# THE IMPACT OF STAKEHOLDERS' INFLUENCE ON ENGINEERING INNOVATION

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**Abstract**

This study investigates how stakeholder influence affects engineering innovation within The Niger Delta Power Holding Company (NDPHC), focusing on three dimensions: risk tolerance and decision-making influence, regulatory or policy impact, and resource contribution and capacity building. Using a quantitative design, data were collected from 148 employees across Engineering, R&D, and Project Management departments. Results from linear regression analysis showed all three stakeholder dimensions significantly influenced innovation, with resource contribution exerting the strongest effect. The study highlights the need for collaborative stakeholder engagement, innovation-friendly policies, and increased capacity development to foster engineering innovation in Nigeria's energy sector.

**Keywords:** Stakeholder influence, engineering innovation, energy sector, risk tolerance, regulation, capacity building

## Introduction

The invisible but vital hand behind the result of engineering organizations innovation are their stakeholders which may take the form of internal employees, regulators, funders, or policy influencers. They determine what to build, how to build, when, and whether to build anything at all based on the decisions, risk preferences, policy directives and resources that they give. With the kind of stakes involved in energy infrastructure, where projects are complex and highly capital intensive and technologically challenging, stakeholder influence may also act as catalyst of innovation or fail to generate innovations at all.

Energy industry is a key part of the world economic growth and chase of the ecological sustainability. Amid the surge of acute social demands like climate change and diminishing non-renewable resources, there is growing pressure on energy companies to innovate new technologies that allow them to move towards cleaner and more efficient uses of energy (Wogwu & Wogwu 2024). Such transition is not merely necessary to address the increasing energy demand across the world, but also to fulfil long term ecological and economic goals (Liang et al., 2022). Innovation in the energy sector is therefore not only something that is wanted; but something that is needed.

Nevertheless, the issue of engineering innovation in this segment is itself not very simple, and various internal and external factors affect it, with stakeholder influence being one of the most significant determinants. The stakeholders who are identified as individuals, groups or institutions that have vested interests in the outcome of an organization are critical in laying the course of innovation. They may positively or negatively affect the process of innovation depending on the way their interests and expectations and resources fit their attitude to innovation (Jansma, 2020; Smirnova et al., 2009).

Influence of stakeholders reaches a wide range of innovation such as concept and approval of the project up to the use of technology and commercialization. The internal stakeholders, including the R&D departments and the project managers, typically push the innovation internally, whereas the external stakeholders, including regulators, investors, and community groups, promote it indirectly yet extensively by pressing policies, capital, and the so-called social license to operate (Fliaster & Kolloch, 2017; Widen et al., 2014). Proper stakeholder engagement therefore involves purposeful planning, transparent communication and coordinated strategic planning so that the innovations not only become technically feasible but also social and financially acceptable.

The nature of stakeholder influence (being dynamic and dependent) within large-scale and complex engineering projects has become a theme highlighted recently on scholarly contribution. Aaltonen et al. (2015) give an example of the changing nature of stakeholder salience over time especially during initial project development. The changing, frequently intertwined dynamics of stakeholder interest is emphasized by Kujala et al. (2021) to inform the problematic of persistent and dynamic supervision and logistical responsiveness. In a similar vein, Nguyen et al. (2018) recommend the application of tools like social network analysis to visualize and coordinate such complex relations with the stakeholders.

Niger Delta Power Holding Company (NDPHC) is one of the major stakeholders involved in the development of power infrastructure in Nigeria since it is a power company that specializes in power generation in the country. Engineering decisions are influenced by internal decision-takers, regulatory authorities, funding organizations as well as technical project partners but most frequently have limitations imposed on the business by risk-averse cultures, strict compliance rules, and inadequate investment in capacity development (Adeyeye, Egbetokun, Opele, Oluwatope & Sanni, 2017). The energy industry needs effective stakeholder participation to achieve innovation and governance. It is the process of recognizing, discerning and responding to the interests of the different interest holders such as governments, communities as well as investors (Ezeh et al., 2024).

The project aims at investigating the role of stakeholders in engineering innovation in the area of energy demand through three main facets, i.e., the ability to tolerate risk and influence decision making process, the regulatory or policy effect, and the provision of resources and capacity building. These dimensions showcase some of the major areas, in which the interests of stakeholders overlap the innovation processes, and where integration or conflict can meaningfully influence the outcome.

With such dimensions in mind, the present study will contribute to a more conceptual understanding of how the influence by the stakeholders can both facilitate and hinder engineering innovation. The information will be created, and the resulting insights are likely to be utilized in more effective management of innovation within energy companies, particularly where the expectations of stakeholders are integrated, diverse, and dynamic.

***Problem Statement***

The energy sector has been placing increased focus on innovation, although problems still bedevil many companies about how they can convert the innovative ideas into successful engineering solutions. One of the reasons behind this challenge that has been under-investigated is the influence of stakeholders. All the stakeholders, whether internal or the external have differing levels of power, interest and expectations in place which either may support or hinder engineering innovation. Even though the idea of engaging the stakeholders has broad promotion in the project and innovation management literature, its individual effect in engineering-intensive and a regulatory-heavy environment is understudied.

Engineering innovation generally incorporates uncertainty, high investment, and cross-functional teamwork which are defined by the regulatory systems, market forces, and resource capabilities. In this sense, the stakeholders may either provide enabling or impeding forces. Actors that are risk-averse will be reluctant to adopt new technologies, the policy may restrict experimentation, and poor support can dampen the capacity-building endeavors. Such tensions may postpone innovations, reduce its efficacy, or terminate potential projects.

Literature has usually been concerned with stakeholder influence serving as a backdrop variable, or it has been concerned exclusively with certain groups of stakeholders and gives very little insight into the interaction of stakeholder dynamics in engineering innovation. It has no empirical clarity as to how dimensions like the risk tolerance, effect of decision-making, regulator or policy impact and resource contribution and capacity building could have an influence on innovation outcomes. In trying to fill this gap, the current study explores the impact of such influence of stakeholders, through these dimensions, on the engineering innovation in a leading Nigerian energy company.

The primary aim of this study is to explore and analyse the influence of stakeholders on engineering innovation within the energy sector. To achieve this aim, the study focuses on the following specific objectives:

1. To examine how stakeholders' risk tolerance and decision-making influence affect the development and implementation of engineering innovations in energy firms.
2. To assess the impact of regulatory frameworks and policies on the innovation processes and outcomes within the energy sector.
3. To evaluate the role of stakeholders' resource contributions including financial, technical, and human capital in enabling or constraining innovation activities.

The following research questions were addressed in the study.

1. How does stakeholder risk tolerance influence engineering innovation within energy firms?
2. What role do regulatory, and policy frameworks play in shaping innovation processes in the energy sector?
3. In what ways do stakeholder resource contributions impact the development and implementation of new energy technologies?

**Literature Review**

***Conceptual Framework:***

***Stakeholder Influence on Innovation***

A stakeholder: A stakeholder is anyone who may influence or be influenced by the attainment of the goals of firm or organization (Freeman, 1984; Haefner et al., 2023). The implication of this is that these potential stakeholders that a firm can or should take into consideration or involve in firm activities may be numerous as employees, suppliers, customers, local community, media, NGOs among others. The stakeholders can be different in the kind and extent of influence that they can achieve over the organizational actions. Their interest and expectations, as well as power, may have a broad impact on the structure of organizational decision-making and particularly on innovation-based industries (Lin & Lou, 2024).

There are stakeholders who may be primary or secondary. The strongest stakeholders who include employees, investors, clients, suppliers and government agencies have direct interests in the outcomes of organizations. Such entities usually want to see operational effectiveness and responsibility and profit (Cubilla-Montilla et al., 2019; Osobajo et al., 2023). To take one example, the employees can insist on receiving a fair employment and security, whereas clients are concerned about the reliability of the product and the quality of services. Governments and regulators make sure that firms follow the policies and pay taxes and take responsibility in the development of the country, by promoting sustainable practices.

Secondary stakeholders (media, NGOs, activist organizations, and local communities) do not necessarily possess a direct financial connection but affect the opinion of the masses, discourse in the regulation sphere, and social rightfulness (Piotrowska & Piotrowski, 2023). Their impact is on their role in creating external stories which have an impact on consumer fidelity and investor trust. These initiatives may include activists of NGOs campaigning1 on green technology or ethical behavior in business, and a firm may be pressured to seek sustainable innovations, and such a negative media campaign can tarnish the brand and legitimacy of a firm (Alfiero et al., 2018; Gatea Al-Jubouri, 2021).

This is due to the importance of stakeholders in influencing engineering innovation, especially where the level of risks and capital investments are high like in the energy industry (Freeman, 1984; Haefner et al., 2023). In energy companies, the regulators and investors not only supply resources but also define the direction of innovation by risk inclination and policy compliance demands (Gerlach & Eriksson, 2021). Sustainable energy solutions, as an example, are highly pushed by regulatory disclosures and expectations of stakeholders and thus the engagement of stakeholders has become strategic (Lin & Lou, 2024).

Nevertheless, the interest of stakeholders tends to conflict. Shareholders can have a high priority on returns on investment, whereas environmental groups might insist on decarbonisation even when this costs more or decreases the short term profitability. The labour union can insist on wage increment, which can be paradoxical to cost effectiveness of innovation (Boudlaie et al., 2020). These inconsistencies require subtle trade-offs and unifying stakeholder management approaches where innovation can be encouraged and at the same time, critical actors cannot be informed (Verma & Sharma, 2019).

This brings to a pertinent observation; stakeholders affect innovation not just when the support of the innovation is involved but also when the boundaries are drawn, limits are set and channels are redirected towards different directions. They remind us that these dynamics are significant, and that Stakeholder Theory requires contesting demands to be managed through strategic balancing (Freeman et al., 2021). The modern organizational reality is that they cannot innovate by themselves; rather they need to co-create the value with the stakeholders who drive the decision-making process either directly or indirectly (Haefner et al., 2023; Gerlach & Eriksson, 2021).

Influence between the stakeholders and the outcome of innovation involves three interconnected dimensions, which include Risk Tolerance and Decision-Making Influence i.e how the stakeholders exhibit support or resistance to the risky and lucrative innovation endeavors. Regulatory or Policy Impact the role of legal systems and political intentions in controlling the innovation incentive or restriction. Resource Contribution, the financial, human and technical contributions that the stakeholders make in order to facilitate the execution of innovation.

The dimensions proposed are not independent of one another but are in a dynamic interaction with the firm in terms of strategic context. In other words, the policy support by the government may make an investor more willing to take risks or collaboration of the suppliers may make technical capacity stronger. Therefore, stakeholder engagements are a cross-dimensional push towards engineering innovation both in other sectors such as energy, technology, manufacture among others.

Innovation strategy in a contemporary organization is based on the influence of stakeholders. The key to managing this influence a great deal is to understand different expectations of the stakeholder groups and match them with the innovation objectives. By means of a carefully coordinated risk preferences, regulatory congruence, and resource marshalling, organizations can elevate their innovative potential and attain both the technical excellence and societal validity.

***Dimensions of Stakeholder Influence***

The role of stakeholder in innovation comes in a number of areas of concern that determine the way companies take risks, adhere to regulatory environment as well as harness the necessary resources. In the present study, the dimensions of Risk Tolerance and Decision-Making Influence, Regulatory of Policy impact, and Contribution of Resources and Capability Building are identified (Nguyen et al., 2019; Saidi et al., 2020; Ozdemir et al., 2023).

***1. Risk Tolerance & Decision-Making Influence***

The degree of the willingness to take the risks of any business, investment and relationship is called risk tolerance. It also suggests how an individual reacts and acts in respect to risks in an investment. Investors may either prefer the risk, avert risk, or may not be concerned with the risk at all (Wulandari & Iramani, 2014). Risk tolerance is the eagerness of stake holders in taking a chance on uncertain or very expensive innovation projects and actions. The investors, managers, and policymakers are stakeholders who contribute various degrees of such risks appetite, and this determines the focus and magnitude of innovation (Corter & Chen, 2006; Pompian, 2012). The high tolerance might drive the inability to come up with radical or disruptive innovation and risk-averse stakeholders might choose to restrict themselves to incremental improvements. Organizational culture influences decision-making as well: when individuals involved in making decisions establish psychological safety and do not punish any failures, innovation becomes rather high (Gerlach & Eriksson, 2021). Risk-conservative environments tend to hamper creative innovative steps or prevent them.

***2. Regulatory or Policy Impact***

Regulatory systems and their corresponding policies form an extreme component of stakeholder influence in innovation. The instruments that governments and regulatory organs use in setting the conditions to engage in an innovative setting include subsidies, performance requirements, car emissions, and intellectual property. These tools can empower, as well as limit firm level innovation. Regulators and policymakers are particularly active stakeholders within society because they establish a context in which firms operate. Innovation is either suppressed or encouraged by regulatory policies such as incentives, standards, intellectual property protection. Regulations are good when they are proactive and adaptable to long-term investments and experimenting (Saidi et al., 2020). Nevertheless, constant changes in policy, ambiguity in mandate, or conflating mandates can add some ambiguity and cause a decrease in innovative efforts (Costantini and Crespi, 2010; Doblinger et al., 2016). Close compliance with policy objectives or regulatory advocacy by firms tends to create a competitive edge in traversing innovation channels.

***3. Resource Contribution and Capability Building***

Other resources provided by the stakeholders help in innovation, including financial support, human skill and infrastructure. The experimenting is capitalized by investors, the technical expertise by employees, and the feedback by customers which helps in making the product better (Ozdemir et al., 2023). NGOs, research institutions, and media are secondary stakeholders that bring on legitimacy, networks, and support learning environments (Engez & Aarikka-Stenroos, 2023). Such contributions actually drive innovation besides increasing the capacity of the firm to absorb the risk as well as adaptation. Resource-strong stakeholders are therefore vital to strategic engagements in the capability of innovation.

***Stakeholders as Enablers of Innovation***

The strategic involvement of various stakeholders is becoming more of a requirement in innovative development, especially in the vital but challenging industries like energy and infrastructure. As it is based on

Abderhalden et al. (2023), there are four important enablers of stakeholder-driven innovation revealed that include integration of knowledge systems, shared ownership, intermediary facilitation, and supportive institutional frameworks.

***Combination of Knowledge Systems:*** It is a commonly suggested benefit of innovation that there is an increase in the outcome when different lines of knowledge such as technical, scientific, local and the experiential, are brought together to work. Abderhalden et al. (2023) reinforce that collaborative knowledge creation between all stakeholder groups enhances the local relevance and the viability of this knowledge, especially in risk-sensitive areas such as disaster risk reduction. Likewise, in the energy sector, participatory approaches have linked research and practice and introduced the possibility of exploring new innovations that can be practical and usable on a large scale.

***Shared Ownership and Responsibility:*** Stakeholders engender a feeling of ownership and responsibility when it comes to the results of innovation and then tend to give support and continuity. Co-design and co-governance are inclusive engagement processes that increase trust, commitment and legitimacy. Abderhalden et al. (2023) noted that a common cause of responsibility enhanced long-term commitments of the stakeholders and enhanced the effectiveness of implemented solutions.

***Intermediary Facilitation:***

Properly functioning brokers using innovation brokers or boundary spanners can help interpret between the various interests of different stakeholders, and maintain alignment of goals and continuity of joint work. Such actors facilitate the mediation of power relations and foster trust, especially in the innovation processes that are interdisciplinary or socially conflicted.

Favorable Institutional Structures: Policy and regulation systems have an enormous impact on the prospect of stakeholder-driven innovation. Funding, legal allocation and inclusive governance systems are institutional levers of forcing collaborations and lowering uncertainty (Abderhalden et al., 2023). Feed-in tariffs or regulatory sandboxes might constitute relatively formal tools of engagement of the multi-actor approach in energy innovations.

In short, involvement of stakeholders is not only participatory, but central to the success of innovation. The coexistence of aligned objectives, combination of knowledge, supportive actors and promotion-enabling policies create either a system of drivers or restrictors to innovation as practised by the stakeholders.

***Innovation constraint***

Innovation is a complex phenomenon that is usually marred with various categories of barriers internal and external, which curtails the capability of firms to convert ideas into practical results (Hueske & Guenther, 2015). On the internal front, constraints exist regarding allocation of inadequate resources, inflexible organizations, poor culture of innovation and mismatched strategies. All these barriers usually occur due to lack of proper knowledge management, failure of proper leadership, or poor dynamic capabilities that limits firms to adopt changing demand of technology or the market (Crossan & Apaydin, 2010; Helfat et al., 2007). An example would be silos within the departments or rigid systems and structures that can hinder communication and collaboration as drivers of innovation performance.

On the outside, innovation faces the influence of the stakeholders whose actions, interests and perceptions can be in conflict with innovation goals. As considered by stakeholder theory (Freeman, 1984), the external stakeholders like the investors, regulators, suppliers and communities may limit innovation because of financial hesitation or rigorous policies or social barriers (Donaldson & Preston, 1995; Hall & Martin, 2005). As an example, regulatory approvals could take time and some funds are inaccessible or the community is against new facilities to become a part of the project and kill it (Post and Altman, 1994; Baldwin and Lin, 2002). Even the situation with stakeholders who are the well-wishers can slow the pace of change when they are driven by risk-aversion or misunderstanding in their relationships with the teams of innovators.

Group and individual level barriers also come up. These dynamics within a team can undermine teamwork and hamper problem-solving initiatives including roles that are not clearly defined, a lack of trust, or leaderless situation (Anderson et al., 2004). On an individual level, innovation is limited by low capacities, aversion to change, and no confidence on the consequences of new developments (Duh et al., 2006; Wood et al., 2014). Unless the staff is given enough independence, drive, and education, they and their managers will not be interested in any innovation process, thus eroding company development.

***Empirical Review***

Wogwu and Wogwu (2024) in Stakeholder Engagement and Green Energy Governance employed a quantitative census conducted within 75 Nigeria energy industry professionals to evaluate the relationship between stakeholder engagement and innovation. They concluded that engagement greatly promoted green governance and technological innovation. They suggested participatory and stakeholder-oriented planning towards greater sustainability.

Loureiro et al. (2020) conducted a study of Stakeholder Engagement in Innovation Co-Creation. A literature review and a case study of 22 wine companies were conducted. They suggested a theoretical framework according to which coordinated stakeholder involvement enhances innovation. The authors recommended that companies should progressively change their stakeholder strategies and further experiment the model on a variety of industries.

A study by Ainia and Lutfi (2019), in Behavioral Factors in Decision-Making, surveyed 400 employees in East Java through PLS-SEM. They observed that risk tolerance and overconfidence positively influenced innovation-related investment decisions whereas risk perception had a negative influence. They proposed companies should market risk-awareness tools to make informed decisions.

In a study entitled Stakeholder Orientation and innovation outcomes, Romito et al. (2023) examined more than 5,000 entries of patent data. Their findings indicated that high stakeholder orientation enhanced innovation originality, although at the cost of little inter-industry transferability. Their advice was to encourage stakeholder learning to maximize depth of innovation.

Lastly, Adeyeye, Egbetokun, & Sanni (2017) used a study of the national innovation survey of Nigeria 2011 in the manufacturing industry to evaluate the role of the different innovation impediments. They discovered that organizational rigidities reduced innovativeness and that regulatory barriers sometimes fostered adaptive innovation behavior. Conversely, knowledge and infrastructure barriers were closely related to lower innovation and lesser external search of knowledge. The paper emphasized the need to look into regulatory and infrastructural issues to ensure firms innovate and 102 expand their knowledge networks.

## Methodology

In this study, use of quantitative methods of research design was adopted in order to review the effects of the influence of stakeholders on the engineering innovation in The Niger Delta Power Holding Company (NDPHC), a government owned and one of the largest energy companies in Nigeria. The research targeted three departments that are at the center of innovation activities, namely Research and Development (R&D), Engineering, and Project Management. Out of a total headcount of 200 of these units (staff), stratified random sampling was used to sample 148 of its population with sufficient representation based on departmental ranks. A research Fluoq used as a primary data collection tool was a structured questionnaire. The instrument was designed to determine the impact of stakeholders on engineering innovation in the three fundamental dimensions including risk tolerance and the influence of decision making, the influence of regulatory or policy and resource contribution and capability building. A five-point Likert scale was used to rate items, and it ranged between items such as strongly disagree, disagree, neutral, agree, and strongly agree. Content validity of the instrument was tested by subject-matter experts, and a small provisional (pilot) test was carried out. The internal reliability was confirmed with a Cronbachs Alpha of 0.81. An analysis of data was performed by means of SPSS 25. Means and standard deviations, with frequencies, were used to summarize the responses of the respondents, and linear regression analysis was utilized to test the direction and strength of the relationship between the stakeholder influence (through the three dimensions) and the outcomes of engineering innovation. To achieve statistical validity, the study used the level of significance which was 0.005.

### *Data Presentation and Analysis*

**Tables 1:** Summary of the questionnaire feedback in percentage (%) of the 148 respondents

| Item Statement | Strongly Disagree (SD) | Disagree (D) | Undecided (U) | Agree (A) | Strongly Agree (SA) |
|---|---|---|---|---|---|
| **Innovation Outcomes** | (%) | (%) | (%) | (%) | (%) |
| Our firm frequently develops new energy technologies | 0 | 3.4 | 20.9 | 64.2 | 11.5 |
| Engineering teams incorporate innovative solutions | 0 | 0 | 27.7 | 58.1 | 14.2 |
| Innovation outcomes align with strategic goals | 0 | 0 | 27.0 | 63.2 | 9.5 |
| Stakeholder support is critical to innovation success | 0 | 2.5 | 20.3 | 64.9 | 12.2 |
| Engineering innovation contributes to competitive advantage | 0 | 1.4 | 22.3 | 66.9 | 9.5 |
| **Risk Tolerance & Decision-Making Influence (RTDMI)** | | | | | |
| Stakeholders are open to taking risks in technology development | 0 | 10.8 | 20.9 | 37.8 | 30.4 |
| Decision-making supports uncertain innovation projects | 0 | 8.8 | 25.0 | 41.2 | 25.0 |
| Risk-averse attitudes limit investment | 0 | 12.2 | 17.6 | 39.9 | 30.4 |
| Risk tolerance positively affects innovation | 0 | 10.8 | 20.3 | 37.2 | 31.8 |
| Risk considerations influence project approval | 0 | 9.5 | 23.6 | 40.5 | 26.4 |
| **Regulatory or Policy Impact (RPI)** | | | | | |
| Current regulations encourage innovation | 0 | 12.8 | 27.7 | 33.8 | 25.7 |
| Policy uncertainties create challenges | 0 | 16.9 | 25.0 | 33.1 | 25.0 |
| Regulatory compliance slows innovation | 0 | 14.9 | 27.0 | 36.5 | 21.6 |
| Government incentives encourage investment | 0 | 16.9 | 23.0 | 41.9 | 18.2 |
| Stakeholders respond to policy changes | 0 | 20.3 | 23.0 | 33.8 | 23.0 |
| **Resource Contribution & Capability Building (CR)** | | | | | |
| Stakeholders provide adequate financial support | 0 | 0 | 17.6 | 44.6 | 37.8 |
| Access to skilled personnel enhances innovation | 0 | 0 | 25.0 | 33.1 | 42.0 |
| Stakeholders provide necessary infrastructure | 0 | 0 | 25.7 | 37.8 | 36.5 |
| Collaboration with external stakeholders provides valuable resources | 0 | 0 | 18.2 | 41.2 | 40.5 |
| Resource constraints limit innovation potential | 0 | 0 | 22.3 | 41.9 | 35.8 |

## TEST OF HYPOTHESIS

**Hypothesis one:**

Hypothesis 1: Risk Tolerance and Decision-Making Influence and Engineering Innovation

$H_0$: RTDMI does not significantly influence Engineering Innovation.

$H_a$: RTDMI significantly influences Engineering Innovation.

**Result:**

The regression output revealed that Risk Tolerance and Decision-Making Influence (RTDMI) had a standardized beta coefficient of 0.445, with a t-value of 7.818 and a p-value of .000. The correlation between RTDMI and Engineering Innovation was r = .464, also significant at p < .001. Therefore the strong positive effect indicates that when stakeholders are more open to taking calculated risks and involved in innovation-related decision-making, engineering innovation performance increases. The hypothesis $H_a$ is supported, and the null hypothesis $H_0$ is rejected. This aligns with existing literature emphasizing that risk-tolerant environments empower technical teams to explore new methods, tools, and technologies without fear of failure.

**Hypothesis Two:** RPI and Engineering Innovation
$H_0$: RPI does not significantly influence Engineering Innovation.
$H_a$: RPI significantly influences Engineering Innovation.
**Result:**
The regression showed a beta of 0.430, t = 7.558, and p = .000. The correlation between RPI and EI was r = .438, significant at p < .001. This suggests that a regulatory environment characterized by clear policies, incentives, and reduced uncertainty enhances innovation outcomes. The alternative hypothesis $H_a$ is supported, while the null $H_0$ is rejected. In practical terms, innovation thrives when stakeholders can navigate stable and innovation-friendly regulations. Government incentives and policy clarity reduce hesitation and stimulate bold engineering decisions.

All three hypotheses were supported by the data. Each stakeholder dimension significantly impacts engineering innovation, with RTDMI having the strongest influence, followed by RPI and CR. These findings reinforce the theoretical proposition that effective stakeholder involvement is not merely supportive but strategically essential for driving innovation in engineering-based projects.

**Hypothesis Three**: CR and Engineering Innovation
$H_0$: CR does not significantly influence Engineering Innovation.
$H_a$: CR significantly influences Engineering Innovation.
**Result:**
The standardized beta for CR was 0.357, with t = 6.267 and p = .000. The Pearson correlation between CR and EI was r = .393, again significant at p < .001. This confirms that the availability of stakeholder resources financial, human, or infrastructural positively contributes to innovation success. The hypothesis $H_a$ is supported, and $H_0$ is rejected. When engineering teams are well-resourced, they are more likely to prototype, test, and deploy innovative solutions with fewer delays and limitations.

**Model Summary**
They are the Dependent variables (DV) and independent variables, based on the three hypotheses, which were broken down into two; at this point the (DV) and (IV) were tested to understand the significant relationship between the two factors.

a. Dependent Variable Engineering Innovation
b. All requested variables entered.

**Table 2: Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | |
|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 |
| 1 | 0.731[a] | 0.535 | 0.525 | 0.23463 | 0.535 | 55.239 | 3 |

**Table 2: CONT Model Summary**

| Model | Change Statistics | |
|---|---|---|
| | df2 | Sig. F Change |
| 1 | 144 | .000 |

a. Predictors: (Constant), Risk Tolerance & Decision-Making Influence, Regulatory or Policy Impact and Resource Contribution and Capability Building
b. Dependent Variable: Engineering Innovation

**Table 3: ANOVA[a]**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 9.123 | 3 | 3.041 | 55.239 | .000[b] |
| | Residual | 7.927 | 144 | .055 | | |
| | Total | 17.050 | 147 | | | |

a. Dependent Variable: Engineering Innovation
b. Predictors: (Constant), Risk Tolerance & Decision-Making Influence (RTDMI), Regulatory or Policy Impact (RPI) and Resource Contribution and Capability Building (CR).

**Table 4: Coefficients[a]**

| Model | | Unstandardized Coefficients B | Unstandardized Coefficients Std. Error | Standardized Coefficients Beta | T | Sig. |
|---|---|---|---|---|---|---|
| 1 | (Constant) | -.199 | .324 | | -.613 | .541 |
| | RTDMI | .370 | .047 | .445 | 7.818 | .000 |
| | RPI | .320 | .042 | .430 | 7.558 | .000 |
| | CR | .347 | .055 | .357 | 6.267 | .000 |

**Table 4 Cont Coefficients[a]**

| Model | Correlations Zero-order | Correlations Partial | Correlations Part | Collinearity Statistics Tolerance | Collinearity Statistics VIF |
|---|---|---|---|---|---|
| 1 (Constant) | | | | | |
| RTDMI | .464 | .546 | .444 | .997 | 1.003 |
| RPI | .438 | .533 | .429 | .999 | 1.001 |
| CR | .393 | .463 | .356 | .996 | 1.004 |

a. Dependent Variable: EI

**Table 5: Collinearity Diagnostics[a]**

| Model | Dimension | Eigenvalue | Condition Index | Variance Proportions (Constant) | RTDMI | RPI | CR |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 3.975 | 1.000 | .00 | .00 | .00 | .00 |
| | 2 | .014 | 17.028 | .00 | .22 | .75 | .02 |
| | 3 | .008 | 21.830 | .01 | .55 | .10 | .41 |
| | 4 | .003 | 39.392 | .99 | .22 | .15 | .57 |

a. Dependent Variable: EI

**Table 6: Correlations**

| | | EI | RTDMI | RPI | CR |
|---|---|---|---|---|---|
| Pearson Correlation | EI | 1.000 | .464 | .438 | .393 |
| | RTDMI | .464 | 1.000 | -.002 | .055 |
| | RPI | .438 | -.002 | 1.000 | .028 |
| | CR | .393 | .055 | .028 | 1.000 |
| Sig. (1-tailed) | EI | . | .000 | .000 | .000 |
| | RTDMI | .000 | . | .488 | .252 |
| | RPI | .000 | .488 | . | .368 |
| | CR | .000 | .252 | .368 | . |
| N | EI | 148 | 148 | 148 | 148 |
| | RTDMI | 148 | 148 | 148 | 148 |
| | RPI | 148 | 148 | 148 | 148 |
| | CR | 148 | 148 | 148 | 148 |

**Table 7: Structural Path Summarized**

| HYPOTHESES | STD BETA | STD ERR | T – STAT | P-VALUE | DECISION |
|---|---|---|---|---|---|
| H1 | 0.045 | 0.047 | 7.818 | .000 | Accepted |
| H2 | 0.430 | 0.042 | 7.558 | .000 | Accepted |
| H3 | 0.357 | 0.055 | 6.267 | .000 | Accepted |

**Discussion of Findings**

The result of this paper provides valuable lessons on the implications of stakeholder dynamics in engineering innovation in the energy sector in Nigeria and specifically the Niger Delta Power Holding Company (NDPHC). All three of the core dimensions, risk tolerance and decision-making influence (RTDMI), regulatory or policy impact (RPI), and resource contribution and capability building (CR) were statistically significant predictors of engineering innovation, highly reflective of the centrality of stakeholder involvement in the determination of innovation outcomes.

Table 1 presents descriptive statistics of dimensions of the stakeholder risk tolerance, regulatory support, and resource contribution. In all the 20 questions, over 70 percent of respondents agreed or strongly agreed that engineering innovation brings in strategic objectives of the firm, technological advancement, and competitive advantage. This revisits the fact that innovation is already an established performance accelerator at the firm and stakeholder buy-in is seen as a pathway to success. Most respondents pointed out that risk-tolerant environments promote innovation. As an example, more than 68 percent responded that open mindedness to technology risks contributed to augmented innovativeness, and more than 70 percent replied that risk attitudes of stakeholder's impacts on decision to approve projects. This reinforces the notion that psychological safety and risk sharing encourage daring new initiatives. The statistics demonstrate a mixed and generally positive opinion. Although more than 59% were in agreement that the applied policies spur innovative solutions, close to 50% also admitted that policy uncertainty and the high volume of regulations may hinder innovation. The respondent data and analysis indicates the two-sided nature of policy, as a facilitator and a limitation.

The support of stakeholder's funds, technical, and infrastructures was rated high. Almost 83 percent of respondents concurred that stakeholder contributions enhance the ability to innovate, and more than three-quarters of respondents believed that external cooperation is beneficial to engineering innovation. However, 57.7% also admitted that innovation is also hindered by resource limitations, implying that overall stakeholder investment and capacity-building still requires stronger results. The findings indicate that the risk appetite of the stakeholders and their proximity in decision-making processes in matters relating innovation is a robust indicator of engineering innovation performance.

The paper has also analyzed the effects of stakeholder dimensions Risk Tolerance and Decision-Making Influence (RTDMI), Regulatory or Policy Impact (RPI), and Resource Contribution and Capability Building (CR) on engineering innovation in an energy company. The results support the hypothesized connections empirically, and they demonstrate that stakeholder engagement matters in determining the outcomes of innovation.

As shown in the model summary in the Table 2 the three stakeholder dimensions together explain 53.5 % of the variance in engineering innovation ($R2 = 0.535$, Adjusted $R\ 2 = 0.525$) which shows a significant amount of explanation. The ANOVA findings in Table 3 further confirm the correctness of this conclusion; the regression model insignificance was not statistically significant ($F = 55.239$, $p < 0.001$), indicating that the independent variables relate to the results of innovative studies.

Careful analysis of the regression coefficient as shown in Table 4 indicates that the three dimensions are significant predictors to engineering innovation. The most influential area is the RTDMI (0.445, $p < 0.001$), as its impact shows that stakeholder readiness to accept ambiguity and contribute to experimental programs is very crucial in promoting innovation. This corresponds to the earlier research (e.g., Gerlach & Eriksson, 2021; Nguyen et al., 2019), reaffirming the value of psychological safety and decision-making frameworks of flexibility.

Table 4 discloses that Regulatory or Policy Impact (RPI) exhibits also a significant and positive result (beta = 0.430, $p < 0.001$), meaning that transparent, consistent, and policy facilitating innovation increase engineering choices and move innovation. This observation supports the findings of previous studies by Doblinger et al. (2016) and Costantini and Crespi (2010) on the importance of adaptive regulation in fueling innovation in the complex and highly regulated sectors such as energy sector.

As seen in Table 4 Resource Contribution (CR) is also a substantial predictor ($p < 0.001$, 0.357) indicating that the financial support, technical expertise, and infrastructure provision by the stakeholders are also critical in the realization of innovative solutions despite its relatively lower significance, even though generally support for the idea has been high. This aligns with the views of Ozdemir et al. (2023) and Engez & Aarikka-Stenroos (2023) that emphasize the importance of constant and various resource flows in the context of innovation ecosystems.

Any suspicion of the multicollinearity of the predictors is overcome by collinearity diagnostics presented in Tables 5 and 6 that show all VIF values are close to 1.00 and that condition indices are within acceptable levels. Furthermore, moderate and significant positive relationships observed between each dimension of stakehouse and engineering innovation (RTDMI = 0.456; RPI = 0.438; CR = 0.393) in Table 7 help to corroborate the results in the regression.

Finally, the structural path summary in Table 8 confirms the acceptance of all three hypotheses:

- H1: RTDMI → Engineering Innovation ($\beta = 0.445$, $t = 7.818$, $p < 0.001$)
- H2: RPI → Engineering Innovation ($\beta = 0.430$, $t = 7.558$, $p < 0.001$)
- H3: CR → Engineering Innovation ($\beta = 0.357$, $t = 6.267$, $p < 0.001$)

In sum, the results underscore that stakeholder influence is not merely supportive but strategic capable of shaping the direction, intensity, and success of engineering innovation. Among the dimensions, risk-oriented decision-making emerges as the most critical enabler, followed by regulatory alignment and resource provision. This suggests that innovation in energy firms is as much a function of behavioral and institutional dynamics as it is of technical or financial inputs.

Overall, the findings confirm that the influence of stakeholders is not only helpful but strategic that can dictate the direction, the force and the success of engineering innovation. Risk-oriented decision-making is the most essential enabler, as well as regulatory alignment and the provision of resources among the dimensions. This implies that product development at energy companies is an equally behavioral and institutional process than it is a technical or investment-related one.

In accordance with the results, the impact of stakeholders is not only purportive but tactical, able to determine even the course, pace, and prosperity of the innovation in engineering. Companies that want to become successful in innovation should focus on developing proactive, transparent, and collaborative relations with essential stakeholders. Specifically the energy companies in

Nigeria need to get regulators on board to develop policy environments that support innovation whilst at the same time are compliant. Similarly, internal stakeholders ought to be enabled to make rational risks, as well as incorporate external forces like the investors, communities, and suppliers in the long-had strategy of innovation planning.

**Conclusion**

This research paper has established that the influence of the stakeholders is a key element that contributes to engineering innovation in energy companies. Particularly, resources mobilization and capacity development with contributions made by the stakeholders have the most impact and the readiness to accept risk and participate in shared decision-making comes after this. Despite the fact that regulatory or policy frameworks are both problematic and can provide opportunities, they can be influential in the case when the stakeholders are involved and have an active part to play in determining the outcomes of the policies. The given results imply that energy companies seeking to advance energy innovation also must consider engaging the stakeholders at the initial stages of project planning, stimulating risk sharing, developing other flexible regulative strategies, and investing in technical and human resources. Further studies may incorporate longitudinal designs to take into account the changing influence of the stake holders, as well as to analyze other sectors to give a comparison analysis.

Recommendations

Going on the results of this research the recommendations offered are:

1. Engage Early: Energy companies ought to include both the external and internal stakeholder's particularly the regulatory bodies and the technical teams early enough in the process of innovation. This will improve congruence in the pursuit of innovation and the expectations of the stakeholders.
2. Cultivate Risk-Sharing Culture: Engineering departments ought to think about loose systems of decision making which embrace uncertainty. Stimulating piloting ventures and innovation center-argumentation through pilot programs and innovation hubs will facilitate stakeholder involvement.
3. Involve Regulators in Innovation Conversations: Companies should involve regulatory bodies in co-designing flexible laws that allow experimentation and commercialization of new technologies at the same time not breaching the compliance.
4. Investment in Resource and Depth: The stakeholders ought to invest in R&D, department technological training, and multidisciplinary development teams. Such investments have direct positive impacts on the engineering innovation capacity of the firm.
5. Institute Feedback Loops: Feedback loops with the stakeholders in place continuously can provide early warnings of the innovation hindrances and can help direct iterative adjustments throughout the project timeline.

***Research Gap and Suggestions for Further Study***

Though the stakeholder role in innovation is well recognized in the literature, past research studies tend to view the role of the various stakeholders one-dimensionally and in an insular way i.e. In relation to small groups like regulators or investors or even consumers and lacks a multi-dimensional view on how different stakeholders in the innovation process can join together and influence the outcome of engineering innovation. In addition, a large percentage of the empirical work has been skewed towards the study of the developed economies where the stability of an institutional framework is well established, thereby restricting the generalisation of such results, when applied in the developing economies such as Nigeria, where the present political, economical, and social factors pose greater complication and uncertainty.

The second major gap is the relative insufficient exploration on the role of stakeholder influence at the convergence of innovation diffusion, policy, and capability build in the energy firms specifically experiencing uncertainty in regulation, scarcity of resources, and market fluctuation. Although the work of Li et al. (2018), Talke & Hultink (2010) pointed out antagonistic relations of various groups of stakeholders, there is limited empirical literature on how companies handle tensions of stakeholder interests strategically on forming the innovation process, particularly in industries that are driven by engineering, and highly technical and financially risky.

Further, existing studies tend to consider stakeholder engagement as a linear or unidimensional process that is independent and separate of the innovation lifecycle. This confines our knowledge on how engagement practices should emerge based on the levels of technologic advancement as well as market penetration.

***Further Research should Explore***

The linear nature of the effect that the stakeholder engagement strategy has on engineering innovation outcomes during various stages of innovation (ideation, development, deployment). Comparative analysis of the influence of stakeholders based on ownership mode in energy public and privately operated companies to get perceptions on how influence shapes up depending on institutional propriety and support. The generation of stakeholder management-based models that embrace the perception of risks, interaction with the regulators, and capacity creation in the low and middle-income settings. To measure the way stakeholder relationships, change with time and affect the succeeding or failure of innovations, the mixed-method or longitudinal designs of analysis can be utilized. Filling these gaps, future research would provide more practical information to the innovation managers, policies, and development actors to match the interests of the stakeholders with the pursuit of innovation in complex se

**Reference**

Aaltonen K., & Kujala J. (2010). A project lifecycle perspective on stakeholder influence strategies in global projects. *Scandinavian Journal of Management*, 26(4), 381–397.

Aaltonen, K., Kujala, J., Havela, L., & Savage, G.T. (2015). Stakeholder Dynamics during the Project Front-End: The Case of Nuclear Waste Repository Projects. *Project Management Journal, 46*, 15 - 41.

Abderhalden, J. M., Scolobig, A., Stoffel, M., Huang Lachmann, J.-T., & Calvello, M. (2025). *Barriers and Enablers to Stakeholder Engagement in the Co-Creation of Disaster Risk Reduction Solutions*. International Journal of Disaster Risk Reduction, 120, 105381. https://doi.org/10.1016/j.ijdrr.2025.105381.

Adeyeye, D., Egbetokun, A., Sanni, M., & others. (2017). How barriers influence firms' search strategies and innovative performance. *International Journal of Innovation Management, 21*(7), 1850011. https://doi.org/10.1142/S1363919618500111

Ainia N. S. N., Lutfi L. (2019). The influence of risk perception, risk tolerance, overconfidence, and loss aversion towards investment decision making: *Journal of Economics, Business, and Accountancy Ventura.* 21(3), Pp. 401 – 413.

Anderson, N., De Dreu, C. K. W., & Nijstad, B. A. (2004). The routinization of innovation research: A constructively critical review of the state-of-the-science. Journal of Organizational Behavior, 25(2), 147–173. https://doi.org/10.1002/job.236

Blind, K. (2012). The influence of regulations on innovation: A quantitative assessment for OECD countries. Research Policy, 41(2), 391–400.

Carson, R.T., Graff Zivin, J., Louviere, J.J., Sadoff, S., & Shrader, J.G. (2020). The Risk of Caution: Evidence from an R&D Experiment. *ERPN: Research (Sub-Topic)*.

Chen, X., Liu, Y., Locatelli, G., He, Q., & Zhang, X. (2024). Exploring dynamics of stakeholder salience and functional roles in megaproject collaborative innovation system: Insights from the Hong Kong-Zhuhai-Macao Bridge. *Engineering, Construction and Architectural Management*. https://doi.org/10.1108/ECAM-09- 2023-0915

Corter, J. E., & Chen, Y. J. (2006). Do investment risk tolerance attitudes predict portfolio risk? Journal of Business and Psychology, 20(3), 369–381. https://doi.org/10.1007/s10869-005-9010-5

Costantini, V., & Crespi, F. (2010). Public policies for a sustainable energy sector: Regulation, diversity and fostering of innovation. Journal of Evolutionary Economics, 20, 565–587. https://doi.org/10.1007/s00191-009-0154-1

Côté, E., & Salm, S. (2022). Risk-adjusted preferences of utility companies and institutional investors for battery storage and green hydrogen investment. *Energy Policy*.

Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. Journal of Management Studies, 47(6), 1154–1191. https://doi.org/10.1111/j.1467-6486.2009.00880.x

Doblinger, C., Dowling, M., & Helm, R. (2016). An institutional perspective of public policy and network effects in the renewable energy industry: enablers or disablers of entrepreneurial behaviour and innovation?. *Entrepreneurship & Regional Development, 28*, 126 - 156.

Donaldson, T., & Preston, L. E. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. Academy of Management Review, 20(1), 65–91. https://doi.org/10.5465/amr.1995.9503271992.

Duh, R. R., Chow, C. W., & Chen, H. (2006). Strategy, IT applications and performance: The role of beliefs about organizational capabilities. Decision Support Systems, 41(4), 728–752. https://doi.org/10.1016/j.dss.2005.05.001

Edler, J., & Fagerberg, J. (2017). Innovation policy: What, why, and how. Oxford Review of Economic Policy, 33(1), 2–23.

Engez, J., & Aarikka-Stenroos, L. (2023). Stakeholder engagement in innovation ecosystems: Mechanisms of legitimacy, alignment, and capability development. Technovation, 122, 102628. https://doi.org/10.1016/j.technovation.2023.102628

Ezeh, M.O., Ogbu, A.D., Ikevuje, A.H., & George, E.P. (2024). Stakeholder engagement and influence: Strategies for successful energy projects. *International Journal of Management & Entrepreneurship Research*.

Fliaster, A., & Kolloch, M. (2017). Implementation of Green Innovations – The Impact of Stakeholders and Their Network Relations. *Environmental Economics eJournal*.

Freeman, R. E. (1984). Strategic management: A stakeholder approach. Boston, MA: Pitman.

Gann, D. M., Wang, Y., & Hawkins, R. (1998). Do regulations encourage innovation?—The case of energy efficiency in housing. Building Research & Information, 26(5), 280– 296. https://doi.org/10.1080/096132198370282

Gerlach, P., & Eriksson, T. (2021). Psychological safety and innovation in high-reliability organizations: A multilevel perspective. Journal of Business Research, 124, 186–195. https://doi.org/10.1016/j.jbusres.2020.11.054

Gonzalez-Porras, L., Heikkinen, A. and Kujala, J. (2021) 'Understanding stakeholder influence: lessons from a controversial megaproject', *Int. J. Human Resources Development and Management,* Vol. 21, Nos. 2/3, pp.191–213.

Gruenhagen, J.H., & Parker, R. (2020). Factors driving or impeding the diffusion and adoption of innovation in mining: A systematic review of the literature. *Resources Policy, 65*, 101540.

Hall, J., & Martin, M. J. C. (2005). Disruptive technologies, stakeholders and the innovation value-added chain: A framework for evaluating radical technology development. R&D Management, 35(3), 273–284. https://doi.org/10.1111/j.1467-9310.2005.00388.x

Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D., & Winter, S. G. (2007). Dynamic capabilities: Understanding strategic change in organizations. Blackwell Publishing.

Hueske A. K., Guenther, E. (2015) What hampers innovation? External stakeholders, the organization, groups and individuals: a systematic review of empirical barrier research. *Wirtschaftsuniversität Wien, Austria*,: (65) Pp 113–148. DOI 10.1007/s11301-014-0109-5

Jankauskas, V., Rudzkis, P., & Kanopka, A. (2014). Risk factors for stakeholders in renewable energy investments.

Jansma, S. R. (2020). Connect and affect: How stakeholder interactions facilitate technological change Doctoral dissertation, University of Twente. *University of Twente Repository.* https://doi.org/10.3990/1.9789036550796

Jiya, T. (2019). Exploring the role of NGOs in energy innovation adoption: Evidence from Nigeria. African Journal of Sustainable Development, 9(2), 25–35.

Liang, T., Zhang, Y., & Qiang, W. (2022). Does technological innovation benefit energy firms' environmental performance? The moderating effect of government subsidies and media coverage. *Technological Forecasting and Social Change*.

Loureiro, S.M., Romero, J., & Bilro, R.G. (2020). Stakeholder engagement in co-creation processes for innovation: A systematic literature review and case study. *Journal of Business Research, 119*, 388-409.

Nguyen, L. T., Brown, A., & Lee, J. (2019). Risk-taking and decision-making in innovation: A stakeholder-oriented perspective. International Journal of Innovation Management, 23(5), 1950047. https://doi.org/10.1142/S1363919619500477

Nguyen, T., Mohamed, S., & Panuwatwanich, K. (2018). Stakeholder Management in Complex Project: Review of

Contemporary Literature. *Journal of Engineering, Project, and Production Management*.

Osobajo, O. A., Oke, A., Ajimy, M., Otitoju, A., & Adeyanju, G. C. (2023). The role of culture in stakeholder engagement: Its implication for open innovation. *Journal of Open Innovation: Technology, Market, and Complexity, 9*(2), 100058. https://doi.org/10.1016/j.joitmc.2023.100058

Ozdemir, V., Firat, M., & Tuncer, K. (2023). Stakeholder capability integration and innovation performance in manufacturing firms. Journal of Business Research, 158, 113688. https://doi.org/10.1016/j.jbusres.2023.113688

Romito .S. Vurro .C. & Benassi .M. (2023). The impact of stakeholder orientation on innovation: an empirical investigation on firm patenting activity; *sinergie, italian journal of management.* 41,(2).

Rosenzweig, S., & Grinstein, A. (2016). How resource constraints influence innovation strategy: A study of small and medium-sized firms. Journal of Product Innovation Management, 33(2), 211–226. https://doi.org/10.1111/jpim.12258

Saidi, K., Magaly Flores Sánchez, I., & Hammami, S. (2020). The impact of renewable energy and innovation on carbon emissions: Evidence from European economies. Renewable Energy, 172, 350–360. https://doi.org/10.1016/j.renene.2020.11.004

Smirnova, M., Podmetina, D., Väätänen, J., & Kouchtch, S. (2009). Key stakeholders' interaction as a factor of product innovation: the case of Russia. *International Journal of Technology Marketing, 4*, 230.

Tidd, J., & Bessant, J. (2020). Managing innovation: Integrating technological, market and organizational change (6th ed.). Hoboken, NJ: Wiley.

Widén, K., Olander, S., & Atkin, B. (2014). Stakeholder influence strategies in collaborative innovation projects. Construction Management and Economics, 32(3), 296–308. https://doi.org/10.1080/01446193.2014.892629

Wogwu, V. E. & Wogwu, K. O. (2024) Stakeholder Engagement in Green Energy Governance of Selected Organization in Nigeria; *International Journal of Strategic Research in Education, Technology and Humanities*; 12 (1)

Wood, D.J., Mitchell, R.K., Agle, B.R., & Bryan, L.M. (2018). Stakeholder Identification and Salience After 20 Years: Progress, Problems, and Prospects. *Business & Society, 60*, 196 - 245.

Wood, M. S., McKelvie, A., & Haynie, J. M. (2014). Making it personal: Opportunity individuation and the shaping of opportunity beliefs. Journal of Business Venturing, 29(2), 252–272. https://doi.org/10.1016/j.jbusvent.2013.04.003

Wulandari, D., & Iramani, R. (2014). Risk tolerance and investment decisions of individual investors. Journal of Business and Economics, 5(6), 635–643.