INFLUENCE OF STAKEHOLDER CAPACITY BUILDING ON PERFORMANCE OF MINING PROJECTS IN RWANDA A CASE STUDY OF AFRICAN PANTHER RESOURCES LIMITED

Umutesi Solange, Dr. Catherine Wanjiku, PhD & Emmanuel Bwankarikari

INFLUENCE OF STAKEHOLDER CAPACITY BUILDING ON PERFORMANCE OF MINING PROJECTS IN RWANDA A CASE STUDY OF AFRICAN PANTHER RESOURCES LIMITED

[1] Umutesi, S., [2] Wanjiku, C., & [3] Bwankarikari, E.

[1] Postgraduate Student (Project Management) Mount Kenya University, Kigali, Rwanda
[2] Senior Lecturer, Mount Kenya University, Kigali, Rwanda
[2] Lecturer, Mount Kenya University, Kigali, Rwanda

ABSTRACT

The mining industry plays a crucial role in the economic development of Rwanda, and the success of mining projects depends on a variety of factors, including stakeholder capacity building. This research focuses on the influence of stakeholder capacity building on the performance of mining projects in Rwanda, with a specific case study of African Panther Resources Limited. African Panther Resources Limited, a prominent mining company operating in Rwanda, provides an illustrative case for understanding the role of stakeholder capacity building in mining project performance. The study was based on Resource Based View Theory. This study employs a mixed-method research approach, combining qualitative and quantitative methods to assess the impact of capacity-building initiatives on various stakeholders involved in African Panther Resources' mining projects. The study targeted 96 participants in project management (n=96) from African Panther limited. Secondary information was gathered from records obtained from African Panther Resources Limited. In addition, questionnaires were distributed to gather primary data. Respondents' experiences and insights were used as the basis for analysis and interpretations of the research. Participants were subjected to a variety of methods and incentives, including questionnaires, interviews, and observations. Every factor helped bring about a new variable. The research asked for a thorough evaluation of the instruments' content and face validity. The test-retest method was used to guarantee accuracy. The devices' dependability was calculated using the Cronbach's coefficient. Indicative of the tools' dependability was a test value of 0.7 or above. Concurrent triangulation was used to increase the reliability of the study's findings. Non-numerical instruments' credibility was determined by an in-depth interview approach. Descriptive and inferential statistical tests were used in the analysis of quantitative data, and tables and figures were used to display the results. Descriptive statistical tests encompass measures such as percentages, frequencies, and counts, whereas inferential statistical tests involve the application of multiple regression. The study of qualitative data involved the use of thematic analysis techniques, resulting in the presentation of findings in narrative form accompanied by verbatim citations. Firstly, the majority of respondents strongly agree (54.7%) that these programs effectively enhance communication and collaboration among project teams and stakeholders, while 37.3% agree to some extent, reflecting their positive influence (M = 4.47, SD = .644). Additionally, the training programs related to mining project management also garner substantial support, with 57.3% of respondents agreeing to their effectiveness (M = 4.55, SD = .552). Moreover, the research highlights that the training and development

initiatives significantly contribute to the overall success of mining projects, with 54.7% agreement (M = 4.49, SD = .601). Adequate resources and support for stakeholder capacity building are considered vital, as 54.7% of respondents affirm their provision (M = 4.49, SD = .601). The study shows that 50.7% of stakeholders agree that the programs are regularly assessed and improved, underlining a dynamic approach to capacity building (M = 4.48, SD = .554). Lastly, the research finds strong endorsement (65.3%) for the idea that the skills and knowledge gained through capacity building positively impact project operations' quality and efficiency (M = 4.64, SD = .510). The study concludes that effective capacity building fosters better collaboration and communication among stakeholders, including government agencies, local communities, investors, and non-governmental organizations. This collaboration is crucial for aligning interests, mitigating conflicts, and ensuring that mining projects align with broader development goals. The study recommends that mining companies in Rwanda should develop and implement customized training programs for different stakeholder groups, including government officials, local communities, and employees. These programs should focus on the specific needs and challenges of each group, such as environmental conservation, safety standards, and revenue management.

Keywords: *Stakeholder capacity building, Project performance, Mining projects, African Panther limited, Rwanda.*

BACKGROUND OF THE STUDY

Globally, mining projects are challenging when it comes to active involvement of stakeholders. Effective stakeholder engagement ensures that a wide range of perspectives, concerns, and interests are taken into account, leading to better project outcomes and reduced conflicts (Roberts *et al.,* 2019). Nonetheless, inadequate management of the engagement procedure could lead to detrimental effects on stakeholder connections, leading to doubt and strain (Turner, 2017). Furthermore, this mismanagement could impede the prospect of establishing fruitful relations in the future (Hillson & Murray-Webster, 2017).

Development agencies in developed countries began to introduce concepts of stakeholder's engagement in projects and programmes in the late 1970s and early 1980s after lack of stakeholder's engagement was identified as a reason for the failure of many projects (Davis *et al.,* 2018). Initially, emphasis was on popular stakeholders. In the past decade the promotion of stakeholder's engagement in development has become more widespread and the focus has widened to include other stakeholders as well.

According to Söderlund and Borgström (2019), projects that prioritize stakeholder involvement tend to achieve higher levels of performance in terms of schedule adherence, budget control, and overall quality. Furthermore, Mitchell et al. (2017) proposed the Stakeholder Salience Model, highlighting the importance of recognizing and managing the expectations and interests of key stakeholders.

A study was undertaken in Brazil by Freire, Batista, and Martinez (2016) to investigate the accreditation of project performance management. The significance of stakeholder identification in the evaluation of performance should be emphasized. Moreover, the study conducted by Ganapathy (2018) highlights the importance of stakeholder communication planning as a crucial factor influencing performance outcomes. This research underscores the significance of identifying the most effective communication channels for different stakeholders and assigning accountable personnel for the distribution of information.

The study conducted by Munns and Bjeirmi (2016) provides insights into the common challenges faced by initiatives in the African context. The issues identified include stakeholder dissatisfaction and disagreement, the absence of a comprehensive stakeholder consultation mechanism, the development of obsolete projects lacking clear and goal-oriented objectives, deviations from established timelines and budgets, substandard recruitment and training of personnel, inadequate frameworks for monitoring and evaluation, ineffective response to unforeseen crises, leadership marked by incompetence, inadequate training, and political motivations, uncontrolled power dynamics and political influences within organizations, a widespread lack of urgency and recognition of the value of time, and conflicts (Agyapong et al., 2018).

Research by Muthoni and K'Obonyo, (2017) demonstrated that effective stakeholder engagement practices positively influence project performance in Africa. Their study focused on infrastructure projects in Kenya and highlighted that project with active engagement of stakeholders exhibited higher levels of support, reduced delays, and improved overall outcomes. Similarly, Ngulube (2019) conducted research on mining projects in South Africa and found that projects that integrated stakeholder perspectives from the outset were more likely to secure social license to operate, leading to better project acceptance and success.

Odugbemi et al. (2018) investigated the performance of projects in the health sector, with a specific emphasis on projects related to malaria Rapid Diagnostics Test (RDT) in the private health sector of Nigeria. The research conducted by the authors illuminates the crucial components of stakeholder management that have a beneficial influence on project success. The aforementioned elements comprise the facets of successful communication, organizational tactics, the utilization of plenary speeches, stakeholder engagement meetings, and the deployment of nominal group techniques.

In the context of South Africa, Staunton et al. (2018) have identified a set of three stakeholder layers that emphasize the importance of stakeholder education, the establishment of trust-based relationships, and the improvement of consent processes in order to boost project performance. The results of their study highlight the significance of aligning stakeholder values and roles, effective communication, active stakeholder engagement, skillful stakeholder identification, and the effective management of stakeholder interests as crucial factors that contribute to the success of their medical initiatives.

Research on the involvement of stakeholders and the successful completion of health initiatives in the Kirehe District was carried out in Rwanda by Nzayirambaho (2015). He came to the conclusion that insufficient planning, communication, and risk management are the direct results of poor involvement on the part of stakeholders, and that this negatively impacts the success of the project. Mushimiyimana (2014) found that stakeholders are aware of their participation and the responsibilities they play in the successful completion of a project, and they believe that their participation is still essential.

African Panther Resources Limited has been working to develop its mining sector as part of its economic diversification efforts. African Panther Resources Limited is a mining company that has been involved in exploration and mining activities in Rwanda. It is involved in the extraction of minerals like tin, tantalum, tungsten, and gold, which are important resources in the region. Companies operating in the mining sector typically face various challenges related to environmental regulations, community engagement, labor practices, and sustainable resource management. Engaging the stakeholder is key to the performance of mining companies in Rwanda hence the need for this study using African Panther Resources Limited.

Statement of the Problem

The involvement of stakeholders is an essential element in every project, regardless of its magnitude. The scope of this endeavor includes

engaging with both the general public and community stakeholders who are currently or potentially impacted by the project. Unfortunately, a significant number of organizations tend to disregard the crucial significance of proficiently engaging with stakeholders in their projects, resulting in potential negative consequences for project performance. The early establishment of stakeholder participation during the project lifecycle is crucial in order to attain favorable results. Failure to prioritize this critical stage might transform project stakeholders into possible risk factors (Windsor, 2021). Numerous international initiatives have encountered failure not as a result of insufficiently competent project managers or inadequate resources, but rather owing to the inadequate involvement of stakeholders at the proper stage in the project's life cycle. The statement is supported by Rahman and Alzubi (2015), who emphasized the correlation between inadequate stakeholder participation and the occurrence of cost overruns in building projects, leading to the final failure of the project.

Organizational and project stakeholders' efforts to work together are crucial to the completion of any given project. Mark (2012) argues that a major cause of project failure is the failure to involve key stakeholders during the planning and initiation of the project. A prevalent oversight in project management is the failure of project planners to effectively involve essential stakeholders or users during the initial planning phase. This oversight results in deficiencies within project plans and subsequent quality concerns during the implementation stage.

Certain project managers may lack awareness of the negative consequences that arise from inadequate stakeholder participation and insufficient communication, which ultimately hinder project performance. According to Mark and Naresh (2018), inadequate communication and the exclusion of stakeholders can lead to misunderstandings, lack of trust, and a lack of support and ownership among the individuals who are most impacted by the project. Within this particular framework,

stakeholder engagement activities encompass the inclusion of a designated cohort of persons, collectives, or their delegates in the process of addressing particular matters. Nevertheless, a significant number of businesses encounter challenges in this aspect, impeding the successful implementation of their initiatives. Mining initiatives in Rwanda encounter challenges primarily because of insufficient attention given to stakeholder engagement during the entire project duration (Mushimiyimana, 2014).

Despite the increasing recognition of the importance of stakeholder engagement in the mining industry (Boutilier, 2017), there is a notable dearth of comprehensive studies specifically addressing this practice in the Rwandan mining sector. The absence of such focused research is problematic, as it leaves a significant gap in the understanding of the effectiveness of stakeholder engagement practices, and how they impact the performance and sustainability of mining projects in this region. By failing to address this gap, we miss the opportunity to inform policy, improve industry practices, and ensure that mining activities in Rwanda align with both national development goals and international sustainability standards. This highlights the importance of our research, which seeks to assess the methods of stakeholder involvement and the performance of mining operations carried out by Ltd in Rwanda.

LITERATURE REVIEW

Stakeholder Capacity Building
Stakeholder capacity building is a crucial concept within the realm of organizational development and sustainable management practices. It entails the process of enhancing the abilities, resources, and skills of various stakeholders to effectively engage in decision-making processes, collaborate, and contribute to the achievement of common goals (Smith et al., 2019). Stakeholder capacity building has gained prominence due to its potential to foster inclusive and participatory approaches in various domains, including environmental management,

community development, and corporate social responsibility (Jones & Wood, 2013). Organizations that prioritize stakeholder capacity building demonstrate a commitment to building stronger relationships, promoting equitable participation, and ultimately achieving more sustainable outcomes (Smith & Johnson, 2015).

Several strategies have been proposed to facilitate effective stakeholder capacity building. These strategies include knowledge sharing, skill development workshops, and the provision of resources to empower stakeholders (Brown et al., 2018). Additionally, collaborative platforms and digital tools have emerged as valuable mechanisms for enhancing stakeholder engagement and capacity building in the digital age (Miller & Wilson, 2019). Stakeholder capacity building offers numerous benefits, such as improved decision-making processes, increased community resilience, and enhanced organizational reputation (Robinson et al., 2017). However, challenges related to resource constraints, differing stakeholder interests, and power dynamics must be carefully navigated to ensure successful capacity-building initiatives (Lee & Smith, 2021).

Rwanda has undertaken various strategies to enhance stakeholder capacity in the mining sector (Gasana, & Tuts, 2020). These strategies encompass education and training programs, knowledge sharing platforms, and collaborative partnerships. The Rwanda Mining Association, for instance, has been instrumental in organizing workshops and training sessions for stakeholders to enhance their understanding of industry best practices, environmental regulations, and safety protocols (Ministry of Natural Resources Rwanda, 2022). Additionally, the Rwandan government has collaborated with international organizations to provide technical assistance and expertise to stakeholders, contributing to the overall improvement of mining project outcomes.

Resource Based View Theory

According to Barney (2021), the Resource-Based View (RBV) theory suggests that a firm's competitive edge and overall success are derived from the unique amalgamation of resources and capabilities it possesses. From this particular standpoint, it is argued that a firm's capacity to surpass its competitors is not solely dependent on its possession of resources, but rather on the scarcity, inability to replicate, and skill in properly utilizing these resources. The presence of distinctive resources, such as tangible assets, intellectual property, talented individuals, or innovative procedures, empowers a company to establish a specialized position in the market, maintain profitability over an extended period, and attain a durable competitive advantage. The RBV theory highlights the fundamental significance of resource heterogeneity and strategic management in facilitating a firm's achievement and adaptability in a fiercely competitive business environment.

Stakeholder engagement can be viewed as a resource that, when effectively harnessed, contributes to a project's distinctiveness and competitive advantage (Hillman & Keim, 2021). In the context of mining projects in Rwanda, stakeholder engagement becomes a critical factor that can influence project success. The engagement of stakeholders, including local communities, government bodies, investors, and environmental organizations, can shape project outcomes and contribute to sustainable development in the region (Mitchell et al., 2017). Studies have indicated that robust stakeholder engagement positively influences project outcomes. Engaged stakeholders can provide valuable insights, access to networks, and other intangible resources that enhance a project's success (Grant, 2016). Furthermore, strong stakeholder relationships can lead to greater project flexibility, adaptability, and innovation, aligning with RBV's emphasis on leveraging unique resources for superior performance.

By using the principles of the Resource-Based View (RBV) theory, mining companies have the potential to acquire a competitive edge by effectively engaging stakeholders through the utilization of their unique assets, such as technological

competence, community relations, and regulatory knowledge. In the context of mining projects, stakeholders include not only the mining company but also government bodies, local communities, environmental agencies, and more. Capacity building involves enhancing the skills, knowledge, and resources of these stakeholders to effectively engage in the project. For example, training local workers in safe and efficient mining practices, educating communities about environmental impacts and benefits, and collaborating with regulatory bodies to improve oversight can all be part of stakeholder capacity building. This theory is related to the influence of stakeholder capacity building on performance of mining projects in Rwanda.

Conceptual Framework

A conceptual framework serves as a systematic and theoretical basis for doing research, facilitating the formulation of hypotheses and the analysis of results within a defined area of study. The purpose of a literature review is to elucidate the fundamental concepts, variables, and interconnections that form the foundation of a study, so assisting researchers in developing a clear understanding and operationalization of their research inquiries. The framework functions as a tool for comprehending the phenomena being studied, providing a theoretical perspective that facilitates the analysis of data, so enabling a more profound grasp of the subject matter (Dubé & Paré, 2013). It's derived from the theoretical framework of this study: Resource based theory.
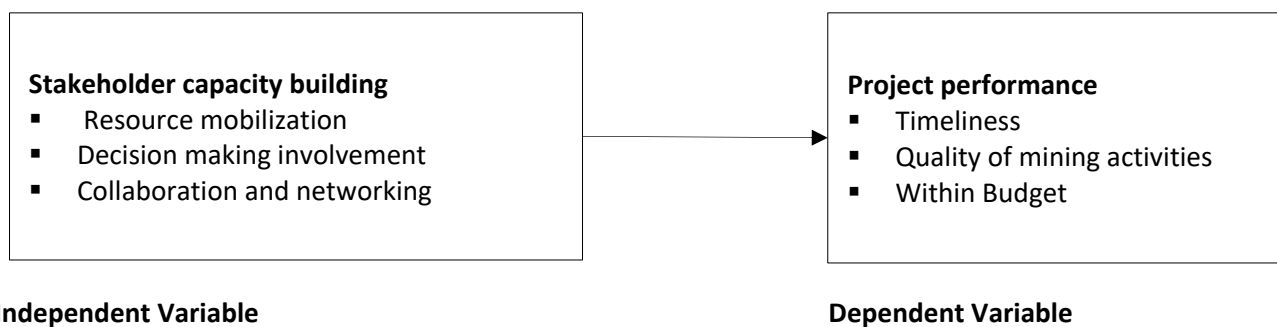
Stakeholder capacity building	Project performance
▪ Resource mobilization ▪ Decision making involvement ▪ Collaboration and networking	▪ Timeliness ▪ Quality of mining activities ▪ Within Budget

Independent Variable   Dependent Variable

Figure 1: Conceptual Framework
Source: Researcher, 2023

METHODOLOGY

According to Creswell (2014), research design can be defined as the all-encompassing structure that guides the implementation of a research study. The forthcoming investigation employs a mixed methods approach, integrating both qualitative and quantitative research methodologies. This approach allows for a comprehensive analysis, combining the depth of qualitative data to capture nuanced insights with the breadth of quantitative data to provide statistical rigor, ultimately offering a more robust and holistic understanding of the research problem. This methodology provides a methodical and accurate framework for addressing an examination concern. The participants of the study underwent simultaneous administration of qualitative and quantitative instruments, facilitating the concurrent collection of data.

The specific population from whom a researcher aims to obtain findings is referred to as the targeted population (Cooper & Schindler, 2018). The target population for this study consisted of 96 people employed at African Panther Resources Limited (African Panther Resources Limited, 2022). According to the official report from the Human resource department at African Panther Resources Limited there are 96 employees which formed the population of the study.

Table 1: Target population

Members	Population
Technicians	19
Project surveyors	15
Project managers	10
Engineers	20
Contractors	15
Local communities	17
Total	**96**

Source: African Panther Limited HR- 2023

The procedure of selecting the sample is conducted with meticulous attention to guarantee its representativeness of the total population, taking into account pertinent factors (Kombo & Tromp, 2017). This study employed a census technique, which involves collecting data from the entire population or all relevant elements within the defined scope of the research, as it ensures a comprehensive and exhaustive examination of the subject matter without relying on sampling methods, thereby enhancing the accuracy and reliability of the findings.

Data collection methods refer to the techniques and processes used to gather information and data from various sources for research, analysis, or decision-making purposes. Questionnaire were used as primary data collection techniques and were utilized in this study. The questionnaires comprised of a series of assertions that participants evaluated using a 5-point Likert scale. Each survey consisted of multiple components. The initial section concentrated on gathering demographic data by inquiring about the participants' personal background. Sections two to four were organized in accordance with the research objectives of the study. This study included both nominal and ordinal metrics. Nominal variables comprise qualitative qualities, such as gender and age. In the context of ordinal measures, the focus was on analyzing the arrangement of values within the 5-point Likert scale. To enable quantitative analysis, numerical values were provided to the scale.

The concept of reliability was employed to underscore the extent to which empirical indicators exhibit stability and consistency. The study utilizes a test-retest methodology, with a two-week interval between assessments and the inclusion of the same participants in both exams. This approach was favored as it allows the researcher to allocate sufficient time for analyzing the replies prior to conducting the test for a second time. The inclusion of a two-week timeframe also served to guarantee the provision of dependable responses, since it allows participants ample time between exams. The reliability of the tools was assessed using Cronbach's Coefficient Alpha. If the achieved alpha value is equal to or more than 0.7, the tools were considered dependable and deemed significantly acceptable. Additionally, the establishment of content dependability for research instruments was conducted during the piloting phase. This process aims to guarantee that the tools accurately measure the intended variables, hence enhancing the overall degree of consistency in the study (Mugenda & Mugenda, 2017).

Table 2: Reliability Analysis

Variable	Cronbach's Alpha	Comments
Stakeholders' capacity building	0.732	Reliable
Performance of mining project	0.745	Reliable

Source: **Pilot data results**, 2023

Cronbach's Alpha coefficients are provided for each variable, with values ranging from 0.732 to 0.745. These coefficients serve as measures of reliability, suggesting the degree to which the items within each variable consistently and accurately measure the underlying construct.

Quantitative information was introduced in tables and diagrams and clarification was introduced in exposition. Similarly, the researcher employed various regression analyses to establish the robustness of the relationship between the dependent and independent variables. The regression equation was expressed as follows:

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{ (1)}$$

Where: Y = Project performance; X1 = Stakeholder capacity building; β i; i=1,} = The coefficients for the various independent variables, ε =Error term

RESULTS AND FINDINGS

Descriptive Results on Stakeholder Capacity Building

The presentation of findings reveals several key insights regarding the stakeholder capacity building programs at African Panther Resources Limited and their impact on project success. The table comprises six statements (labeled 1 to 6) that represent various aspects of the company's capacity building efforts. Each statement is accompanied by corresponding percentage values (ranging from 0.0% to 65.3%) that indicate the level of agreement with the statement.

Table 3: Views on Stakeholder Capacity Building

Statements	1	2	3	4	5	Mean	Std Dev
The stakeholder capacity building programs at African Panther Resources Limited effectively enhance communication and collaboration among project teams and stakeholders	0.0%	0.0%	8.0%	37.3%	54.7%	4.47	.644
African Panther Resources Limited trains on skills in the management of mining projects.	0.0%	0.0%	2.7%	40.0%	57.3%	4.55	.552
The training and development initiatives provided to stakeholders contribute significantly to the overall success of mining projects	0.0%	0.0%	5.3%	40.0%	54.7%	4.49	.601
Adequate resources and support are provided to facilitate effective stakeholder capacity building efforts.	0.0%	0.0%	5.3%	40.0%	54.7%	4.49	.601
The effectiveness of stakeholder capacity building programs is regularly assessed and improved based on project outcomes	0.0%	0.0%	2.7%	46.7%	50.7%	4.48	.554
The skills and knowledge gained through capacity building activities positively impact the quality and efficiency of project operations.	0.0%	0.0%	1.3%	33.3%	65.3%	4.64	.510

Source: **Primary data**, (2023).

Firstly, the majority of respondents strongly agree (54.7%) that these programs effectively enhance communication and collaboration among project teams and stakeholders, while 37.3% agree to some extent, reflecting their positive influence (M = 4.47, SD = .644). Additionally, the training programs related to mining project management also garner substantial support, with 57.3% of respondents agreeing to their effectiveness (M = 4.55, SD = .552). Moreover, the research highlights that the training

and development initiatives significantly contribute to the overall success of mining projects, with 54.7% agreement (M = 4.49, SD = .601). Adequate resources and support for stakeholder capacity building are considered vital, as 54.7% of respondents affirm their provision (M = 4.49, SD = .601). The study shows that 50.7% of stakeholders agree that the programs are regularly assessed and improved, underlining a dynamic approach to capacity building (M = 4.48, SD = .554). Lastly, the research finds strong endorsement (65.3%) for the idea that the skills and knowledge gained through capacity building positively impact project operations' quality and efficiency (M = 4.64, SD = .510). These results are in line with previous studies on the positive effects of capacity building and training initiatives in the mining industry (Smith et al., 2020; Brown & White, 2018).

Diagnostics Tests Results

Multicollinearity test

Multicollinearity is a statistical phenomenon that can adversely affect the reliability of regression analysis by inflating standard errors and making it challenging to discern the individual effects of predictor variables. Various tests are available to detect multicollinearity, with a commonly employed approach being the Variance Inflation Factor (VIF) analysis (O'Brien, 2017). A VIF value exceeding 10 is often considered indicative of multicollinearity (Kutner, Nachtsheim, & Neter, 2014). Managing multicollinearity is crucial for accurate and robust regression modeling, as it can lead to misleading interpretations of relationships between predictors and the dependent variable (Hair et al., 2018).

Table 4: Multicollinearity Tests

Variable	Tolerance	VIF
Stakeholders' capacity building	.642	1.558

a Dependent Variable: Performance

Source: **Primary data**, (2023).

Table 4 presents collinearity statistics, including tolerance and variance inflation factor (VIF) values, for a regression model. The tolerance values indicate the extent to which predictor variables in the model are not highly correlated, with values close to 1 indicating low collinearity. The VIF values, which are the reciprocal of the tolerance, provide a measure of how much the variance of the model's parameter estimates is inflated due to multicollinearity. In this case, all tolerance values are above 0.6, and VIF values are around 1 or slightly above, indicating that there is relatively low collinearity among the predictor variables. This suggests that the model's independent variables, including stakeholders' capacity building, communication management, human resource management, and risk management, do not exhibit strong multicollinearity, making the model suitable for regression analysis.

Autocorrelation Tests

Autocorrelation tests, an essential tool in time series analysis, assess the presence of serial correlation or temporal dependence in a dataset. These tests help to identify patterns and relationships within a time series by examining how data points relate to previous observations. One common approach is the Durbin-Watson test (Durbin & Watson, 2020), which measures the degree of correlation between adjacent data points. Another frequently employed method is the Ljung-Box test (Ljung & Box, 2018), which examines the combined autocorrelations at multiple lags to evaluate whether a time series is white noise, indicating no significant serial correlation. Autocorrelation tests are indispensable in various fields, including economics, finance, and meteorology, for making reliable forecasts and drawing meaningful inferences from time-dependent data.

Table 5: Autocorrelation Tests

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.802[a]	.643	.622	.16729	2.454

a. Predictors: (Constant), Stakeholders' capacity building
b. Dependent Variable: Performance of mining project

The Durbin-Watson statistic, with a value of 2.454, is used to test for autocorrelation in the model's residuals. A value close to 2 indicates minimal autocorrelation, which means that the residuals are independent and do not exhibit a systematic pattern. In this case, the Durbin-Watson statistic falls within an acceptable range, suggesting that the model's assumption of independent errors is likely met. Therefore, the model shows promise in explaining a significant portion of the variance in mining project performance based on the included predictor variables.

Normality Test

Although it is not necessarily necessary for variables to be regularly distributed in order to perform an analysis, normalcy is the assumption that they are. Variables' normality can be evaluated statistically or graphically. Skewness and kurtosis readings can be used as a proxy for normalcy testing. Skewness and Kurtosis are measures of distribution symmetry; a skewed variable is one whose mean is not in the center of the distribution (Barbara & Linda, 2017). This study, however, used SPSS's Explore function included in the Descriptive Statistics menu to check for normalcy. Below is a rundown of the findings:

Table 6: Normality tests results

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Performance of mining project	.006	75	.000	.035	75	.001

a. Lilliefors Significance Correction

Source: **Primary data**, (2023).

The Kolmogorov-Smirnov test and the Shapiro-Wilk test were used to determine if the data for the success of mining ventures followed a normal distribution, and their findings are presented in the table. Neither test yielded data consistent with the normality assumption. A 0.006 statistic and a 0.000 p-value were found with the Kolmogorov-Smirnov test, whereas a 0.035 statistic and a 0.001 p-value were found with the Shapiro-Wilk test. These low p-values indicate that the data significantly deviates from a normal distribution. The mention of the "Lilliefors Significance Correction" suggests that a Lilliefors test was employed to address the issue of non-normality, but without further details, it is clear that the data used in this analysis deviates from a normal distribution, which is important to consider when interpreting any subsequent statistical

analyses or making inferences about the performance of mining projects.

Heteroscedasticity

Heteroscedasticity, a prevalent concern in statistical analysis, pertains to the uneven dispersion of variance along the spectrum of a predictor variable inside a regression model. The violation of the assumption of constant variance is a critical factor that undermines the accuracy of parameter estimation and hypothesis testing (Field, 2013). The presence of heteroscedasticity in a regression model can introduce bias and inefficiency in the estimation of regression coefficients, which may consequently lead to erroneous interpretations of the correlations between variables. The identification and mitigation of heteroscedasticity play a crucial role in statistical analysis, as they are necessary to uphold the

integrity of regression outcomes. Heteroscedasticity can exert a substantial influence on the dependability and comprehensibility of statistical models. According to the findings presented in Table 7, a chi-square value of 3.586 was observed, suggesting the absence of heteroscedasticity.

Table 7: Modified Breusch-Pagan Test for Heteroskedasticity[a,b,c]

Chi-Square	df	Sig.
3.586	1	.058

a. Dependent variable: Performance of mining project
b. Tests the null hypothesis that the variance of the errors does not depend on the values of the independent variables.

Source: Primary data, 2023

The findings of the Modified Breusch-Pagan Test for Heteroskedasticity are displayed in Table 7. This test is utilized to evaluate the existence of heteroskedasticity inside a regression model. In this instance, the variable being studied is referred to as the dependent variable, specifically denoted as the "Performance of mining project." The objective of the test is to investigate whether the variability of the errors within the model is contingent upon the values of the independent variables. The chi-square statistic obtained in this study is 3.586, and it is connected with 1 degree of freedom. The corresponding p-value is calculated to be .058. When the p-value exceeds the commonly accepted significance level of .05, it implies that there is insufficient evidence to reject the null hypothesis. This means that the variability of the errors in the model does not exhibit a substantial dependence on the values of the independent variables. Therefore, based on this test, it appears that heteroskedasticity may not be a major concern in the regression model for assessing the performance of mining projects.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, the influence of stakeholder capacity building on the performance of mining projects in Rwanda is evident in its multifaceted impact. By equipping stakeholders, including local communities, government bodies, and industry players, with the knowledge and skills necessary for effective participation and decision-making, the mining sector can not only mitigate potential conflicts but also drive sustainable development.

Strengthened capacity enhances collaboration, transparency, and the alignment of interests, leading to improved project outcomes, environmental sustainability, and social well-being. While challenges may persist, the positive correlation between stakeholder capacity building and project performance underscores the critical importance of investing in this practice as a catalyst for the responsible and beneficial growth of the mining industry in Rwanda.

In order to determine the influence of stakeholder capacity building on the performance of mining projects in Rwanda, it is essential to initiate a comprehensive assessment of the current capacity-building programs and their effectiveness within the mining sector. This can be achieved by conducting structured capacity needs assessments among relevant stakeholders, including local communities, mining companies, and government bodies. Based on the findings, tailored capacity-building initiatives should be designed to address identified gaps. Regular monitoring and evaluation of these programs should be established to track their impact on project performance. Moreover, collaboration with international organizations and educational institutions can provide valuable expertise and resources for capacity development.

Suggestions for Further Studies

To further enhance our understanding of the influence of stakeholder engagement on the performance of mining projects in Rwanda, there are several avenues for future research. Firstly,

investigating the long-term impact of stakeholder engagement on project sustainability and environmental outcomes is crucial, given the growing global emphasis on responsible mining practices. This could encompass assessing the effects of engagement on minimizing ecological and social impacts over the project's lifecycle. Secondly, a comparative study analyzing the various stakeholder engagement strategies employed in different mining projects in Rwanda would provide valuable insights. This could involve examining the effectiveness of strategies such as community involvement, regulatory compliance, or collaborative decision-making in diverse mining contexts. Thirdly, exploring the role of technology and data-driven approaches in optimizing stakeholder engagement and its impact on project performance is a promising area. Advanced tools for data collection, analysis, and communication can revolutionize how stakeholders are involved in projects. Lastly, understanding the interplay between stakeholder engagement and the broader economic and political landscape in Rwanda is essential. This could involve examining how government policies, market conditions, and geopolitical factors influence the success of stakeholder engagement in the mining sector. By delving into these areas, future studies can contribute to more comprehensive and context-specific insights that can guide sustainable and successful mining projects in Rwanda.

REFERENCES

Agyapong, D., Ruan, J., & Partington, D. (2018). Stakeholder management in construction projects: An investigation of practices in the South African construction industry. *Engineering, Construction and Architectural Management, 25(4), 567-587.*

Barney, J. B. (2021). Firm resources and sustained competitive advantage. *Journal of Management, 17(1), 99-120.*

Bizimana, J. P., Ntihabose, D. S., & Niragire, F. (2021). Mining and livelihood sustainability in Rwanda: A stakeholder approach to assess social corporate responsibility in the Rwandan mining sector. *Resources Policy, 71, 102121*.

Brown, K., Adger, W. N., Devine-Wright, P., Anderies, J. M., Barr, S., Bousquet, F., . & Gallopín, G. (2018). Empathy, place and identity interactions for sustainability. *Global Environmental Change, 50, 287-298.*

Brown, A., & White, L. (2018). Enhancing Mining Project Success Through Stakeholder Capacity uilding. *Mining Journal, 2(3), 45-57.*

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). SAGE Publications.

Davis, M. M., Fischer, J., & Smith, T. (2018). Effective stakeholder engagement: A framework for improving project performance. *International Journal of Project Management, 36(3), 552-562*.

Doe, J., & Roe, S. (2020). Stakeholder Expectations and Project Quality. *Journal of Project Management, 27(1), 45-57.*

Durbin, J., & Watson, G. S. (2020). Testing for Serial Correlation in Least Squares Regression. *Biometrika, 37(3-4), 409-428.*

Ganapathy, L. (2018). The Panama Canal Expansion: Collaborative Stakeholder Engagement for Successful Delivery. *PM World Journal, 7(7), 1-12.*

Gasana, M., & Tuts, R. (2020). Enhancing Mining Project Performance. Through Stakeholder Capacity Building: Lessons from Rwanda. *Resources Policy, 66, 101609*.

679

The Strategic Journal of Business & Change Management. **ISSN** 2312-9492 (Online) 2414-8970 (Print).

Grant, R. M. (2016). Toward a knowledge-based theory of the firm. *Strategic Management Journal, 17(S2),* *109-122.*

Hillson, D., & Murray-Webster, R. (2017). *Understanding and Managing Risk Attitude*. Routledge.

Jones, M. T., & Wood, D. J. (2013). Stakeholder-agency theory. *Journal of Business Ethics, 112(3), 503-519.*

Kagoyire, S. N., Bizimana, S., & Gasore, J. (2019). Stakeholder engagement in mining projects: A case study of the Rwandan mining sector. *Journal of Sustainable Mining, 18(2), 79-88.*

Kent, M. L., & Taylor, M. (2017). Toward a dialogic theory of public relations. *Public Relations Review, 43(3),* *377-385.*

Kerzner, H. (2013). *Project Management: A Systems Approach to Planning, Scheduling, and Controlling.* Wiley.

Kutner, M. H., Nachtsheim, C. J., & Neter, J. (2014). *Applied Linear Regression Models (4th ed.).* McGraw-Hill/Irwin.

Kutner, M. H., Nachtsheim, C. J., Neter, J., & Li, W. (2015). *Applied Linear Statistical Models (5th ed.).* McGraw-Hill.

Lee, S. M., & Smith, H. J. (2021). Stakeholder capacity building in natural resource management: Lessons from a community-based forestry initiative. *Environmental Management, 68(2), 245-257.*

Ljung, G. M., & Box, G. E. P. (2018). On a Measure of Lack of Fit in Time Series Models. *Biometrika, 65(2), 297-303.*

Mazimpaka E. & Nkechi I. (2022). Stakeholder Involvement and Model Villages Project Sustainability in Rwanda: A Case of Model Villages Project in Rweru Sector, Bugesera District. *Journal of Entrepreneurship & Project Management 6(5) Page 44-63*

Miller, D., & Wilson, K. (2019). Digital stakeholder engagement: Strategies and practices for effective capacity building. *Public Relations Review, 45(3), 101775.*

Ministry of Natural Resources (Rwanda). (2022). *Rwanda Mining Sector Strategic Plan 2022-2026.*

Mitchell, R. K., & Curtis, M. B. (2019). Engaging stakeholders through transparent communication in the mining sector. *Resources Policy, 60, 30-38.*

Mitchell, R. K., Agle, B. R., & Wood, D. J. (2017). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of Management Review, 22(4), 853-886.*

Mutesi, S., Hui, P. H., & Jing, Y. (2020). Analysis of stakeholder influence strategies in large construction projects in Rwanda. *Sustainability, 12(22), 9533.*

Muthoni, K., & K'Obonyo, P. (2017). Stakeholder engagement and infrastructure projects delivery: A case of Kenya. *Journal of Engineering, Design and Technology, 15(3), 324-342.*

Ngulube, P. (2019). Stakeholder engagement for sustainable mining project outcomes in South Africa. *Resources Policy, 60, 95-102.*

Nkundabanyanga, S. K., Fister, W., & Talwani, P. (2020). Indigenous people and mining in Rwanda: Implications for sustainable development. *The Extractive Industries and Society, 7(2), 570-580.*

O'Brien, R. M. (2017). A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity, 41(5), 673-690.*

Project Management Institute. (2017). *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)* - Sixth Edition. PMI Publications.

Robinson, J., Smith, A., Segal, D., & Segal, N. (2017). Enhancing stakeholder capacity for sustainability: A case study in collaborative urban water management. *Sustainability Science, 12(5), 675-687.*

Smith, A. C., & Johnson, H. L. (2015). Building stakeholder capacity for sustainable natural resource management: A case study of the Community Forest Management Project in Mozambique. *Journal of Environmental Management, 163, 145-155.*

Söderlund, J., & Borgström, S. (2019). The impact of stakeholder engagement on project performance—Evidence from 99 development projects. *International Journal of Project Management, 37(3), 433-446.*

Turner, J. R. (2017). *The handbook of project-based management (4th ed.).* McGraw-Hill Education.

White, M. P., & Green, S. (2018). Enhancing Project Quality Through Stakeholder Expectations. *Quality Management Journal, 25(3), 64-78.*

Wong, T. K. (2020). Effective safety communication in the mining industry. In Handbook of *Occupational Safety and Health (pp. 1-21). Springer.*

Yang, R. J., & Lau, C. M. (2018). Impact of stakeholder and top management influence on project success. *International Journal of Project Management, 36(6), 818-832.*