Article

Green knowledge management to achieve corporate sustainable development

Rahmi Widyanti[1,*], Ismi Rajiani[2], Basuki Basuki[1]

[1] Graduate Management Program, MAB Islamic University, Banjarmasin 70123, Indonesia

[2] Social Studies Department, Lambung Mangkurat University, Banjarmasin 70123, Indonesia

* Corresponding author: Rahmi Widyanti, rahmiwidyanti@yahoo.com

Abstract: The mining industry significantly impacts the three pillars of sustainable development: the economy, the environment, and society. Therefore, it is essential to incorporate sustainability principles into operational practices. Organizations can accomplish this through knowledge management activities and diverse knowledge resources. A study of 300 employees from two of the largest mining corporations in South Kalimantan, Indonesia, found that four out of five elements of knowledge management—green knowledge acquisition, green knowledge storage, green knowledge application, and green knowledge creation—have a direct impact on the sustainability of businesses. The calculation was determined using Structural Equation Modelling (SEM). However, the study also found that the influence of collectivist cultural norms inhibits the direct effect of green knowledge sharing on corporate sustainable development. The finding suggests that companies operating in collectivist cultures may need to take additional measures to encourage knowledge sharing, such as rewarding employees for sharing their expertise on green initiatives, supportive organizational culture, clear expectations, and opportunities for social interaction.

Keywords: green knowledge management; mining industry; organizational sustainability; collectivist cultures

1. Introduction

Recently, there has been a growing global interest among governing bodies in establishing regulations and protocols for producing and providing goods and services that demonstrate a high degree of environmental sustainability (Abbas and Khan, 2022). The trend has increased recognition among organizations to promote environmental sustainability (Sanchez-Planelles et al., 2022). In response, organizations have begun to prioritize reconfiguring their operational and managerial processes (Azam et al., 2022). These organizations recognize that technological, social, political, and environmental developments have significantly threatened their ability to obtain and maintain a competitive advantage (Bhandari et al., 2022). Additionally, the growing concern among consumers about the depletion of natural resources, as well as the pollution of water, air, and soil (Yi et al., 2023), is compelling companies to embrace environmentally sustainable practices and reduce their dependence on fossil fuels (Li and Qamruzzaman, 2023). This activity leads to a reduction in ecological vulnerabilities.

The ability of an organization to learn and retain knowledge determines whether it will succeed or fail (Rajiani and Normuslim, 2023). Including knowledge management (KM) in operation has been widely recognized as essential in developing strategies, generating new products and services, and supervising

operational procedures (Bresciani et al., 2022). However, due to environmental concerns, modern enterprises have broadened the scope of knowledge management and initiated the incorporation of environmental factors (Sahoo et al., 2022). The implementation of green knowledge management (GKM) has emerged as an essential strategic tool for organizations (Wang et al., 2022), providing them with a competitive advantage in attaining the Corporate Sustainable Development (CSD). One of the critical factors determining the extent to which an organization dedicated to GKM practices is the evaluation of the influence of these practices on the green performance of the organization and the potential benefits they can provide to the natural environment (Cai et al., 2023). Due to its recent emergence, the existing literature on GKM needs help comprehensively address all facets of knowledge management, specifically concerning the natural environment.

The notion of CSD is intricately connected to three fundamental factors: the environment, economy, and society (Soomro et al., 2023). The environmental dimension of sustainability emphasizes maintaining clean air and water, preserving natural habitats, reducing reliance on non-renewable resources, developing eco-friendly goods, and mitigating hazardous gas and liquid emissions (Shehzad et al., 2022). Rodríguez-Espíndola et al. (2022) assert that the social dimension of sustainability enhances organizational interactions with individuals and society and advances human welfare by cultivating a more profound comprehension of requirements. Additionally, it emphasizes the advancement of cultural life, the establishment of societal equity, the development and support of social life, the protection of human rights, and the pursuit of justice. The economic dimension of sustainability adopts a practical strategy to enhance sales and reduce operational expenses to optimize profitability (Lopes et al., 2022).

The interdependence of environmental, social, and economic sustainability within the context of GKM is crucial to achieving success. To reach sustainability goals, organizations prioritize integrating knowledge management (GKM) with overarching organizational strategies (Chaithanapat et al., 2022). Organizations' acquisition and integration of green information have been found to substantially influence their environmental performance (Shahzad et al., 2022). GKM has the potential to facilitate the long-term sustainability of businesses. A limited study has been conducted on the function of GKM in CSD despite recognizing its significance in the domains of innovation (Ul-Durar et al., 2023) and organizational performance (Abbas and Khan, 2022).

The mining industry in Indonesia, particularly coal mining, has a significant impact on the environment and surrounding communities. Coal mining operations often lead to deforestation, air and water pollution, and land degradation, which can have detrimental consequences for the health and well-being of nearby communities. These communities may experience respiratory illnesses, loss of livelihood due to damaged ecosystems, and even displacement from their homes. Expanding the discussion on these environmental problems and their impact on surrounding communities is crucial for understanding the full scope of the challenges faced by Indonesia's mining industry. By highlighting the real-world impact of these environmental issues, the study can further emphasize the importance of incorporating sustainability principles into operational practices. This will not only

mitigate the negative environmental impacts of mining but also contribute to the overall well-being of surrounding communities and promote sustainable development in Indonesia.

Thus, this research primarily aims to emphasize the critical need to integrate sustainability principles into mining operations and highlight the crucial role of knowledge management in fostering sustainable practices within the mining industry. The study underscores the importance of green knowledge acquisition, storage, sharing, application, and creation. It further aims to provide actionable recommendations for mining companies and policymakers, focusing on leveraging knowledge management strategies to effectively minimize environmental and social impacts, considering Indonesian cultural characteristics.

In Indonesia, the government is seeking various ways to increase economic growth in the less developed part of the country, including South Kalimantan (Rajiani et al., 2023). Economic growth in this region is dominated by coal mining. Although the coal mining industry plays a vital role in the economy, mining activities negatively impact the environment and are detrimental to local people. For example, the narrower floodplain wetland fishing areas where people traditionally make a living as anglers are one of the impacts (Hidayat et al., 2022). Nevertheless, due to the Extractive Industries Transparency Initiative (EITI) agreement, coercive pressure has compelled mining corporations to exhibit a heightened commitment to address environmental concerns. The EITI is a comprehensive strategy to assist developing countries in addressing the challenges of the resource curse. The Indonesian government initially was not keen to participate, but since the World Bank has integrated the EITI as a requirement for approving new loans, Indonesia has adopted it (Basuki et al., 2021). Therefore, the primary objective of this study is to highlight the practices of GKM to achieve CSD within Indonesian mining companies. Since environmental issues have become a political agenda in Indonesia (Lai, 2023), this research output will provide academics, industrialists, ecologists, and other stakeholders with enhanced capabilities to effectively attain CSD by leveraging GKM.

From a socioeconomic perspective, the mining industry's favourable impacts can be attributed to its growth, leading to the sector's contribution to a country's gross domestic product (Hatane et al., 2021). Furthermore, the expansion of the mining sector contributes to the rise in employment opportunities, a crucial factor in attaining sustainable development's economic and social objectives (Jahanmiri et al., 2021). Nevertheless, the mining sector ranks as one of the primary contributors to waterway, soil, and air pollution. The extraction and refinement of mineral resources result in significant environmental contamination, characterized by substantial land degradation, the generation of substantial quantities of waste materials, including mine and flotation tailings, ash, sulphur dioxide, carbon dioxide, and significant volumes of wastewater, as well as incidents of oil spills (Jovanović et al., 2023). Pollution is a significant factor in climate change, as it not only disrupts the natural balance of ecosystems but also results in the degradation of habitats and a subsequent decline in biodiversity (Szabo et al., 2022).

Various studies examining the effects of the mining business on environmental pollution and sustainable development emphasize the need for modifying current

practices within the mining sector to safeguard the environment, human well-being, and accomplish sustainable development (Pouresmaieli et al., 2023). These modifications suggest adopting sustainable business practices and suitable knowledge management methods. Knowledge management enhances the distribution of knowledge inside an organization (Olan et al., 2022). It supports the generation of innovation to achieve sustainable business outcomes (de Bem Machado et al., 2021). Consequently, the organization endeavours to incorporate the interplay between nature and society into novel green knowledge conceptual frameworks (Borah et al., 2021). Green knowledge encompasses more than just information on the environment. It encompasses various approaches and considerations for responding to this situation and pursuing sustainable environmental, social, and economic growth (Malik et al., 2023).

GKM can be conceptualized as a system comprising five components: green knowledge acquisition, green knowledge storage, green knowledge sharing, green knowledge application, and green knowledge creation (Yu et al., 2022). Green knowledge acquisition pertains to the process through which a company acquires, extracts, and organizes knowledge of environmental preservation and conservation (Mohamad et al., 2020). While learning through knowledge creation or acquisition, organizations also experience knowledge loss due to the inability to retain specific critical components (Serenko, 2022). Therefore, organizations must establish a proficient system for knowledge storage. Green knowledge sharing involves disseminating and exchanging environmentally conscious knowledge among various parties, such as colleagues, competitors, suppliers, and other stakeholders. The objective is to foster innovative approaches, technologies, tools, and techniques that can effectively mitigate or reduce the adverse impacts of business operations on the natural environment (Sahoo et al., 2022).

Sharing knowledge is intricately connected to applying knowledge, as it allows individuals to put their knowledge into practice (Chin et al., 2022). Organizations can gain a competitive advantage by implementing environmentally innovative ideas, procedures, and technologies (Ahmadi-Gh and Bello-Pintado, 2022). This pertains to the assertion made by Ikujiro Nonaka, widely regarded as the pioneer of knowledge management, that sharing and applying knowledge facilitates the generation of novel knowledge and the development of fundamental capabilities inside organizations. Information sharing and application are closely tied to knowledge development (Huang et al., 2022). Green knowledge creation refers to generating novel content, ideas, or concepts explicitly pertaining to the environment through the interaction of tacit and explicit knowledge within an individual, group, or organization (Abbas and Khan, 2022).

Research has demonstrated that knowledge management yields favourable outcomes for sustainable business results. Mikalauskiene and Atkociuniene (2019) conducted a study examining the influence of knowledge management on sustainable development. The findings indicate that organizations aspiring to promote social well-being, environmental preservation, and social health must establish an environment conducive to facilitating knowledge processes. Gómez-Marín et al. (2022) examined the significance of knowledge management in facilitating the adoption of sustainable business practises within the construction industry. This was

achieved via the proposition of a comprehensive roadmap. Knowledge management facilitates the dissemination of valuable information and intellectual assets, thereby significantly contributing to an organization's long-term viability (Zhang et al., 2022). In a study conducted by Alam et al. (2023), the enhancement of corporate sustainability and adherence to sustainable development principles are contingent upon effective knowledge management practises and the establishment of robust channels for information exchange between the organization and its external environment.

The Indonesian government has committed to attain a state of net-zero emissions by 2060 while concurrently aiming to decrease the intensity of its greenhouse gas emissions by 41% before 2030. To achieve a harmonious equilibrium between mitigating the detrimental ramifications of climate change and fostering sustainable economic growth, Indonesian authorities are to acknowledge the capacity of their nation to curtail emissions (Raihan et al., 2023). One approach to addressing the complex yet critical issue of emission reduction is examining the significance of many factors that influence the level of emissions. Since the mining sector is one of the most significant emission contributors (Cox et al., 2022), creating ecological knowledge within mining organizations to mitigate the problem is compulsory (Chen et al., 2022).

Thus, we hypothesize:

Hypothesis 1: Green knowledge acquisition positively affects coal mining corporate sustainable development.

Hypothesis 2: Green knowledge storage positively affects coal mining corporate sustainable development.

Hypothesis 3: Green knowledge sharing has a positive effect on coal mining corporate sustainable development

Hypothesis 4: Green knowledge application positively affects coal mining corporate sustainable development.

Hypothesis 5: Green knowledge creation positively affects coal mining corporate sustainable development.

The following section of this article provides an overview of the materials and methods employed, followed by a presentation of the results, a discussion of the findings, and finally the conclusions drawn from the study together with recommendations based on the outcomes.

2. Materials and methods

The present investigation adopted a cross-sectional research design, applying purposive random sampling. The authors used snowball sampling to collect data from participants within personal networks and social media platforms. A web-based survey was distributed to employees of Adaro Energy Ltd. and Bukit Asam Prima Ltd., the two largest coal operators in South Kalimantan, Indonesia. The survey was conducted between February 22 and July 24, 2023. The survey conducted garnered a total of 320 replies from the cohort of employees. 300 responses were considered genuine, demonstrating a noteworthy response rate of 93.75%. Hair et al. (2020) conducted a study that proposed detailed guidelines for determining the minimal

sample size. Assuming that the quantity of latent variables does not exceed seven and a minimum of three observable variables measures each latent variable, it is recommended that the minimum sample size should be at most 150 cases. The current study utilized a set of 36 measurable variables, and our sample size of 320 exceeds the minimum of 150.

The largest ethnic group in South Kalimantan is the Banjarese, making up the majority of the sample. In addition, South Kalimantan is home to a diverse population of various ethnic groups, such as the Dayak people, Malays, and several sub-ethnic groups. These individuals originate from urban centers such as Banjarmasin or mining communities in more remote areas, thereby bringing diverse perspectives and experiences to the study.

South Kalimantan, located in Indonesia's Kalimantan province, provides an enthralling setting for investigating knowledge management strategies in the mining industry. The province's extensive mineral resources, like as coal, gold, and diamonds, have attracted significant mining activity, making it an important contributor to Indonesia's economic success. This mining activity, however, has prompted concerns about the environmental and social effects, emphasizing the need for sustainable practices. Several elements combine to make South Kalimantan an appropriate case study for diving into mining knowledge management.

The mining landscape of South Kalimantan includes large-scale operations, small-scale artisanal mining, and everything in between. This variety allows for a broad picture of knowledge management difficulties and opportunities at various mining scales. Indonesia's rich cultural legacy in South Kalimantan, which emphasizes community and collaboration, provides a unique context for investigating how knowledge management approaches might be tailored to accord with local values and customs. The province's diverse ecosystems, including rainforests, wetlands, and coastal areas, are especially vulnerable to mining's effects. This increased environmental sensitivity emphasizes the significance of effective knowledge management in mitigating these effects.

The mining industry in South Kalimantan has adopted a comprehensive strategy for incorporating green knowledge integration. Knowledge transfer programs facilitate the empowerment of employees by equipping them with expertise in sustainability, whilst technical upgrades prioritize the utilization of cleaner energy sources and the enhancement of resource efficiency. The act of collaborating facilitates the exchange of knowledge, while the implementation of environmental impact assessments serves as a guiding framework for the adoption of responsible mining methods. The integration of sustainability objectives into corporate plans facilitates the harmonization of economic prosperity with the responsible management of the environment. The aforementioned endeavors have resulted in economic advantages, diminished ecological consequences, and improved business standing.

The research employed a seven-point Likert scale to assess the participants' expressions on all examined parameters. Green knowledge management echoed in green knowledge acquisition, green knowledge storage, green knowledge sharing, green knowledge application, and green knowledge creation was measured with 26 items adapted from Yu et al. (2022). Corporate sustainable development reflecting

economic, social, and environmental sustainability was measured with 10 items adopted from Jovanović et al. (2023). The relationship among variables is depicted in **Figure 1**.

The preliminary stage involved employing descriptive statistics to elucidate the characteristics of the research participants and their overall perception of variables. In the following stage, we utilize the Statistical Package for the Social Sciences (SPSS) Amos software to implement covariance-based structural equation modeling (CB-SEM). The selection of structural equation modeling (SEM) as the preferred method for testing the theory is based on the proposition that specific variables do not impact green knowledge management and that certain variables related to corporate sustainable development are not associated with particular factors. The model's relationships are validated using a comprehensive measurement recommended by Zhang et al. (2020). This measurement entails the examination of several indicators, including the Chi-square (χ^2), Minimum Sample Discrepancy Function (χ^2/df), Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA).
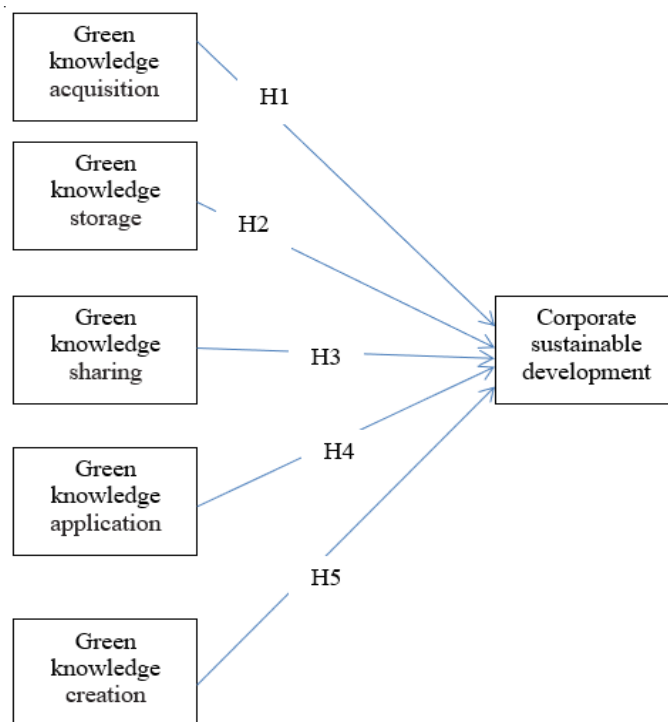

Figure 1. Relationship among construct.

Hypothesis testing involves examining the likelihood of each path's direct effects. A probability equal to or less than 0.05 is necessary to establish a substantial effect. Discriminant validity is demonstrated by examining factor loadings, which requires a minimum criteria of 0.50 for factor loadings to be acceptable (Hair et al., 2020). The model's reliability is determined using the classical coefficient alpha, with a threshold of 0.60 or above (Bonett and Wright, 2014).

Jovanović et al. (2023) identified 10 essential elements of CSD: responsible storage, emission reduction technology, time-based improvement, environmental

report transparency, health and safety, community relations, profit focus, input efficiency, waste cost reduction, and waste revenue. Using the same method, we labeled Yu et al. (2022) GKM structures. We classified external stakeholder involvement, internal stakeholder collaboration, eco-friendly practices training, effective information systems, and promoting sustainable offerings as green knowledge acquisition. Green knowledge storage elements include eco-friendly practices, sustainability information management, retrieval systems, competition analysis, and knowledge retention. Environmental discussions, structured information sharing, learning sharing tools, environmental innovation recognition, communication channels, and stakeholder education comprise green knowledge sharing. Knowledge application includes regulatory adherence, expertise application, experiential learning, information-driven methods, and eco-friendly dedication. Knowledge creation elements include data-driven goods, knowledge exchange, innovation rewards, eco-collaborations, and continual improvement.

3. Results

The analysis of the demographic profiles of respondents encompasses factors such as gender, age, educational attainment, length of current employment, and other relevant variables. The data indicates that the male demographic constituted the majority of respondents (80%), with a significant proportion (65%) above 35. Moreover, a considerable proportion of the participants had pursued tertiary education, with a majority having completed an associate degree (70%), while the remainder had obtained a bachelor's degree or higher (30%). The data reveals that a significant proportion of the respondents, precisely 70%, have been gainfully employed in the coal mining industry for a decade. Subsequently, 30 % of the employees have been affiliated with their organizations for five years. Only 5 respondents (1.66%) have rendered their services to the organization for less than five years. **Table 1** exhibits the mean of every variable.

Table 1. Variable means.

Items	Mean	Std. Deviation
Responsible storage	3.823	1.929
Emission reduction technology	4.496	1.794
Time-based improvement	3.696	1.789
Environmental report transparency	4.956	1.841
Health & safety	5.083	1.569
Profit focus	5.710	1.385
Input efficiency	6.380	1.202
Waste cost cut	4.623	1.488
Waste revenue	5.253	1.803
Corporate sustainable development mean (Y)	4.891	1.645
External stakeholder engagement	6.596	0.797

Table 1. (*Continued*).

Items	Mean	Std. Deviation
Internal stakeholder collaboration	6.486	0.863
Eco-friendly practices training	5.250	1.503
Effective information system	6.350	1.063
Promoting sustainable offerings	5.083	1.874
Knowledge acquisition mean (X^1)	5.953	1.480
Eco-friendly practices knowledge	5.806	1.571
Sustainability information management	5.203	1.953
Retrieval system	5.640	1.561
Competitor analysis	5.090	1.592
Knowledge retention	4.753	1.802
Knowledge storage mean (X^2)	5.298	1.695
Environmental discussions	5.870	1.460
Structured knowledge sharing	4.913	2.076
Learning and sharing tools	5.073	1.668
Environmental innovation recognition	4.860	1.891
Communication channels	4.893	2.096
Educating stakeholder	5.203	1.767
Knowledge sharing mean (X^3)	5.135	1.8271
Regulation adherence	4.920	1.791
Applying expertise	5.236	1.805
Experiential learning	4.930	1.846
Information-driven strategies	5.483	1.816
Eco-friendly dedication	5.870	1.397
Knowledge application mean (X^4)	5.287	1.731
Data-driven products	5.566	1.583
Promoting knowledge exchange	5.506	1.083
Rewarding innovation	5.236	1.805
Eco-collaborations	4.930	1.846
Continuous improvement	5.483	1.816
Knowledge creation mean (X^5)	5.344	1.626

The average score of 4.891 indicates that people in the mining business have a moderately optimistic view of corporate sustainable development. This shows that they are open to putting sustainability practices into their business processes, even if they could be more excited about it. The moderate mean suggests respondents are open to accepting CSD practices, but there may be some reservations or caution. They are ready to participate in sustainable projects but might need more information,

help, or a clearer picture of the benefits to accept and use CSD fully. This could be due to the mining business facing unique problems and having to think about the environment in a complicated way.

Rated the highest, the elevated mean value of 5.953 for knowledge acquisition indicates that mining companies actively acquire knowledge regarding environmentally favorable practices. This increased emphasis on knowledge acquisition might be attributable to Indonesia's adoption of EITI (Basuki et al., 2021). However, most of all, the mining industry has realized that the success or failure of an organization is largely contingent upon its capacity to acquire and retain knowledge (Rajiani and Normuslim, 2023). The elevated average value for knowledge acquisition is consistent with the mining industry's goal to mitigate its environmental footprint. The proactive nature of this approach exemplifies a dedication to improving sustainable practices by acquiring and incorporating knowledge from diverse external and internal sources.

The moderate mean (5.298) for knowledge storage (X^2) illustrates the proactive attitude of the mining industry towards maintaining organized knowledge repositories. This emphasis corresponds with variables associated with the storage of knowledge about eco-friendly practices, sustainability management, retrieval efficiency, competitor analysis, and knowledge retention. The industry's commitment to organized information management originates from its recognition of its crucial role in addressing regulatory requirements, mitigating risks, ensuring environmental responsibility, and optimizing operational efficiency within the complex mining environment. The moderate mean for knowledge sharing (X^3) = 5.135 underscores the mining industry's awareness of the significance of sharing environmental knowledge. While active knowledge sharing is evident, the moderate mean hints at an opportunity to enhance these exchanges' structure, depth, and effectiveness. Structured discussions, systematic knowledge sharing methods, integrated tools, innovation recognition, refined communication, and strategic stakeholder education could all contribute to addressing the complex environmental challenges that the mining industry faces. Knowledge application refers to the use of acquired knowledge in real-world situations. In the context of the mining industry, the average score of 5.287 indicates that mining companies are moderately proactive in implementing their knowledge of environmentally friendly practices to navigate complex environmental challenges effectively. The arithmetic mean emphasizes their dedication to practical application across multiple dimensions, resulting in ethical, effective, and sustainable mining practices. The process of knowledge creation entails the generation of novel insights, ideas, and solutions by integrating pre-existing information. Within the mining business, a proactive inclination exists towards cultivating innovation and creativity, as indicated by the mean score of 5.344 out of 7. The mean value suggests that mining corporations are actively involved in generating new information to promote sustainable practices and successfully tackle environmental concerns. The industry's dedication to generating positive change and maintaining long-term sustainability in mining practices is evident through its focus on data-driven products, knowledge exchange, innovation recognition, eco-collaborations, and continual development.

The range of standard deviation values spans from around 0.797 to 2.096. The observed range of values demonstrates different levels of dispersion among the data points relative to the average. A more significant standard deviation in some items may be expected due to the nature of the variables being measured, which are relatively new, and the diversity of the sample population.

Table 2 shows the operationalization and validation of the instrument. The factor loadings for all items exceeded the threshold of 0.50, as recommended by Hair et al. (2020). Additionally, the Cronbach α coefficient for each observed variable exceeded the established threshold values of 0.60 (Bonett and Wright, 2014). Therefore, it can be concluded that the instrument has met the criteria for validity and reliability.

Table 2. Validity and reliability measurement.

Construct	Items	Factors loading	Cronbach Alpha
Corporate sustainable development	1. Our organization responsibly stores ash.	0.746	0.804
	2. Our organization prioritizes using technology to limit harmful material emissions.	0.700	0.806
	3. Our organization's production has a lower negative environmental impact than in past years.	0.713	0.805
	4. Our organization regularly updates the public on its environmental impacts and dangers.	0.689	0.802
	5. We adhere to the occupational health and safety programme.	0.693	0.802
	6. Our leadership prioritizes the rights and needs of indigenous people and the local community.	0.746	0.804
	7. In our organization, profit maximization is the fundamental goal.	0.767	0.804
	8. In recent years, our business has cut input expenses while maintaining production levels.	0.771	0.802
	9. Our waste management expenses per unit of output have dropped in recent years.	0.675	0.812
	10. Our organization maximizes revenue from the selling of waste.	0.664	0.812
Knowledge acquisition	1. Our company constantly gathers information on eco-friendly products and services from external stakeholders.	0.765	0.808
	2. Internal stakeholders provide information on eco-friendly products and processes to my organization.	0.771	0.808
	3. My company offers frequent training to staff on eco-friendly products and practices.	0.626	0.807
	4. Our well-developed information system provides staff with the necessary information.	0.749	0.809
	5. My company promotes employee learning about eco-friendly products and services.	0.780	0.813

Table 2. (*Continued*).

Construct	Items	Factors loading	Cronbach Alpha
Knowledge storage	1. My organization has appropriate knowledge about eco-friendly products and processes.	0.773	0.815
	2. Our information system effectively manages information about eco-friendly products and processes.	0.775	0.817
	3. Our information system makes it easy to retrieve problem-specific information.	0.769	0.807
	4. We have extensive knowledge of our competitors' business practices and environmental impact.	0.680	0.805
	5. If a person leaves, our information system retains their finest knowledge.	0.569	0.801
Knowledge sharing	1. Our employees discuss new environmental changes and share knowledge	0.680	0.805
	2. Sharing and learning from each other is organized.	0.671	0.804
	3. The latest tools and technologies let us learn and share.	0.586	0.808
	4. My company promotes employees who contribute new ideas and knowledge to improve environmental protection.	0.632	0.808
	5. Email, training, and workshops inform my employees of environmental and commercial developments.	0.711	0.804
	6. We frequently educate our consumers, suppliers, and stakeholders about nature.	0.724	0.803
Knowledge application	1. Our company follows environmental rules in its activities.	0.514	0.807
	2. My company applies expertise to create eco-friendly products and services.	0.737	0.802
	3. We learn from our mistakes and experiences to enhance our environmental performance.	0.741	0.800
	4. We apply the obtained information to create eco-friendly company strategies.	0.775	0.799
	5. We are committed to applying eco-friendly strategies.	0.701	0.810
Knowledge creation	1. My company creates eco-friendly products and services using existing data.	0.895	0.808
	2. The management promotes debates and discussions to generate new knowledge.	0.895	0.808
	3. Management values and rewards employees who propose innovative ideas, information, and solutions.	0.737	0.802
	4. We partner with other firms to develop eco-friendly products and methods.	0.741	0.800
	5. We regularly assess new suggestions for improvement.	0.775	0.799

The comprehensive model of the research is illustrated in **Figure 2.**
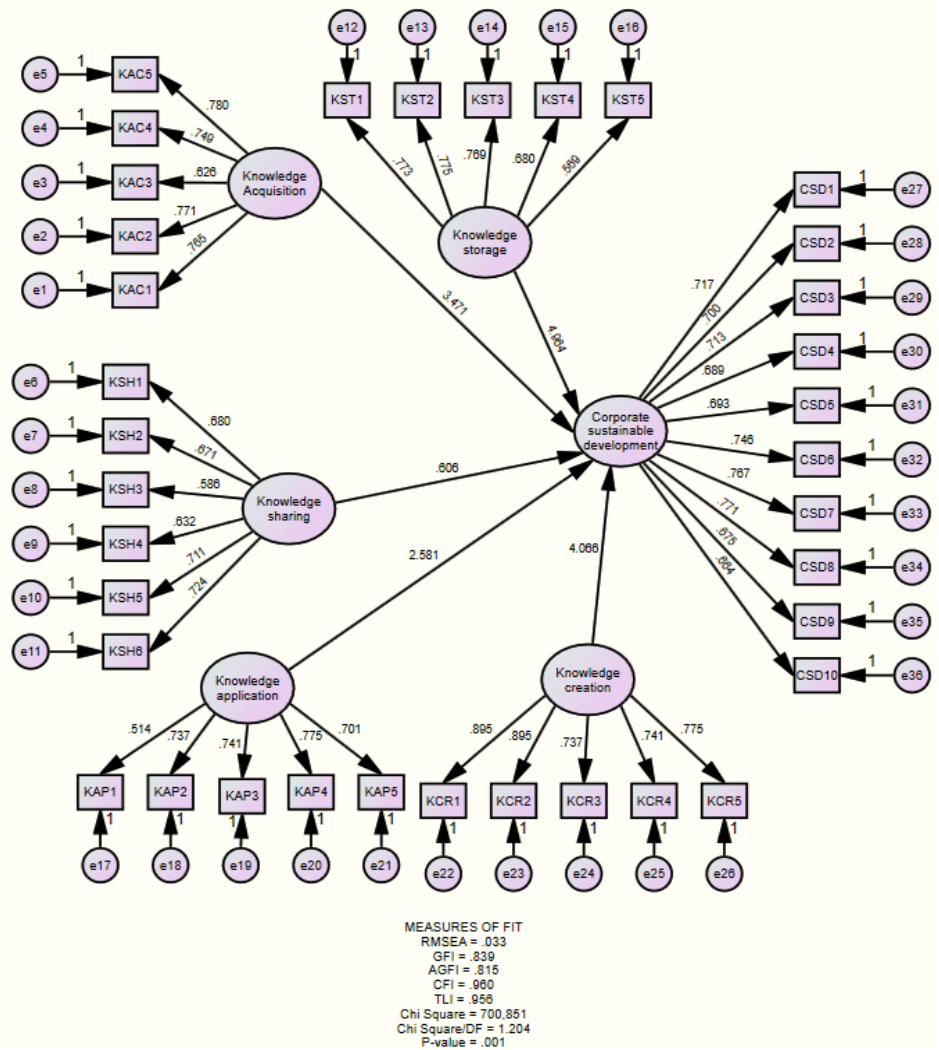
Figure 2. Research full model research.

The evaluation of the goodness of fit (GoF) criterion in **Figure 2** reveals that the χ^2 value is 700,851, accompanied by a probability value of 0.001. This model is currently considered inadequate as the probability value is below the threshold of 0.05. Nevertheless, it is possible to reassess the adequacy of the model by considering alternative criteria. For instance, the model's goodness of fit may be evaluated based on a CMIN/DF ratio of 1.204, a GFI value of 0.839, and an AGFI value of 0.815. These values indicate that the model is marginally fit.

Additionally, the model's fit can be assessed using other indices, such as a CFI value of 0.960 (exceeding the threshold of 0.95), a TLI value of 0.956 (exceeding the threshold of 0.95), and an RMSEA value of 0.033 (below the threshold of 0.08). The model has been fitted with the research data and has met the necessary criteria. Although the GFI and AGFI values fall below the designated threshold, they remain within an acceptable range (Schuberth et al., 2022).

Examining hypotheses involves assessing Critical Ratio (CR) values and the significance values pertaining to the influence between variables. The acceptance of the hypothesis occurs when the significance value is below 0.05, as stated by Hair et

al. (2020). The findings of the structural equation modeling analysis conducted to examine the stated hypothesis are displayed in **Table 3**.

Table 3. Summary of path relationship among constructs.

Constructs	Estimate	CR	P	Conclusion
Green knowledge acquisition → CSD	0.197	3.471	0.001	Significant
Green knowledge storage → CSD	0.295	4.964	0.000	Significant
Green knowledge sharing → CSD	0.033	0.606	0.554	Not significant
Green knowledge application → CSD	0.141	2.581	0.003	Significant
Green knowledge creation → CSD	0.235	4.066	0.000	Significant
$R = 0.785$	$R^2 = 0.617$			

The hypothesis test produced the following results. The first hypothesis suggests that the acquisition of green knowledge positively influences the sustainable development of Indonesian coal mining companies. The direct effect size of 0.197 indicates that sustainable development outcomes also increase for each unit increase in green knowledge acquisition. The significance probability value of 0.001 indicates that the occurrence of this effect by coincidence is improbable. The value of 3,471 for the critical ratio is greater than the threshold, providing statistical support for accepting this hypothesis. This is consistent with the notion that adopting eco-friendly practices through acquiring knowledge can improve the sustainability of coal mining operations.

The second hypothesis suggests that storing green knowledge contributes positively to the sustainable growth of Indonesian coal mining companies. The significant direct effect of 0.295% significantly influences sustainable development outcomes. This effect is statistically significant, as indicated by the deficient probability value 0.000. Moreover, the critical ratio value of 4.964 is well above the threshold, indicating that acceptance of the hypothesis is strongly supported. This highlights the significance of retaining and applying green knowledge to promote sustainable coal mining practices.

In contrast to the first two hypotheses, the third hypothesis suggests that sharing green knowledge may not substantially impact the sustainable development of Indonesian coal mining companies. The direct effect size of 0.033 is modest, and the probability value of 0.554 exceeds the conventional cutoff of 0.05. In addition, the value of 0.606 for the critical ratio lies below the acceptable range, resulting in the rejection of this hypothesis. Knowledge exchange may not be the primary driver of sustainable development in the coal mining industry.

The fourth hypothesis asserts that applying green knowledge positively affects the sustainable development of Indonesian coal mining companies. The direct effect size of 0.141 suggests that sustainable development outcomes are moderately impacted. The significance probability value of 0.003 indicates statistical significance, and the value of the critical ratio, 2.581, supports accepting this hypothesis. This highlights the importance of green knowledge implementation in promoting sustainable practices in the coal mining industry.

The fifth hypothesis asserts that the production of green knowledge contributes positively to the sustainable development of Indonesian coal mining companies. The direct effect size of 0.235 significantly affects sustainable development outcomes. The meager probability value of 0.000 suggests that statistical significance is substantial. In addition, the value of 4.066 for the critical ratio significantly exceeds the threshold, providing strong support for accepting this hypothesis. This highlights the significance of innovative green knowledge generation in advancing coal mining industry sustainability.

4. Discussion

The acquisition of green knowledge positively affects corporate sustainable development (CSD). This indicates that when mining companies actively pursue and acquire knowledge about sustainable practices, it can assist them in operating more sustainably (Mohamad et al., 2020). Mining companies can develop and implement sustainable operational strategies after acquiring green knowledge. In many instances, Indonesian and international environmental regulations are becoming more stringent (Lai, 2023; Abbas and Khan, 2022). Green knowledge acquisition ensures that mining companies operate within legal boundaries and avoid potential penalties or legal issues by keeping them abreast of these regulations, including the implementation of the Extractive Industries Transparency Initiative (EITI) as a prerequisite for the approval of new loans (Basuki et al., 2021). Therefore, acquiring green knowledge is a crucial investment for Indonesian mining companies because they can reduce their environmental impact, comply with regulations, and enhance their long-term sustainability (Rajiani and Normuslim, 2023).

Here are some specific examples of how Indonesian mining companies have utilized green knowledge acquisition. The world's largest copper and gold mine, PT Freeport Indonesia, has invested in a number of environmentally friendly initiatives, such as a water treatment facility that reduces water consumption by 70 percent and a waste management system that recycles 99 percent of its waste (Astuti, 2023). In the two companies where research was conducted, PT Adaro Energy, Indonesia's largest coal mining company, has devised a plan to reduce its greenhouse gas emissions by 41 percent by 2030. This plan includes investing in renewable energy initiatives and improving efficiency (Martha, 2022). Another company, PT Bukit Asam, has planted over 10 million trees to mitigate and achieve net zero carbon emissions in 2060 (Ramadhani, 2022). These are just a few examples of how Indonesian mining companies are reducing their environmental impact through green knowledge acquisition. As the mining industry continues to evolve, it is evident that Indonesian mining companies will place a greater emphasis on ecological knowledge acquisition.

The significance of green knowledge storage emphasizes the significance of systematically preserving and managing environmentally sustainable information and practices within organizations. In a world where environmental regulations and public scrutiny are increasing, the capacity to effectively store green knowledge is a competitive advantage (Bhandari et al., 2022). It enables businesses to maintain their sustainability efforts over time, adapt to changing conditions, and demonstrate their

commitment to long-term sustainability. This is consistent with global initiatives, such as the Sustainable Development Goals (SDGs) of the United Nations, which emphasize the necessity of responsible resource management and sustainable production (Wang et al., 2022). Since Indonesia is a significant mining nation, green knowledge storage is essential. Green knowledge storage can assist mining companies in achieving this objective by equipping them with the knowledge and resources necessary to make informed decisions regarding sustainable mining practices (Rajiani and Normuslim, 2023). Regardless of EITI adoption, currently, the Indonesian government is committed to sustainable development as evidenced in the investigation (Astuti, 2023; Martha, 2022; Ramadhani, 2022), and the mining industry is a substantial economic contributor (Hidayat et al., 2022). Mining companies can safeguard the environment and contribute to Indonesia's sustainable development by storing and managing green knowledge effectively.

Although green knowledge sharing was not statistically significant in this study compared to previous findings (Sahoo et al., 2022; Chin et al., 2022), its significance in contemporary world development must be addressed. Knowledge sharing is fundamental to organizational learning and innovation (Ahmadi-Gh and Bello-Pintado, 2022; Huang et al., 2022; Rajiani and Nurmuslim, 2023). Collaboration and information exchange are crucial for addressing complex sustainability challenges in a global context. While knowledge sharing does not directly impact CSD in this specific analysis, it remains a critical factor in keeping abreast of industry best practices and emerging sustainability trends. In a global context, it promotes the dissemination of green knowledge across industries and regions, thereby facilitating collective sustainability efforts.

In countries characterized by collectivism, such as Indonesia, Japan and China, withholding knowledge is often perceived as a means of exerting power. The rationale behind this phenomenon is information's potential to influence individuals and assert dominance in various circumstances. Within various cultural contexts, individuals with the means to acquire information are frequently perceived as possessing more significant power than others who lack such access (Hofstede et al., 2010). Consequently, individuals in this study may exhibit a reduced propensity to disseminate pertinent information to their peers, even when it directly relates to the current undertaking. Further, individuals under such circumstances may be less motivated to engage in decision-making processes instead of deferring to their superiors (Rajiani and Kot, 2020). Therefore, managers must apply specific strategies to encourage employees to share their knowledge, for example, reward those willing to share their knowledge on green issues. Besides, the high-power distance of Indonesia (78 out of 100) also affects the tendency of hiding knowledge. Employees in countries with high power distance, such as Indonesia, may be less inclined to share their knowledge due to various factors, including: Respect for authority is highly valued in cultures with a high-power distance, where there is a strong emphasis on showing deference to figures of authority. This situation can create challenges for employees who wish to challenge or express disagreement with their superiors, even if they possess valuable knowledge to contribute.

Employees in high power distance cultures may experience fear of reprisal, as they may be hesitant to share their knowledge without obtaining permission from

their superiors due to the potential for reprimand or punishment. This perception arises from the belief that superiors possess the authority to influence the professional paths and livelihoods of their subordinates. In high power distance cultures, employees may have a lower tendency to trust their colleagues, particularly those who hold lower positions. This lack of trust can be attributed to the cultural norms that emphasize hierarchical relationships. This fear can make individuals hesitant to share their knowledge, as they worry that it may be used against them or that they won't be given proper credit for it. Apart from cultural factors, structural factors may also play a role in contributing to the knowledge-sharing gap in countries with high power distance. For instance, organizations in these countries might possess less advanced knowledge management systems and may be less inclined to promote or incentivize employees to share their knowledge.

In collectivist cultures, people are more likely to value and participate in essential activities to the group. By rewarding knowledge sharing, organizations can signal to employees that it is a necessary behavior valued by the organization. When people are rewarded for sharing knowledge, they are more likely to repeat that behavior in the future. This is because rewards provide positive reinforcement, which makes the behavior more likely to occur again. When people are rewarded for sharing knowledge, they are more likely to trust that others will also share their knowledge. This trust can help create a more open and collaborative environment conducive to knowledge sharing (Nguyen et al., 2021). It is important to note that rewards are not the only factor that can encourage knowledge sharing in collectivist cultures. Other factors, such as a supportive organizational culture, clear expectations, and opportunities for social interaction, can also play a role. However, rewards can be valuable for encouraging knowledge sharing in collectivist cultures (Pereira and Mohiya, 2021). These studies suggest that applying green knowledge is integral to corporate sustainable development (Gómez-Marín et al., 2022; Zhang et al., 2022; Alam et al., 2023). Companies can reduce their environmental impact by applying green knowledge, improving efficiency, and gaining a competitive advantage. From a global development perspective, this reflects the increasing importance of translating sustainability principles into concrete actions to address global challenges, including climate change and biodiversity loss (Yi et al., 2023; Cai et al., 2023).

In Indonesian society, as in many other parts of the globe, the significance of green knowledge application has far-reaching implications for environmental sustainability and social welfare. Due to awareness of its abundant biodiversity, unique ecosystems, and susceptibility to climate change (Astuti, 2023; Martha, 2022; Ramadhani, 2022), as well as pressure from donor countries (Basuki et al., 2021), Indonesian society has become more concerned about environmental issues. Thus, implementing green knowledge is crucial for mitigating these obstacles. Green knowledge application is consistent with Indonesia's dedication to achieving sustainability goals, including those enumerated in the Sustainable Development Goals (SDGs) of the United Nations (Shehzad et al., 2022). Indonesian businesses contribute to national and global sustainability initiatives by applying green knowledge to mining operations and other industries. This includes objectives regarding renewable energy, responsible consumption, and marine and terrestrial life

(Astuti, 2023; Martha, 2022; Ramadhani, 2022). Natural resources abound in Indonesia, and responsible resource management is essential for the country's sustainable development. The application of green knowledge contributes to resource conservation, thereby reducing the harmful effects of mining on forests, rivers, and ecosystems. Global environmental regulations and standards are evolving rapidly (Rodríguez-Espíndola et al., 2022). Indonesian businesses must acclimate to these changes to remain competitive in global markets and meet international standards. The application of green knowledge enables businesses to navigate these ever-changing standards effectively.

The significance of green knowledge creation corresponds to the transforming global innovation and sustainability landscape. Fostering a culture of innovation and continuous learning is crucial for addressing sustainability issues in the current world (Rajiani and Nurmuslim, 2023). Green knowledge creation is a forward-looking strategy in which organizations actively endeavor to develop new environmentally friendly solutions and practices. This is consistent with global aspirations for sustainable innovation, which entail the development of technologies and approaches that address current environmental challenges and promote long-term sustainability and resilience in the face of future uncertainties (Sanchez-Planelles et al., 2022).

Due to Indonesia's unique environmental challenges, cultural values, and economic aspirations, green knowledge creation is significant in the country's context. Indonesia is renowned for its abundant biodiversity and natural beauty, but it also confronts significant environmental problems, such as deforestation, habitat loss, and air and water pollution (Hidayat et al., 2022). Green knowledge creation is essential because it enables organizations to develop innovative, sustainable solutions tailored to Indonesia's particular environmental requirements. Indonesia is committed to attaining the Sustainable Development Goals (SDGs) of the United Nations, which include clean energy, responsible consumption, and environmental protection objectives (Raihan et al., 2023). Green knowledge creation contributes to achieving these objectives by fostering the development of new technologies, practices, and methods that adhere to the principles of sustainable development. The Indonesian culture places a premium on community and ecological harmony. Green knowledge creation can enhance community engagement when rooted in local cultural values, making sustainability initiatives more effective and acceptable to local stakeholders (Rajiani et al., 2023). As a developing nation, Indonesia aims for economic growth while mitigating environmental harm. Green knowledge creation encourages the creation of sustainable business models and ecological technologies in support of economic development. This is consistent with Indonesia's desire to create a resilient and sustainable economy.

In conclusion, these variables' significance in contemporary global development aligns with the global transition toward sustainability and responsible business practices. These variables reflect the growing recognition that organizations, including those in the mining industry, are essential in addressing urgent environmental challenges and contributing to global sustainable development objectives. Although their significance may vary across contexts and industries, their significance in the context of sustainable development remains undeniable.

Local communities play an important role in the mining landscape of South Kalimantan. They frequently suffer the brunt of the socio-environmental consequences of mining activities. These effects might emerge as changes in land use patterns, deterioration of water quality, air pollution, and disruptions to traditional livelihoods. Recognizing these difficulties, mining companies have focused participation and partnership with local populations. This includes executing community development projects, creating job opportunities, and improving infrastructure, all with the goal of improving citizens' socioeconomic well-being. Mitigating socio-environmental consequences has proven to be a complicated task. South Kalimantan mining corporations have embraced environmental impact assessments and sustainable mining techniques in order to reduce negative effects on local ecosystems. Furthermore, they've built channels for ongoing communication with affected communities in order to address issues, receive feedback, and collaborate on mitigation initiatives. These efforts have resulted in concrete results, such as the restoration of mined areas, investments in community health and education, and the adoption of sustainable resource management techniques.

It is critical to recognize that comprehensive mitigation of socio-environmental consequences is an ongoing and complex process. Companies and local communities work together to address environmental concerns, adapt to changing circumstances, and develop new solutions. The success of these mitigation efforts is dependent on effective teamwork, compliance with environmental standards, and a firm commitment to long-term sustainability. Finally, the inclusion of local communities, collaborative initiatives, and adherence to sustainable mining practices have all played a role in mitigating socio-environmental consequences in the South Kalimantan mining industry. Consistent adherence to these principles is critical to ensuring that the mining industry can coexist with local populations in a mutually profitable and environmentally responsible manner.

5. Conclusion and recommendations

Within the specific context of the mining sector in South Kalimantan, Indonesia, this study has emphasized the crucial significance of knowledge management activities in advancing sustainability principles within operational procedures. The mining industry's substantial influence on the economy, environment, and society underscores the need for a proactive strategy to reduce adverse consequences and amplify its benefits to sustainable development. The results of this study indicate that four essential components of knowledge management, specifically green knowledge acquisition, green knowledge storage, green knowledge application, and green knowledge creation, directly impact the long-term viability of businesses operating in the mining industry. Nevertheless, it is essential to acknowledge a subtle component of the research results: the impact of collectivist cultural norms on the direct correlation between disseminating environmentally friendly knowledge and advancing sustainable practices within corporations. Collaboration and information sharing in Indonesia are impacted by communal ideals and conventions, which are vital in collectivist cultures in many country regions. The research discovered that

under a collectivist cultural framework, the direct influence of sharing green knowledge on the sustainable development of corporations may be impeded.

This study's focus on a specific region and two prominent mining corporations is one of its limitations. The findings may need to be more generalizable to regions or smaller mining companies with different cultural norms and operational contexts. Although the study touched on the impact of collectivist cultural norms on knowledge sharing, it did not delve into the complexities of cultural factors. Future research could investigate this aspect in greater depth to comprehend how cultural values impact sustainability initiatives. In addition, future research could compare knowledge management practices and their impact on sustainability in diverse cultural contexts in Indonesia and other collectivist nations. This would expand our understanding of the relationship between culture, knowledge exchange, and sustainability outcomes.

Author contributions: Conceptualization, IR and RW; methodology, BB; software, BB; validation, IR, and RW; formal analysis, IR; investigation, BB; resources, BB; data curation, BB; writing—original draft preparation, RW; writing—review and editing, IR; visualization, RW; supervision, RW; project administration: BB. All authors have read and agreed to the published version of the manuscript.

Conflict of interest: The authors declare no conflict of interest.

References

Abbas, J., & Khan, S. M. (2022). Green knowledge management and organizational green culture: an interaction for organizational green innovation and green performance. Journal of Knowledge Management, 27(7), 1852–1870. https://doi.org/10.1108/jkm-03-2022-0156

Ahmadi-Gh, Z., & Bello-Pintado, A. (2022). Why is manufacturing not more sustainable? The effects of different sustainability practices on sustainability outcomes and competitive advantage. Journal of Cleaner Production, 337, 130392. https://doi.org/10.1016/j.jclepro.2022.130392

Alam, S., Zhang, J., Khan, N., & Ali, A. (2023). Mechanism of knowledge management process towards minimizing manufacturing risk under green technology implementation: an empirical assessment. Environmental Science and Pollution Research, 30(18), 51977–51994. https://doi.org/10.1007/s11356-023-25945-2

Astuti, F. W. (2023). 5 Freeport Indonesia's Papua Environmental Preservation Commitments (Indonesian). Available online: https://www.idntimes.com/life/inspiration/firda-widi-astuti/pelestarian-lingkungan-oleh-freeport-indonesia-c1c2 (accessed on 12 December 2023).

Azam, W., Khan, I., & Ali, S. A. (2022). Alternative energy and natural resources in determining environmental sustainability: a look at the role of government final consumption expenditures in France. Environmental Science and Pollution Research, 30(1), 1949–1965. https://doi.org/10.1007/s11356-022-22334-z

Basuki, B., Rajiani, I., & Widyanti, R. (2021). Boosting sustainability performance through supply chain quality management in the mining industry. Polish Journal of Management Studies, 24(2), 41–54. https://doi.org/10.17512/pjms.2021.24.2.03

Bhandari, K. R., Ranta, M., & Salo, J. (2022). The resource-based view, stakeholder capitalism, ESG, and sustainable competitive advantage: The firm's embeddedness into ecology, society, and governance. Business Strategy and the Environment, 31(4), 1525–1537. Portico. https://doi.org/10.1002/bse.2967

Bonett, D. G., & Wright, T. A. (2014). Cronbach's alpha reliability: Interval estimation, hypothesis testing, and sample size planning. Journal of Organizational Behavior, 36(1), 3–15. https://doi.org/10.1002/job.1960

Borah, P. S., Dogbe, C. S. K., Pomegbe, W. W. K., Bamfo, B. A., & Hornuvo, L. K. (2021). Green market orientation, green innovation capability, green knowledge acquisition and green brand positioning as determinants of new product success. European Journal of Innovation Management, 26(2), 364–385. https://doi.org/10.1108/ejim-09-2020-0345

Bresciani, S., Rehman, S. U., Giovando, G., & Alam, G. M. (2022). The role of environmental management accounting and environmental knowledge management practices influence on environmental performance: mediated-moderated model. Journal of Knowledge Management, 27(4), 896–918. https://doi.org/10.1108/jkm-12-2021-0953

Cai, X., Khan, N. A., & Egorova, O. (2023). Transactional leadership matters in green creative behaviour through workplace learning and green knowledge management: moderating role of social network sites use. Personnel Review. https://doi.org/10.1108/pr-12-2020-0894

Chen, J., Jiskani, I. M., Lin, A., et al. (2022). A hybrid decision model and case study for comprehensive evaluation of green mine construction level. Environment, Development and Sustainability, 25(4), 3823–3842. https://doi.org/10.1007/s10668-022-02206-9

Chin, T., Shi, Y., Palladino, R., & Faggioni, F. (2022). A Yin-Yang dialectical systems theory of knowledge creation. Journal of Knowledge Management. https://doi.org/10.1108/jkm-07-2022-0524

Cox, B., Innis, S., Kunz, N. C., & Steen, J. (2022). The mining industry as a net beneficiary of a global tax on carbon emissions. Communications Earth & Environment, 3(1). https://doi.org/10.1038/s43247-022-00346-4

de Bem Machado, A., Secinaro, S., Calandra, D., & Lanzalonga, F. (2021). Knowledge management and digital transformation for Industry 4.0: a structured literature review. Knowledge Management Research & Practice, 20(2), 320–338. https://doi.org/10.1080/14778238.2021.2015261

Gómez-Marín, N., Cara-Jiménez, J., Bernardo-Sánchez, A., Álvarez-de-Prado, L., & Ortega-Fernández, F. (2022). Sustainable knowledge management in academia and research organizations in the innovation context. The International Journal of Management Education, 20(1), 100601. https://doi.org/10.1016/j.ijme.2022.100601

Hair, J. F., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. Journal of Business Research, 109, 101–110. https://doi.org/10.1016/j.jbusres.2019.11.069

Hatane, S. E., Tarigan, J., Kuanda, E. S., & Cornelius, E. (2021). The contributing factors of intellectual capital disclosures in agriculture and mining sectors of Indonesia and Thailand. Accounting Research Journal, 35(2), 196–218. https://doi.org/10.1108/arj-02-2020-0022

Hidayat, A. S., Rajiani, I., & Arisanty, D. (2022). Sustainability of Floodplain Wetland Fisheries of Rural Indonesia: Does Culture Enhance Livelihood Resilience? Sustainability, 14(21), 14461. https://doi.org/10.3390/su142114461

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). Cultures and Organizations: Software of the Mind, 3rd edition. McGraw Hill Professional.

Huang, W., Chau, K. Y., Kit, I. Y., Nureen, N., Irfan, M., & Dilanchiev, A. (2022). Relating Sustainable Business Development Practices and Information Management in Promoting Digital Green Innovation: Evidence From China. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.930138

Jahanmiri, S., Asadizadeh, M., Alipour, A., Nowak, S., & Sherizadeh, T. (2021). Predicting the Contribution of Mining Sector to the Gross Domestic Product (GDP) Index Utilizing Heuristic Approaches. Applied Artificial Intelligence, 35(15), 1990–2012. https://doi.org/10.1080/08839514.2021.1997225

Jovanović, V., Stanković, S., & Krstić, V. (2023). Environmental, Social and Economic Sustainability in Mining Companies as a Result of the Interaction between Knowledge Management and Green Innovation—The SEM Approach. Sustainability, 15(16), 12122. https://doi.org/10.3390/su151612122

Lai, Y. (2023). PDI-P takes aim at Prabowo-led food estate project. Available online: https://www.thejakartapost.com/indonesia/2023/08/19/pdi-p-takes-aim-at-prabowo-led-food-estate-project.html (accessed on 12 December 2023).

Li, Q., & Qamruzzaman, M. (2023). Innovation-Led Environmental Sustainability in Vietnam—Towards a Green Future. Sustainability, 15(16), 12109. https://doi.org/10.3390/su151612109

Lopes, J. M., Gomes, S., Pacheco, R., Monteiro, E., & Santos, C. (2022). Drivers of Sustainable Innovation Strategies for Increased Competition among Companies. Sustainability, 14(9), 5471. https://doi.org/10.3390/su14095471

Malik, M., Ali, M., Latan, H., & Chiappetta Jabbour, C. J. (2023). Green project management practices, green knowledge acquisition and sustainable competitive advantage: empirical evidence. Journal of Knowledge Management, 27(9), 2350–2375. https://doi.org/10.1108/jkm-06-2022-0466

Martha, F. P. (2022). Adaro (ADRO) seeks bank support to reduce carbon emissions (Indonesian). Available online: https://ekonomi.bisnis.com/read/20220406/44/1519552/tekan-emisi-karbon-adaro-adro-minta-dukungan-bank (accessed on 12 December 2023).

Mikalauskiene, A., & Atkociuniene, Z. (2019). Knowledge Management Impact on Sustainable Development. Montenegrin Journal of Economics, 15(4), 149–160. https://doi.org/10.14254/1800-5845/2019.15-4.11

Mohamad, A. A., Ramayah, T., & Lo, M. C. (2020). Sustainable Knowledge Management and Firm Innovativeness: The Contingent Role of Innovative Culture. Sustainability, 12(17), 6910. https://doi.org/10.3390/su12176910

Nguyen, M., Malik, A., & Sharma, P. (2021). How to motivate employees to engage in online knowledge sharing? Differences between posters and lurkers. Journal of Knowledge Management, 25(7), 1811–1831. https://doi.org/10.1108/jkm-08-2020-0649

Olan, F., Ogiemwonyi Arakpogun, E., Suklan, J., Nakpodia, F., Damij, N., & Jayawickrama, U. (2022). Artificial intelligence and knowledge sharing: Contributing factors to organizational performance. Journal of Business Research, 145, 605–615. https://doi.org/10.1016/j.jbusres.2022.03.008

Pereira, V., & Mohiya, M. (2021). Share or hide? Investigating positive and negative employee intentions and organizational support in the context of knowledge sharing and hiding. Journal of Business Research, 129, 368–381. https://doi.org/10.1016/j.jbusres.2021.03.011

Pouresmaieli, M., Ataei, M., & Nouri Qarahasanlou, A. (2023). A scientometrics view on sustainable development in surface mining: Everything from the beginning. Resources Policy, 82, 103410. https://doi.org/10.1016/j.resourpol.2023.103410

Raihan, A., Pavel, M. I., Muhtasim, D. A., Farhana, S., Faruk, O., & Paul, A. (2023). The role of renewable energy use, technological innovation, and forest cover toward green development: Evidence from Indonesia. Innovation and Green Development, 2(1), 100035. https://doi.org/10.1016/j.igd.2023.100035

Rajiani, I., & Normuslim, N. (2023). Knowledge management and organizational learning to improve the organizational performance of mines in Indonesia. Journal of Infrastructure, Policy and Development, 7(2), 2227. https://doi.org/10.24294/jipd.v7i2.2227

Rajiani, I., & Kot, S. (2020). Javanese Indonesia: Human Resource Management Issues in a Uniquely Collectivist Culture. Cultural Management: Science and Education, 4(2), 9–21. https://doi.org/10.30819/cmse.4-2.01

Rajiani, I., Prayitno, H. J., Kot, S., Ismail, N., & Iswarani, W. P. (2023). Developing Local Education Content Supplementary Textbook Innovation by Referencing to Women in Floating Market. Indonesian Journal on Learning and Advanced Education (IJOLAE), 5(2), 136–150. https://doi.org/10.23917/ijolae.v5i2.22005

Ramadhani, P. I. (2022). Bukit Asam prepares three strategies towards net zero emission (Indonesian). Available online: https://www.liputan6.com/saham/read/5093353/bukit-asam-siapkan-tiga-strategi-menuju-net-zero-emission (accessed on 12 December 2023).

Rodríguez-Espíndola, O., Cuevas-Romo, A., Chowdhury, S., et al. (2022). The role of circular economy principles and sustainable-oriented innovation to enhance social, economic and environmental performance: Evidence from Mexican SMEs. International Journal of Production Economics, 248, 108495. https://doi.org/10.1016/j.ijpe.2022.108495

Sahoo, S., Kumar, A., & Upadhyay, A. (2022). How do green knowledge management and green technology innovation impact corporate environmental performance? Understanding the role of green knowledge acquisition. Business Strategy and the Environment, 32(1), 551–569. https://doi.org/10.1002/bse.3160

Sanchez-Planelles, J., Segarra-Oña, M., & Peiro-Signes, A. (2022). Identifying different sustainable practices to help companies to contribute to the sustainable development: Holistic sustainability, sustainable business and operations models. Corporate Social Responsibility and Environmental Management, 29(4), 904–917. https://doi.org/10.1002/csr.2243