

THE INFLUENCE OF GREEN LEADERSHIP AND ENTREPRENEURSHIP ON THE SUSTAINABILITY OF MANUFACTURING COMPANIES: MEDIATION OF GREEN INNOVATION AND KNOWLEDGE MANAGEMENT

Muhammad Iqbal Abdul Rasyid

Universitas Indonesia, Indonesia

muhammad.iqbal19@ui.ac.id

Mone Stephanus

Universitas Indonesia, Indonesia

mone.stepanus@ui.ac.id

Abstract

The industrial sector is one of the main contributors to Indonesia's economic development and GDP. However, the growth of the manufacturing industry cannot be separated from negative effects such as waste or emissions produced. The industrial sector is under pressure to immediately reduce the impact of its production emissions and waste on the environment. It needs to transform in a greener direction to improve the company's sustainability performance which consists of 3 aspects, namely economic, environmental, and social. This research will examine the influence of green transformational leadership, knowledge-oriented leadership, and green entrepreneurial orientation on corporate sustainability performance through the mediating role of green innovation and knowledge management processes. The research will be carried out using qualitative methods on 133 manufacturing industries in Indonesia with Structural Equation Modeling (SEM) analysis with the Partial Least Square (PLS) method to test the hypothesis. The results of this research show that the role of mediation has a positive influence on the company's sustainability performance, especially the knowledge management process which can act as a mediator between green transformational leadership, knowledge-oriented leadership, and green entrepreneurial orientation and the company's sustainability performance.

Kata kunci: Green Transformational Leadership, Knowledge-Oriented Leadership, Green Entrepreneurship Orientation, Green Innovation, Sustainability Performance

Abstrak

Sektor industri merupakan salah satu kontributor utama terhadap pembangunan ekonomi dan PDB Indonesia. Namun pertumbuhan industri manufaktur tidak lepas dari dampak negatif seperti limbah atau emisi yang dihasilkan. Sektor industri berada di bawah tekanan untuk segera mengurangi dampak emisi dan limbah produksinya terhadap lingkungan. Perlu adanya transformasi ke arah yang lebih hijau untuk meningkatkan kinerja keberlanjutan perusahaan yang terdiri dari 3 aspek yaitu ekonomi, lingkungan, dan sosial. Penelitian ini akan menguji pengaruh kepemimpinan transformasional hijau, kepemimpinan berorientasi pengetahuan, dan orientasi kewirausahaan hijau terhadap kinerja keberlanjutan perusahaan melalui peran mediasi inovasi hijau dan proses manajemen pengetahuan. Penelitian akan dilakukan dengan menggunakan metode kualitatif pada 133 industri manufaktur di Indonesia dengan analisis Structural Equation Modeling (SEM) dengan metode Partial Least Square (PLS) untuk menguji hipotesis. Hasil penelitian ini menunjukkan bahwa peran mediasi memberikan pengaruh positif terhadap kinerja keberlanjutan perusahaan, khususnya proses manajemen pengetahuan yang dapat berperan sebagai mediator antara kepemimpinan transformasional hijau, kepemimpinan berorientasi pengetahuan, dan orientasi kewirausahaan hijau dengan keberlanjutan perusahaan. pertunjukan.

Kata kunci: Kepemimpinan Transformasional Ramah Lingkungan, Kepemimpinan Berorientasi Pengetahuan, Orientasi Kewirausahaan Ramah Lingkungan, Inovasi Ramah Lingkungan, Kinerja Keberlanjutan



INTRODUCTION

Economic growth can be seen as an increase in the number and value of products or services that can be produced in a country, which is often referred to as Gross Domestic Product (GDP). One sector that contributes to economic improvement is the manufacturing sector with a contribution to Indonesia's GDP of 18.3% in 2021 (BPS, 2021). The manufacturing sector processes raw materials into intermediate products or finished products by increasing the added value of these products. Apart from increasing the value of goods, the industrial sector also absorbs a large number of workers with data showing that the number of workers in the manufacturing sector is 18.64 million people. Therefore, the economic growth of a country cannot be separated from the growth of industry in that country. However, apart from providing benefits to the country or society, it is also inseparable from the negative effects it has on the environment. Negative effects occur because industrial activities release waste products such as exhaust emissions and waste from production activities which have the potential to pollute the environment. Unwise use of energy results in poor energy efficiency of a production process and has the potential to waste energy that could potentially be utilized. Apart from that, production products that have been used by consumers also have the potential for pollution. The remaining packaging for a product has the potential to become waste that is difficult for the environment to decompose so that the waste accumulates and becomes a pollutant for the environment.

At the global level, environmental pollution has become a special concern because the rate of the global warming process is faster than expected because the emissions released by humans are greater than the ability to absorb emissions by nature. The rate of global warming needs to be slowed down until it is stopped because it can have huge impacts, such as increasing the level of damage from natural disasters and rising sea levels which can cause coastal flooding. Indonesia has issued policies which are derivatives of global agreements to be implemented in Indonesia. One form of policy is green industry which focuses on existing industries in Indonesia to transform towards industries that pay attention to the environment. The form of transformation is the transition from the use of non-environmentally friendly energy to new, renewable energy for the manufacturing process, efficient use of raw materials and energy and creating products that are more environmentally friendly.

Changes in the business paradigm shift which initially focused on economics with the inclusion of environmental aspects require massive changes to the company's organization. A transformational leader is needed who can inspire and motivate all aspects of the organization to

achieve common goals. Green transformational leadership is leadership that tends to care about the environment and is able to inspire followers to provide environmental performance above expectations.¹ Research conducted by Özgül and Zehir shows that green transformational leadership is able to have a positive impact on a company's financial performance, either directly or through the mediation of green innovation.² Green transformational leadership is able to provide the inspiration and motivation needed for its followers to show above average performance. This research is in contrast to research conducted by Torugsa et al., which shows that companies that pursue environmental aspects will experience a decline in financial performance.

One aspect of triple bottom line evaluation is the economic aspect of a company. A company needs to have and maintain their competitive advantage by exploiting current advantages and exploring opportunities for the future by carrying out entrepreneurial activities. Green entrepreneurial orientation is the tendency to pursue potential opportunities that generate economic and ecological benefits through environmentally friendly initiative activities Li et al. Research conducted by Shehzad et al., found that green entrepreneurial orientation can influence green innovation activities carried out by manufacturing industrial companies in Pakistan.³

In the company's steps to achieve the desired sustainability performance, leadership and entrepreneurial aspects are not enough to achieve this. There needs to be real action that can transform the company, such as innovation within the company. The innovation steps taken by companies to achieve the expected environmental aspects are referred to as green innovation. Chen et al. define green innovation as “innovation related to green products or processes, including innovation in technologies involved in energy saving, pollution prevention, waste recycling, green product design, or corporate environmental management.”⁴ Green innovation is divided into product innovation and green processes where product innovation emphasizes product and packaging innovation, product reuse, and eco-labelling. Meanwhile, process innovation emphasizes

¹ Yu-Shan Chen, Ching-Hsun Chang, and Yu-Hsien Lin, “Green Transformational Leadership and Green Performance: The Mediation Effects of Green Mindfulness and Green Self-Efficacy,” *Sustainability* 6, no. 10 (October 2014), <https://doi.org/10.3390/su6106604>.

² Burcu Özgül and Cemal Zehir, “How Managers’ Green Transformational Leadership Affects a Firm’s Environmental Strategy, Green Innovation, and Performance: The Moderating Impact of Differentiation Strategy,” *Sustainability* 15, no. 4 (February 15, 2023), <https://doi.org/10.3390/su15043597>.

³ Muhammad Usman Shehzad et al., “Knowledge Management Enablers and Knowledge Management Processes: A Direct and Configurational Approach to Stimulate Green Innovation,” *European Journal of Innovation Management* 27, no. 1 (January 2, 2024), <https://doi.org/10.1108/EJIM-02-2022-0076>.

⁴ Yu-Shan Chen, Shyh-Bao Lai, and Chao-Tung Wen, “The Influence of Green Innovation Performance on Corporate Advantage in Taiwan,” *Journal of Business Ethics* 67, no. 4 (September 1, 2006), <https://doi.org/10.1007/s10551-006-9025-5>.

innovation in the actual production process by pursuing energy savings and preventing the resulting pollution.⁵

Innovation carried out in an organization will focus on the knowledge and knowledge management capabilities of the company. In pursuing knowledge within the company, top leaders need to have knowledge-oriented leadership characteristics. Leadership is described as a way to inspire others to work hard to complete important tasks Dessler. Leadership in knowledge organizations is particularly relevant when workers perceive leaders as actively involved and committed to supporting knowledge and learning activities. According to Ribiere and Sitar, corporate leadership in organizational knowledge requires leading through a knowledge lens to maximize the information value of exploration and exploitation processes. Because highly creative companies must combine exploration and exploitation efforts to achieve organizational ambidexterity. A good knowledge management process is also very important in the innovation process carried out in a company. The knowledge management process consisting of knowledge acquisition, knowledge sharing, and knowledge application needs to be carried out clearly and systematically to improve performance. Research conducted by Shehzad et al., shows that knowledge-oriented leadership and good knowledge management processes in companies have a positive effect on green innovation performance in these companies.⁶ These results support research conducted by Singh et al., which emphasizes the importance of leadership in encouraging the development and acceptance of new ideas by modeling desired behavior and inspiring followers to generate and share information.⁷

LITERATURE REVIEW

Green Transformational Leadership

The transformational leadership approach underlies the main part of transformational leaders in improving performance at all levels of the organization. Empirically, the transformational leadership approach proposes various ways in which transformational leaders can influence their teams and organizational performance. Transformational leaders in a company's top management can promote transformational leadership throughout the company by serving as role models for leaders at lower levels. Green transformational leadership can influence not only internal corporate values and corporate sustainability performance. The main goal of a company's green

⁵ Colin C. J. Cheng, Chen-lung Yang, and Chwen Sheu, "The Link between Eco-Innovation and Business Performance: A Taiwanese Industry Context," *Journal of Cleaner Production* 64 (February 1, 2014), <https://doi.org/10.1016/j.jclepro.2013.09.050>.

⁶ Shehzad et al., "Knowledge Management Enablers and Knowledge Management Processes."

⁷ Sanjay Kumar Singh et al., "Green Innovation and Environmental Performance: The Role of Green Transformational Leadership and Green Human Resource Management," *Technological Forecasting and Social Change* 150 (January 1, 2020), <https://doi.org/10.1016/j.techfore.2019.119762>.

implementation is to improve its environmental and economic performance. Therefore, green transformational leadership enables companies to achieve their environmental and economic goals. In companies with an environmentally oriented culture, environmental preservation is embedded in everyone's daily routine, and every employee carries out environmental responsibilities actively, which encourages environmentally friendly behavior by creating an atmosphere of full participation in environmental conservation.

The influence of green transformational leadership is also significant on the green innovations carried out. Green innovation consists of several functional areas. For example, R&D personnel, environmental engineers, and designers work together to examine the effects of their products on the environment and health at the design stage of a product. A study by Huang and Li shows a significant positive correlation between corporate coordination capabilities and green innovation. Other literature shows that transformational leaders are one of the important elements who can use the coordination capabilities needed to promote innovation successfully. Chen and Chang emphasize that green transformational leadership is a leadership style that can integrate environmental management into product development and offer different things in product choices to the public.⁸ In relation to a company's sustainability performance, green innovation is progress in processes, products, technology and management structures that aims to protect the environment by reducing resource consumption and minimizing waste and pollution. Green innovation is important in improving success factors for a company's sustainability performance because it offers more flexibility and better performance of employee knowledge resources. So, based on the arguments above, the researcher suspects the following hypothesis

H1a: Green transformational leadership has a positive effect on corporate sustainability performance through the mediation of green innovation.

H1b: Green transformational leadership has a positive effect on a company's sustainability performance through the mediation of the knowledge management process.

Green Entrepreneurial Orientation

Research conducted by Lumpkin and Dess succeeded in linking entrepreneurial orientation with the company's tendency to seek new business opportunities. In this sense, an entrepreneurial organization can encourage proactive and risky innovation to address new markets. Therefore, the core of entrepreneurial orientation is innovation, proactiveness, and risk-taking behavior, developed and encouraged by the top management team as determining factors in the company's competitive strategy. Krauz et al., observed that green entrepreneurial orientation can improve an organization's

⁸ Chen, Chang, and Lin, "Green Transformational Leadership and Green Performance."

environmental performance by facilitating the organization's capacity to explore industry trends and exploit emerging opportunities.

Companies with a green entrepreneurial orientation are more likely to achieve green innovation more quickly than those whose primary goal is to maximize revenue. Based on the VRIO framework (valuable, rare, inimitable, non-substitutable) entrepreneurial orientation explains how businesses are structured to identify and capture opportunities. Entrepreneurial orientation has been shown to stimulate product and process innovation in companies. Therefore, as a strategic step, green entrepreneurial orientation can help companies develop organizational strength to create as many green innovation products as possible. A green entrepreneurial orientation empowers organizations to seize opportunities and use current technologies effectively for optimal resource utilization to create environmentally friendly products and processes. Therefore, green entrepreneurial orientation can help companies improve process effectiveness, reduce waste and lower costs through green innovation practices. So, based on the arguments above, the researcher suspects the following hypothesis.

H2a: Green entrepreneurial orientation has a positive effect on corporate sustainability performance through the mediation of green innovation.

H2b: Green entrepreneurial orientation has a positive effect on corporate sustainability performance through the mediation of the knowledge management process.

Knowledge Oriented Leadership

RBV theory considers leadership to be an important resource for environmental management and corporate performance and important for coordinating activities among stakeholders. The important role of leaders in inspiring and encouraging followers to achieve company goals increases innovation results. Knowledge-oriented leadership can do this by developing, modeling, recognizing, appreciating and appreciating new and creative ideas produced by followers. In addition, leaders assist followers in learning and integrating information, which results in interesting knowledge exploration and exploitation.⁹ Such leadership inspires their followers by stimulating their intelligence and giving them the confidence to take risks when implementing new ideas, which helps disseminate and commercialize information more effectively.

Leadership is important in corporate knowledge processes because individual employees perceive leaders as actively involved and committed to promoting learning and knowledge efforts. Knowledge-oriented leadership makes it comfortable in relationship-based settings that focus on

⁹ Mario J. Donate and Jesús D. Sánchez de Pablo, "The Role of Knowledge-Oriented Leadership in Knowledge Management Practices and Innovation," *Journal of Business Research* 68, no. 2 (February 1, 2015), <https://doi.org/10.1016/j.jbusres.2014.06.022>.

collaboration and mentoring that ensure the development of a knowledge process culture. Recent literature highlights that such leadership helps the knowledge management process by emphasizing the importance of leaders encouraging followers to share their knowledge, abilities, talents and experiences with colleagues to foster a healthy and positive work environment. So, based on the arguments above, the researcher suspects the following hypothesis

H3a: Knowledge-oriented leadership has a positive effect on green innovation.

H3b: Knowledge-oriented leadership has a positive effect on the knowledge management process.

Green Innovation

Theoretically, innovation not only guarantees competitive advantage but also ensures ecological benefits along with social welfare. Principal provisions have been developed for innovation when assigned to different parts of business, namely, eco-innovation, eco-innovation, GI and sustainable innovation. It is important to recognize how these terms differ from one another. Previous research suggests that ecological innovation, eco-innovation, environmental innovation and GI are interchangeable. Sustainable innovation combines social and environmental dimensions. However, according to Franceschini et al., eco-innovation addresses environmental and economic aspects. In contrast, sustainable innovation grips it with social and moral dimensions and is firmly identified with the goals of business management and competition. Chen et al. recommend that eco-innovation can allude to the invasion of green processes and green products.¹⁰

Several studies show a positive relationship between green innovation and company performance. Green product innovation is one of the main factors that enable environmental sustainability and growth.¹¹ Investments in green innovation can provide new opportunities to present new market opportunities and achieve environmentally friendly products. In addition, product innovation has an important meaning in increasing environmentally friendly production capabilities, strengthening an environmentally friendly image, and improving company performance. Additionally, companies can reduce their costs with process innovation. Pollution is generally caused by waste of resources, materials not fully used, or loss of energy.¹² The findings suggest that cost savings can be easily achieved through simple preventative measures. Research has shown that green innovation has a positive impact on competitive advantage and corporate

¹⁰ Chen, Lai, and Wen, "The Influence of Green Innovation Performance on Corporate Advantage in Taiwan."

¹¹ Rosa Maria Dangelico and Devashish Pujari, "Mainstreaming Green Product Innovation: Why and How Companies Integrate Environmental Sustainability," *Journal of Business Ethics* 95, no. 3 (September 1, 2010), <https://doi.org/10.1007/s10551-010-0434-0>.

¹² Stefan Ambec and Paul Lanoie, "Does It Pay to Be Green? A Systematic Overview," *Academy of Management Perspectives* 22, no. 4 (2008).

sustainability.^{13,14} Xie et al. concluded that the latest and clean technology is the main element of green process innovation which is positively correlated with financial performance. Therefore, companies can gain further competitive advantages with GPI, and stronger GPI can improve company performance. So based on the arguments above, the researcher suspects the following hypothesis

H4: Green innovation has a positive effect on corporate sustainability performance

Knowledge Management Process

The knowledge management process is one of the superior strategies for improving organizational innovation performance, and is also perfect for finding new directions for corporate sustainability performance. The association between knowledge management processes and corporate sustainability performance emerges when organizational management contributes to the adoption and utilization of green resources for innovation through the knowledge and capabilities of the workforce. Recent research highlights that acquiring new knowledge is critical to achieving corporate sustainability. Recent studies also identify that the knowledge management process has a direct and positive influence on sustainable company performance.¹⁵ Green Innovation is a critical success factor for corporate sustainability because it offers more flexibility and better performance through the latest technology. Advanced technology is applied to reduce energy use, prevent pollution, waste recycling and environmental management.¹⁶ Noruzy et al. argue that the Knowledge Management Process has a positive impact on company performance through decisive innovation.

Researchers have widely discussed the direct relationship between innovation and corporate sustainability.¹⁷ The knowledge management process of acquiring knowledge helps organizations improve their capabilities and overcome their problems in terms of limitations.¹⁸ Most employees get their information from their organizations, such as coworkers and team members. In

¹³ Chen, Lai, and Wen, "The Influence of Green Innovation Performance on Corporate Advantage in Taiwan."

¹⁴ Cheng, Yang, and Sheu, "The Link between Eco-Innovation and Business Performance."

¹⁵ Jawad Abbas and Mustafa Sağsan, "Impact of Knowledge Management Practices on Green Innovation and Corporate Sustainable Development: A Structural Analysis," *Journal of Cleaner Production* 229 (August 2019), <https://doi.org/10.1016/j.jclepro.2019.05.024>.

¹⁶ Chen, Lai, and Wen, "The Influence of Green Innovation Performance on Corporate Advantage in Taiwan."

¹⁷ Angela Triguero, Lourdes Moreno-Mondéjar, and María A. Davia, "Drivers of Different Types of Eco-Innovation in European SMEs," *Ecological Economics, Land Use*, 92 (August 1, 2013), <https://doi.org/10.1016/j.ecolecon.2013.04.009>.

¹⁸ Gema Albort-Morant, Antonio L. Leal-Rodríguez, and Valentina De Marchi, "Absorptive Capacity and Relationship Learning Mechanisms as Complementary Drivers of Green Innovation Performance," *Journal of Knowledge Management* 22, no. 2 (January 1, 2018), <https://doi.org/10.1108/JKM-07-2017-0310>.

addition, information is obtained from external sources such as consumers, rivals, producers, collaborators and specialists.¹⁹ Recent studies have established that the application of knowledge can facilitate companies' sustainable practices to obtain green innovation outcomes.²⁰ Companies can identify substantial innovative methods of increasing their competitiveness by using knowledge. So, based on the arguments above, the researcher suspects the following hypothesis
H5: Knowledge Management Process has a positive effect on the company's sustainability performance.

H6: The knowledge management process has a positive effect on green innovation.

Corporate Sustainability Performance

Through the evolution of industrial expansion, the use of natural resources by the industrial sector has increased rapidly.²¹ This situation creates a scarcity in the supply of natural resources that encourages environmental plunder. Increasing demand has resulted in exacerbating this problem further.²² In the latest literature on environmental management, these concerns have been addressed by sustainable development. The definition of SD adopted globally by WCED is "Development that meets the needs of the present without compromising the ability of future generations to meet their needs." In this definition, WCED includes economic, environmental and social issues. These three fundamentals of corporate sustainability performance are known as the "triple bottom line" (TBL), influencing current and future generations. In this approach, each pillar (environmental, economic and social) of sustainability is significant; and can be considered an integrative theory of sustainability.²³ Thus, a company's sustainability performance can be understood as "progress that integrates environmental, economic, and social dimensions."

The following is the concept of the research model:

¹⁹ Abbas and Sağsan, "Impact of Knowledge Management Practices on Green Innovation and Corporate Sustainable Development."

²⁰ Mohsin Shahzad et al., "Relation of Environment Sustainability to CSR and Green Innovation: A Case of Pakistani Manufacturing Industry," *Journal of Cleaner Production* 253 (April 20, 2020), <https://doi.org/10.1016/j.jclepro.2019.119938>.

²¹ Abbas and Sağsan, "Impact of Knowledge Management Practices on Green Innovation and Corporate Sustainable Development."

²² Mohsin Shahzad et al., "Exploring the Influence of Knowledge Management Process on Corporate Sustainable Performance through Green Innovation," *Journal of Knowledge Management* 24, no. 9 (November 17, 2020), <https://doi.org/10.1108/JKM-11-2019-0624>.

²³ MingLang Tseng, Ming Lim, and Wai Peng Wong, "Sustainable Supply Chain Management: A Closed-Loop Network Hierarchical Approach," *Industrial Management & Data Systems* 115, no. 3 (January 1, 2015), <https://doi.org/10.1108/IMDS-10-2014-0319>.

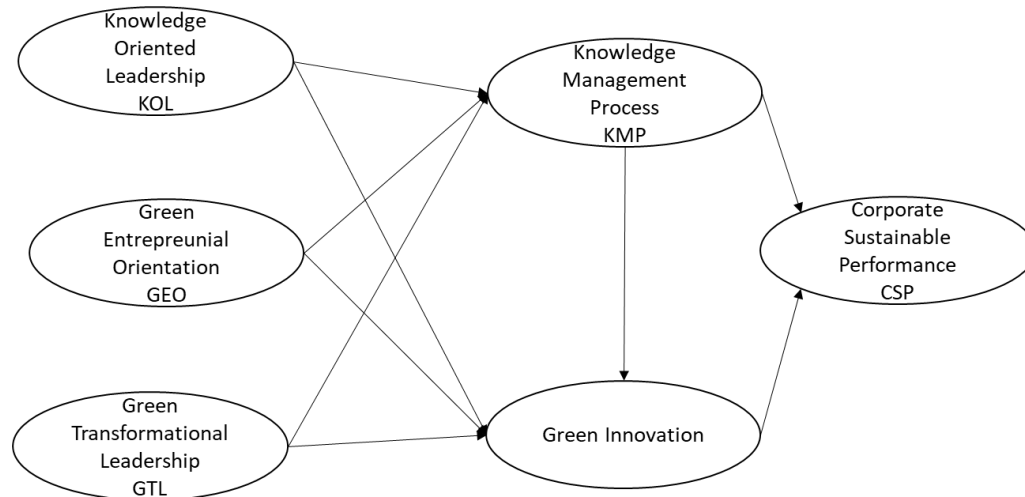


Figure 1. Concept of the Research Model

RESEARCH METHOD

This study used a quantitative method; the information analyzed was obtained through primary data in the form of the distribution of questionnaires to respondents with approved statements from previous studies with some modifications. Researchers used the Structural Equation Model (SEM) as the main statistical tool in data analysis. SEM is used to examine the relationship between the variables involved in this study and to test the conceptual model designed based on the relevant theory. Using SEM, researchers can examine the relationship between these variables and measure how much the proposed model matches the data collected.

The population that is the subject of this study is manufacturing industry in Indonesia. The data that was successfully collected to become the sample in this study came from 132 respondents. This study uses primary data obtained through a survey of respondents using a questionnaire from the Google form which consists of a number of closed questions using a 7-point Likert Scale which has a range from (1) which indicates 'strongly disagree' to (7) which indicates 'strongly agree'. Statistical tests in this study used PLS Structural Equation Modeling (SEM) using SmartPLS 4.0 tools.

Sample and Data Collection

In this research, the population of respondents is all medium and large industries operating in Indonesian jurisdictions that have the Indonesian Standard Classification of Environment and Business (KBLI) in category C (Processing Industries). This is because only industries included in category C have processing processes from raw materials or semi-finished products into higher quality products. The research respondents were the founders (founders or co-founders), upper management, plant managers, and business development companies, where they better understand

and understand the strategies carried out and the performance of their companies. The online distribution of the questionnaire used was made using the Google Form website-based application, which is a service from Google that allows users to create surveys, ask questions and answers with online formulary features that can be customized according to the researcher's needs. So researchers can get answers directly and in real-time from the intended respondents.

The data collected was 145 respondents with 133 respondents who met the criteria, this number has exceeded the minimum sample required for the Partial Least Square - Structure Equation Modeling analysis method with the criteria for a number of paths of 6 with a minimum R2 value of 0.1 with a minimum number of 130 respondents.²⁴

Measure of Construct

The construct measurement scale or the variables in the hypothetical model refer to previous studies whose results have been tested. The questionnaire for the knowledge-oriented leadership construct was taken from research conducted by Donate and Pablo where there were 6 question items.²⁵ Next, questionnaire to measure the construct of green entrepreneurial orientation was taken from research conducted by Li et al with 6 question items. Next, questionnaire to measure the green transformational leadership construct was taken from research conducted by Chen and Chang with 6 question items.²⁶ Next, questionnaire to measure the construct of the knowledge management process was taken from research conducted by Darroch with 3 dimensions, namely knowledge acquisitions, knowledge sharing, knowledge application. Next, questionnaire to measure the green innovation construct was taken from research conducted by Chen, Lai, and Wen with 2 dimensions, namely green process innovation and green product innovation.²⁷ Last, the questionnaire to measure the construct of corporate sustainability performance was taken from research conducted by Hao, Gu, and Wang with 3 dimensions, namely social, economic and environmental.

²⁴ Joseph Hair et al., *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (SAGE, 2017).

²⁵ Donate and Sánchez de Pablo, "The Role of Knowledge-Oriented Leadership in Knowledge Management Practices and Innovation."

²⁶ Chen, Chang, and Lin, "Green Transformational Leadership and Green Performance."

²⁷ Chen, Lai, and Wen, "The Influence of Green Innovation Performance on Corporate Advantage in Taiwan."

RESULT AND DISCUSSION

Measurements Model Assesment

In the variant-based SEM model or PLS-Path Modeling, this model consists of an outer model (measurement model) and an inner model (structural model). Thus, the evaluation model in PLS-PM also consists of 2 stages, namely the evaluation of the outer model and the inner model. The latent variable measurement model is measured by a reflective indicator, the direction of the causal relationship from the latent variable to the indicator. Meanwhile, the reflective measurement model is assessed based on the validity and reliability of latent variable measurements.

In data processing techniques using SEM-PLS, the process of evaluating the measurement model (Outer Model) is carried out to determine the relationship between constructs and indicators by analyzing the values of convergent validity, discriminant validity, and reliability.

Table 1. Measuremet Model Assesment (Outer Model)

Variable			Indicator	Factor Loading	Cronbach Alpha	Composite Reliability	AVE
Green Transformational Leadership			GTL1	0,803	0,919	0,937	0,713
			GTL2	0,796			
			GTL3	0,848			
			GTL4	0,931			
			GTL5	0,83			
			GTL6	0,852			
Green Entrepreneurial Orientation			GEO1	0,805	0,756	0,834	0,517
			GEO2	0,668			
			GEO3	0,824			
			GEO4	0,832			
			GEO5	0,65			
Knowledge Oriented Leadership			KOL1	0,615	0,652	0,672	0,532
			KOL2	0,272			
			KOL3	0,534			
			KOL4	0,262			
			KOL5	0,582			
			KOL6	0,808			
Knowledge Management Process	Knowledge Acquisitions	KAC1	0,559	0,795	0,868	0,541	
		KAC2	0,511				
		KAC3	0,814				
		KAC4	0,676				
		KAC5	0,747				
		KAC6	0,826				
	Knowledge Sharing	KS1	0,649	0,762	0,838	0,519	
		KS2	0,753				
		KS3	0,834				
		KS4	0,852				
		KS5	0,634				
	Knowledge Application	KAP1	0,609	0,793	0,857	0,566	
		KAP2	0,916				
		KAP3	0,847				
		KAP4	0,877				
KAP5		0,665					
Green Innovation			GPD11	0,787	0,723	0,828	0,549
			GPD12	0,784			
			GPD13	0,778			
			GPD14	0,598			
			GPR11	0,879			

Variable		Indicator	Factor Loading	Cronbach Alpha	Composite Reliability	AVE			
Corporate Sustainability Performance	Green Process Innovation	GPRI2	0,855	0,888	0,907	0,695			
		GPRI3	0,8						
		GPRI4	0,739						
	Financial Performance	FP1	0,848						
		FP2	0,908						
		FP3	0,729						
		FP4	0,928						
		FP5	0,738						
	Environmental Performance	ENVP1	0,85				0,693	0,801	0,511
		ENVP2	0,511						
		ENVP3	0,685						
		ENVP4	0,764						
	Social Performance	SOCP1	0,877				0,911	0,934	0,739
		SOCP2	0,837						
		SOCP3	0,878						
SOCP4		0,801							
SOCP5		0,901							

Additionally, discriminant validity for all latent variables in the model was tested with the Fornell–Larcker criterion. The square root value of AVE on the diagonal lines is higher than the correlations between the constructs in the model. According to this result, it can be concluded that all variables in the current research model meet discriminant validity.

Table 2. Discriminant Validity

	ECO	ENV	GEO	GPDI	GPRI	GTL	KA	KD	KOL	KR	SOC
ECO	0.834										
ENV	0.334	0.715									
GEO	0.378	0.415	0.719								
GPDI	0.391	0.509	0.464	0.741							
GPRI	0.410	0.522	0.390	0.732	0.820						
GTL	0.232	0.434	0.598	0.274	0.284	0.844					
KA	0.457	0.662	0.683	0.392	0.355	0.634	0.735				
KD	0.594	0.543	0.441	0.268	0.334	0.431	0.602	0.720			
KOL	0.226	0.294	0.481	0.194	0.127	0.632	0.495	0.423	0.622		
KR	0.557	0.632	0.490	0.456	0.480	0.595	0.669	0.565	0.553	0.752	
SOC	0.514	0.609	0.467	0.467	0.516	0.643	0.688	0.600	0.571	0.747	0.860

Hypothesis Test Results

In the inner model analysis, the researcher set a significance level of 5% (error rate). This means that the probability of error that is tolerated in the study is 5% or 0.05. If the results of the statistical test obtained a p-value ≤ 0.05 , it means that the probability of error obtained is still within the tolerance limit set by the researcher, so that it is said to be significant, or the hypothesis is accepted. If the results of the statistical test obtained a p-value > 0.05 , it is said to be not significant. Based on the research results it is known that all hypotheses are supported by the data. Another parameter that shows significance is the statistical value of $T > 1.96$. While the direction of the relationship can be seen in the Original Sample value.

Table 3. Hypothesis Test Result

Hipotesis	t-Statistic	p-values	Conclusion
H1a GTL -> GI	1,144	0,253	Not Supported
H1b GTL -> KMP	5,238	0,000	Supported
H2a GEO -> GI	2,943	0,003	Supported
H2b GEO -> KMP	4,996	0,000	Supported
H3a KOL -> GI	0,551	0,582	Not Supported
H3b KOL -> KMP	3,382	0,001	Supported
H4 GI -> CSP	3,829	0,000	Supported
H5 KMP -> CSP	10,044	0,000	Supported
H6 KMP -> GI	3,874	0,000	Supported

Discussion

The results of this research are based on the data in the table, rejecting hypothesis H1a and accepting hypothesis H1b. The research results state that there is no direct positive relationship between green transformational leadership and green innovation (t-statistic = 1.443 and p value = 0.253). Meanwhile, the research results show that there is a direct positive relationship between green transformational leadership and the Knowledge Management Process (t-statistic = 5.238 and p value = 0.000). This shows that green transformational leadership that inspires employees in the organization has not had a direct effect on the innovation carried out. Green transformational leadership can spur the knowledge management process in the organization to obtain, share and use the knowledge they already have. Proxy for a good knowledge management process in the company so that it can get benefits in the form of increasing innovation and achieving company sustainability performance. This can be seen in the mediation effect of GTL on the indirect effect GTL -> KMP -> GI -> CSP with t-statistic value = 1.976 and p value = 0.048 and GTL -> KMP -> GI with t statistic value = 3.361 and p value =0.001

Leadership behavior and characteristics have a major influence in enhancing or limiting a company's knowledge management capabilities. Bass and Avolio argue that transformational leaders positively encourage employees to communicate and share knowledge with each other. According to Birasnav et al., transformational leaders emphasize the formation of a knowledge-supporting culture in the form of developing a series of values, assumptions and beliefs related to knowledge that shape employee behavior in carrying out knowledge activities and engaging in the knowledge management process. Several researchers have shown that TL behavior is positively related to knowledge acquisition, knowledge sharing, and knowledge application. Ugwu and Okore argue that TL is significantly associated with several factors supporting knowledge management activities such as organizational learning, new technologies, and reward systems that encourage employees to share knowledge and create new knowledge.

Green transformational leadership is a popular leadership style in creating an innovative environment and stimulating employees to look for out-of-the-box solutions to mitigate environmental problems.²⁸ Green transformational leadership which can inspire followers through charismatic behavior and encourage them to achieve desired changes,²⁹ has not been able to have a significant influence on the results of green innovation carried out. This leadership focuses on inspiring and encouraging employees to achieve the company's environmentally friendly goals as well as creating an environment to foster innovation. Therefore, mediating variables are needed for the knowledge management process as a forum and environment for the innovation needed by its followers. This shows that the green innovation process carried out in the manufacturing industry in Indonesia is bottom-up where green ideas emerge from basic level workers.

The results of this research based on the data in the table accept the hypotheses H2a and H2b. The research results show that there is a direct positive relationship between green entrepreneurial orientation and the Knowledge Management Process (t-statistic = 4.496 and p value = 0.000) and green innovation (t-statistic = 2.943 and p value = 0.003). This shows that companies that have a green entrepreneurial orientation are able to improve their knowledge management process capabilities and green innovation capabilities. The nature of green entrepreneurship will encourage companies to exploit their strengths and explore opportunities that will bring competitive advantage in the future. This exploitation capability will be in line with the desire to reduce pollutants produced from the production process in order to achieve more competitive production costs. Meanwhile, exploration capabilities will encourage companies to create new environmentally friendly products. Exploration and exploitation capabilities need to be supported by good knowledge management in the company with the ability to capture new knowledge, share knowledge, and apply existing knowledge for exploitation and exploration activities.

This is in line with what Zhou et al. found that GEO can be used to promote both aspects of corporate green innovation.³⁰ In addition, green entrepreneurs consolidate multiple resources and mitigate environmental impacts, thereby enabling them to identify and exploit GI possibilities through more controllable deployment and organization of resources. The findings of this research also reveal the significant impact of GEO on the KM process and are consistent with the research

²⁸ Xingdong Wang, Kong Zhou, and Wenxing Liu, "Value Congruence: A Study of Green Transformational Leadership and Employee Green Behavior," *Frontiers in Psychology* 9 (October 9, 2018), <https://doi.org/10.3389/fpsyg.2018.01946>.

²⁹ Víctor Jesús García-Morales, María Magdalena Jiménez-Barrionuevo, and Leopoldo Gutiérrez-Gutiérrez, "Transformational Leadership Influence on Organizational Performance through Organizational Learning and Innovation," *Journal of Business Research* 65, no. 7 (July 1, 2012), <https://doi.org/10.1016/j.jbusres.2011.03.005>.

³⁰ Yu Zhou et al., "Dynamic Capability Matters: Uncovering Its Fundamental Role in Decision Making of Environmental Innovation," *Journal of Cleaner Production* 177 (March 10, 2018), <https://doi.org/10.1016/j.jclepro.2017.12.208>.

of Latif et al. and Stuetzer et al. who found that management efforts such as experimentation and risk-taking, which are important components of GEO, impact the way knowledge is produced and shared.^{31,32} From a KM perspective, organizational structures that support risk taking and experimentation can foster learning and the creation and distribution of knowledge.

The results of this research based on the data in the table reject hypothesis H3a and accept hypothesis H3b. The research results state that there is no direct positive relationship between knowledge-oriented leadership and green innovation (t-statistic = 0.551 and p value = 0.582). Meanwhile, the research results show that there is a direct positive relationship between knowledge-oriented leadership and the Knowledge Management Process (t-statistic = 3.382 and p value = 0.01). This shows that knowledge-oriented leadership in the Indonesian manufacturing industry requires a good knowledge management process proxy in the company so that it can get benefits in the form of increased innovation and achieve company sustainability performance. This can be seen in the mediation effect of KMP on the indirect effect KOL -> KMP -> GI -> CSP with a value (t-statistic = 1.976 and p value = 0.048).

These results are in line with research conducted by Shehzad et al., which shows that there is a significant impact of KOL on the KM process.³³ It can be explained that organizational factors are very important for the effectiveness of KM processes, with leadership standing out as a clear path for employees to achieve their responsibilities and roles efficiently.³⁴ These results also confirm previous research that leadership has a major influence on the KM process.^{35,36,37} This research shows that leadership that integrates transformational and transactional leadership characteristics as well as attractive motivational and communication aspects is an efficient introduction to the process of creating, acquiring, sharing and implementing KM. A leader can contribute and improve this challenging situation by demonstrating top-level leadership. dedication and leadership in KM related initiatives.

³¹ Khawaja Fawad Latif et al., "Direct and Configurational Paths of Knowledge-Oriented Leadership, Entrepreneurial Orientation, and Knowledge Management Processes to Project Success," *Journal of Intellectual Capital* 22, no. 1 (January 1, 2020), <https://doi.org/10.1108/JIC-09-2019-0228>.

³² Michael Stuetzer et al., "Entrepreneurship Culture, Knowledge Spillovers and the Growth of Regions," *Regional Studies* 52, no. 5 (May 4, 2018), <https://doi.org/10.1080/00343404.2017.1294251>.

³³ Shehzad et al., "Knowledge Management Enablers and Knowledge Management Processes."

³⁴ G. Dessler, *A Framework for Management* (Prentice-Hall, 2002).

³⁵ Latif et al., "Direct and Configurational Paths of Knowledge-Oriented Leadership, Entrepreneurial Orientation, and Knowledge Management Processes to Project Success."

³⁶ Amjad Iqbal et al., "From Knowledge Management to Organizational Performance: Modelling the Mediating Role of Innovation and Intellectual Capital in Higher Education," *Journal of Enterprise Information Management* 32, no. 1 (January 1, 2018), <https://doi.org/10.1108/JEIM-04-2018-0083>.

³⁷ Donate and Sánchez de Pablo, "The Role of Knowledge-Oriented Leadership in Knowledge Management Practices and Innovation."

The results of this research, based on the data in the table, accept hypothesis 4 which states that there is a direct positive relationship between Green Innovation and company sustainability performance (t-statistic = 3.829 and p value = 0.000). These results are in line with research conducted by Shahzad et al. which found that green innovation had a positive effect on the company's sustainability performance. Companies that care about the negative impact of their business operations on the environment can more easily move towards environmental sustainability (Martinez et al., 2014). Green innovation is an inspiration for companies to achieve economic sustainability by reducing production costs and minimizing the waste generated.³⁸ Reducing production costs can be done by minimizing energy use, use of raw materials, and environmentally friendly products.³⁹ Green innovation also influences aspects of social sustainability where business companies that have high social responsibility are more active and concerned about meeting consumer demand for greener products in order to reduce the environmental impact caused.⁴⁰

The results of this research based on the data in the table accept hypothesis 5 which states that there is a direct positive relationship between the Knowledge Management Process and the company's sustainability performance (t-statistic = 10.044 and p value = 0.000). These results are consistent with those of Abbas and Sagsan who found a positive relationship between the knowledge management process and company sustainability performance.⁴¹ Advanced knowledge offers a better understanding of everything such as finances, employee skill development and customer preferences.⁴² According to Tseng's research, AC is an important tool for employees to collaborate and ensure consistent improvements across all organizational departments to improve performance.⁴³ If companies succeed in sharing knowledge among all employees of the organization, this will improve the company's operational, economic and non-economic performance, as well as coordination between different stakeholders, leading to environmental innovation.⁴⁴ KD is very important; this can bring to life workers' talents and abilities, which will lead to innovation and performance. To improve performance, organizations need to apply the

³⁸ Albort-Morant, Leal-Rodríguez, and De Marchi, "Absorptive Capacity and Relationship Learning Mechanisms as Complementary Drivers of Green Innovation Performance."

³⁹ Triguero, Moreno-Mondéjar, and Davia, "Drivers of Different Types of Eco-Innovation in European SMEs."

⁴⁰ Albort-Morant, Leal-Rodríguez, and De Marchi, "Absorptive Capacity and Relationship Learning Mechanisms as Complementary Drivers of Green Innovation Performance."

⁴¹ Abbas and Sagsan, "Impact of Knowledge Management Practices on Green Innovation and Corporate Sustainable Development."

⁴² Jenny Darroch, "Developing a Measure of Knowledge Management Behaviors and Practices," *Journal of Knowledge Management* 7, no. 5 (January 1, 2003), <https://doi.org/10.1108/13673270310505377>.

⁴³ Shu-Mei Tseng, "The Impact of Knowledge Management Capabilities and Supplier Relationship Management on Corporate Performance," *International Journal of Production Economics* 154 (August 1, 2014), <https://doi.org/10.1016/j.ijpe.2014.04.009>.

⁴⁴ Tseng.

knowledge they have acquired effectively and quickly so that they can achieve the highest level of customer satisfaction.⁴⁵

The results of this research based on the data in the table accept hypothesis 6 which states that there is a direct positive relationship between the Knowledge Management Process and green innovation (t-statistic = 3.874 and p value = 0.000). These results are in line with research by Abbas and Sagsan which shows that there is a positive relationship between the knowledge management process and green innovation.⁴⁶ The impact of the KM process on green innovation shows the ability of KM to trigger environmental innovation activities. This finding is similar to Yusr et al. found that KM processes significantly improve product innovation capabilities. KM processes provide opportunities for workers to collaborate and share knowledge.⁴⁷ Through collaboration, workers can have access to external information requiring intensive research and development activities. They can utilize the experiences of colleagues in their operations to develop environmentally friendly technologies.⁴⁸

CONCLUSION

This research helps to understand how companies achieve sustainability performance by. The implementation of green innovation and knowledge management processes has a significant influence on a company's sustainability performance. Companies that care about the negative impact of their business operations on the environment can more easily move towards environmental sustainability. The knowledge management process plays a positive role because gaining knowledge is important for employees to collaborate and ensure consistent improvements. In addition, leader and company characteristics such as knowledge-oriented leadership, green transformational leadership, and green entrepreneurial orientation have a significant influence on the knowledge management process and only the green entrepreneurial orientation variable has a significant influence on green innovation. All these variables can create an innovation-friendly environment so that the knowledge management process is good. Meanwhile, the leadership styles studied have not been able to directly influence the results of green innovation carried out in the manufacturing industry. The knowledge management process variable has a significant impact on

⁴⁵ Tsung-Hsien Kuo, "How to Improve Organizational Performance through Learning and Knowledge?," ed. Peter Nielsen and Palle Rasmussen, *International Journal of Manpower* 32, no. 5/6 (January 1, 2011), <https://doi.org/10.1108/01437721111158215>.

⁴⁶ Abbas and Sağsan, "Impact of Knowledge Management Practices on Green Innovation and Corporate Sustainable Development."

⁴⁷ Maha Mohammed Yusr et al., "Does Interaction between TQM Practices and Knowledge Management Processes Enhance the Innovation Performance?," *International Journal of Quality & Reliability Management* 34, no. 7 (January 1, 2017), <https://doi.org/10.1108/IJQRM-09-2014-0138>.

⁴⁸ Abbas and Sağsan, "Impact of Knowledge Management Practices on Green Innovation and Corporate Sustainable Development."

Muhammad Iqbal Abdul Rasyid, Mone Stephanus: The Influence of Green Leadership and Entrepreneurship on the Sustainability of Manufacturing Companies: Mediation of Green Innovation and Knowledge Management

green innovation in triggering environmental innovation activities and becomes a mediating variable for leadership factors and the innovation carried out. Knowledge management processes provide opportunities for workers to collaborate and share knowledge. Through collaboration, workers can have access to external information requiring intensive research and development activities.

BIBLIOGRAPHY

- Abbas, Jawad, and Mustafa Sağsan. "Impact of Knowledge Management Practices on Green Innovation and Corporate Sustainable Development: A Structural Analysis." *Journal of Cleaner Production* 229 (August 2019). <https://doi.org/10.1016/j.jclepro.2019.05.024>.
- Albort-Morant, Gema, Antonio L. Leal-Rodríguez, and Valentina De Marchi. "Absorptive Capacity and Relationship Learning Mechanisms as Complementary Drivers of Green Innovation Performance." *Journal of Knowledge Management* 22, no. 2 (January 1, 2018). <https://doi.org/10.1108/JKM-07-2017-0310>.
- Ambec, Stefan, and Paul Lanoie. "Does It Pay to Be Green? A Systematic Overview." *Academy of Management Perspectives* 22, no. 4 (2008).
- Chen, Yu-Shan, Ching-Hsun Chang, and Yu-Hsien Lin. "Green Transformational Leadership and Green Performance: The Mediation Effects of Green Mindfulness and Green Self-Efficacy." *Sustainability* 6, no. 10 (October 2014). <https://doi.org/10.3390/su6106604>.
- Chen, Yu-Shan, Shyh-Bao Lai, and Chao-Tung Wen. "The Influence of Green Innovation Performance on Corporate Advantage in Taiwan." *Journal of Business Ethics* 67, no. 4 (September 1, 2006). <https://doi.org/10.1007/s10551-006-9025-5>.
- Cheng, Colin C. J., Chen-lung Yang, and Chwen Sheu. "The Link between Eco-Innovation and Business Performance: A Taiwanese Industry Context." *Journal of Cleaner Production* 64 (February 1, 2014). <https://doi.org/10.1016/j.jclepro.2013.09.050>.
- Dangelico, Rosa Maria, and Devashish Pujari. "Mainstreaming Green Product Innovation: Why and How Companies Integrate Environmental Sustainability." *Journal of Business Ethics* 95, no. 3 (September 1, 2010). <https://doi.org/10.1007/s10551-010-0434-0>.
- Darroch, Jenny. "Developing a Measure of Knowledge Management Behaviors and Practices." *Journal of Knowledge Management* 7, no. 5 (January 1, 2003). <https://doi.org/10.1108/13673270310505377>.
- Dessler, G. *A Framework for Management*. Prentice-Hall, 2002.
- Donate, Mario J., and Jesús D. Sánchez de Pablo. "The Role of Knowledge-Oriented Leadership in Knowledge Management Practices and Innovation." *Journal of Business Research* 68, no. 2 (February 1, 2015). <https://doi.org/10.1016/j.jbusres.2014.06.022>.
- García-Morales, Víctor Jesús, María Magdalena Jiménez-Barrionuevo, and Leopoldo Gutiérrez-Gutiérrez. "Transformational Leadership Influence on Organizational Performance through Organizational Learning and Innovation." *Journal of Business Research* 65, no. 7 (July 1, 2012). <https://doi.org/10.1016/j.jbusres.2011.03.005>.
- Hair, Joseph, G. Tomas M. Hult, Christian Ringle, and Marko Sarstedt. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. SAGE, 2017.
- Iqbal, Amjad, Fawad Latif, Frederic Marimon, Umar Farooq Sahibzada, and Saddam Hussain. "From Knowledge Management to Organizational Performance: Modelling the Mediating

- Role of Innovation and Intellectual Capital in Higher Education.” *Journal of Enterprise Information Management* 32, no. 1 (January 1, 2018). <https://doi.org/10.1108/JEIM-04-2018-0083>.
- Kuo, Tsung-Hsien. “How to Improve Organizational Performance through Learning and Knowledge?” Edited by Peter Nielsen and Palle Rasmussen. *International Journal of Manpower* 32, no. 5/6 (January 1, 2011). <https://doi.org/10.1108/01437721111158215>.
- Latif, Khawaja Fawad, Omar Afzal, Adeel Saqib, Umar Farooq Sahibzada, and Waqar Alam. “Direct and Configurational Paths of Knowledge-Oriented Leadership, Entrepreneurial Orientation, and Knowledge Management Processes to Project Success.” *Journal of Intellectual Capital* 22, no. 1 (January 1, 2020). <https://doi.org/10.1108/JIC-09-2019-0228>.
- Özgül, Burcu, and Cemal Zehir. “How Managers’ Green Transformational Leadership Affects a Firm’s Environmental Strategy, Green Innovation, and Performance: The Moderating Impact of Differentiation Strategy.” *Sustainability* 15, no. 4 (February 15, 2023). <https://doi.org/10.3390/su15043597>.
- Shahzad, Mohsin, Ying Qu, Saad Ahmed Javed, Abaid Ullah Zafar, and Saif Ur Rehman. “Relation of Environment Sustainability to CSR and Green Innovation: A Case of Pakistani Manufacturing Industry.” *Journal of Cleaner Production* 253 (April 20, 2020). <https://doi.org/10.1016/j.jclepro.2019.119938>.
- Shahzad, Mohsin, Ying Qu, Abaid Ullah Zafar, Saif Ur Rehman, and Tahir Islam. “Exploring the Influence of Knowledge Management Process on Corporate Sustainable Performance through Green Innovation.” *Journal of Knowledge Management* 24, no. 9 (November 17, 2020). <https://doi.org/10.1108/JKM-11-2019-0624>.
- Shehzad, Muhammad Usman, Jianhua Zhang, Mir Dost, Muhammad Shakil Ahmad, and Sajjad Alam. “Knowledge Management Enablers and Knowledge Management Processes: A Direct and Configurational Approach to Stimulate Green Innovation.” *European Journal of Innovation Management* 27, no. 1 (January 2, 2024). <https://doi.org/10.1108/EJIM-02-2022-0076>.
- Singh, Sanjay Kumar, Manlio Del Giudice, Roberto Chierici, and Domenico Graziano. “Green Innovation and Environmental Performance: The Role of Green Transformational Leadership and Green Human Resource Management.” *Technological Forecasting and Social Change* 150 (January 1, 2020). <https://doi.org/10.1016/j.techfore.2019.119762>.
- Stuetzer, Michael, David B. Audretsch, Martin Obschonka, Samuel D. Gosling, Peter J. Rentfrow, and Jeff Potter. “Entrepreneurship Culture, Knowledge Spillovers and the Growth of Regions.” *Regional Studies* 52, no. 5 (May 4, 2018). <https://doi.org/10.1080/00343404.2017.1294251>.
- Triguero, Angela, Lourdes Moreno-Mondéjar, and María A. Davia. “Drivers of Different Types of Eco-Innovation in European SMEs.” *Ecological Economics, Land Use*, 92 (August 1, 2013). <https://doi.org/10.1016/j.ecolecon.2013.04.009>.
- Tseng, MingLang, Ming Lim, and Wai Peng Wong. “Sustainable Supply Chain Management: A Closed-Loop Network Hierarchical Approach.” *Industrial Management & Data Systems* 115, no. 3 (January 1, 2015). <https://doi.org/10.1108/IMDS-10-2014-0319>.
- Tseng, Shu-Mei. “The Impact of Knowledge Management Capabilities and Supplier Relationship Management on Corporate Performance.” *International Journal of Production Economics* 154 (August 1, 2014). <https://doi.org/10.1016/j.ijpe.2014.04.009>.
- Wang, Xingdong, Kong Zhou, and Wenxing Liu. “Value Congruence: A Study of Green Transformational Leadership and Employee Green Behavior.” *Frontiers in Psychology* 9 (October 9, 2018). <https://doi.org/10.3389/fpsyg.2018.01946>.

Muhammad Iqbal Abdul Rasyid, Mone Stephanus: The Influence of Green Leadership and Entrepreneurship on the Sustainability of Manufacturing Companies: Mediation of Green Innovation and Knowledge Management

Yusr, Maha Mohammed, Sany Sanuri Mohd Mokhtar, Abdul Rahim Othman, and Yaty Sulaiman. "Does Interaction between TQM Practices and Knowledge Management Processes Enhance the Innovation Performance?" *International Journal of Quality & Reliability Management* 34, no. 7 (January 1, 2017). <https://doi.org/10.1108/IJQRM-09-2014-0138>.

Zhou, Yu, Jin Hong, Kejia Zhu, Yang Yang, and Dingtao Zhao. "Dynamic Capability Matters: Uncovering Its Fundamental Role in Decision Making of Environmental Innovation." *Journal of Cleaner Production* 177 (March 10, 2018). <https://doi.org/10.1016/j.jclepro.2017.12.208>.