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STRATEGIC PLANNING AND GREEN FINANCE IN ENHANCING SUSTAINABILITY PERFORMANCE OF VILLAGE-OWNED ENTERPRISES

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Abstract

This study examines the effects of strategic planning and green finance on the sustainability performance of Village-Owned Enterprises (BUMDes) in Kuantan Singingi Regency, with human resource competence and innovation capability as moderating variables. While prior research highlights the role of strategic planning and green finance in organizational sustainability, empirical evidence in village-based enterprises remains limited and often overlooks internal capabilities as contingency factors. Grounded in Resource-Based Theory and aligned with the Village Sustainable Development Goals (SDGs)—covering economic, social, and environmental dimensions—this study adopts a quantitative survey approach. Data were collected from 155 active BUMDes managers and supervisors out of 218 units and analyzed using SEM-PLS. The results show that strategic planning and green finance positively and significantly enhance sustainability performance. Human resource competence strengthens the impact of strategic planning but weakens the effect of green finance, while innovation capability does not moderate these relationships. The findings contribute theoretically by refining the application of Resource-Based Theory in village enterprises and empirically by proposing a contextual sustainability framework for improving BUMDes management performance.

INTRODUCTION

Village-Owned Enterprises (BUMDes) are positioned as institutional instruments to strengthen village economic independence while promoting community-based development governance. In the context of sustainable development, BUMDes are expected to function not only as economic entities, but also as institutional mechanisms capable of simultaneously integrating economic, social, and environmental objectives. This orientation is in line with the Sustainable Development Goals (SDGs) agenda, which emphasizes the importance of community-based enterprises in creating inclusive and sustainable economic growth. However, in practice, the ability of BUMDes to internalize sustainability principles into organizational strategies and operations remains a conceptual and empirical issue that has not been fully addressed.

This issue is even more relevant in rural areas whose economies depend on agriculture, plantations, and natural resource-based micro-enterprises, such as Kuantan Singingi Regency

in Riau Province. This characteristic puts BUMDes in a strategic yet vulnerable position, because on the one hand they act as drivers of the local economy, but on the other hand they face pressure to maintain environmental sustainability and social cohesion. Empirical evidence shows that of the 218 registered BUMDes, only 155 are actively operating and most are still in the growth and development stage, reflecting institutional capacity limitations and low levels of organizational independence.

The challenges to the sustainability of BUMDes are reflected in the three dimensions of the triple bottom line. From an economic perspective, BUMDes still face limitations in profitability, low business diversification, and high dependence on external capital support (Susilo & Prasetyo, 2024). As a result, business activities tend to be short-term oriented and have not created sustainable added value. From a social perspective, low community participation in management and decision-making limits the contribution of BUMDes to job creation, equitable distribution of economic benefits, and strengthening of social cohesion (Basri et al., 2023;Basri et al., 2025). Meanwhile, in terms of the environment, environmentally friendly practices such as resource efficiency, waste management, and land conservation have not been systematically integrated into the operations of BUMDes engaged in the agriculture and plantation sectors. This condition indicates that the triple bottom line paradigm has not been strategically internalized, but remains normative and administrative in nature.

From a theoretical perspective, this weak sustainability performance cannot be separated from the limitations of strategic planning and the use of sustainable financing instruments in BUMDes governance. Without integrated strategic planning, organizations find it difficult to allocate resources, manage social and environmental risks, and respond adaptively to green development demands (Sari et al., 2024). In line with the increasing agenda of sustainable development, green finance is seen as an important instrument to support rural economic transformation through the development of environmentally friendly businesses, such as organic farming, renewable energy, and community-based waste management. However, in practice, the use of green finance by BUMDes is still limited due to weak planning capacity, managerial skills, and technical understanding related to green financing.

Previous literature shows inconsistent findings regarding the impact of strategic planning and green finance on sustainability performance. A number of studies have found that strategic planning has a positive effect on organizational performance (Rizuan et al., 2024; Barbosa et al., 2020), while other studies confirm that planning is often symbolic and not followed by effective implementation (Honig & Karlsson, 2013) Similarly, green finance is recognized as playing an important role in promoting sustainable development (Shaikh et al., 2024; Gao et al., 2025) but the impact is limited when organizations lack adequate internal capacity, particularly in terms of innovation and governance (Frimpong et al., 2022; Wang et al., 2023) The inconsistency of these findings indicates a theoretical gap regarding the role of internal organizational resources in bridging the effectiveness of strategic planning and green finance.

Within the framework of Resource-Based Theory (Barney, 1991), an organization's success in achieving competitive advantage and long-term sustainability is determined by its ability to manage internal resources that are valuable, rare, difficult to imitate, and irreplaceable. In the context of BUMDes, human resource competencies and innovation capabilities are intangible resources that have the potential to determine the effectiveness of strategic planning and green finance implementation. Human resource competencies are crucial because BUMDes managers are required to understand the characteristics of natural resource-based businesses, environmental risks, and the complexity of green financing. Without adequate competencies, green finance has the potential to be ineffective or even inefficient. Meanwhile, innovation capabilities enable BUMDes to adapt green strategies and financing into business models that are relevant to the local context, increase product added value, and integrate environmentally

friendly practices in a sustainable manner (Razaq et al., 2024). However, innovation in BUMDes still tends to be incremental and has not yet functioned as a strategic enabler in promoting sustainability performance.

Based on the above description, this study aims to fill the literature gap by simultaneously testing the influence of strategic planning and green finance on the economic, social, and environmental sustainability performance of BUMDes, as well as analyzing the role of human resource competencies and innovation capabilities as moderating variables. The novelty of this study lies in the contextualization of Resource-Based Theory in community-based village economic organizations, particularly in explaining how the internal resources of BUMDes determine the effectiveness of strategic planning and green finance in promoting sustainability performance. The findings of this study are expected to contribute theoretically by expanding the application of RBT in the context of BUMDes, as well as practically for local governments and BUMDes managers in designing policies and strategies for strengthening inclusive and sustainable village institutions.

HYPOTHESIS DEVELOPMENT

Theoritical Framework

This study is based on Resource-Based Theory (RBT) and Stakeholder Theory as the main conceptual frameworks for explaining the mechanisms of achieving sustainable performance in community-based organizations. RBT emphasizes that competitive advantage and long-term sustainability are determined by an organization's ability to manage internal resources that are valuable, scarce, difficult to imitate, and irreplaceable (Barney et al., 2011). In this perspective, strategy is not viewed as a normative goal, but rather as a mechanism for configuring and mobilizing internal resources to produce superior and sustainable performance.

In the context of BUMDes, strategic planning serves as a dynamic instrument that directs the allocation and development of internal resources to align with sustainability goals. Human resource competencies and innovation capabilities are strategic assets that enable BUMDes to identify sustainable business opportunities, manage social and environmental risks, and adapt business models to the characteristics of the village economy. Thus, the relationship between strategic planning and sustainability performance can be explained causally through RBT, where the effectiveness of strategic planning depends on the quality and configuration of the internal resources possessed by the organization.

Green finance, within the RBT framework, is not only understood as an external financing instrument that is operational or regulatory in nature, but as a strategic resource whose value is determined by the internal capacity of the organization to access, manage, and integrate it into its business strategy. Without adequate human resource competencies and strong innovation capabilities, green finance has the potential to become an unproductive resource or even cause inefficiencies. Therefore, the effectiveness of green finance in improving the sustainability performance of BUMDes is theoretically contingent on the internal capabilities of the organization.

Meanwhile, Stakeholder Theory complements the RBT perspective by emphasizing the importance of organizational legitimacy in meeting the economic, social, and environmental expectations of various stakeholders (Freeman, 1984). In the context of BUMDes, sustainability is determined not only by internal efficiency, but also by the organization's ability to create shared value for the village community, local government, and the surrounding environment. Therefore, the sustainability performance of BUMDes reflects the results of interactions between internal resource-based strategies and the legitimacy demands of stakeholders (Sari et al., 2024).

The integration of RBT and Stakeholder Theory provides a more comprehensive analytical framework for explaining how strategic planning and green finance contribute to the

sustainability performance of BUMDes. Strategic planning plays a role in configuring internal resources, green finance provides financial support for sustainable initiatives, while human resource competencies and innovation capabilities serve as moderating mechanisms that determine the extent to which these two instruments can be implemented effectively. Thus, the synergy between internal resources, strategy, and green financing becomes the main foundation for achieving the long-term sustainability of BUMDes.

Strategic Planning and Sustainability Performance

Strategic planning reflects an organization's ability to systematically formulate its vision, mission, and long-term direction, taking into account the balance between economic, social, and environmental dimensions. (David, 2023). Through effective strategic planning, organizations can anticipate risks, capitalize on opportunities, and adapt their strategies to changes in the environment

Previous research shows that strategic planning has a positive impact on organizational sustainability because it strengthens the effectiveness of strategy implementation and the efficiency of resource utilization (Barbosa et al., 2020); (Rizuan et al., 2024). In the context of BUMDes, targeted planning helps optimize local potential, increase community participation, and encourage the achievement of Village Sustainable Development Goals (SDGs) (Sari et al., 2024).

H_1: Strategic planning has a positive effect on the sustainability performance of BUMDes.

Green Finance and Sustainability Performance

Green finance is a financial instrument that supports environmentally friendly economic activities such as renewable energy investment, resource efficiency, and sustainable waste management. Green financing plays an important role in supporting economic transformation towards more sustainable practices, both through technological innovation and socio-economic empowerment at the local level.

For BUMDes, access to green finance can strengthen community economic resilience, increase sustainable production capacity, and encourage environmentally-based social innovation (Wibowo et al., 2024; Andriani, 2025). However, the effectiveness of green finance implementation is often hampered by weak strategic planning and managerial capacity (Jusniarti & Kartika, 2024). With the support of good governance and institutional capacity, green finance has the potential to improve the economic, social, and environmental sustainability performance of BUMDes.

H_2: Green finance has a positive impact on the sustainability performance of BUMDes.

The Role of Moderation in Human Resource Competency

From the perspective of Resource-Based Theory, competent human resources are key to the successful implementation of organizational strategies and the achievement of sustainable competitive advantage. Human resource competencies include conceptual, technical, and social skills that enable individuals to contribute effectively to decision-making and strategy implementation processes (Ulrich & Dulebohn, 2021).

Previous studies have confirmed that human resource competencies strengthen the relationship between organizational strategy and sustainability performance by increasing effectiveness, accountability, and innovation capabilities (Widyastuti & Haryanto, 2021; Anggraeni, 2021). In the context of BUMDes, human resources with a strong understanding of sustainability principles are better able to integrate economic, social, and environmental dimensions into strategic planning and to optimize the responsible use of green finance (Sari et al., 2024;Basri et al., 2021).

H_{3a}: Human resource competencies strengthen the influence of strategic planning on the sustainable performance of BUMDes.

H_{3b}: Human resource competencies strengthen the impact of green finance on the sustainability performance of BUMDes.

The Moderating Role of Innovation Capability

Innovation capability refers to an organization's capacity to generate, adapt, and apply new ideas or technologies in order to enhance economic, social, and environmental value (Teece et al., 1997). Organizations with a high level of innovation tend to be more adaptive to external dynamics and more responsive in leveraging green financing opportunities for sustainable productive activities.

In the context of BUMDes, strategic planning often remains normative and administrative in nature, thereby requiring innovation capability to enable adaptive implementation in response to the social, economic, and environmental dynamics of rural communities. Innovation capability allows BUMDes to translate strategic plans into flexible, innovative, and locally grounded operational programs, thereby enhancing the effectiveness of strategies in achieving sustainability performance. In line with Resource-Based Theory (Barney, 1991), Innovation capability constitutes an intangible, valuable, and difficult-to-imitate strategic resource that enhances the effectiveness of strategic planning implementation in creating competitive advantage and long-term sustainability performance (Khanra et al., 2022).

Innovation capability is also expected to strengthen the effect of green finance on the sustainability performance of BUMDes, particularly in addressing technological, infrastructural, and technical competency constraints commonly found in rural areas. Innovation capability enables BUMDes not only to adopt but also to adapt green technologies supported by green financing in alignment with local conditions and the availability of village resources (Saunila & Ukko, 2014). Studi Widodo et al. (2023) This indicates that BUMDes with high innovation capability are able to develop sustainable business models based on green finance, optimize the allocation of green funds, and improve operational efficiency as well as resource management. Moreover, technological innovation capability has been shown to enhance the effectiveness of green finance utilization in promoting more sustainable production practices and achieving sustainability performance indicators. Thus, consistent with the principles of Resource-Based Theory *Theory* (Barney, 1991), Innovation capability functions as a strategic resource that strengthens the impact of green finance on the sustainability performance of BUMDes. This implies that innovation acts as a key driving factor that amplifies the effectiveness of both strategic planning and green finance in promoting long-term organizational sustainability.

***H_{4a}:* Innovation capability strengthens the effect of strategic planning on the sustainability performance of BUMDes.**

***H_{4b}:* Innovation capability strengthens the effect of green finance on the sustainability performance of BUMDes.**

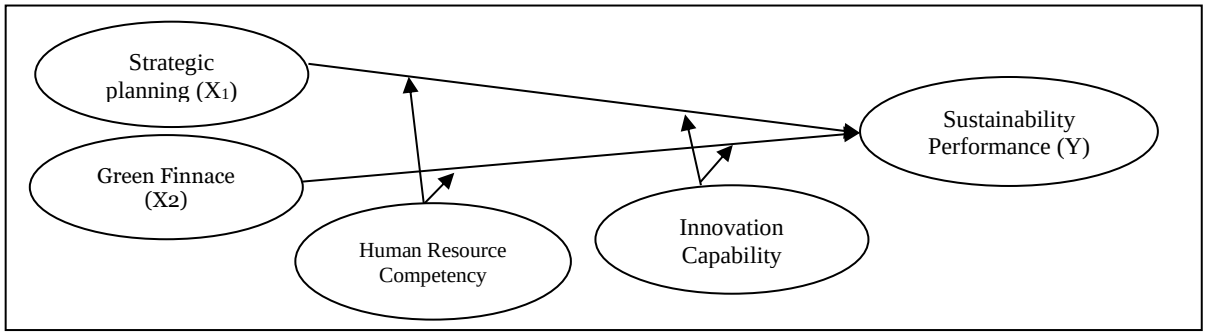


Figure 1.
Research Framework

RESEARCH METHODS

This study adopts a quantitative approach to examine the effects of strategic planning and green finance on the sustainability performance of Village-Owned Enterprises (BUMDes), as well as the moderating roles of human resource competence and innovation capability.

The study population comprises all Village-Owned Enterprises (BUMDes) in Kuantan Singingi Regency. Of the 218 registered BUMDes, only 155 active BUMDes met the research criteria. Respondents were selected using purposive sampling, based on the consideration that the chosen respondents possessed relevant information and sufficient understanding aligned with the objectives of the study. According to Darmawan (2013) in (Hidayat & Haryanto, 2024) The respondent criteria applied in the sampling process required individuals to possess adequate knowledge of the conditions and management of Village-Owned Enterprises (BUMDes). Respondents from each BUMDes were selected using purposive sampling, targeting individuals with relevant knowledge, experience, and direct involvement in the management and strategic decision-making processes of BUMDes. The respondents comprised Directors, Secretaries, Treasurers, Unit Heads, and Supervisory Board members. Each BUMDes was provided with three research questionnaires, which were subsequently completed by the selected respondents.

The minimum required sample size was determined using G*Power software, with an effect size of 0.10 and a statistical power of 0.80, resulting in a minimum sample size of 125 respondents. Data were collected through an online survey using a Google Forms–based questionnaire distributed via email and social media platforms.

Instruments and Variable Measurement

This study employs primary data collected directly from respondents through a structured questionnaire. Each construct is measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

The sustainability performance variable was adapted from (Kurnianto, 2024) and encompasses three main dimensions: economic, social, and environmental. The strategic planning variable was measured based on indicators adapted from (Rizuan et al., 2024) dan AlQershi (2024), which include clarity of strategic objectives, employee participation in the planning process, continuous strategy updating, and the development of strategic alternatives.

Furthermore, green finance was measured using indicators related to renewable energy investment, green infrastructure financing, environmentally friendly financial policies, support for emission reduction projects, and environmental risk management (Clark, 2015; Ronaldo & Suyatno, 2022; Zan et al., 2024).

The variable of human resource competency was adapted from (Rahman dan Permatasari 2021) and (Noe et al., 2014) The human resource competency variable, encompassing the dimensions of knowledge, skills, and attitudes, was adapted from established theories in human resource management. Meanwhile, innovation capability refers to (Basri et al., 2022) dan (Widjajanti et al., 2017), consisting of new product development, appropriate technology implementation, process adaptation, and response to competitors.

Data Analysis Techniques

Using a variance-based Structural Equation Modeling (SEM) approach with SmartPLS software. This method was chosen because it is capable of handling data with non-normal distributions and relatively small sample sizes. (Ghozali & Latan, 2017). He analysis was conducted in two main stages:

1. Evaluation of the Measurement Model (Outer Model): This involves assessing convergent validity, discriminant validity, and composite reliability. Indicators are considered valid if their loading factor exceeds 0.70, and reliable if both composite reliability and Cronbach's alpha exceed 0.70.

2. Evaluation of the Structural Model (Inner Model): This is used to examine the relationships among latent variables through path coefficient analysis, R-square values, and effect size (f^2). The significance of the effects is tested using the bootstrapping method at a 5% significance level (p-value < 0.05; t-statistic > 1.96).

Results and Discussion

In this study, questionnaires were distributed to 155 BUMDes in Kabupaten Kuantan Singingi in accordance with the sampling criteria described in Chapter III. Each BUMDes received three questionnaires, resulting in a total of 465 questionnaires distributed. Of these, only 202 were returned, and 190 met the criteria for analysis. The response rate in this study was 43.44%.

Tabel 1.
Respondent Characteristics.

Category	Category	N	Persentase (%)
Gender	Male	157	82,63%
	Female	33	17,37%
	Total	**190**	**100%**
Educational Attainment	SHS	52	27,37 %
	D4/S1	137	72,11 %
	S2/S3	1	0,52 %
	Total	**190**	**100 %**
Position in BUMDes	Director of BUMDes	148	77,89 %
	Secretary of BUMDes	4	2,11 %
	Treasurer of BUMDes	4	2,11 %
	Unit Head	15	7,89 %
	Supervisor of BUMDes	19	10 %
	Total	**190**	**100 %**

Source: Output SmartPLS, 2025

Statistic Deskriptif

Descriptive statistics were conducted to provide an overview of the data distribution, including minimum, maximum, mean, and standard deviation values. The results are presented in Table 2.

Tabel 2.
Uji *statistic deskriptif*

Variabel	Code Indicator	Mean	Min	Mak	Standart Deviation	category
Strategic Planning	X1.1 – X1.4	4.13	2.00	5.00	0.73	High
Green Finance	X2.1 – X2.7	4.28	2.00	5.00	0.88	Very High
Human Resource Competence	M1.1 – M1.5	4.05	1.00	5.00	0.76	High
Innovation Capability	M2.1 – M2.6	4.12	2.00	5.00	0.82	High
Sustainability Performance	Y1 – Y7	4.13	1.00	5.00	0.87	High

Source : Output of SmartPLS, 2025

The descriptive analysis revealed that all research variables fell into the high category, with mean scores above 4.00 on the Likert scale, indicating effective implementation of managerial and sustainability practices in BUMDes in Kabupaten Kuantan Singingi. Green Finance recorded the highest mean (M = 4.28; SD = 0.88), followed by Strategic Planning (M

= 4.13; SD = 0.73), Innovation Capability (M = 4.12; SD = 0.82), **Human Resource Competence** (M = 4.05; SD = 0.76), and **Sustainability Performance** (M = 4.13; SD = 0.87). These findings suggest that BUMDes have made significant progress in sustainability-based management, particularly in the social dimension, although further improvements in the economic and environmental dimensions, as well as in the consistency of strategy implementation and innovation, are needed to enhance long-term competitiveness.

Outer Model Testing Results

The evaluation of the outer model was conducted to assess the validity and reliability of the research constructs before proceeding to the structural model analysis. Based on the analysis using SmartPLS (2025**)**, all indicators of Strategic Planning**,** Green Finance**,** Human Resource Competence**,** Innovation Capability**,** and Sustainability Performance exhibited outer loading values above 0.70 (Table 2). These values indicate that each indicator adequately represents its construct and demonstrates a strong relationship with the corresponding latent variable (Hair et al., 2011).

Furthermore, the results of the convergent validity test, indicated by the Average Variance Extracted (AVE) values, showed that all constructs exceeded 0.50, in accordance with the criteria recommended by (1998). This indicates that each variable is able to explain more than 50% of the variance in its indicators. Specifically, the AVE values were 0.845 for Strategic Planning, 0.701 for Green Finance, 0.909 for Human Resource Competence, 0.832 for Innovation Capability**,** and 0.644 for Sustainability Performance. These results confirm that all constructs exhibit good convergent validity This indicates that each variable is able to explain more than 50% of the variance in its indicators. Specifically, the **AVE**values were 0.845 for Strategic Planning, 0.701 for Green Finance, 0.909 for Human Resource Competence, 0.832 for Innovation Capability, and 0.644 for Sustainability Performance**.** These results confirm that all constructs exhibit good convergent validity.

From the reliability perspective, the results showed that the Cronbach's alpha and Composite Reliability (CR) values for all constructs exceeded the minimum threshold of 0.70, ranging from 0.909 to 0.975 for Cronbach's alpha and from 0.927 to 0.980 for CR. This indicates that all constructs exhibit excellent internal consistency and are reliable for measuring the intended variables.

Tabel 3.
Outer Loading Test Results

Variabel	Indikator	Convergen Validity		Internal Consistency	
		Loading (>0,7)	AVE (>0,5)	Composite Reliability (>0,7)	Cronbach's Alpha (>0,7)
Strategic Planning	X1.1	0,930	0.845	0.956	0.939
	X1.2	0.910			
	X1.3	0.937			
	X1.4	0.901			
Green Finance	X2.1	0.762	0.701	0.942	0.927
	X2.2	0.791			
	X2.3	0.879			
	X2.4	0.861			
	X2.5	0.909			
	X2.6	0.919			
	X2.7	0.718			
Human Resource Competence	M1.1	0.929	0.909	0.980	0.975
	M1.2	0.959			
	M1.3	0.954			
	M1.4	0.971			

Variabel	Indikator	Convergen Validity		Internal Consistency	
		Loading (>0,7)	AVE (>0,5)	Composite Reliability (>0,7)	Cronbach's Alpha (>0,7)
Innovation Capability	M1.5	0.954	0.832	0.967	0.960
	M2.1	0.905			
	M2.2	0.917			
	M2.3	0.929			
	M2.4	0.945			
	M2.5	0.883			
	M2.6	0.892			
Sustainability Performance	Y1	0.794	0.644	0.927	0.909
	Y2	0.809			
	Y3	0.799			
	Y4	0.839			
	Y5	0.797			
	Y6	0.810			
	Y7	0.767			

Source : Output of SmartPLS, 2025

Discriminant validity was then assessed using two approaches: the Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT)**.** The Fornell–Larcker results indicated that the square root of the AVE for each construct was greater than its correlations with other constructs, demonstrating the ability of each variable to distinguish itself from the others. For example, the square root of the AVE values for Green Finance (0.837), Strategic Planning (0.919), Human Resource Competence (0.953), Innovation Capability (0.912), and Sustainability Performance (0.803) were all higher than their correlations with other constructs (Table 3).

Table 4.
HTMT test

	Green Finance	**Innovation Capability**	**Human Resource Competence**	**Strategic Planning**	**Sustainability Performance**
Green Finance					
Innovation Capability	0.766				
Human Resource Competence	0.518	0.473			
Strategic Planning	0.541	0.395	0.750		
Sustainability Performance	0.633	0.503	0.541	0.681	

Source : Output of SmartPLS, 2025

These findings are further supported by the HTMT results, where all HTMT ratio values were below the threshold of 1.0 (Henseler et al., 2014). This confirms that the research model exhibits strong discriminant validity, indicating that each construct is distinct and does not overlap with other variables.

Overall, the evaluation of the outer model demonstrates that all research variables meet the criteria for convergent validity, discriminant validity, and internal reliability. Therefore, all constructs can be considered valid and reliable, making them suitable for the subsequent stage of the inner model analysis and examination of relationships among latent variables.

Table 5.
Test Fornell–Larcker

	Green Finnace	Innovation Capability	Human Resource Competence	Strategic Planning	Sustainability Performance
Green Finance	**0.837**				
Innovation Capability	0.725	**0.912**			
Human Resource Competence	0.490	0.459	**0.953**		
Strategic Planning	0.505	0.377	0.718	**0.919**	
Sustainability Performance	0.617	0.498	0.513	0.628	**0.803**

Source : Output of SmartPLS, 2025

Inner Model Test Results

The evaluation of the inner model begins with the coefficient of determination (R^2). The R-square value of 0.581 indicates that 58.1% of the variance in Sustainability Performance is explained by Strategic Planning, Green Finance, Human Resource Competence, and Innovation Capability, including their moderating effects. This result suggests a moderate-to-substantial level of explanatory power, while the remaining 41.9% is attributable to other factors beyond the model.

Following the assessment of explanatory power, the effect size (f^2) was examined to determine the individual contribution of each exogenous construct to Sustainability Performance. The results of the F-square test are presented in Table 6.

Tabel 6.
F-Square Test Result

Variabel	Y
Green Finance	0.040
Innovation Capability	0.013
Human Resource Competence	0.014
Strategic Planning	0.153
Innovation Capability X *Green Finance*	0.008
Innovation Capability X Strategic Planning	0.004
Human Resource Competence X *Green Finance*	0.040
Human Resource Competence X Strategic Planning	0.48

Sumber: Output SmartPLS, 2025

Based on the analysis, the Strategic Planning variable has an f^2 value of 0.153, which falls into the moderate category (Cohen, 1988). These findings indicate that Strategic Planning is a key determinant that substantively contributes to enhancing BUMDes Sustainability Performance, particularly in guiding resource allocation and integrating economic, social, and environmental objectives. The relatively larger effect size suggests that BUMDes sustainability is more sensitive to the quality of internal planning compared to other supporting factors.

Green Finance exhibited an f^2 value of 0.060, which falls into the weak category. Although it has a statistically significant effect, the small effect size indicates that the contribution of green finance to BUMDes Sustainability Performance remains limited in substantive terms. This suggests that green financing functions more as a supporting factor rather than a primary driver of sustainability, with its effectiveness heavily dependent on the organization's internal readiness and capabilities.

Human Resource Competence ($f^2 = 0.014$) and Innovation Capability ($f^2 = 0.013$) fall into the very weak category, indicating that these two variables have not yet made a meaningful direct contribution to BUMDes sustainability performance. The small effect sizes reflect a gap

between the potential of internal resources and the actual ability of BUMDes to convert them into sustainable performance, suggesting that these variables are more relevant as contingency factors rather than primary determinants.

Regarding moderating effects, the interactions Human Resource Competence × Green Finance (f^2 = 0.040) and Human Resource Competence × Strategic Planning (f^2 = 0.048) show weak effect sizes, indicating that HR competence only modifies the main relationships to a limited extent. This reinforces the interpretation that HR competence acts as a boundary condition, rather than a dominant enhancer, particularly in the context of complex green finance utilization, which requires specific managerial capabilities.

Meanwhile, the interactions Innovation Capability × Green Finance (f^2 = 0.008) and Innovation Capability × Strategic Planning (f^2 = 0.004) are classified as very weak, indicating that innovation capability has not yet been strategically integrated into BUMDes sustainability mechanisms.

Overall, the effect size findings confirm that Strategic Planning is the most dominant factor in enhancing BUMDes Sustainability Performance, whereas Green Finance**,** Human Resource Competence, and Innovation Capability still play relatively minor roles in substantive terms. This indicates that, at the current stage, improvements in BUMDes sustainability are more driven by the strengthening of internal strategic foundations than by green financing instruments or innovation capabilities that are not yet fully developed.

Tabel 7.
Q-Square Test Result

	Q^2predict	RMSE	MAE
Y	0.500	0.720	0.498

Sumber: Output SmartPLS, 2025

Based on the results in Table 7, the Q^2 value of 0.500 (0.500 > 0) indicates that the model possesses predictive relevance (Chin, 1998, as cited in Ghozali, 2018).

Regarding the RMSE, the value of 0.720 represents the average squared deviation between the model's predicted values and the actual values of the dependent variable (Y). A value of 0.720 indicates a moderate prediction error, suggesting that the model performs reasonably well.

Furthermore, the MAE value of 0.498 indicates that, on average, the model's predicted values deviate by approximately 0.5 units from the actual values. This suggests that the model's predictions are reasonably close to the observed values, confirming that the model can be used as a reliable analytical tool.

Hypothesis Testing

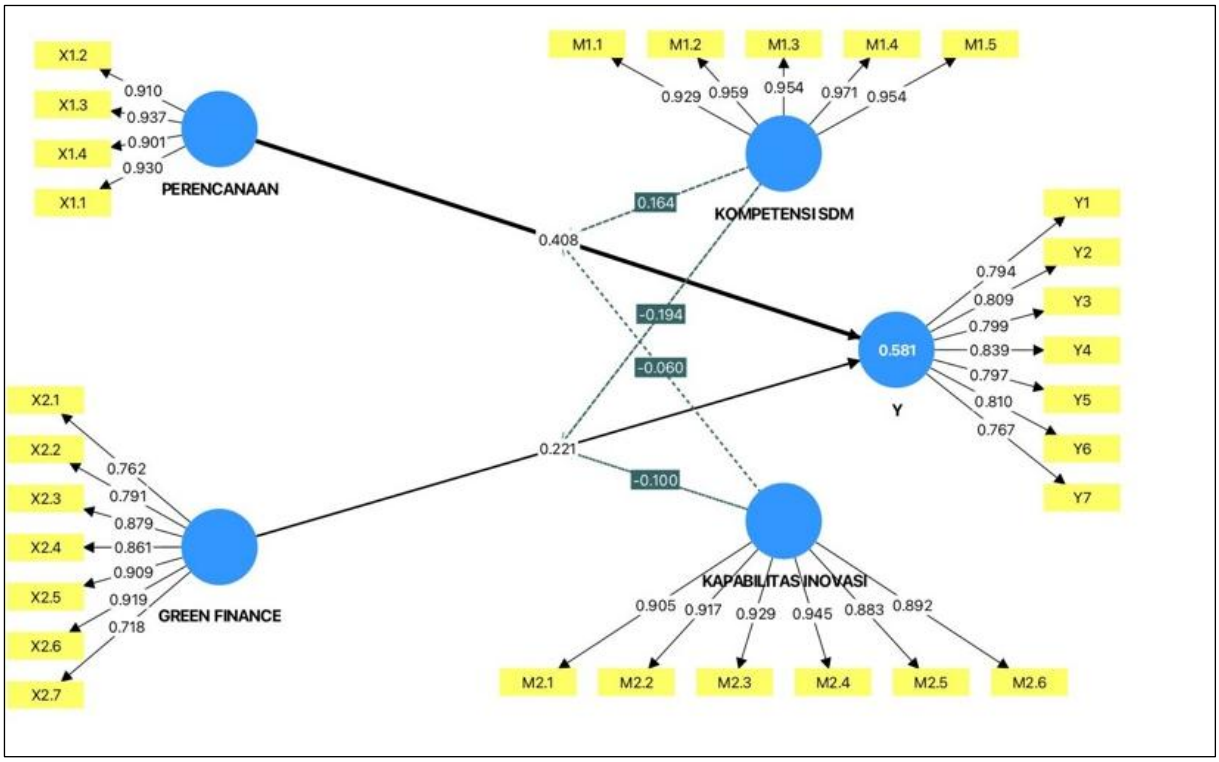
Hypothesis testing in Table 8 was conducted using the bootstrapping procedure in SmartPLS 4.0 by examining the Path Coefficients table, specifically the T-statistics and p-values columns. The hypotheses were tested at a 5% significance level, with a p-value < 0.05 considered statistically significant. Path coefficients were deemed significant if the T-statistic > 1.645. The strength of the relationships was interpreted based on the path coefficient values, with < 0.30 indicating a moderate effect, 0.30–0.60 a strong effect, and > 0.60 a very strong effect. (Hair., et al, 2014).

Table 8.
Hipotesis Test Result

Variabel	Original sample	*T statistics*	*P values*	Notes
Strategic Planning → Sustainability Performance	0.408	2.850	0.004	H_1 Accepted
Green Finance → Sustainability Performance	0.221	2.680	0.007	H_2 Accepted

Variabel	Original sample	*T statistics*	*P values*	Notes
Human Resource Competence × Strategic Planning → Sustainability Performance	0.164	2.054	0.040	H_{3a} Accepted
Human Resource Competence × Green Finance → Sustainability Performance	-0.194	2.055	0.040	H_{3b} Rejected
Innovation Capability × Strategic Planning → Sustainability Performance	-0.060	0.695	0.487	H_{4a} Rejected
Innovation Capability × Green Finance → Sustainability Performance	-0.100	1.286	0.199	H_{4b} Rejected

Sumber: Output SmartPLS, 2025



Sumber: Output SmartPLS, 2025

Figure 2.
Research Model

Discussion

The Effect of Strategic Planning on BUMDes Sustainability Performance

The results indicate that Strategic Planning has a positive and significant effect on BUMDes Sustainability Performance**.** This finding not only confirms the empirical relationship but also provides a causal explanation, showing that strategic planning functions as a key mechanism for configuring and mobilizing internal resources to achieve sustainability objectives. Within the framework of Resource-Based Theory (RBT)**,** strategic planning enables BUMDes to identify, allocate, and exploit valuable and hard-to-imitate resources in a more targeted manner, thereby generating sustainable competitive advantage (Barney, 1991).

Furthermore, this is consistent with the Stakeholder Theory (Freeman, 1984) indicating that strategic planning involving the active participation of stakeholders can enhance social legitimacy and foster collective support, which is crucial for the successful implementation of strategies. In the context of BUMDes, strategic planning serves not only as an administrative tool but also as a means to ensure that the direction of village development aligns with community interests and environmental conservation. These findings are consistent with

previous research (Rizuan et al., 2024), (Barbosa et al., 2020), and (Suharyani & Djumarno, 2023) which confirms that strategic planning plays a significant role in enhancing organizational sustainability performance, particularly in community-based social entities

The Effect of Green Finance on BUMDes Sustainability Performance

The results indicate that Green Finance has a positive and significant effect on BUMDes Sustainability Performance. Causally, green finance functions as an enabler by providing financial resources to support investments in environmentally friendly and inclusive economic activities. However, these findings also suggest that the contribution of green finance to sustainability is not automatic; rather, it depends on how such financing is integrated into the strategies and operations of BUMDes.

From the Stakeholder Theory perspective, the implementation of green finance reflects BUMDes' responsiveness to stakeholder expectations regarding environmental and social responsibilities, thereby enhancing legitimacy and public trust. From the Resource-Based Theory (RBT) standpoint, green finance can be viewed as a potential resource whose value depends on the organization's internal capabilities in managing it. This explains why green financing can improve sustainability performance, yet its impact tends to be more limited compared to strategic planning. Green finance provides opportunities for BUMDes to invest in organic farming projects, as well as sustainable waste and resource management, ultimately strengthening economic, social, and environmental dimensions simultaneously. These findings are consistent with previous studies Shaikh et al (2024) and Gao et al. (2025) which confirms that green financing plays an important role in enhancing organizational sustainability performance, particularly in community-based and rural development sectors.

The Moderating Role of Human Resource Competence on Strategic Planning and Green Finance

The findings indicate that Human Resource (HR) Competence plays a crucial role in strengthening the relationship between Strategic Planning and BUMDes Sustainability Performance. HR personnel with sustainability-oriented knowledge, skills, and attitudes are able to translate strategic plans into effective operational actions, enhance resource efficiency, and reinforce organizational accountability (Ulrich & Dulebohn, 2021; Widyastuti & Haryanto, 2021). This reinforces the view that competent human resources constitute a strategic asset in line with the principles of Resource-Based Theory (RBT)**,** where people serve as a valuable, hard-to-imitate resource capable of generating sustainable value.

However, a different pattern emerged in the relationship between Green Finance and BUMDes Sustainability Performance. Human Resource (HR) competence appeared to weaken this relationship, indicating limitations in technical and managerial capacity for managing green financing within BUMDes. Hypothesis testing revealed that HR competence diminishes the moderating role in the relationship between green finance and sustainability performance, as reflected by a negative interaction coefficient. These findings suggest that the HR competencies possessed by BUMDes are not yet fully aligned with the technical requirements for managing green finance, resulting in suboptimal impacts on sustainability performance. In practice, HR tends to focus existing capacities on operational activities and short-term economic outcomes, whereas environmental program management requires specific skills such as environmental risk analysis, ecological impact assessment, and accountable green fund reporting. This outcome is not entirely consistent with the assumptions of Resource-Based Theory (RBT)**,** which positions HR competence as a strategic organizational resource (Barney, 1991), and differs from previous studies that reported a positive role of enhancing HR competence in improving the effectiveness of green finance (Wang et al., 2023). This underscores that the success of green finance does not solely depend

on the availability of financial facilities but also necessitates the strengthening of human resource capacities. Therefore, efforts to enhance competencies through targeted training and skill development constitute a crucial strategy to ensure that the implementation of green finance can yield a more significant impact on the sustainability performance of BUMDes.

Moderating Role of Innovation Capability on Strategic Planning and Green Finance

The findings indicate that innovation capability has not yet played a significant role in strengthening the influence of strategic planning or green finance on sustainability performance. Conceptually, however, innovation—whether in products, processes, or technologies—is regarded within the Resource-Based Theory (RBT) framework as a primary source of sustainable competitive advantage (Barney, 1991; Teece et al., 1997).

The empirical conditions of BUMDes indicate that resource constraints, limited access to technology, and an underdeveloped culture of innovation constitute major barriers to the effective implementation of strategies and green financing. From the perspective of Stakeholder Theory, the lack of innovation also undermines the organization's capacity to meet the expectations of the community and other stakeholders (Rohmah et al., 2022). Therefore, innovation development should be established as a strategic priority for BUMDes through the strengthening of basic technological capacities, adaptation of local business models, and inter-village collaboration to accelerate innovative learning.

These findings signal that innovation is not merely the outcome of individual creativity but requires systemic support—through regulation, funding, and institutional environments—to function effectively as a genuine enhancer of village sustainability strategies

CONCLUSION

The findings of this study indicate that strategic planning and green finance have a positive impact on the sustainability performance of BUMDes. Well-directed strategic planning strengthens the integration of economic, social, and environmental objectives, while green finance provides financial support for the development of environmentally friendly enterprises and the enhancement of village economic resilience. Human resource competencies have been shown to reinforce the relationship between strategy and green finance on sustainability performance, underscoring the critical role of HR capacity as a key driver in the implementation of sustainable strategies. However, innovation capability has not yet played a significant role, suggesting that the innovative capacity of BUMDes needs to be further developed to serve as a source of sustainable competitive advantage.

This study was conducted exclusively on Village-Owned Enterprises (BUMDes) located in Kuantan Singingi Regency. Therefore, the findings may not fully reflect the conditions of BUMDes in other regions with different social, economic, and cultural characteristics. Data were collected through questionnaires, making the results highly dependent on respondents' perceptions. This approach may introduce subjective bias, for example, due to differences in understanding the questions or the tendency to provide socially desirable responses.

Based on the findings of this study, several recommendations can be proposed:

Local governments and BUMDes management are advised to organize targeted and practical training programs covering green finance literacy, preparation of green financing proposals, and management of environmentally friendly enterprises. This capacity-building is crucial, as general human resource competencies remain insufficient to optimally support the implementation of green finance.

BUMDes are encouraged to develop innovations that go beyond incremental or administrative improvements, focusing instead on energy efficiency, waste management, and the development of green enterprises based on local potential. In addition to training,

continuous mentoring programs supported by monitoring and evaluation mechanisms are needed. Collaboration with universities, relevant Regional Government Agencies (OPDs), and village assistance institutions is essential to ensure that the innovations produced are not merely for short-term survival but are oriented toward long-term sustainability.

This study extends and qualifies the Resource-Based Theory (RBT) by demonstrating that the sustainable advantage of BUMDes is determined not only by the possession of internal resources but also by the organization's ability to configure and mobilize these resources through systematic strategic planning. The findings highlight the role of strategic planning as a resource orchestration mechanism that links internal assets to economic, social, and environmental sustainability objectives. Consequently, this study broadens the application of RBT to community-based rural economic organizations, a context that has received relatively limited attention in the international literature.

Furthermore, the findings on the moderating effect of human resource competencies provide a theoretical refinement of RBT by showing that HR competencies do not always function as a universal enabler. While HR competencies strengthen the effectiveness of strategic planning, they paradoxically weaken the influence of green finance on sustainability performance, positioning HR capacity as a boundary condition in the utilization of green financing instruments. Meanwhile, the non-significant role of innovation capability challenges the normative assumptions of RBT that position innovation as an inherently strategic source of advantage, emphasizing that the strategic value of innovation is contextual and heavily dependent on institutional support and organizational readiness. From the perspective of Stakeholder Theory, these findings indicate that fulfilling stakeholder expectations regarding sustainability relies not only on normative commitment but also on the alignment between internal capabilities and the sustainability strategies adopted by the organization.

The findings of this study offer practical implications for the management of Village-Owned Enterprises (BUMDes) in Kuantan Singingi Regency in efforts to enhance sustainability performance. Empirical evidence indicates that strategic planning is the dominant factor, while green finance serves as a supportive element whose effectiveness heavily depends on the readiness of internal capabilities. Therefore, BUMDes should prioritize the preparation of realistic, measurable strategic plans oriented toward the integration of economic, social, and environmental objectives before expanding the utilization of green financing.

First, the findings on the negative moderating effect of human resource competencies on the relationship between green finance and sustainability performance imply that HR capacity building cannot be general or generic but must be specific and contextual. Training and mentoring programs for BUMDes managers should focus on technical skills in managing green finance, such as preparing green financing proposals, conducting environmental risk analyses, evaluating ecological impacts, and reporting the accountable use of green funds. Without competency development aligned with the complexity of green finance, green financing may fail to produce optimal impacts on BUMDes sustainability performance.

Second, although innovation capability has not yet demonstrated a significant moderating role, the findings highlight the need for a more targeted and incremental approach to innovation. BUMDes are encouraged to prioritize innovations that are practical and tailored to local characteristics, such as developing products based on village resources, improving simple production processes, and utilizing appropriate technologies. This approach is more relevant than promoting complex innovations that are unsupported by organizational capacity and institutional environments.

Third, the study emphasizes the importance of stakeholder support in strengthening the social legitimacy and sustainability of BUMDes programs. Local governments, assisting institutions, and business partners are expected not only to provide financial support but also to facilitate technical and institutional backing that enables effective implementation of strategies

and green finance. The synergy between internal strategic planning and targeted external support is key to ensuring the long-term sustainability of village enterprises.

Overall, the findings suggest that achieving sustainable performance in BUMDes cannot be accomplished through partial measures. Instead, it requires strengthening internal strategic foundations, enhancing context-specific HR competencies, and fostering innovation and stakeholder support that are aligned with local realities. Through this integrated approach, BUMDes can more effectively serve as engines of village economic development while maintaining social and environmental balance in a sustainable manner.

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