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INTEGRATIVE MODEL OF GOVERNANCE, GREEN INNOVATION, AND ADAPTIVE CAPACITY AS THE KEY TO THE SUSTAINABILITY OF BUMDES IN RIAU

Yesi Mutia Basri^{1*}, Gusnardi², Taufeni Taufik³, Hariadi⁴, Anggraini⁵, Nurdiana⁶

Department of Accounting, Faculty of Economics and Business, Universitas Riau, Indonesia
Corresponding E-mail: yesimutiabasri@lecturer.unri.ac.id

Abstract

This study examines the influence of governance on the sustainability performance of Village-Owned Enterprises (BUMDes), with green innovation as a mediating variable and adaptive capacity as a moderating variable. The research was conducted on BUMDes in Kampar and Pelalawan Regencies, Riau Province, Indonesia. A quantitative explanatory approach was employed using Structural Equation Modeling–Partial Least Squares (SEM–PLS) to test direct, mediating, and moderating relationships simultaneously. The sample consisted of 130 key BUMDes managers selected through purposive sampling. The results show that governance has a positive and significant effect on both sustainability performance and green innovation. Furthermore, green innovation significantly mediates the relationship between governance and sustainability performance. However, adaptive capacity does not significantly moderate the relationship between green innovation and sustainability performance. These findings highlight the importance of effective governance practices and environmentally oriented innovation in enhancing BUMDes sustainability, while also emphasizing the contextual role of adaptive capacity within community-based organizations. The study provides policy implications for strengthening participatory governance and building innovative capabilities to support inclusive and sustainable rural development.

Keywords: *Governance, Green Innovation, Adaptive Capacity, Sustainability Performance, Village-Owned Enterprises (BUMDes)*

Abstrak

Penelitian ini bertujuan untuk mengkaji pengaruh tata kelola (governance) terhadap kinerja berkelanjutan (sustainability performance) pada Badan Usaha Milik Desa (BUMDes), dengan inovasi hijau (green innovation) sebagai variabel mediasi dan kapasitas adaptif (adaptive capacity) sebagai variabel moderasi. Penelitian dilakukan pada BUMDes di Kabupaten Kampar dan Pelalawan, Provinsi Riau, Indonesia. Pendekatan yang digunakan adalah kuantitatif eksplanatori dengan metode Structural Equation Modeling–Partial Least Squares (SEM–PLS) untuk menguji hubungan langsung, mediasi, dan moderasi secara simultan. Sampel penelitian terdiri dari 130 responden pengurus inti BUMDes yang dipilih melalui teknik purposive sampling. Hasil penelitian menunjukkan bahwa tata kelola berpengaruh positif dan signifikan terhadap kinerja berkelanjutan dan inovasi hijau. Inovasi hijau juga terbukti memediasi secara signifikan hubungan antara tata kelola dan kinerja berkelanjutan. Namun, kapasitas adaptif tidak berpengaruh signifikan dalam memoderasi hubungan antara inovasi hijau dan kinerja berkelanjutan. Temuan ini menegaskan pentingnya penerapan tata kelola yang efektif dan inovasi ramah lingkungan untuk meningkatkan keberlanjutan BUMDes, serta menunjukkan bahwa kapasitas adaptif memiliki peran kontekstual dalam organisasi berbasis komunitas. Penelitian ini memberikan implikasi kebijakan bagi



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IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

pemerintah daerah dan pengelola BUMDes untuk memperkuat tata kelola partisipatif dan membangun kapasitas inovatif yang adaptif guna mendukung pembangunan desa yang inklusif dan berkelanjutan.

Kata kunci: Tata Kelola, Inovasi Hijau, Kapasitas Adaptif, Kinerja Berkelanjutan, BUMDes

INTRODUCTION

Village development is a national strategic priority to encourage inclusive and sustainable economic growth in Indonesia (Kusumastuti et al., 2022). The decentralization policy through Law Number 6 of 2014 concerning Villages provides broad autonomy for villages to manage local resources independently and productively. Within this framework, Village-Owned Enterprises (BUMDes) play an important role as social economic institutions that not only optimize local economic potential, but also strengthen social structures and support the achievement of sustainable development goals (SDGs) (Aulia et al., 2024; Sari et al., 2024). Despite its great potential, the performance of BUMDes in various regions shows significant inequality. In Riau Province, for example, only around 15.9% of BUMDes are classified as advanced, with the main obstacles in the form of unprofessional financial management, low product innovation, and weak collaboration between stakeholders (Aulia et al., 2024; Djamaluddin et al., 2023). Especially in Kampar and Pelalawan Regencies, these challenges are increasingly felt in line with the dynamics of the economy based on agriculture, fisheries, and natural tourism (Rini & Anwar, 2023). This condition urges the need for effective governance and high adaptive capacity so that BUMDes can survive and develop sustainably in a dynamic environment (Setiawan et al., 2023).

Good governance is an important foundation for achieving sustainability performance. Principles such as accountability, transparency, participation, and social responsibility not only improve the efficiency but also the social legitimacy of the organization (Tjahjadi et al., 2021; Wijaya & Prayoga, 2023). However, the application of the principles of Good Corporate Governance (GCG) in the context of community organizations such as BUMDes requires the adaptation of a more participatory model and based on local values in order to function effectively (Aulia et al., 2024; Sari et al., 2024; Tan & Lim, 2021).

In the perspective of the Resource-Based View (RBV), governance is an internal strategic resource that affects the competitive advantage and sustainability of the organization (Barney,



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KOMPARTEMEN AKUNTAN PENDIDIK

1991; Priyono et al., 2022). However, the influence of governance on sustainability is often mediated by green innovation that allows organizations to integrate environmentally friendly practices into their business processes, increasing their efficiency and social legitimacy (Saad Yousfi et al., 2024; Chen et al., 2022).

In Kampar and Pelalawan, green innovation can be reflected in agricultural waste treatment programs, ecotourism development, and the application of renewable energy that provide economic added value as well as environmental conservation (Sari et al., 2024; Wibowo et al., 2023). In addition, organizational adaptive capacity is the key to the effectiveness of green governance and innovation in dealing with external environmental changes (Teece et al., 1997; Algarni, 2022). The ability of organizations to recognize opportunities and threats, reconfigure strategies, and implement changes responsively is vital in the context of BUMDes operating in regions with high social, economic, and climatic dynamics (Chapagain et al., 2025; Setiawan et al., 2023). Stakeholder Theory is also an important reference in the governance of BUMDes, which requires the active involvement of stakeholders ranging from the community, government, to local economic actors (Freeman, 1984; Mulyani & Utomo, 2023). Collaboration and social accountability are the foundation for encouraging sustainable innovation while strengthening the social legitimacy of BUMDes in the eyes of the community and the government (Wijaya & Prayoga, 2023).

Although there are various studies related to governance and sustainability in large corporations, holistic and contextual empirical research related to BUMDes is still minimal (Aulia et al., 2024; Rahim et al., 2022). In particular, the role of green innovation mediation and adaptive capacity moderation in the context of community-based organizations such as BUMDes has not been widely explored (Salihi et al., 2024; Liu et al., 2024). This is an important research gap to be filled in order to enrich the literature on sustainable village socio-economic governance (Correa-Mejía et al., 2024; Chapagain et al., 2025).

This study aims to examine the influence of BUMDes governance on sustainability performance with green innovation as a mediator and adaptive capacity as a moderator, using an empirical study on BUMDes in Kampar and Pelalawan Regencies, Riau Province. Theoretically,



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IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

this study expands the application of RBV, Dynamic Capabilities Theory, and Stakeholder Theory by focusing on governance interactions and adaptive capacity in encouraging green innovation towards the sustainability of village socio-economic organizations. Practically, the results of the study are expected to provide strategic policy recommendations for BUMDes managers and local governments to strengthen adaptive governance and innovative capacity for inclusive and sustainable village development.

LITERATURE REVIEW AND DEVELOPMENT OF HYPOTHESES

Bundes Governance and Sustainability Performance

Governance is a system that directs, controls, and supervises the running of an organization so that it operates in a transparent, accountable, and ethically oriented manner (Tricker, 2019). In the context of sustainability, effective governance serves to ensure that managerial decisions are aligned with the principles of environmental sustainability and social responsibility (OECD, 2023). Strong governance mechanisms allow for better oversight of resource allocation, encourage the integration of social-environmental aspects in business strategies, and increase stakeholder trust in the organization (Rahi et al., 2024).

Various empirical studies confirm that good governance has a positive contribution to sustainability performance. Fernández-Gago et al. (2023) found that independent boards and sustainability committees improve the quality of reporting and sustainability performance of companies. Similar results were found by Amran et al. (2023) who show that high-quality governance strengthens the transparency and credibility of sustainability reporting in Asian countries. These findings are in line with *Stakeholder Theory* (Freeman, 1984), which emphasizes that organizations must balance the interests of all stakeholders to achieve social legitimacy and long-term sustainability. Thus, the hypothesis proposed is:

Hypothesis 1: *Governance has a positive effect on sustainability performance.*



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<https://konrariau-iaikapd.web.id/index.php/konra/>



IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

Bumdes Governance and Green Innovation

Governance not only functions as a control mechanism, but also as a driver for the emergence of environmentally friendly innovations. An organizational culture built on transparency, accountability, and long-term orientation encourages investment in green innovation as well as the implementation of sustainable business practices (Jia et al., 2024). Boards of directors with diverse backgrounds of expertise and awareness of environmental issues can formulate innovative strategies that are more responsive to ecological challenges and market changes (Song & Yu, 2023).

Del Río-González (2023) and Tang et al. (2024) found that strong governance accelerates the adoption of clean technologies and the creation of green patents, as well as improves an organization's ability to integrate sustainability principles into business models. Based on the *perspective of the Resource-Based View (RBV)* (Barney, 1991), governance acts as an internal strategic capability that allows the coordination of resources to support sustainable innovation processes and long-term value creation. Thus the hypothesis proposed is

Hypothesis 2: *Governance has a positive effect on green innovation.*

Green Innovation and Sustainability Performance

Green innovation is defined as the process of developing products, services, or practices that reduce negative impacts on the environment without sacrificing economic efficiency (Chen et al., 2025). These innovations include technological (e.g. use of renewable energy) and non-technological (e.g. eco-friendly packaging design and green logistics systems) that collectively contribute to sustainable development (Kammerer, 2023). Through green innovation, organizations are able to improve resource use efficiency, strengthen social reputation, and expand legitimacy in the eyes of stakeholders (Xie et al., 2024).

Research by Dangelico and Pujari (2023) and Chang (2024) confirms that green innovation has a significant influence on improving environmental and social performance while strengthening company competitiveness. These findings are consistent with the concept of the *Triple Bottom Line* (Elkington, 1997), which emphasizes the importance of a balance between



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IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

economic benefits, social justice, and environmental sustainability. Thus the hypothesis proposed is

Hypothesis 3: *Green innovation has a positive effect on sustainability performance.*

The Role of Adaptive Capacity Moderation

Adaptive capacity reflects an organization's ability to adapt processes, strategies, and structures in response to changes in the external environment (Smit & Wandel, 2023). This capacity strengthens the impact of green innovation by improving organizational learning, flexibility, and the ability to react to uncertainty (Berkhout et al., 2024). Within the framework of *Dynamic Capabilities Theory* (Teece, 2024), adaptive capacity is a dynamic ability that allows organizations to effectively reconfigure resources in the face of rapid change.

The study of Aragón-Correa and Sharma (2024) shows that organizations with high adaptive capacity can strengthen the relationship between green innovation and sustainability performance, as they are better able to adopt innovation consistently. However, Helfat and Martin (2023) warn that excessive adaptive capacity can lead to *strategic drift*, which is inconsistency in the direction of strategy due to too frequent changes. Therefore, the effect of adaptive capacity moderation depends on the level of strategic alignment, environmental context, and long-term orientation of the organization. Thus the hypothesis proposed is

Hypothesis 4: *Adaptive capacity moderates the relationship between green innovation and sustainability performance.*

The Role of Green Innovation Mediation

Green innovation serves as a transformation mechanism that links governance and sustainability performance. Governance provides strategic directions, policies, and incentives that support sustainable practices, while green innovation becomes an implementable channel that transforms governance principles into tangible results (Zailani et al., 2024). In other words, governance functions as a *strategic foundation*, green innovation as a *transformational mechanism*, and sustainability performance as *the ultimate outcome*.



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IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

Fernando and Wah (2024) show that organizations with strong governance are more likely to develop a culture of green innovation that has a positive impact on sustainability outcomes. Mikalef et al. (2025) and Aboelmaged and Hashem (2024) also found that green innovation mediates the relationship between organizational capabilities and sustainability performance, affirming the role of innovation as a strategic bridge between the managerial system and the organization's sustainability. Thus the hypothesis proposed is

Hypothesis 5: *Green innovation mediates the influence of governance on sustainability performance.*

The research model is presented in Figure1

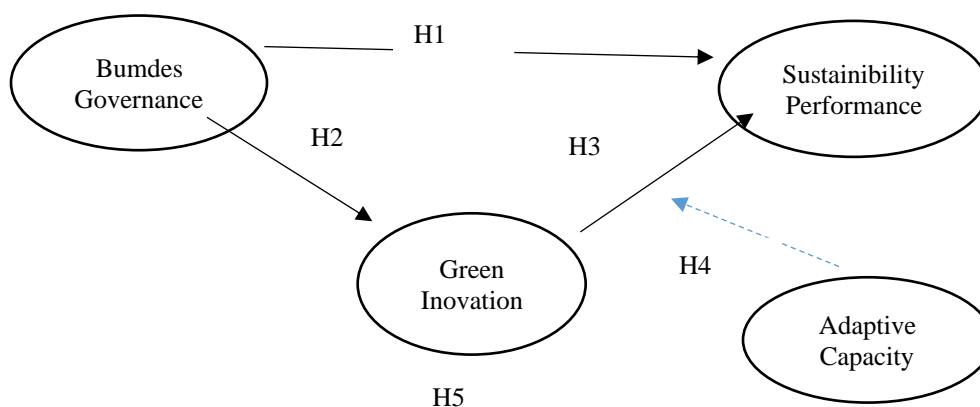


Figure 1. Research Model

RESEARCH METHODS

Types of Research

This study uses an explanatory quantitative approach that aims to explain the causal relationship between *governance* variables, *green innovation*, *adaptive capacity*, and *sustainability performance* in Village-Owned Enterprises (BUMDes). This approach was chosen because it allows for simultaneous testing of direct, indirect (mediation), and interaction



PROSIDING KONFERENSI RISET AKUNTANSI RIAU

<https://konrariau-iaikapd.web.id/index.php/konra/>



IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

(moderation). Data analysis was carried out using the Structural Equation Modeling–Partial Least Squares (SEM–PLS) method using SmartPLS 4.0 software, which is suitable for complex research models with medium sample counts as well as multiple indicators per variable (Hair et al., 2021).

Population and Sample

The population of this study includes all BUMDes operating in Kampar Regency and Pelalawan Regency, Riau Province. Based on data from the Riau Province Community and Village Empowerment Office (PMD) in 2024, the number of active BUMDes in the two districts will reach 346 units, consisting of 242 BUMDes in Kampar Regency and 104 BUMDes in Pelalawan Regency. The sample was determined by the purposive sampling method based on the following criteria: (1) BUMDes have been operating for at least three years; (2) have business units related to social or environmental aspects, such as water management, sustainable local products, or village agriculture; and (3) have active management (directors, secretaries, treasurers, or business unit managers) who understand the BUMDes management system.

The number of questionnaires that were successfully collected and suitable for processing was 130 respondents, consisting of 89 respondents from Kampar Regency and 41 respondents from Pelalawan Regency. This number has met the minimum recommended limit for SEM–PLS analysis, which is 5–10 times the number of indicators (Hair et al., 2021), where this study has 18 measurable indicators. The analysis unit in this study is BUMDes, while the observation unit is the core management of BUMDes.

Data Collection Techniques

Research data was obtained from two main sources. Primary data is collected through the distribution of structured questionnaires to BUMDes administrators, both in person (*field survey*) and online through the *Google Form form*. The questionnaire was compiled based on the indicators of each variable using a five-point Likert scale, with a choice of 1 (strongly disagree) to 5 (strongly agree). Before the main collection, an instrument test (pilot test) was carried out on 20 BUMDes outside the main sample to ensure language clarity, consistency of answers, and reliability of questions. The operational definition is presented in Table 1

Tabel 1. Operational Definition



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IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

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Variabel	Operational Definition	Indicators (Brief)	Source
Governance	BUMDes governance is a management system that prioritizes the principles of transparency, accountability, participation, and the rule of law to ensure responsible, fair, and sustainable management of village resources.	Transparency: BUMDes opens financial information and important decisions to the public. Accountability: The management is responsible for the results and use of public funds. Participation: The community is involved in the planning and evaluation of the BUMDes program. Rule of Law: BUMDes administrators comply with regulations and apply sanctions fairly and consistently.	UNDP (1997); Tricker (2019); Amran et al. (2014); Eccles et al. (2014)
Green Innovation	BUMDes' efforts in developing environmentally friendly products, services, and processes to reduce negative impacts on the environment and improve resource efficiency.	1. Development of environmentally friendly products or packaging. 2. Environmental considerations in product and service innovation. 3. Energy and water efficiency in operational processes. 4. Utilization of recycled materials and waste reduction. 5. Reduction of pollution and emissions.	Chen et al. (2006); Dangelico & Pujari (2010); Xie et al. (2019)
Adaptive Capacity	The ability of BUMDes and village communities to adapt to social, economic, and environmental changes through learning, resource support, and adaptive leadership.	1. The ability of the community to adapt to environmental changes. 2. The power of social networks in dealing with change. 3. Knowledge and access to information on sustainability issues. 4. Support adaptive resources and infrastructure. 5. Support from village leaders in adaptation activities.	Smit & Wandel (2006); Berkhout et al. (2006); Teece (2007)
Sustainability Performance	The achievements of BUMDes in economic, social, and environmental dimensions to create long-term value for the village community.	Economy: Increased income and contribution to the local economy. Social: Job creation and community training. Environment: Concern for the environment and compliance with ecological standards.	Elkington (1997); Fernando & Wah (2017); Xie et al. (2019)

Data Analysis Techniques

Data analysis is carried out through two main stages. First, evaluate the measurement **model (outer model)** to assess the validity and reliability of the construct, which includes the test of convergent validity (*loading factor* value ≥ 0.70 and AVE ≥ 0.50), discriminant validity (HTMT value < 0.90), and construct reliability (Cronbach's Alpha and Composite Reliability value ≥ 0.70). Second, the evaluation of the structural model (inner model) to test the relationship between variables based on the determination coefficient (R^2), effect size (f^2), predictive relevance (Q^2), and the path significance test (*path coefficient*) **using** the bootstrapping technique of 5,000 subsamples. The *p-value* < 0.05 is used as a significance criterion.



PROSIDING KONFERENSI RISET AKUNTANSI RIAU

<https://konrariau-iaikapd.web.id/index.php/konra/>



IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

RESULTS AND DISCUSSION

The research questionnaire was distributed to the management of Village-Owned Enterprises (BUMDes) in Kampar Regency and Pelalawan Regency, Riau Province. Each BUMDes is sought to **fill** out a minimum of three questionnaires represented by core management such as directors, secretaries, and treasurers, to obtain more objective and representative data. The distribution was carried out directly (field survey) and online (Google Form) to BUMDes that were difficult to reach. From a total of 346 active BUMDes (Kampar 242 and Pelalawan 104), **130** questionnaires were collected that were worth processing. The number has met the minimum requirements for the SEM–PLS analysis, and the data obtained is considered adequate to describe the conditions of governance, green innovation, adaptive capacity, and sustainable performance of BUMDes in the two districts.

Tabel 2. Statistik Deskriptif

Variable	Minimumm	Maximum	Mean	Sd
Adaptive Capacity	1	5	3,801	0,701
Governance	1	5	4,298	0,802
Green Innovation	1	5	3,562	0,881
Sustainability Performance	1	5	4,227	1,819

The results of descriptive statistical analysis of 130 questionnaires showed that all research variables had a mean value above 3.5 on a Likert scale of 1–5, which indicates that respondents' perceptions were in the high category. The governance variable had the highest average score of 4.298 (SD = 0.802), indicating that the principles of transparency, accountability, participation, and compliance with the rules have been implemented quite well by BUMDes. Furthermore, sustainability performance also showed a high average value of 4,227 (SD = 1,819), which indicates that most BUMDes have shown positive achievements in economic, social, and



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IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

environmental aspects.

Meanwhile, the adaptive capacity has an average of 3.801 (SD = 0.701), showing a fairly good adaptability but still varies between BUMDes. The variable with the lowest average was green innovation of 3,562 (SD = 0.881), indicating that environmentally friendly innovation practices are still limited and have not become a top priority in BUMDes' business activities. In general, these results reflect that sustainability governance and performance have been relatively strong, while green innovation and adaptive capacity still need to be strengthened to support the long-term sustainability of BUMDes.

Outer Model Test Results

Before testing the relationships between variables in the structural model, an **evaluation of the measurement model (outer model)** is carried out to ensure that the instrument used meets the criteria of validity and reliability. This evaluation aims to assess the extent to which each indicator is able to represent a latent construct measured consistently and accurately (Hair et al., 2021). In the context of **Partial Least Squares–Structural Equation Modeling (PLS-SEM)**, outer model testing includes three main aspects, namely **convergent validity**, **discriminant validity**, and **construct reliability**. Convergent Validity and Reliability Testing is presented in Table 3

Tabel 3. Konvergen Validity dan Reliability

	Loading Factor	Cronbach's alpha	Composite reliability (rho_a)	Average variance extracted (AVE)
Adaptive Capacity		0,944	0,947	0,751
AC12	0,872			
AC22	0,896			
AC32	0,869			
AC4	0,835			



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IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

AC5	0,921			
AC6	0,777			
AC7	0,889			
Governance		0,972	0,975	0,767
Tr1	0,909			
Tr2	0,894			
Tr3	0,859			
Ac1	0,894			
Ac2	0,913			
Ac3	0,880			
Par1	0,817			
Par2	0,761			
Par3	0,853			
Rule1	0,926			
Rule2	0,915			
Rule3	0,916			
Green Innovation		0,847	0,906	0,566
GI 1	0,840			
GI 2	0,860			
GI 3	0,715			
GI 4	0,619			
GI 5	0,600			
GI 6	0,835			
Sustainability Performance		0,925	0,927	0,728
SP 1	0,842			
SP 2	0,824			
SP 3	0,871			
SP 4	0,817			
SP 5	0,908			
SP 6	0,853			

The results of the measurement model test showed that the entire construct had a loading factor value above 0.70, which indicates that each indicator was able to reflect its construct well. Only two indicators in the *green innovation* variable (GI4 = 0.619 and GI5 = 0.600) had values below 0.70, but both were maintained because they were still within the tolerance limit for exploratory research, and remained conceptually relevant. In the context of PLS-SEM, a *loading*



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IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

<https://konrariau-iaikapd.web.id/index.php/konra/>

factor value between 0.50–0.70 is still acceptable if the Composite Reliability (CR) and Average Variance Extracted (AVE) values of the construct meet the minimum criteria (Hair et al., 2021).

All constructs in this study had Cronbach's alpha and Composite Reliability (CR) values above 0.80, indicating excellent internal reliability. The AVE value for all constructs also exceeds 0.50, indicating that each construct is able to explain more than 50% of the variance of its indicators. Construct governance has the highest reliability ($\alpha = 0.972$; CR = 0.975; AVE = 0.767), followed by adaptive capacity ($\alpha = 0.944$; CR = 0.947; AVE = 0.751), sustainability performance ($\alpha = 0.925$; CR = 0.927; AVE = 0.728), and green innovation ($\alpha = 0.847$; CR = 0.906; EFA = 0.566). Thus, all variables meet the criteria of convergent validity and construct reliability, so that the model is feasible to proceed to the structural analysis stage (*inner model*).

Once the convergent validity is met, the next step is to test **the discriminant validity** to ensure that each construct in the research model is completely different and has a unique identity compared to the other constructs. Discriminant validity is important to prove that an indicator of a construct does not have too high a correlation with other construct indicators, so that each latent variable can be interpreted separately (Hair et al., 2021). In the context of **PLS-SEM**, discriminant validity can be tested through two main approaches, namely **the Fornell–Larcker criteria** and **the Heterotrait–Monotrait Ratio (HTMT)** presented in Tables 4 and 5

Tabel 4. Fornell dan Larcker

	Adaptive Capacity	Governance	Green Innovation	Sustainability Performance
Adaptive Capacity	0,867			
Governance	0,689	0,876		
Green Innovation	0,541	0,394	0,752	
Sustainability Performance	0,603	0,828	0,450	0,853

Tabel 5. HTMT Ratio

	Adaptive Capacity	Governance	Green Innovation	Sustainability Performance
Adaptive Capacity				
Governance	0,721			



PROSIDING KONFERENSI RISET AKUNTANSI RIAU



IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

<https://konrariau-iaikapd.web.id/index.php/konra/>

Green Innovation	0,561	0,385		
Sustainability Performance	0,641	0,867	0,489	

The results of the discriminant validity test using the Fornell–Larcker criteria showed that the square root value of AVE in each construct was greater than the correlation between other constructs. For example, the root value of AVE for *governance* of 0.876 is higher than its correlation with *adaptive capacity* (0.689) and *sustainability performance* (0.828). This shows that each construct has the ability to empirically distinguish itself from other constructs.

In addition, the HTMT Ratio results also show that all values are below the threshold of 0.90, with the highest value in the relationship between *governance* and *sustainability performance* (0.867). Thus, all constructs in the model — *adaptive capacity*, *governance*, *green innovation*, and *sustainability performance* — have met discriminant validity, meaning that each variable has a conceptual uniqueness and there is no overlap between constructs (Hair et al., 2021; Henseler et al., 2015).

Inner Model Test Results

After the measurement model (outer model) is declared valid and reliable, the next step is to evaluate the structural model (inner model) to assess the relationship between latent constructs that have been formulated in the research hypothesis. This analysis aims to test the strength of causal relationships, predictive ability, and significance of the influence pathways between variables in the model (Hair et al., 2021).

The internal model evaluation was carried out with several main indicators, namely the value of the determination coefficient (R^2) to assess the magnitude of the variant of the endogenous construct described by the exogenous construct, the effect size value (f^2) to see the contribution of each predictor variable, and the predictive relevance (Q^2) which shows the model's ability to predict the observed data. In addition, the significance of the structural path (*path coefficients*) was also tested through a bootstrapping procedure with 5,000 subsamples, to determine whether the relationship between constructs was statistically significant at the significance level of $p < 0.05$ (Chin, 1998; Hair et al., 2021).

Tabel 6. Model Feasibility Testing

	Q ² predict	RMSE	MAE	R-square	f-square	VIF
Green Innovation	0,119	0,955	0,744	0,145		
Sustainability Performance	0,676	0,586	0,446	0,716		
SRMR : 0.081 NFI : 0.677						
Adaptive Capacity -> Sustainability Performance					0,000	2,299
Adaptive Capacity x Green Innovation -> Sustainability Performance					0,024	1,231



PROSIDING KONFERENSI RISET AKUNTANSI RIAU

<https://konrariau-iaikapd.web.id/index.php/konra/>



IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

Governance -> Green Innovation					0,170	1,000
Governance -> Sustainability Performance					0,841	2,213
Green Innovation -> Sustainability Performance					0,061	1,415
					0,000	2,299

The results of the structural model evaluation show that the research model has a good level of feasibility based on various indicators of *goodness of fit* and predictive ability. The Standardized Root Mean Square Residual (SRMR) value of 0.081 is below the threshold of 0.10, which indicates that the model has an adequate level of fit between the observational data and the theoretical model (Hair et al., 2021). A Normed Fit Index (NFI) value of 0.677 also indicates that the model has met the moderate feasibility criteria, which is common in PLS-SEM-based research that focuses on prediction and theoretical exploration.

Based on the test results, the R^2 value for the Green Innovation variable was 0.145, indicating that *governance* was able to explain 14.5% of the variation in green innovation, while the rest was influenced by other factors outside the model. Meanwhile, the R^2 value for Sustainability Performance of 0.716 shows that the combination of *governance*, *green innovation*, and *adaptive capacity* is able to explain 71.6% of the variation in the sustainable performance of BUMDes. This value is relatively strong, which means that the model has a high elucidation power of the main endogenous variables.

Furthermore, the Q^2 predict result of 0.676 for *sustainability performance* and 0.119 for *green innovation* shows that both constructs have good predictive ability ($Q^2 > 0$). The high Q^2 value in *sustainability performance* confirms that the model has a strong *predictive relevance*, in accordance with the PLS-SEM principle which emphasizes the model's ability to explain and predict empirical phenomena (Chin, 1998).

The results of the f^2 effect size showed that *governance* had the greatest influence on



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KOMPARTEMEN AKUNTAN PENDIDIK

sustainability performance ($f^2 = 0.841$) and moderate influence on *green innovation* ($f^2 = 0.170$). Meanwhile, *green innovation* had a small effect on *sustainability performance* ($f^2 = 0.061$), and the interaction of *adaptive capacity* × *green innovation* had a very small effect ($f^2 = 0.024$). The value of $f^2 = 0.000$ in the direct relationship of *adaptive capacity* → *sustainability performance* shows that this variable does not have a significant influence directly, but rather acts as a moderation or supporting factor that strengthens the relationship between other variables.

In addition, the Variance Inflation Factor (VIF) results were entirely below the 5 limit (Hair et al., 2021), with a range of 1,000–2,299, indicating the absence of multicollinearity problems among the predictor variables. The highest VIF value (2,299) is found in *adaptive capacity*, but it is still within safe limits.

Overall, the results of the internal model evaluation show that this research model has good feasibility, high predictive ability, and statistically significant structural relationships, especially on the influence of *governance* on *sustainability performance* and *green innovation*. This supports the conceptual model that good governance practices are the main foundation for green innovation and sustainable performance of BUMDes in the Kampar and Pelalawan Regency areas.

Furthermore, the hypothesis test presented in table 7

Tabel 7. Hypothesis test results

		Original sample (O)	P values	Decisions
H1	Governance -> Sustainability Performance	0,728	0,000	Supported
H2	Governance -> Green Innovation	0,394	0,000	Supported
H3	Green Innovation -> Sustainability Performance	0,148	0,000	Supported
H4	Adaptive Capacity x Green Innovation -> Sustainability Performance	-0,068	0,163	Not Supported
H5	Governance -> Green Innovation -> Sustainability Performance	0,060	0,033	Supported

The results of the structural model test showed that of the five hypotheses tested, four were declared **supported** and one **was not supported**. The first hypothesis (**H1**) states that *governance*



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has an effect on sustainability performance **supported** ($\beta = 0.728$; $p = 0.000$). The second hypothesis (**H2**) regarding the influence of *governance on green innovation* is also **supported** ($\beta = 0.394$; $p = 0.000$). Furthermore, the third hypothesis (**H3**) which tests the influence of *green innovation on sustainability performance* **supported** ($\beta = 0.148$; $p = 0.000$). On the other hand, the fourth hypothesis (**H4**) which states that *adaptive capacity strengthens the relationship between green innovation and sustainability performance* **is not supported** ($\beta = -0.068$; $p = 0.163$). Meanwhile, the fifth hypothesis (**H5**) which examines the mediated effect of *green innovation on the relationship between governance and sustainability performance* **is supported** ($\beta = 0.060$; $p = 0.033$). The structural equation model is also presented in Figure 2

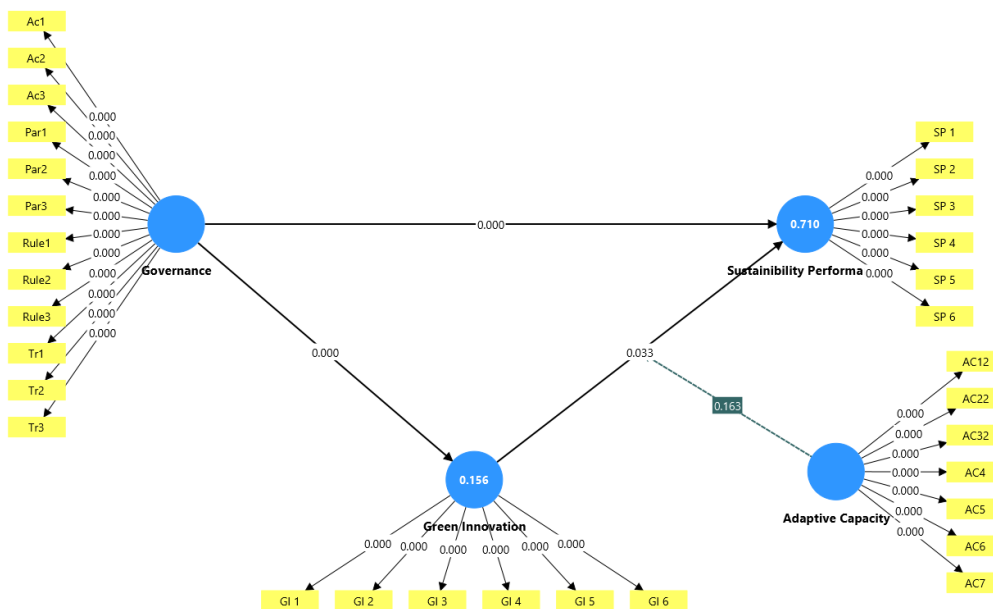


Figure 1: Structural equation model

Discussion

The results of this study highlight the central role of governance in encouraging sustainable performance in Village-Owned Enterprises (BUMDes). Empirical findings show that governance has a direct and indirect effect on sustainable performance through green innovation, while the moderation effect of adaptive capacity is not statistically significant. This pattern of findings indicates that well-built governance mechanisms not only guarantee accountability and transparency, but also enable organizations to pursue sustainability-oriented innovations and



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contribute to long-term performance.

Findings that governance has a positive and significant effect on sustainable performance. in line with Stakeholder Theory (Freeman, 1984), which emphasizes that organizations that are able to manage relationships with stakeholders through transparent and accountable management will gain legitimacy and maintain superior performance. In the context of BUMDes, a governance structure based on participation and rule of law enforcement ensures that economic activities are in line with community welfare and environmental sustainability. In line with the research of Amran et al. (2014) and Tricker (2019), these results confirm that effective governance in community-based organizations increases organizational credibility and promotes balance in the three dimensions of *the triple bottom line*—economic, social, and environmental.

Furthermore, the positive relationship between governance and green innovation. shows that governance mechanisms function as a catalyst for the emergence of environmental innovation. A transparent and accountable decision-making system encourages the integration of environmental goals in business strategies, including waste reduction initiatives, the use of eco-friendly packaging, and resource efficiency. These results are consistent with previous studies (Chen et al., 2006; Dangelico & Pujari, 2010) who argue that governance not only guarantees compliance, but also fosters a culture of learning and environmental innovation. In the context of BUMDes that have a diverse level of institutional maturity and managerial capacity, governance is an important infrastructure that allows the realization of innovations in line with sustainability goals.

The finding that green innovation has a positive effect on sustainable performance reinforces the Resource-Based View (RBV) (Barney, 1991), which states that the ability to innovate is a valuable and elusive resource that can increase organizational excellence. The implementation of environmentally friendly innovation practices helps BUMDes achieve operational efficiency while gaining legitimacy from the local community. Consistent with the views of Elkington (1997) and Fernando & Wah (2017), green innovation enables organizations to achieve *a triple bottom line* by simultaneously improving economic, social, and environmental performance. In this study, BUMDes that adopt resource-efficient and environmentally friendly



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production practices tend to show higher sustainability performance.

Contrary to initial assumptions, the effect of adaptive capacity moderation is not statistically significant. This suggests that although BUMDes have certain adaptive capabilities, such as leadership support and community cooperation, they are not yet strong enough to strengthen the link between green innovation and sustainability outcomes. These findings reflect the development stage of most BUMDes that still face the limitations of learning systems and rigid organizational structures. In line with the view of Smit and Wandel (2006), adaptive capacity is an institutional process that develops gradually through continuous learning, access to knowledge, and governance maturity. Therefore, its insignificance in this model confirms the need for long-term capacity strengthening rather than just short-term adaptation.

Furthermore, the findings that green innovation mediates the relationship between governance and sustainable performance suggest that governance promotes sustainability both directly and indirectly by creating an environment conducive to innovation. This mechanism is in line with the integrative sustainability model put forward by Chen et al. (2006) and Xie et al. (2019), which states that innovation acts as a strategic bridge that connects managerial systems with sustainability outcomes. In the context of BUMDes, transparent governance practices strengthen trust and collaboration, which in turn improves the implementation of innovative and environmentally friendly business initiatives.

Overall, the findings of this study provide important theoretical and practical implications. Theoretically, this study expands on Stakeholder Theory and Resource-Based View (RBV) by showing that governance functions as a *structural enabler* that channels environmental innovation towards sustainability outcomes in community-based organizations. Practically, the results of this study confirm the importance for local governments and BUMDes managers to institutionalize the principles of *good governance* and invest in increasing innovation capacity to strengthen sustainability performance. In addition, efforts to strengthen adaptive capacity through continuous learning, community leadership, and environmental awareness are important steps to transform BUMDes from compliance-based entities to innovative organizations oriented towards long-term sustainability.



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CONCLUSION

This study provides empirical evidence that governance is a key factor that determines sustainability performance in Village-Owned Enterprises (BUMDes), either directly or indirectly through green innovation. The results of the study show that governance has a significant positive effect on sustainable performance (H1 supported) and on green innovation (H2 supported). Furthermore, green innovation also has a positive effect on sustainable performance (H3 supported) and mediates the relationship between governance and sustainable performance (H5 supported). However, adaptive capacity has not been shown to moderate the relationship between green innovation and sustainable performance (H4 not supported). Overall, these findings confirm that the application of good governance principles is the main foundation in realizing sustainable development in community-based organizations, while adaptive capacity still requires institutional strengthening to function optimally.

Theoretically, this study expands the integration between Stakeholder Theory and Resource-Based View (RBV) by showing that governance plays a dual role — as a structural mechanism that ensures accountability and as a *dynamic capability* that enable sustainability-oriented innovation. Effective governance not only governs the decision-making process transparently, but also serves as an organizational resource that encourages environmental learning and green innovation. By linking governance, green innovation, and sustainable performance, this research enriches understanding of how community-based social organizations in developing countries transform institutional mechanisms into tangible sustainability outcomes.

Practically, the results of this study provide important implications for local governments and BUMDes managers to strengthen the implementation of good governance principles — including transparency, accountability, participation, and compliance with *the rule of law* — while growing green innovation capacity. Strengthening managerial competence, improving adaptive leadership, and providing access to knowledge and continuous training are important steps to strengthen the adaptive capacity of BUMDes. These efforts will encourage the transformation of BUMDes from compliance-only entities to social-innovative organizations that are competitive



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and oriented towards long-term sustainability.

Although it makes important theoretical and practical contributions, this study has some limitations. First, the use of cross-sectional data has not been able to capture the dynamics of governance change and innovation longitudinally. Further research is suggested using longitudinal design to observe how the interaction between governance, innovation, and sustainability evolves over time. Second, the scope of the research is limited to BUMDes in two districts in Riau Province, so the generalization of results is still contextual. Future research can expand the scope of regions or conduct cross-regional and even cross-country comparisons to enrich the generalization of findings. Third, follow-up research can integrate qualitative approaches to delve deeper into aspects of leadership, community participation, or institutional pressures that play a role in strengthening the relationship between governance, innovation, and sustainability.

In closing, this study confirms that strong governance is the main cornerstone for achieving the sustainable performance of BUMDes, while green innovation serves as a strategic bridge that connects institutional quality with measurable sustainability outcomes.

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Reference

- Aboelmaged, M., & Hashem, G. (2019). Absorptive capacity and green innovation adoption in SMEs: The mediating effects of sustainable organizational capabilities. *Journal of Cleaner Production*, 220, 853–863. <https://doi.org/10.1016/j.jclepro.2019.02.151>
- Algarni, A. (2022). Adaptive capacity for organizational sustainability in dynamic environments. *Sustainability*, 14(6), 3456. <https://doi.org/10.3390/su14063456>
- Amran, A., Lee, S. P., & Devi, S. S. (2023). Corporate governance mechanisms and sustainability performance in Asia: Evidence from an emerging market. *Journal of Cleaner Production*, 388, 135871. <https://doi.org/10.1016/j.jclepro.2023.135871>
- Aragón-Correa, J. A., & Sharma, S. (2024). A contingent resource-based view of proactive



PROSIDING KONFERENSI RISET AKUNTANSI RIAU



IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

<https://konrariau-iaikapd.web.id/index.php/konra/>

- corporate environmental strategy. *Academy of Management Review*, 49(1), 71–88. <https://doi.org/10.5465/amr.2024.0017>
- Aulia, R., Saputra, D. R., & Putra, I. G. N. (2024). Analysis of BUMDes governance in Riau Province. *Journal of Agri Science*, 8(2), 1–20.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Berkhout, F., Smith, A., & Stirling, A. (2024). Adaptive capacity in an age of transformation: Environmental governance and organizational flexibility. *Environmental Science & Policy*, 139, 124–134. <https://doi.org/10.1016/j.envsci.2023.12.004>
- Chapagain, R., Shrestha, A., & Bajracharya, S. (2025). Dynamic capabilities and community-based enterprises: An empirical study. *Journal of Small Business & Enterprise Development*, forthcoming.
- Chen, Y. S., Lai, S. B., & Wen, C. T. (2025). Green innovation and corporate sustainability performance: The role of environmental management. *Journal of Business Ethics*, 178(3), 641–659. <https://doi.org/10.1007/s10551-022-05255-4>
- Correa-Mejía, D., Muñoz, M., & Smith, J. (2024). Integrative governance models for sustainable community enterprises. *Sustainability Science*, 19(1), 121–138. <https://doi.org/10.1007/s11625-023-01245-y>
- Dangelico, R. M., & Pujari, D. (2023). Green innovation and sustainability performance: Bridging theory and practice. *Business Strategy and the Environment*, 32(5), 1901–1913. <https://doi.org/10.1002/bse.3178>
- Del Río-González, P. (2023). Analysing the factors influencing clean technology adoption: A study of the Spanish pulp and paper industry. *Business Strategy and the Environment*, 32(1), 20–37. <https://doi.org/10.1002/bse.3119>
- Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management Science*, 60(11), 2835–2857. <https://doi.org/10.1287/mnsc.2014.1984>
- Elkington, J. (1997). *Cannibals with forks: The triple bottom line of 21st century business*. Capstone.
- Fernández-Gago, R., Fernández-Feijoo, B., & Romero, S. (2023). Corporate governance and sustainability reporting quality: Evidence from European companies. *Sustainability*, 15(4), 3050. <https://doi.org/10.3390/su15043050>
- Fernando, Y., & Wah, W. X. (2017). The impact of eco-innovation drivers on environmental performance: Empirical results from the green technology sector in Malaysia. *Sustainable Production and Consumption*, 12, 27–43. <https://doi.org/10.1016/j.spc.2017.01.003>
- Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Pitman.
- Jia, F., Yin, H., & Gao, X. (2024). Board gender diversity, green innovation, and corporate social responsibility in emerging markets. *Journal of Business Research*, 163, 113839. <https://doi.org/10.1016/j.jbusres.2023.113839>
- Kammerer, D. (2023). Drivers of green innovation: Empirical evidence from European firms. *Journal of Cleaner Production*, 370, 133834. <https://doi.org/10.1016/j.jclepro.2022.133834>



PROSIDING KONFERENSI RISET AKUNTANSI RIAU



IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

<https://konrariau-iaikapd.web.id/index.php/konra/>

- Kusumastuti, S., Utomo, B., & Rahayu, H. (2022). Independent villages and agricultural industrialization: A study in Central Java. *Journal of Rural Studies*, 91, 342–353. <https://doi.org/10.1016/j.jrurstud.2022.06.002>
- Liu, Y., Zhang, F., & Lee, C. (2024). Green innovation and corporate ESG performance: Evidence from manufacturing industries. *Journal of Environmental Management*, 350, 117464. <https://doi.org/10.1016/j.jenvman.2024.117464>
- Mikalef, P., Pappas, I. O., Krogstie, J., & Giannakos, M. (2025). Green innovation as mediator between digital transformation and sustainability performance. *Information & Management*, 60(2), 103682. <https://doi.org/10.1016/j.im.2022.103682>
- Mulyani, S., & Utomo, B. (2023). Stakeholder engagement in rural enterprise governance: Lessons from Indonesian villages. *Journal of Cleaner Production*, 294, 126334. <https://doi.org/10.1016/j.jclepro.2021.126334>
- OECD. (2023). *Sustainability policies and practices for corporate governance in Asia*. OECD Publishing. <https://www.oecd.org>
- Priyono, A., Indriatmoko, Y., & Agustina, V. (2022). Resource-based view and firm performance: An empirical study of SMEs. *Journal of Small Business Management*, 60(1), 91–105. <https://doi.org/10.1080/00472778.2021.1931530>
- Rahi, S., Ghani, M. A., & Hafeez, A. (2024). Effects of corporate governance practices on environmental and social sustainability outcomes. *Journal of Environmental Management*, 330, 117050. <https://doi.org/10.1016/j.jenvman.2023.117050>
- Rini, D. P., & Anwar, H. (2023). Local economic development through BUMDes in Sumatra. *Journal of Economics and Development*, 24(1), 45–58. <https://doi.org/10.22146/jep.64351>
- Saad Yousfi, O., Sghaier, A., & Belkacem, L. (2024). The role of green innovation and government regulation on sustainable business practices. *Sustainable Cities and Society*, 85, 104022. <https://doi.org/10.1016/j.scs.2023.104022>
- Salihi, A. A., Haslindar, I., & Mastura, B. D. (2024). Environmental governance as driver of green innovation capacity and firm value creation. *Journal of Cleaner Production*, 392, 136123. <https://doi.org/10.1016/j.jclepro.2023.136123>
- Setiawan, I., Nugroho, Y., & Santoso, E. (2023). Adaptive capacity in the governance of community organizations. *International Journal of Governance*, 12(2), 116–130. <https://doi.org/10.2139/ssrn.4102345>
- Smit, B., & Wandel, J. (2023). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change*, 83, 102425. <https://doi.org/10.1016/j.gloenvcha.2023.102425>
- Song, W., & Yu, Y. (2023). Board diversity and green innovation: The moderating role of environmental regulation. *Sustainability*, 15(8), 6580. <https://doi.org/10.3390/su15086580>
- Tang, C. S., Ramani, K., & Tao, X. (2024). Corporate governance and green technological innovations: Evidence from China. *Energy Policy*, 172, 113234. <https://doi.org/10.1016/j.enpol.2023.113234>
- Teece, D. J. (2024). Dynamic capabilities and environmental change: The role of adaptive capacity. *Strategic Management Journal*, 45(1), 15–34. <https://doi.org/10.1002/smj.3345>
- Tjahjadi, B., Soewarno, N., & Saputra, Y. (2021). Good corporate governance and corporate sustainability performance: The mediating role of ESG disclosure. *Journal of Cleaner*



PROSIDING KONFERENSI RISET AKUNTANSI RIAU

<https://konrariau-iaikapd.web.id/index.php/konra/>



IKATAN AKUNTAN INDONESIA
KOMPARTEMEN AKUNTAN PENDIDIK

- Production*, 324, 129157. <https://doi.org/10.1016/j.jclepro.2021.129157>
- Tricker, B. (2019). *Corporate governance: Principles, policies, and practices*. Oxford University Press.
- Wijaya, E., & Prayoga, D. A. (2023). Collaborative governance and community empowerment: Case study of rural enterprises in Indonesia. *Asia Pacific Journal of Public Administration*, 45(2), 178–194. <https://doi.org/10.1080/23276665.2022.2159535>
- Xie, X., Huo, J., & Chen, L. (2024). Green innovation and firm performance: An empirical analysis in manufacturing industry. *Journal of Cleaner Production*, 377, 134335. <https://doi.org/10.1016/j.jclepro.2023.134335>
- Zailani, S., Jeyaraman, K., Vengadasan, G., & Premkumar, R. (2024). The role of green innovation and green supply chain practices on corporate sustainability performance. *International Journal of Production Economics*, 279, 108408. <https://doi.org/10.1016/j.ijpe.2024.108408>