institutional and political constraints affecting implementation credibility.

Recommendations

For South Sudanese policymakers, rather than focusing exclusively on establishing new petroleum legislation, priority should be on strengthening the enforcement capacity of agencies like as the National Petroleum and Gas Commission. Both central and local governments should streamline institutional mandates further to reduce governance fragmentation and improve coordination among petroleum oversight agencies. Joint operating companies and other relevant petroleum operators are encouraged to invest in improving the quality of PM&E with well-specified feedback-to-action pathways by institutionalizing its systems as core management tools rather than formal legislative reform alone. International development partners should support long-term strengthening initiatives that emphasize governance implementation capacity and not just formal legislative reform alone. Finally, future similar studies should conduct longitudinal studies on PM&E mechanisms, regulatory environment, and project performance to provide deeper insight into how regulatory effectiveness and participatory governance evolve and sustain performance improvements over time.

Ethical Approval:

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Conflicts of Interest

There is no any conflict of interest in the research.

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Appendix

Appendix 1: Total Number of Population

Variable	Potion of leadership	Institution				
		MoP	**DPOC**	**GPOC**	**SPOC**	**Total**
Occupation	Undersecretary	1				1
	Technical Advisor/Consultant	3	1			3
	Director General for Petroleum Authority	1				1
	Director General for Planning	1				1
	Director for Production and Operations	1				1
	Director for Exploration and Development	1				1
	Director for Data Management	1				1
	Director for Refineries and Pipelines	1				1
	Director for Community Development	1				1
	Vice President	1	1	1	1	3
	General Manager, Exploration and Development		1	1	1	3
	General Manager, Commercial & Services/Finance & Services/HR, GS and SCM		1	1	1	3
	General Manager, UDC		1			1
	D/General Manager, Commercial & Services/UDC		1	1		2
	Legal Manager/ Legal Affairs	1	1	1	1	4
	Development Manager		1	1	1	3
	Exploration Manager		1	1	1	3
	Construction and Facilities Manager		1	1	1	3
	Planning Manager		1	1	1	3
	HSE Manager		1	1	1	3
	CPL Manager		1	1	1	3
	Downstream Manager			1		1

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	Internal Audit and Compliance Manager		1	1	1	3
	Human Resource/ Training & Development Manager		1	1	1	3
	General Services Manager		1	1	1	1
	Community Development Manager		1	1	1	3
	Production and TS Manager		1	1	1	3
	President Office Manager			1		1
	Field-base Manager		1	1	1	3
	Deputy Drilling, Development, TS, HSE, Production		1	1	1	3
	Section Head, Business Performance, WPB/Planning		1	1	1	3
	Section Head		6	6	6	18
Total		**14**	**25**	**30**	**25**	**94**

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