

The Drivers of Sustainability Practices in SMEs and the Impact on Business Performance

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The concept of sustainability practices by Small and Medium-sized Enterprises (SMEs) is often ignored, specifically in developing countries. This requires optimal attention, considering the significant role of SMEs in economic growth and the significant collective impact on the ecological environment. Therefore, this study aimed to analyze the impact of collaboration and innovation on SMEs sustainability practices and business performance. A total of 169 samples were obtained from metal manufacturing companies located in the Tegal, Klaten, and Greater Jakarta regions through purposive sampling. The results showed that collaboration significantly and positively affected SMEs sustainability practices, using SEM-PLS analysis. Innovation also positively influenced sustainability practices and business performance. Furthermore, the positive impacts of collaboration and innovation on business performance were mediated by sustainability practices. Sustainability practices also positively affected business performance, showing that the enhancement of sustainability practices commitment was required to achieve Sustainable

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Development Goals (SDGs) without sacrificing SMEs business growth. From the results, the implementation of other variables was recommended for future analyses, to improve the understanding of the different factors driving sustainability practices in SMEs.

Keywords: Sustainability practices; collaboration; innovation; business performance.

1. INTRODUCTION

"Sustainability" was a concept initially observed in the report of the World Commission on Environment and Development (WCED), entitled "*Our Common Future*". The concept was defined as "meeting the needs of the present without compromising the ability of future generations to achieve relevant demands" [1]. From this context, the prevalence of sustainable development was essential and considered a requirement for a multidisciplinary approach to address enhancement issues and ensure the well-being of the present and future global population. The development phenomenon also implicitly focused on the need for a long-term perspective, acknowledging the interconnection between social, economic, and environmental aspects [2].

The concept of sustainability is subsequently studied through the macro and micro approaches related to the entire economic system and specific actors (individual, company, and government), respectively. In business sectors, company sustainability focuses on meeting the direct and indirect stakeholders need without disregarding the achievement of future demands [3]. This shows that the concept focuses on adopting strategies and actions capable of meeting present and future business needs, as well as societal expectations [4]. It is also a perception comprising several aspects, including environmental, social, and economic dimensions. From this context, the economic aspect of sustainability shows that company has a cash flow feasibility ensuring liquidity and significant returns to shareholders. For the environmental aspect, company is required to have a positive impact by maintaining systematic balance and protecting natural resources. Meanwhile, the social dimension includes contributing to the community to achieve a significant effect through the enhancement of human capital development patterns. These descriptions prove that company needs to implement a comprehensive sustainability approach containing all dimensions because the achievement of success in one category will not help long-term sustainability [5].

The objectives in Sustainable Development Goals (SDGs) are also unachievable without the business world support, specifically in SDG-8 (Decent Work and Economic Growth) or SDG-9 (Industry, Innovation, and Infrastructure). This issue represents a call to action for businesses, opening up opportunities to develop new sustainable products and services [6]. The issues related to sustainable development have subsequently transformed the corporate landscape, serving as an important determinant of company success. Furthermore, large companies strategically adopt relevant practices to achieve long-term benefits [7]. In supporting business excellence, the effects of the sustainability practices were extensively analyzed in large and multinational company [8,9]. "However, the analysis focusing on Small and Medium-sized Enterprises (SMEs) remained limited, indicating the ignorance of sustainability practices, specifically in the social and environmental aspects. This ignorant behavior was prevalent in SMEs in developing countries" [10].

Several previous studies subsequently identified the social and environmental initiatives adopted by SMEs, specifically in developed countries [11]. This was consistent with Martins et al. [7], where 74% and 26% of the analyzed peer-reviewed papers published from 2000 to June 2020 in the Web of Science database were related to developed and developing countries, respectively, using the Systematic Literature Review method. Bartolacci et al. [12] also conducted a similar study using bibliometric analysis and a systematic literature review of documents between 1999 and 2018. This showed that most publications originated from developed countries, such as Spain, Australia, and Italy. However, publications related to developing nations were observed in Malaysia, South Africa, Ghana, India, and China. The document differences between developed and developing countries were also consistent with the earlier perspective focusing on the ignorance of sustainability practices in SMEs, specifically in the social and environmental aspects in underdeveloped nations [10].

Based on Yadav et al. [13], several important driving factors related to sustainability practices were identified using the systematic literature review method and thematic analysis of 1987-2018 peer-reviewed journals. These factors were generally categorized into two groups, namely external and internal variables. From this context, collaboration was considered the external variable positively influencing sustainability practices of SMEs. Regarding the analysis, the advancement of the practices and performance was supported in previous reports through inter-company networks and operational collaboration [10]. For the internal factors, innovation significantly and positively affected sustainability practices [14,15]. This was consistent with Chege and Wang [16] in Kenyan agribusiness company, where technological innovation was an organizational characteristic playing an essential role in implementing sustainability practices.

We found that quantitative studies examining the impact of collaboration and innovation on sustainability practices and business performance in the context of developing countries, specifically within the SMEs sector, are not widely conducted. To the best of the author's knowledge, there is no such research in the context of Indonesia. Therefore, the objective of this study is to analyze the impact of collaboration and innovation on SMEs sustainability practices and business performance, specifically in manufacturing company in Indonesia.

2. LITERATURE REVIEW

2.1 Business Performance

Management experts were responsible for the definition of business performance, such as Armstrong and Baron [17]. In this context, performance was defined as the outputs achieved by individuals or groups in carrying out assignments. Robbins and Judge [18] also stated that the phenomenon originated from the work achieved by a person or people in performing the assigned tasks measured through specific criteria. In Bratton and Gold [19], performance was achieved by individual or group tasks, using specific criteria and compared to established standards. Furthermore, business performance showed company ability to achieve relevant objectives, such as increasing revenue, profit, market share, and company value. This was measured using various indicators, including financial ratios, sales growth, and customer

satisfaction, as described by Richard et al. [20]. In this context, business performance was observed from three perspectives, namely (1) The financial dimension, including several indicators such as revenue, profit, and ROI, (2) The customer aspect, including consumer satisfaction, loyalty, and market share, and (3) The internal process dimensions, prioritizing operational efficiency, product quality, and innovation measurements.

2.2 Sustainability Practices

In various SMEs, sustainability practices are presently non-formal, unstructured, limited in scope, and not managed as part of relevant business strategy [21]. This is because company does not actively communicate the social and environmental activities within the framework of CSR or sustainability. External social activities also mostly focus on philanthropic events, such as charity and donations. Meanwhile, internal operations are limited to HR practices, including workplace health, safety, training, and development [22].

The present construct of sustainability practices is expected to follow the format used by several previous scholars, including social, environmental, economic, and governance aspects. According to Das et al. [23], social sustainability practices comprised workforce diversity and compensation balance, occupational health and safety, human resource development, and public responsibility activities. For the environmental aspect, various indicators were also observed, including an eco-friendly workplace, greenhouse gas emission monitoring and control, waste management practices, and resource-saving processes for water and electricity.

Chowdhury et al. [24] subsequently stated that the social aspect contained occupational health and safety, human resource development, diversity, and absenteeism, with the environmental dimension containing greenhouse gas emission monitoring, waste and water recycling, renewable energy use, and biodiversity. Meanwhile, the economic aspect included cost savings through waste minimization, investment in energy-efficient technology and more optimal operating methods, as well as the development of internal control systems. It also contained a company effort to maximize profits, reduce operational costs, establish long-term business strategies, and

monitor employee productivity [25]. The governance dimension also contained the possession of necessary permits, clarity of functions and responsibilities in each work department, adequate accounting systems, tax compliance, and organization management through applicable regulations and ethical values [26,27].

2.3 Collaboration

Collaboration is presently a popular term in business, whose philosophy has penetrated various sectors of the economy and society due to originating from 'co-labor' or working with others to achieve common goals. This shows that close collaboration between company can produce superior economic outcomes than traditional exchange relationships, leading to the establishment of values and competitive advantages [28].

Based on many reports, several factors affected sustainability practices, such as local community and closest stakeholders care, networking in clusters, value chain collaboration, and effective communication. This proved that sustainability practices were significantly and positively enhanced through collaboration. For SMEs, a collaborative operational approach became a solution pattern during the implementation of limited resources and was optimally considered for the achievement of SDGs [21]. In this case, company could access the resources supporting greater financial benefits by collaborating with other organizations [29]. Various reports also examined the failure of collaboration efforts, which occurred due to the inadequate understanding of relevant indicators, namely cooperation and coordination focusing on the arrangements of interests and actions [30].

2.4 Innovation

Innovation is defined as the transformation of knowledge and ideas into new products, processes, or services [31]. This explains that innovative practices are commonly distinguished by developing new elements capable of being successfully implemented in the market. The practices are also considered a primary pattern to differentiate company products from relevant competitors. Moreover, innovation is a source of value addition to products and services in rapidly changing markets, enhancing the company competitive advantage [32].

According to the OECD, innovation was defined as the implementation of new products and marketing methods, to sustain company competitive advantage. Research & Development (R&D) and Patents were also common indicators for measuring innovation, with relevant investment providing innovative efforts and resource allocation to innovation activities. In addition, Patents represented the tangible outcomes of observable and unobservable innovativeness, expressing the dual characteristics prioritizing the quantity of innovation and the economic value [33].

Innovation is subsequently a close process focusing on a radical transformation of innovative resources across the entire procedure. In the Value Chain theory, it is considered a gradual, unbroken process comprising the stages of creation, development, and diffusion (generation-development-diffusion). This shows that the assessment of innovation efficiency should consider two key processes, namely creation and transformation. Therefore, innovative activities are categorized into R&D and the commercialization stage [33]. Innovation development and adoption are also expected to have three basic characteristics, including complexity, dynamism, and uncertainty. This proves that the innovative processes for sustainable development are a relatively newer phenomenon, whose development and implementation are as complex, dynamic, and uncertain as other procedural strategies [34].

The Relationship Between Collaboration and Sustainability Practices: Collaboration is a key factor in assessing the enhanced outcomes achievable by SMEs when working collectively, compared to independent task performance. This is primarily achieved through networking and engagement with various stakeholders and partners. In this context, the synergistic benefits originating from the networks positively influence sustainability practices of SMEs. Previous studies also widely supported the progress in sustainability practices and performance through inter-company networks and collaborative efforts [10,35]. Furthermore, SMEs play a significant role in propagating sustainability requirements from consumers and effectively disseminating relevant processes in the entire supply chain [29,36].

Effective and open communication is another important aspect of collaboration [10], where the shift from audit and monitoring toward accessible

dialogue among stakeholders will prevent SMEs from being trapped in unethical practices and mere compliance [37]. In line with the literature recommendations, collaboration construct also includes the following, (1) exchanging data related to sustainable best practices in SMEs clusters, (2) meeting consumer sustainability requirements, (3) incorporating sustainability criteria in supplier selection, and (4) disclosing sustainability practices information to external stakeholders. These perspectives lead to the formulation of the following hypothesis:

H₁: Collaboration positively affects SMEs sustainability practices.

The Relationship Between Innovation and Sustainability Practices: Sustainability challenges are related to innovation as a complex procedure of implementing new elements in products, processes, marketing methods, and organizational practices in business, organizations, or external relationships [38]. According to Sezen and Çankaya [39], innovation (eco-process innovation) significantly and positively affected sustainability practices in the automotive, chemical, and electronics sectors in Turkey. Suchek et al. [40] also explained that company needs to be aware and actively engaged in more sustainability practices, to transition to responsible production and consumption. In this process, company was required to rethink and innovate business models toward providing value to customers while simultaneously considering the environmental and social aspects. Furthermore, Lai et al. [41] found that company innovative capability positively influenced sustainability practices in Taiwan. Chege & Wang [16] also successfully stated that technological innovation was organizational characteristic playing an essential role in sustainability practices implementation in Kenyan agribusiness company. Other study also confirmed positive impact of innovation to sustainability practices [42]. These descriptions lead to the formulation of the following hypothesis:

H₂: Innovation positively affects SMEs sustainability practices.

The Relationship Between Collaboration and Innovation with Business Performance in SMEs: Financial performance is the most common proxy variable used to assess a company business growth. Based on several previous reports, the direct impact of

collaboration and innovation (independent variables) on business performance was observed.

Several previous studies found a direct positive impact between collaboration and business performance, such as Yanes-Estévez et al. [43], which focused on the importance of effectively managing relationships between SMEs, the suppliers, and consumers. This was in line with the strategies to enhance cooperation in the supply chain, as successful company often consistently outperformed relevant competitors. Neneh [44] also proved that customer orientation had a positive and significant relationship with company performance. In Ahmad et al. [45], a significant role was found in SMEs performance regarding market orientation and collaboration effects. Furthermore, the hypotheses prioritizing the positive relationship between innovation and business performance were widely accepted in academic studies [46–51]. These descriptions lead to the formulation of the following statements:

H₃: Collaboration positively affects SMEs business performance.

H₄: Innovation positively affects SMEs business performance.

The Relationship Between Sustainability Practices and SMEs Business Performance: Various studies were conducted to associate sustainability practices with the entire business performance of company, with *most* and *a few* of the analyses focusing on *large corporations* and *SMEs* in developed Western countries, respectively. However, limited reports depending on the topics were observed in developing nations [10].

In driving business growth, the impact of sustainability practices in large company was proved by previous relevant studies [52]. According to Malesios et al. [53], a significant positive relationship was identified between specific sustainability practices and financial performance in SMEs. Das and Rangarajan [10] also found that good sustainability practices positively affected business growth in 200 SMEs-based leather and chemical industry sectors in India. These descriptions are responsible for the formulation of the following hypothesis:

H₅: Sustainability practices positively affects SMEs business performance.

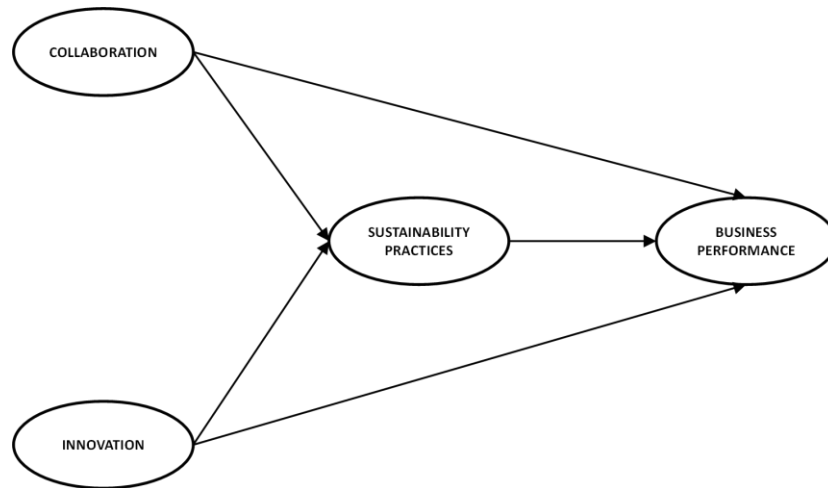


Fig. 1. Conceptual Framework

The Relationship Between Collaboration and Innovation on SMEs Business Performance Mediated by Sustainability Practices: In previous reports examining the relationship between the entire variables, the effects of collaboration and innovation on business performance were observed through sustainability practices [15,16,23]. Therefore, this study aims to analyze the mediating role of sustainability practices in the relationship between the independent (collaboration and innovation) and dependent (business performance) variables, leading to the formulation of the following statements:

H₆: Sustainability practices mediate the positive effect of collaboration on SMEs business performance.

H₇: Sustainability practices mediate the positive effect of innovation on SMEs business performance.

Fig. 1 presents the proposed conceptual framework.

3. METHOD

Hypothesis testing was conducted in the quantitative analysis, to examine the direct and indirect effects of collaboration and innovation on SMEs business performance through the mediation of sustainability practices. The following variables were used in the analytical processes:

3.1 Dependent Variable

The implemented dependent variable was SMEs business performance, whose measurement was

adopted from Das et al. [23], using four indicators.

3.2 Independent Variables

The following independent variables were implemented in the analytical processes:

- a. Collaboration measurement was adopted from Das et al. [21,23] and Zulu-Chisanga et al. [29] using six indicators.
- b. Innovation analysis was implemented from Tomšič et al. [15] using five indicators.

3.3 Mediating Variable

The implemented mediating variable was sustainability practices, which were measured across four dimensions, including environmental [21,24], social [23,24], economic [24,25], and governance [26], [27] with 6, 7, 6, and 7 indicators, respectively.

These variable measurements subsequently implemented a 5-point Likert scale, ranging from SD (strongly disagree) to SA (strongly agree).

The experimental population consisted of SMEs that were the subjects of empowerment and development by the Directorate-General of SMEs and Various Industries, Indonesian Ministry of Industry. These SMEs belonged to the ISIC (Indonesian Standard Industrial Classification) code 24-30, with 169 samples obtained through purposive sampling, and the survey was conducted during the period of July to September 2023.

Structural Equation Model-Partial Least Square (SEM-PLS) model was experimentally used to address the study questions, considering the heterogeneity of the obtained sample, as described in Fig. 2. The following procedural steps were adopted during the implementation of the model. Firstly, the *Instrument Tests* were implemented to analyze validity using outer loadings. In this context, an indicator was considered valid with outer loading and discriminant validity (Average Variance Extracted; AVE) greater than 0.5, showing the interrelatedness of the indicators forming a variable/dimension. Reliability testing was also conducted to assess the consistency of indicators for each variable/dimension, proving that an indicator was considered reliable with CR (Composite Reliability) value greater than 0.7. Secondly, *Model Fit Testing* focused on the analysis of multicollinearity, where each independent variable was considered free from intercorrelation when the Variance Inflation Factor (VIF) was less than 10. Adjusted R-Square testing also assessed the extent to which independent variables explained variation in the dependent determinant. The adjusted R-Square value also ranged from 0 to 1, prioritizing a stronger and weaker fit when closer to 1 and 0, respectively. Thirdly, *Hypothesis Testing* focused on analyzing the direct and indirect effects of independent variables on dependent determinants. This showed that the decision-making criteria depended on the p-value from the t-statistic. Ho and Ha were also rejected and accepted when the p-value was less than the

significance level (α) set at alpha degrees of 5% and 10%.

4. RESULT AND DISCUSSION

Table 1 showed the demographic characteristics of the participants. The study used sample size of 169 participants. Out of the total of 169, 57,4% (n = 97) were in Tegal, 23,7% (n = 40) were in Klaten, and 18,9% (n = 32) were in Greater Jakarta. The majority of those who answered the questionnaire were company owners (60,4 % or 102). Most companies were 10 years old or younger (40,2 % or 68 companies). Most companies had a staff size of fewer than 20 people (60,4 % or 102 companies).

The procedural analysis of SEM-PLS using SMARTPLS 3 was presented in Fig. 2, with validity and reliability tests presented in Table 2. Based on the results, all the implemented indicators of business performance, sustainability practices, collaboration, and innovation were considered valid, as shown by the outer loading values > 0.5. This was in line with the analysis of discriminant validity, which produced AVE values > 0.5 for all variables. Therefore, a relationship was observed between one indicator and another in forming each dimension/variable. The indicators were also considered reliable with CR values > 0.7 for all dimensions/variables. These results showed the validity and reliability of all indicators used to measure the dimensions/variables, confirming the inclusion in hypothesis testing.

Table 1. Participant's Profile

Profile	Description	Frequency	%
Location	Tegal	97	57,4%
	Klaten	40	23,7%
	Greater Jakarta	32	18,9%
	TOTAL	169	100,0%
Respondent's position	Owner	102	60,4%
	Manager	51	30,2%
	Supervisor	16	9,5%
	TOTAL	169	100,0%
Company age	≤ 10 years	68	40,2%
	11 - 20 years	46	27,2%
	>20 years	55	32,5%
	TOTAL	169	100,0%
Number of employees	Below 20	102	60,4%
	20 - 50	36	21,3%
	51 - 100	20	11,8%
	> 100	11	6,5%
	TOTAL	169	100,0%

Source: Processed data

Table 2. Discriminant validity and reliability test

Variables/Dimensions/Indicators	Outer Loading	Average Variance Extracted (AVE)	Composite Reliability
Business Performance			
BP1	0.788	0.744	0.921
BP2	0.884		
BP3	0.894		
BP4	0.881		
Sustainability Practices Environment			
SPE1	0.741	0.665	0.922
SPE2	0.861		
SPE3	0.850		
SPE4	0.725		
SPE5	0.858		
SPE6	0.844		
Economics			
SPEC1	0.631	0.594	0.897
SPEC2	0.757		
SPEC3	0.830		
SPEC4	0.802		
SPEC5	0.846		
SPEC6	0.736		
Good Governance			
SPG1	0.790	0.682	0.937
SPG2	0.884		
SPG3	0.846		
SPG4	0.828		
SPG5	0.741		
SPG6	0.845		
SPG7	0.837		
Social			
SPS1	0.576	0.547	0.893
SPS2	0.835		
SPS3	0.849		
SPS4	0.795		
SPS5	0.727		
SPS6	0.721		
SPS7	0.633		
Collaboration			
COLL1	0.859	0.565	0.885
COLL2	0.780		
COLL3	0.812		
COLL4	0.757		
COLL5	0.703		
COLL6	0.564		
Innovation			
INNO1	0.823	0.612	0.887
INNO2	0.717		
INNO3	0.765		
INNO4	0.751		
INNO5	0.848		

Source: Processed data

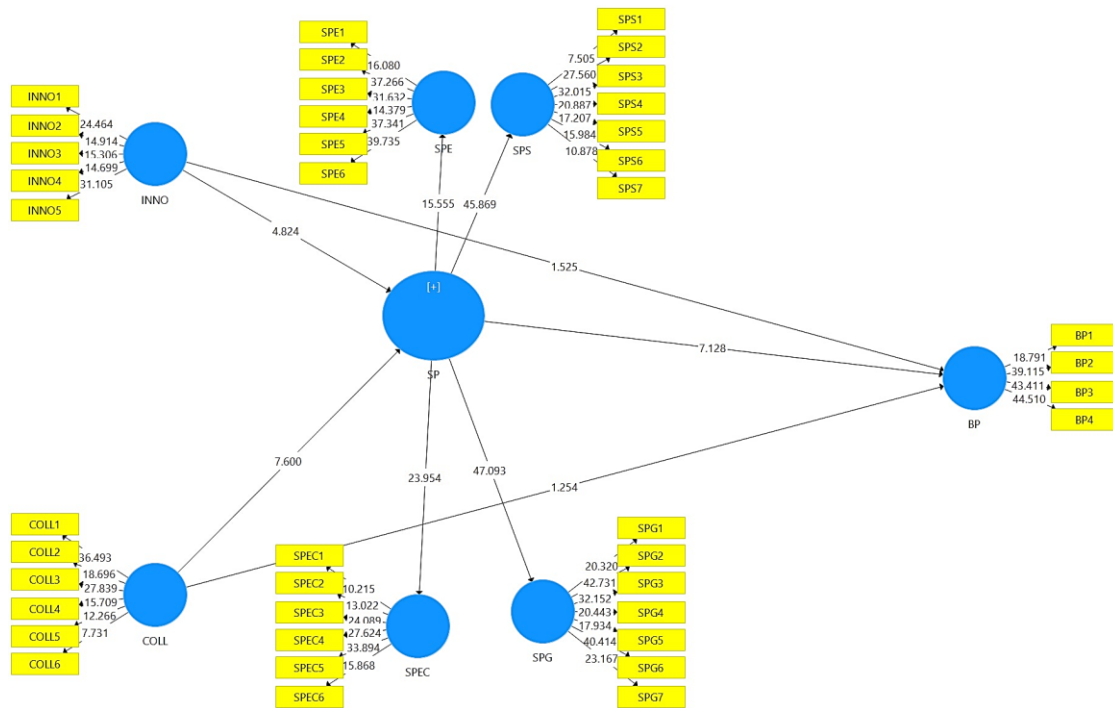


Fig. 2. SEM-PLS research model

Table 3 presented Heterotrait-Monotrait Ratio (HTMT), and all HTMT values between two constructs were less than 0.9, indicating that these constructs were considered to have good convergent consistency and could be distinguished from other constructs.

Table 4 presented the descriptive statistical calculations, where fairly positive responses were obtained for business performance with an average score and standard deviation of 3.846 and 0.676, respectively. This suggested that the majority of participants answers were between 3 and 4. The statistics for sustainability practices also produced fairly positive responses, with average and standard deviation values of 3.779 and 0.550, respectively. In this variable, the highest answer was observed for the economic dimension with a mean score of 3.952,

accompanied by governance, social, and environmental domains at values of 3.894, 3.822, and 3.447, respectively. Furthermore, innovation obtained fairly positive answers with average and standard deviation scores of 3.904 and 0.531, respectively, proving that most responses ranged from 3 to 4. For collaboration, the descriptive statistics also showed mean and standard deviation values of 4.072 and 0.519, respectively. This confirmed that participants provided good responses ranging from 3 to 5.

The model fit testing for the structural model in SEM-PLS was presented in Tables 5 and 6. Based on the analysis, no multicollinearity was found in sustainability practices and business performance models, because all independent variables produced VIF values < 10.

Table 3. Heterotrait-Monotrait Ratio (HTMT)

	BP	COLL	INNO	SPE	SPEC	SPG
COLL	0.681					
INNO	0.684	0.764				
SPE	0.470	0.454	0.467			
SPEC	0.703	0.753	0.740	0.510		
SPG	0.847	0.701	0.619	0.489	0.757	
SPS	0.741	0.726	0.728	0.688	0.772	0.812

Source: Processed data

Table 4. Descriptive Statistics

Variable and Dimension	Mean	Std. Deviation	Minimum	Maximum
Business Performance	3.846	0.676	2.000	5.000
Sustainability Practices	3.779	0.550	2.518	5.000
Environment	3.447	0.819	1.000	5.000
Social	3.822	0.625	2.143	5.000
Economic	3.952	0.547	2.333	5.000
Governance	3.894	0.659	2.143	5.000
Innovation	3.904	0.531	2.200	5.000
Collaboration	4.072	0.519	2.667	5.000

Source: Processed data

Table 5. Multicollinearity

Independent Variable	Model of Sustainability Practices	Model of Business Performance
Collaboration	1.714	2.201
Innovation	1.714	2.011
Sustainability practices		2.275

Source: Processed data

According to Table 6, the coefficient of determination for sustainability practices produced an Adjusted R-squared value of 0.555. This showed that innovation and collaboration explained 55.5% of the attitudinal differences expressed by the variable, with the remaining 44.5% representing other unimplemented indicators. For business performance model, an adjusted R-squared value of 0.576 was obtained. This proved that innovation, collaboration, and sustainability practices evaluated 57.6% of the behavioral differences provided by the variable, with the remaining 42.4% prioritizing other excluded factors. Therefore, the generated model produced a strong goodness of fit (GoF) with values exceeding 50%, specifically for the micro system analyzing individual units within the metal industry SMEs.

In Table 7, the hypothetical analysis outputs were observed, with collaboration significantly and positively impacting sustainability practices in SMEs operating in the metal industry (H1). This was expressed by the estimated, t-statistic, and p-value scores of 0.463, 7.600, and $0.000 < 0.05$, respectively. Innovation also significantly and positively affected sustainability practices, prioritizing the acceptance of H2. This was described by the estimated, t-statistic, and p-value coefficients of 0.361, 4.824, and $0.000 < 0.05$, respectively. Furthermore, H3 was rejected because the effects of collaboration on business performance were not significant and positive, as portrayed by the estimated, t-statistic, and p-

value scores of 0.098, 1.254, and 0.105, respectively. Hypothesis 4 (H4) was also accepted because innovation positively affected business performance. This was expressed by the estimated and p-value coefficients of 0.129 and $0.064 < 0.1$, respectively.

Hypothesis 5 (H5) was also accepted because sustainability practices significantly and positively affected business performance, as described by the estimated, t-statistic, and p-value scores of 0.597, 7.128, and $0.000 < 0.05$, respectively. Based on the indirect effect testing, sustainability practices mediated the positive impact of collaboration on business performance. This was proved by the estimated, t-statistic, and p-value coefficients of 0.276, 4.819, and $0.000 < 0.05$, describing the acceptance of H6. Furthermore, H7 was supported because sustainability practices mediated the positive effect of innovation on business performance, as presented by the estimated, t-statistic, and p-value scores of 0.216, 4.030, and $0.000 < 0.05$, respectively.

According to the results, collaboration and innovation affected business performance through the mediation of sustainability practices comprising four dimensions. This showed that the social dimension had the highest contribution at 0.898, accompanied by governance, economic, and environmental domains at 0.885, 0.840, and 0.717, respectively, as presented in Fig. 3.

Table 6. Coefficient of determination test

Structural Model	R Square	R Square Adjusted
Sustainability Practices	0.561	0.555
Business Performance	0.583	0.576

Source: Processed data

Table 7. Hypothesis result-evaluation of structure model

Hypothesis Description	Estimate	C.R.	p-value	Conclusion
H ₁ Collaboration positively impacts sustainability practices in SMEs	0.463	7.600	0.000**	Hypothesis supported
H ₂ Innovation positively affects sustainability practices in SMEs	0.361	4.824	0.000**	Hypothesis supported
H ₃ Collaboration positively influences the SMEs business performance	0.098	1.254	0.105	Hypothesis not supported
H ₄ Innovation positively impacts SMEs business performance	0.129	1.525	0.064*	Hypothesis supported
H ₅ Sustainability practices positively affect SMEs business performance	0.597	7.128	0.000**	Hypothesis supported
H ₆ Sustainability practices mediate the positive influence of collaboration on SMEs business performance	0.276	4.819	0.000**	Hypothesis supported
H ₇ Sustainability practices mediate the positive impact of innovation on SMEs business performance	0.216	4.030	0.000**	Hypothesis supported

*=alpha 10% **=alpha 5%

Source: Processed data

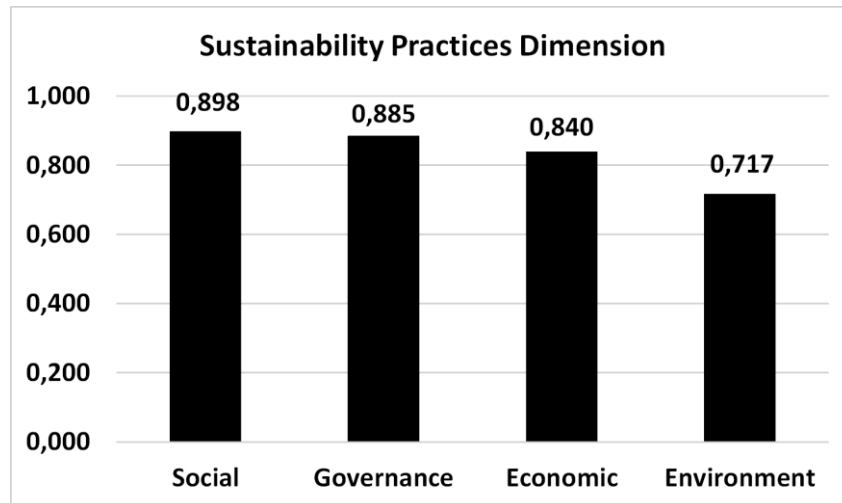


Fig. 3. Coefficient Contributions of Sustainability Practices

Source: Processed data

The results obtained validated the positive impact of sustainability practices on SMEs business performance, as found in several previous studies [10,53–55]. This relationship was explained through the following reasons. Firstly, responsible business practices developed a better image for SMEs, leading to the achievement of customer loyalty, employee

satisfaction, and improved company growth. Secondly, sustainability practices were commonly publicized as part of a company public communication, causing a positive effect on business development. Thirdly, sustainable activities allowed the differentiation of company and were perceived as an essential source of competitive advantage. The association between

sustainability practices and business practices was also understood by the respondents in the study. This prioritized the belief that the practices were essential for the progress and sustainability of organizations, due to primarily supporting competitive advantages by ensuring the preference of the products for the market or customers. The sustainability practices also helped in efficient and effective production processes, as well as optimized resource implementation.

The positive impact of collaboration on sustainability practices was subsequently confirmed and consistent with various previous studies [10,36,56,57]. In this context, collaboration commonly focused on relationships with customers and suppliers, ensured information transparency to external parties, and shared data among business actors regarding sustainability practices. Large company also imposed sustainability practices requirements on SMEs as their suppliers. This prioritized the significance of company in effectively disseminating sustainability practices in the supply chain, serving as intermediaries for customers sustainability requirements. Meanwhile, collaboration did not positively impact business performance, as described by Baah et al. [58]. From this context, collaborating with stakeholders in adopting sustainability practices produced contradictory outcomes. The need for technology, extra work procedures, or additional investments could increase company costs. However, collaboration could positively influence customer retention and revenue. These might explain the reason the entire business performance was not significantly affected.

Sustainability practices also mediated the positive impact of collaboration on business performance. This was due to the inability of collaboration to directly affect business performance, which prioritized additional costs regarding the requirements to be actualized. However, the implementation of sustainability practices led to the acquisition of a competitive advantage, operational effectiveness, and efficiency, as well as better prospects for orders and revenue. In this case, collaboration significantly and positively influenced business performance through the mediation of company sustainability practices.

Based on the results, innovation positively and significantly impacted both sustainability

practices and business performance directly and indirectly, supporting the development of many previous studies [15,16,39,41,46–49,59–62]. This showed that sustainability practices were achieved through innovation, regarding processes and products. Process innovation modified production procedures for effective and efficient outputs concerning resource usage, such as raw materials, water, or energy. Furthermore, more advanced innovation was related to the adoption of green technologies in the manufacturing process. Product innovation commonly covered the establishment of new products consistent with consumer preferences prioritizing sustainability issues. Innovation in processes and products subsequently expressed the implementation of sustainability practices and supported business performance from various perspectives. This proved that the business performance improved due to the decreased operational expenses achieved through process innovation and the increased revenue focusing on consumer acceptance of innovative and sustainable products.

5. CONCLUSION

In conclusion, the following outcomes were deduced, (1) Collaboration significantly and positively affected sustainability practices in SMEs, without directly influencing business performance, (2) Innovation significantly and positively impacted both sustainability practices and business performance in SMEs, (3) Sustainability performance positively affected business performance, (4) the positive effect of both collaboration and innovation on business performance was mediated by sustainability practices.

The role of SMEs in economic growth is significant, as is their collective impact on the ecological environment. This research proved that the sustainability practices carried out by SMEs continue to have a positive influence on their business performance. Therefore, the implementation of sustainability practices in SMEs needs to be enhanced to support our commitment to SDGs, without compromising the growth of the SMEs themselves.

This research utilized independent variables such as collaboration and innovation. There is a need to expand the use of other variables, both external and internal, to identify other factors influencing the sustainability practices of SMEs.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Brundtland GH. Our common future, world commission on environment and development (WCED). Oxford: Oxford University Press; 1987.
2. Avesani M. Sustainability, sustainable development, and business sustainability, in Life Cycle Sustainability Assessment for Decision-Making: Methodologies and Case Studies, Elsevier, 2019;21–38. DOI:10.1016/B978-0-12-818355-7.00002-6.
3. Porter ME, Kramer MR. The link between competitive advantage and corporate social responsibility. *Harv Bus Rev.* 2006; 84(12):78–92.
4. Ayuso S, Navarrete-Báez FE. How does entrepreneurial and international orientation influence SMEs' Commitment to Sustainable Development? Empirical Evidence from Spain and Mexico. *Corp Soc Responsib Environ Manag.* 2018; 25(1):80–94. DOI: 10.1002/csr.1441.
5. Günerergin M Penbek Ş, Zaptçioğlu D. Exploring the problems and advantages of turkish smes for sustainability. *Procedia Soc Behav Sci.* Oct, 2012;58:244–251. DOI:10.1016/j.sbspro.2012.09.998.
6. Jiménez E, de la Cuesta-González M, Boronat-Navarro M. How small and medium-sized enterprises can uptake the sustainable development goals through a cluster management organization: A case study," *Sustainability (Switzerland).* 2021; 13(11). DOI:10.3390/su13115939.
7. Martins A, Branco MC, Melo PN, Machado C. Sustainability in small and medium-sized enterprises: a systematic literature review and future research agenda. *Sustainability (Switzerland).* Jun 2022; 14(11). DOI:10.3390/su14116493.
8. Pham DC, Do TNA, Doan TN, Nguyen TXH, Pham TKY. The impact of sustainability practices on financial performance: empirical evidence from Sweden," *Cogent Business and Management.* 2021;8(1) DOI:10.1080/23311975.2021.1912526.
9. Rahi AF, Akter R, Johansson J. Do sustainability practices influence financial performance? Evidence from the Nordic financial industry," *Accounting Research Journal.* Feb, 2022;35(2):292–314. DOI:10.1108/ARJ-12-2020-0373.
10. Das M, Rangarajan K. Impact of policy initiatives and collaborative synergy on sustainability and business growth of Indian SMEs," *Indian Growth and Development Review.* Dec. 2020;13(3): 607–627. DOI:10.1108/IGDR-09-2019-0095.
11. Evans N, Sawyer J. CSR and stakeholders of small businesses in regional South Australia. *Social Responsibility Journal.* 2010;6(3):433–451. DOI:10.1108/17471111011064799.
12. Bartolacci F, Caputo A, Soverchia M. Sustainability and financial performance of small and medium sized enterprises: A bibliometric and systematic literature review. *Bus Strategy Environ,* Mar, 2020; 29(3):1297–1309. DOI:10.1002/bse.2434.
13. Yadav N, Gupta K, Rani L, Rawat D. Drivers of sustainability practices and SMEs: A Systematic Literature Review. *European Journal of Sustainable Development.* Oct, 2018;7(4). DOI:10.14207/ejsd.2018.v7n4p531.
14. Gandhi NS, Thanki SJ, Thakkar JJ. Ranking of drivers for integrated lean-green manufacturing for Indian manufacturing SMEs," *J Clean Prod.* Jan,2018;171:675–689. DOI: 10.1016/j.jclepro.2017.10.041.
15. Tomšič N, Bojnec Š, Simčič B .Corporate sustainability and economic performance in small and medium sized enterprises. *J Clean Prod.* Dec, 2015;108:603–612. DOI:10.1016/j.jclepro.2015.08.106.
16. Chege SM, Wang D. The influence of technology innovation on SME performance through environmental sustainability practices in Kenya," *Technol Soc.* Feb, 2020;60. DOI:10.1016/j.techsoc.2019.101210.
17. Armstrong M, Baron A. *Managing Performance: Performance Management in Action,* First. London: CIPD; 2005.
18. Robbins SP, Judge TA. *Essentials of Organizational Behavior,* Thirteenth. New York: Pearson; 2017.
19. Bratton J, Gold J. *Human resources management : Theory and Practice,* Sixth. London: Palgrave Macmillan; 2017.

20. Richard PJ, Devinney TM, Yip GS, Johnson G. Measuring organizational performance: Towards methodological best practice,” *Journal of Management*. 2009;35(3):718–804. DOI:10.1177/0149206308330560.
21. Das M, Rangarajan K, Dutta G. Corporate sustainability in small and medium-sized enterprises: a literature analysis and road ahead. *Journal of Indian Business Research*. 12, no. 2. Emerald Group Holdings Ltd. Apr. 28, 2020;271–300. DOI:10.1108/JIBR-09-2017-0166.
22. Langwell C, Heaton D. Using human resource activities to implement sustainability in SMEs. *Journal of Small Business and Enterprise Development*. Aug. 2016;23(3):652–670. DOI:10.1108/JSBED-07-2015-0096.
23. Das M, Rangarajan K, Dutta G. Corporate sustainability in SMEs: an Asian perspective,” *Journal of Asia Business Studies*, Emerald Group Holdings Ltd. Jan 10, 2020;14(1):109–138. DOI:10.1108/JABS-10-2017-0176.
24. Chowdhury RH, Choi S, Ennis S, Chung D. Which dimension of corporate social responsibility is a value driver in the oil and gas industry?,” *Canadian Journal of Administrative Sciences*. Jun. 2019;36(2): 260–272. DOI:10.1002/cjas.1492.
25. Chen ZF, Hong C, Occa A. How different CSR dimensions impact organization-employee relationships: The moderating role of CSR-culture fit,” *Corporate Communications*. 2019;24(1):63–78. DOI:10.1108/CCIJ-07-2018-0078.
26. Rubio-Andrés M, del M. Ramos-González M, Sastre-Castillo MÁ, Danvila-del-Valle I. Exploring sustainability, good governance, and social responsibility in small and medium enterprises. *Corp Soc Responsib Environ Manag*. Mar 2020;27(2):852–869. DOI:10.1002/csr.1849.
27. Shalhoob H, Hussainey K. Environmental, Social and Governance (ESG) Disclosure and the Small and Medium Enterprises (SMEs) Sustainability Performance. *Sustainability (Switzerland)*. Jan. 2023; 15(1). DOI:10.3390/su15010200.
28. Payan JM, Padín C, Ferro C, Svensson G. Action and social alignment components of collaboration in SME business relationships,” *Journal of Small Business and Entrepreneurship*, Nov. 2019;31(6): 463–481. DOI:10.1080/08276331.2018.1459014.
29. Zulu-Chisanga S, Chabala M, Mandawa-Bray B. The differential effects of government support, inter-firm collaboration and firm resources on SME performance in a developing economy. *Journal of Entrepreneurship in Emerging Economies*. Feb. 2021;13(2):175–195. DOI:10.1108/JEEE-07-2019-0105.
30. Gulati R, Wohlgezogen F, Zhelyazkov P. The Two Facets of Collaboration: Cooperation and Coordination in Strategic Alliances. *Academy of Management Annals*. Jun. 2012;6(1):531–583. DOI:10.1080/19416520.2012.691646.
31. Seow AN, Choong YO, Ramayah T. Small and medium-size enterprises’ business performance in tourism industry: the mediating role of innovative practice and moderating role of government support. *Asian Journal of Technology Innovation*. 2021;29(2):283–303. DOI:10.1080/19761597.2020.1798796.
32. Crossan MM, Apaydin M. A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*. 2010;47(6):1154–1191. DOI:10.1111/j.1467-6486.2009.00880.x.
33. Zhang Z, Zhu H, Zhou Z, Zou K. How does innovation matter for sustainable performance? Evidence from small and medium-sized enterprises. *J Bus Res*. Dec. 2022;153:251–265. DOI:10.1016/j.jbusres.2022.08.034.
34. Silvestre BS, Țircă DM. Innovations for sustainable development: Moving toward a sustainable future. *Journal of Cleaner Production*. Jan. 20, 2019;208:325–332. DOI:10.1016/j.jclepro.2018.09.244.
35. Zahoor N, Donbesuur F, Khan Z, Tarba SY, Cooper CL. Revisiting the Accelerated Internationalization of Emerging Market SMEs: The Roles of Firms’ Collaborations and Environmental Management Practices,” *Sustainability*, Jan. 2023;15(2) :1685. DOI:10.3390/su15021685.
36. Ayuso S, Roca M, Colomé R. SMEs as ‘transmitters’ of CSR requirements in the supply chain. *Supply Chain Management*. 2013;18(5):497–508. DOI:10.1108/SCM-04-2012-0152.
37. Huq FA, Stevenson M, Zorzini M. Social sustainability in developing country

- suppliers: An exploratory study in the ready made garments industry of Bangladesh,” *International Journal of Operations and Production Management*. 2014;34(5):610–638.
DOI:10.1108/IJOPM-10-2012-0467.
38. OECD, *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*, 3rd Edition. Paris: OECD Publishing; 2005.
 39. Sezen B, Çankaya SY. Effects of Green Manufacturing and Eco-innovation on Sustainability Performance. *Procedia Soc Behav Sci*. 2013;99:154–163.
DOI:10.1016/j.sbspro.2013.10.481.
 40. Suchek N, Fernandes CI, Kraus S, Filser M, Sjögrén H. Innovation and the circular economy: A systematic literature review. *Bus Strategy Environ*. Dec. 2021;30(8):3686–3702.
DOI:10.1002/bse.2834.
 41. Lai WH, Lin CC, Wang TC. Exploring the interoperability of innovation capability and corporate sustainability. *J Bus Res*. Apr. 2015;6(4867–871).
DOI:10.1016/j.jbusres.2014.11.043.
 42. Baeshen Y, Soomro YA, Bhutto MY. Determinants of Green Innovation to Achieve Sustainable Business Performance: Evidence From SMEs. *Front Psychol*; 12, Nov. 2021.
DOI:10.3389/fpsyg.2021.767968.
 43. Yanes-Estévez V, García-Pérez AM, Oreja-Rodríguez JR. Arcs of communication and small- and medium-sized enterprise performance. *Journal of Advances in Management Research*. Oct. 2019;16(4):625–644.
DOI:10.1108/JAMR-09-2018-0079.
 44. Neneh BN. Customer orientation and SME performance: The role of networking ties. *African Journal of Economic and Management Studies*. 2018;9(2):178–196.
DOI:10.1108/AJEMS-03-2017-0043.
 45. Ahmad Z, Chao L, Chao W, Ilyas S. How collaboration impacts in the market orientation-performance relationship of SMEs? A perspective from belt and road initiative. *Journal of Business and Industrial Marketing*. 2020;36(5):796–806.
DOI:10.1108/JBIM-12-2019-0518.
 46. Hernandez-Espallardo M, Osorio-Tinoco F, Rodriguez-Orejuela A. Improving firm performance through inter-organizational collaborative innovations: The key mediating role of the employee’s job-related attitudes. *Management Decision*. Jun. 2018;56(6):1167–1182.
DOI:10.1108/MD-02-2017-0151.
 47. Maldonado-Guzmán G, Garza-Reyes JA, Pinzón-Castro SY, Kumar V. Innovation capabilities and performance: are they truly linked in SMEs? *International Journal of Innovation Science*. Mar. 2019;11(1):48–62.
DOI:10.1108/IJIS-12-2017-0139.
 48. Ramadani V, Hisrich RD, Abazi-Alili H, Dana LP, Panthi L, Abazi-Bexheti L. Product innovation and firm performance in transition economies: A multi-stage estimation approach. *Technol Forecast Soc Change*. Mar. 2019;140:271–280.
DOI:10.1016/j.techfore.2018.12.010.
 49. Singhal C, Mahto RV, Kraus S. Technological Innovation, Firm Performance, and Institutional Context: A Meta-Analysis. *IEEE Trans Eng Manag*. Oct. 2020;1–11.
DOI:10.1109/tem.2020.3021378.
 50. Heenkenda HMJCB, Xu F, Kulathunga KMMCB, Senevirathne WAR. The Role of Innovation Capability in Enhancing Sustainability in SMEs: An Emerging Economy Perspective,” *Sustainability (Switzerland)*. Sep. 2022;14(17)
DOI:10.3390/su141710832.
 51. Le TT, Ikram M. Do sustainability innovation and firm competitiveness help improve firm performance? Evidence from the SME sector in Vietnam. *Sustain Prod Consum*. Jan. 2022;29:588–599.
DOI:10.1016/j.spc.2021.11.008.
 52. Flammer C. does corporate social responsibility lead to superior financial performance? A Regression Discontinuity Approach; 2013.
Available:<http://ssrn.com/abstract=2146282>
 53. Malesios C, Skouloudis A, Dey PK, Ben Abdelaziz F, Kantartzis A, Evangelinos K. Impact of small- and medium-sized enterprises sustainability practices and performance on economic growth from a managerial perspective: Modeling considerations and empirical analysis results,” *Bus Strategy Environ*. Nov. 2018; 27(7):960–972.
DOI:10.1002/bse.2045.
 54. Aboelmaged M. The drivers of sustainable manufacturing practices in Egyptian SMEs and their impact on competitive

- capabilities: A PLS-SEM model. J Clean Prod. Feb. 2018;175:207–221. DOI:10.1016/j.jclepro.2017.12.053.
55. Hazlina Ahmad N, Abidur Rahman S, Liyana Khairul Afendi Rajendran N, Abdul Halim H. Sustainable entrepreneurship practices in Malaysian manufacturing SMEs: the role of individual, organisational and institutional factors; 2020.
56. Journeault M, Perron A, Vallières L. The collaborative roles of stakeholders in supporting the adoption of sustainability in SMEs. J Environ Manage. Jun. 2021;287. DOI:10.1016/j.jenvman.2021.112349.
57. Masocha R, Fatoki O. The impact of coercive pressures on sustainability practices of small businesses in South Africa. Sustainability (Switzerland). Aug. 2018; 10(9). DOI:10.3390/su10093032.
58. Baah C, et al. Examining the correlations between stakeholder pressures, green production practices, firm reputation, environmental and financial performance: Evidence from manufacturing SMEs. Sustain Prod Consum. Jul. 2021;27:100–114. DOI:10.1016/j.spc.2020.10.015.
59. Ismanu S, Kusmintarti A, Riawjanti NI. The effects of product innovation, process innovation and government policy on SMEs Performance: Evidence from Indonesia. Journal of Asian Finance, Economics and Business. 2021;8:305–311. DOI:10.13106/jafeb.2021.vol8.no12.0305.
60. Lopes de Sousa Jabbour AB, Ndubisi NO, Roman Pais Seles BM, “Sustainable development in Asian manufacturing SMEs: Progress and directions,” Int J Prod Econ. Jul. 2020;225. DOI:10.1016/j.ijpe.2019.107567.
61. Otache I, Usang OUE. Innovation capability and SME performance in times of economic crisis: does government support moderate?,” African Journal of Economic and Management Studies. Feb. 2022;13(1):76–88. DOI: 10.1108/AJEMS-08-2021-0362.
62. Shashi, Centobelli P, Cerchione R, Singh R. The impact of leanness and innovativeness on environmental and financial performance: Insights from Indian SMEs,” Int J Prod Econ. Jun. 2019;212: 111–124. DOI:10.1016/j.ijpe.2019.02.011.

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