Volume 08, Issue 01, 2025. pp. 67–83
Research Article
DOI: https://doi.org/10.3126/npjbe.v8i1.85398

New perspective
Journal of Business and Economics

Leveraging Green Finance and Digitalization for enhancement of SMEs' performance in Nepal: Mediating Role of Sustainable Business Practices

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Abstract

This study examines the effect of green finance and digitalization on the business performance of SMEs, with a particular focus on the mediating role of sustainable business practices in the relationship of green finance and business performances and digitalization and business performances. A quantitative research method has been employed in this study where primary data with a sample size of 135 was collected from field surveys done inside the Kathmandu valley through a structured questionnaire developed using a 5-point Likert scale. The collected data were coded into SPSS for descriptive and inferential analysis, using Regression Analysis and the Baron Kenny mediation analysis to assess the relationship between the variables. The findings indicated that both green finance and digitalization positively impact the business performance of SMEs. Sustainable business practices partially mediate the relationship between green finance and performance, but no such mediating effect was found for digitalization. These findings underscore the importance of aligning green finance initiatives with sustainable business practices to achieve improved performance outcomes among SMEs.

Keywords: green finance, digitalization, SME, impact, business performance

Article Info.

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Article History
Received: 2025, July 10
First Revised: 2025, Aug 12
Second Revised: 2025, Sept 10
Accepted: 2025, Oct 05
Cite
Shrestha, R., Shrestha, A., & Tiwari, M. (2025). Leveraging green finance and digitalization for enhancement of SMEs' performance in Nepal: Mediating role of sustainable business practices. *New Perspective: Journal of Business and Economics*, *8*(1), 67–83. https://doi.org/10.3126/npjbe.v8i1.85398

Introduction

Small and Medium-sized Enterprises (SMEs) are defined variably across countries, typically based on thresholds of revenue, assets, or number of employees, with a common upper limit of around 200 to 250 employees globally (Liberto, 2022; OECD, 2021). In Nepal, the Industrial Enterprises Act (2020) sets SMEs as enterprises with more than 9 employees, with fixed capital limits of NPR 150 million for small and NPR 400 million for medium enterprises (Government of Nepal, 2020). SMEs play a crucial role in the global economy, comprising about 90% of businesses and providing over half of employment worldwide (World Bank, 2019). In Nepal, they contribute 22% of GDP and employ approximately 1.8 million people, also fostering women's empowerment and inclusive development (Friedrich Naumann Foundation, 2024).

Green finance, aimed at shifting financial flows to environmentally sustainable projects (UNEP, 2018), is gaining momentum globally and in Nepal, where national frameworks and regulatory guidance promote green investments, especially in renewable energy and sustainable agriculture (UNDP, 2021; NRB, 2025). Access to finance

remains a critical challenge for SMEs adopting sustainable practices. Alongside, digitalization enhances business efficiency and market reach through tools like mobile banking and e-commerce, supported by Nepal's Digital Nepal Framework (OECD, 2021; Nepal et al., 2024).

Business performance, measured through profitability, productivity, and growth, is vital for SMEs given their significant economic role (Kaplan & Norton, 2015; Friedrich Naumann Foundation, 2024). While financing, skilled labor, innovation, and digital adoption have proven to affect SME performance, sustainable business strategies integrating Environmental, Social, and Governance (ESG) criteria are increasingly recognized for driving long-term resilience and competitiveness (World Bank, 2022). Globally, green economies are expanding rapidly, with significant investments in renewables and sustainability in Asia-Pacific markets (IEA, 2023). Nepal's focus on hydropower, organic farming, and eco-tourism aligns with its 2045 net-zero target and reflects emerging market leadership in sustainability.

Problem Statement

Prior research confirms that green finance positively impacts SME sustainability and business outcomes, with digitization and pro-environmental behaviors further facilitating this relationship (Budisaptorini & Wibowo, 2024; Appiah-Kubi et al., 2024). Corporate Social Responsibility (CSR) also mediates sustainability performance, while external factors like international green financing, financial literacy, and social capital influence adoption among SMEs (Khababa & Jalingo, 2023; Ihsan et al., 2024; Nepal et al., 2024; Sumastuti et al., 2024). Financial innovations through FinTech improve access but may pose challenges to green innovation priorities (Joshi & Karmacharya, 2024; Popescu & Popescu, 2019). Despite these insights, there remains limited research focused on Nepal's unique economic environment, which features a smaller, less diversified financial sector and evolving technology landscape. The geographic concentration of studies from other regions limits their applicability to Nepal, where SME growth and green finance are still emerging trends.

Research Objective

To address these gaps, this study aims to analyze the effects of green finance and digitalization on SME business performance in Nepal. Furthermore, it investigates the mediating role of sustainable business practices in the relationship between green finance, digitalization, and SME performance. By focusing on SMEs within Nepal's evolving economic and technological context, this research seeks to generate relevant insights for fostering sustainable and competitive business models in emerging markets.

Literature Review

Khababa and Jalingo (2023) examine the mediating role of Corporate Social Responsibility (CSR) in the relationships among green finance, green investment, green technology, and sustainability within SMEs in Saudi Arabia, while also investigating the moderating effect of corporate governance. Utilizing a quantitative cross-sectional design with data from 250 SME employees analyzed through Partial Least Squares Structural Equation Modeling (PLS-SEM), they find that adoption of green finance, investment, and technology positively stimulates CSR activities, resulting in better sustainability outcomes. Strong corporate governance further reinforces this relationship.

Building on this, Ihsan et al. (2024) explore the impact of access to finance (ATF) on SMEs' green performance in Pakistan, underscoring CSR's mediating role within the framework of the Triple Bottom Line and stakeholder theories. Their results indicate that improved financial access and strong CSR initiatives significantly enhance sustainable practices. Similarly, Budisaptorini and Wibowo (2024) investigate Indonesian SMEs, revealing that green finance and environmental practices positively affect business performance, which mediates the sustainability outcome. Their study emphasizes that green financing's contribution

to sustainability is maximized when linked to enhanced firm success.

Nepal et al. (2024) focus on the role of international green financing in facilitating low-carbon energy transitions in developing countries, highlighting the digital economy's moderating influence. They document substantial increases in renewable energy adoption, particularly in low-income nations, driven by green financial flows augmented through robust digital infrastructure. Correspondingly, Joshi and Karmacharya (2024) assess FinTech adoption in Nepalese financial institutions, finding it positively impacts sustainability performance and green finance, but potentially hampers green innovation due to short-term prioritization.

Popescu and Popescu (2019) provide evidence from Romania linking CSR and intellectual capital to improved financial and non-financial firm performance. Sumastuti et al. (2024) examine Indonesian MSMEs, illustrating how green finance, financial literacy, and social capital collectively enhance financial performance and sustainability. Appiah-Kubi et al. (2024) delve into the mediating roles of pro-environmental behavior and digitization in the relationship between green finance and SMEs' sustainability reporting, confirming that digitization strengthens the impact. Leveraging green finance and digitalization has emerged as a crucial strategy for enhancing the performance of SMEs in Nepal, with sustainable business practices playing a mediating role. Mishra and Aithal (2022) emphasize the imperative of green financing in Nepal's context, highlighting its potential to direct financial resources towards environmentally friendly projects that promote long-term economic and social benefits. Complementing this, Mishra and Rai (2017) demonstrate that eco-friendly practices yield superior organizational performance compared to conventional models, underlining the tangible benefits of sustainability integration. Further, Mishra and Aithal (2023) explore factors influencing green banking practices and confirm that financial sector support significantly drives sustainability adoption among SMEs. The review by Mishra et al. (2024) synthesizes evidence showing that environmental sustainability orientations positively influence organizational outcomes, reinforcing the significance of embedding sustainability in business strategies.

The role of green innovation in boosting corporate financial performance is elaborated by Mishra (2025), signaling that innovation aligned with sustainability can create competitive advantages. Talent management intertwined with green technology adoption, as discussed by Mishra (2024), is vital for equipping SMEs with the skills necessary to thrive in sustainable markets. Celestin and Mishra (2024) further consolidate the evolution of sustainable finance instruments, such as green bonds, that facilitate public sector development and indirectly support SME growth. Digital transformation coupled with Green Human Resource Management (Gautam et al., 2025) enhances institutional performance and can be adapted by SMEs to optimize both environmental and operational efficiencies. Lastly, the trends in Green-HRM (Tamang & Mishra, 2022) highlight how employee engagement in sustainability initiatives strengthens organizational culture and performance.

Together, these studies underscore that green finance and digitalization, when channeled through sustainable business practices, offer significant pathways for improving SME performance in Nepal's evolving economic landscape.

While prior studies substantiate the positive role of green finance and sustainability practices, their geographic focus is scattered across diverse economies, including Saudi Arabia, Pakistan, Indonesia, Nepal, Romania, and others, leading to fragmented insights. In Nepal, existing empirical studies remain limited and lack comprehensive integration of green finance, digitalization, and sustainable business practices within SMEs. Moreover, variations in financial maturity, technological development, and economic complexity challenge the generalizability of

findings from other regions to Nepal's emerging context. Notably, current literature often isolates financial or sustainability outcomes without thoroughly examining their interrelations mediated by sustainable practices.

Operational Definition of Variables

Green Finance

Financial investments targeted at environmentally beneficial projects, including green bonds, loans, and sustainable funds that facilitate the transition to a low-carbon economy and inclusive social growth (Budisaptorini & Wibowo, 2024; Joshi & Karmacharya, 2024).

Digitalization

Adoption and integration of digital technologies (e.g., digital payments, e-commerce) that enhance operational efficiency and enable implementation of sustainable business activities within SMEs (Joshi & Karmacharya, 2024; Budisaptorini & Wibowo, 2024).

Business Performance

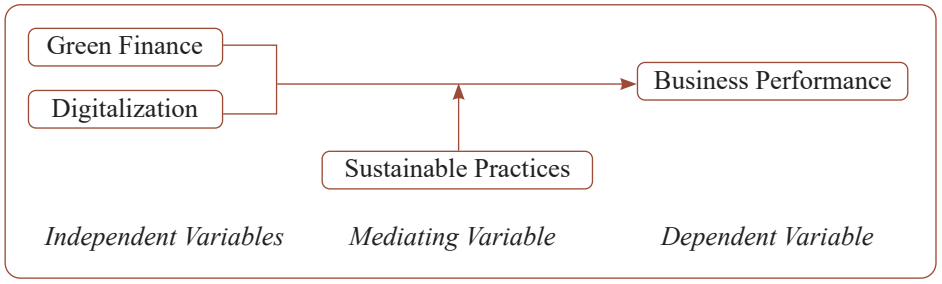
The effectiveness and efficiency of a firm's operations in achieving financial goals and market competitiveness, measured through profitability, revenue growth, market share, and customer satisfaction (Budisaptorini & Wibowo, 2024; Nepal et al., 2024).

Sustainable Business Practices

Environmentally and socially responsible approaches that reduce ecological impact and foster long-term viability, including CSR, ethical labor, renewable energy, and waste reduction strategies (Budisaptorini & Wibowo, 2024; Nepal et al., 2024).

Figure 1

Conceptual Framework



From above contextual framework, following hypothesis is formulated:

H1: Green finance has a positive impact on SMEs business performance.

H2: Digitalization has a positive impact on SMEs business performance.

H3: Sustainable business practices plays a mediating role in the relationship between green finance and SMEs business performance.

H4: Sustainable business practices plays a mediating role in the relationship between digitalization and SMEs business performance.

Methodology

This study employs a quantitative research approach to investigate the impact of green finance and digitalization on the business performance of SMEs, with sustainable business practices serving as the mediating variable. The primary data source consists of responses gathered through a structured questionnaire. The unit of analysis is the SME organization, specifically within the Kathmandu Valley, chosen to ensure feasibility and contextual relevance.

The questionnaire comprised 27 items measured on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Following

the item-to-response ratio guideline of 1:5 (Hair et al., 2010), a sample size of 135 respondents was deemed appropriate. Due to the absence of a comprehensive SME database and constraints in time and resources, a non-probability convenience sampling method was employed to select SMEs willing to participate.

A pilot test involving 15 respondents was conducted to assess question relevance and clarity; feedback from the pilot informed necessary revisions. Data collection was executed through a combination of online surveys (via Google Docs) and physical field visits, facilitating a diverse and representative sample across the Kathmandu Valley.

Data quality was ensured through tests for internal and external validity. Internal consistency was assessed using Cronbach's Alpha, which yielded a reliability coefficient of 0.811, indicating strong reliability. External validity was maintained by rigorous sorting, screening, and consistency checks. Out of 141 collected responses, 135 valid responses were retained for analysis. Data were coded and processed using IBM SPSS Version 23.

Descriptive statistics summarized the demographic and response patterns, while inferential statistics including multicollinearity testing, Baron and Kenny's mediation analysis, and the Sobel test were applied to explore relationships among variables and test the study hypotheses.

Results and Discussion

Green finance and digitalization both positively impact SME performance. Sustainable business practices partially mediate the effect of green finance, but no mediation is observed for digitalization, highlighting the role of sustainability in enhancing business outcomes.

Table 1

Cronbach's Alpha

Reliability Statistics	
Variables	**Cronbach's Alpha**
Green Finance	0.754
Digitalization	0.817
Business Performance	0.727
Sustainable Practices	0.718
Overall Reliability Statistics	
No. of Items	Cronbach's Alpha
27	0.810

The Cronbach's Alpha Test was conducted to measure reliability and internal consistency of the different measures used in the study. It describes the extent to which all the items in a test measure the same construct. The test yielded 0.754 for green finance, 0.817 for digitalization, 0.727 for business performance and 0.718 for sustainable business practices. The value of Cronbach's alpha is greater than 0.5. Based on the rule of thumb, digitalization falls under a good reliability range (0.8 t0 0.9 indicates good reliability) and the other three variables also fall under acceptable ranges (0.7 to 0.8 indicates good reliability).

The overall reliability of the study yielded 0.810 , which shows a good reliability and demonstrates a great internal consistency and reliability among the items supporting further analysis.

Table 2

Demographic Profile of the SMEs

Demographic Profile		Frequency	Percent	Cumulative Percent
Sector of operation	Retail and Wholesale	63	46.7	46.7
	Manufacturing	27	20	66.7
	IT and Digital	8	5.9	72.6
	Agro based	1	0.7	73.3
	Others	36	26.7	100
	Total	135	100	
Years in operation	Less than 1 year	8	5.9	5.9
	1-3 years	26	19.3	25.2
	4-7 years	19	14.1	39.3
	Above 7 years	82	60.7	100
	Total	135	100	
Education Level of owners	SLC/SEE	10	7.4	7.4
	+2 Graduate	32	23.7	31.1
	Bachelor's Degree	61	45.2	76.3
	Masters and above	32	23.7	100
		135	100	

Note. Field Survey

The data from 135 SMEs in the Kathmandu Valley reveals that the majority operate in the retail and wholesale sector (46.7%), followed by manufacturing (20%), while sectors like IT and Digital (5.9%) and agro-based enterprises (0.7%) are significantly underrepresented. Most businesses are well-established, with 60.7% operating for over 7 years, indicating a mature SME landscape. In terms of education, SME owners are predominantly well-educated, with 45.2% holding a Bachelor's degree and 23.7% having a Master's degree or higher. The findings suggest a concentration of experienced, educated entrepreneurs mainly engaged in trade, highlighting opportunities to foster growth in underrepresented sectors and newer businesses.

Table 3

Demographic Profile of the SMEs

Demographic Profile		Frequency	Percent	Cumulative Percent
Use of Digital Platform	Yes	103	76.3	76.3
	No	32	23.7	100
	Total	135	100	
Adoption of Digital Platform	Digital Payments	50	37	37
	E-commerce platforms	8	5.9	43
	Both	77	57	100
	Total	135	100	

Note. Field Survey

Demographic Profile		Frequency	Percent	Cumulative Percent
Status of Loans taken	Yes from BFI	63	46.7	46.7
	Yes from grants	3	2.2	48.9
	No but planning to	21	15.6	64.4
	No, not interested	48	35.6	100
	Tatal	135	100	

Note. Field Survey

Among the 135 SMEs surveyed, a significant majority (76.3%) reported using digital platforms, indicating widespread digital engagement, though 23% still do not use them. In terms of platform adoption, 37% use digital payments, 5.9% use e-commerce platforms, and 57% use both, suggesting growing integration of digital tools in business operations. Regarding financing, 46.7% have taken loans from banks and financial institutions (BFIs), while 2.2% received grants. Additionally, 15.6% are planning to take loans, and 35.6% are not interested, reflecting a mixed level of financial engagement and possibly a cautious or self-reliant approach among a notable portion of SMEs.

Table 4

Multicollinearity Test

Model	DV	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
(Constant)	BP	2.419	0.319		7.585	0		
Avg_D		0.247	0.065	0.31	3.816	0	0.993	1.007
Avg_GF		0.138	0.066	0.17	2.097	0.038	0.993	1.007

To test the presence of any multicollinearity between independent variables, Tolerance and Variance Inflation Factor (VIF) was used. According to (Oke et al., 2019) tolerance and variance inflation factor can measure the presence of multicollinearity equally. A tolerance close to 1 means there is little multicollinearity, whereas a value close to 0 suggests that multicollinearity may be a threat. (Daoud, 2017) also explained that if any of the VIF values exceeds 5 or 10, it implies that the associated regression coefficients are poorly estimated because of multicollinearity.

The collinearity statistics indicate no multicollinearity between digitalization and green finance, as both variables have VIF values of 1.007 and tolerance values of 0.993, which are well within acceptable ranges. This confirms that the predictors are not highly correlated and can be reliably included in the regression model without distortion.

Mediation Effect Analysis

This study has used The Baron and Kenny approach for testing the mediation effect of Sustainable Business Practices on the relationship between Green Finance and Business Performance and Digitalization and Business Performance.

As defined by Baron and Kenny (1986), a series of regression equations must be estimated for a deeper understanding of mediational hypotheses. To test the mediation hypothesis, there are 3 regression equations which are run to confirm 4 different paths in the model:

- Regressing the dependent variable (BP) on independent variable (GF or D) — Path c
- Regressing mediator (SP) on independent variable (GF and D) — Path a
- Regressing dependent variable (BP) on both independent variable (GF and D) and on mediator (SP) — Path b and Path c'

The 'Path b' which establishes relation between mediating variable and dependent variable is not done as a separate model but in a combined regression model in Step 3. This approach is essential to control for the independent variable, thereby isolating the true mediating effect.

The following is the role of the 4 paths:

- **Path a:** Shows whether the independent variable influences the mediator
- **Path b:** Examines whether the mediator affects the dependent variable, controlling for the independent variable
- **Path c:** Measures the overall effect of the independent variable on the dependent variable without including the mediator.
- **Path c':** Assesses whether the independent variable still affects the dependent variable after accounting for the mediator

Table 5

Correlation (Green Finance)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.197a	0.039	0.032	0.575
2	.322a	0.104	0.097	0.59737
3	.285a	0.081	0.068	0.56423

In Model 1, the correlation coefficient (R) was 0.197, indicating a weak positive linear relationship between GF and BP. The adjusted coefficient of determination (Adjusted R^2) between the two variables is 0.032, meaning only 3.2% of the variance in BP is explained by GF alone. Although modest, this value meets the first condition for establishing a mediation pathway, provided the relationship is statistically significant.

In Model 2, the relation between our mediating variable (SP) and independent variable (GF) is a bit more stronger with the correlation coefficient value being R= 0.322, which shows a moderate positive relationship. The adjusted coefficient of determination (Adjusted R^2) is 0.097 suggesting that GF explains approximately 9.7% of the variance in SP, which satisfies the second condition for mediation (path a).

In Model 3, the R value is 0.285, indicating that the combination of independent variable (GF) and mediating variable (SP) had a stronger relationship with dependent variable (BP) than GF alone. The Adjusted R^2 for this model was 0.068, showing that the combined model explains 6.8% of the variance in BP.

Table 6

ANOVA Test (Green Finance)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.775	1	1.775	5.369	.022b
	Residual	43.973	133	0.331		
	Total	45.748	134			

Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	5.497	1	5.497	15.404	.000b
	Residual	47.461	133	0.357		
	Total	52.958	134			
3	Regression	3.725	2	1.863	5.851	.004b
	Residual	42.023	132	0.318		
	Total	45.748	134			

The ANOVA (Analysis of Variance) test is done to see if our model is statistically significant and if the model is fit for study.

In Model 1, the ANOVA table tests whether the independent variable (GF) significantly predicts the dependent variable (BP). The F-statistic is 5.369 with a corresponding significance value, p = 0.022 (p< 0.05). This rejects the null hypothesis (H0) and accepts H1 which means that the regression model is statistically significant, and GF does explain a small but meaningful portion of the variance in BP.

In the Model 2, the ANOVA tests whether GF significantly predicts the mediator SP. The F-value is much higher at 15.404, with a highly significant p-value (p < 0.001). This rejects the null hypothesis which means that this regression model is statistically significant.

In Model 3, it examines whether the mediator (SP), while controlling for GF, contributes to predicting BP. The F-statistic is 5.851 and the p-value is 0.004, which is statistically significant.

Table 7

Coefficients (Green Finance)

Model	Heading	DV	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Path (Effects)
			B	Std. Error	Beta			
1	(Constant)	BP	3.322	0.224		14.801	0	
	Avg_GF		0.159	0.069	0.197	2.317	0.022	Path c (TOTAL)
2	(Constant)	SP	2.406	0.233		10.316	0	
	Avg_GF		0.28	0.071	0.322	3.925	0	Path a
3	(Constant)	BP	2.835	0.296		9.592	0	
	Avg_GF		0.102	0.071	0.127	1.438	0.153	Path c' (DIRECT)
	Avg_SP		0.203	0.082	0.218	2.475	0.015	Path b

Model 1: Between the Independent Variable (GF) and Dependent Variable (BP)

The findings demonstrated a significance level (p- value) of 0.022 (p < 0.05). Thus, we reject the null hypothesis, implying that Green Finance (GF) has a statistically significant effect on Business Performance (BP). This indicates that the Path c (TOTAL effect) is satisfied. This finding is also consistent with the first hypothesis of the study: Green finance has a positive impact on SMEs business performance.

The unstandardized regression coefficient (B) is 0.159, which means that for every unit increase in GF, the BP increases by 0.159 units. The standard error suggests that there might be ±0.069 uncertainty around this estimate, which reflects a moderate precision.

Model 2: Between the Independent variable (GF) and Mediating Variable (SP)

The findings demonstrated a significance level (p- value) of 0 (less than 0.05), rejecting the null hypothesis and implying that Green Finance (GF) has a statistically significant effect on Sustainable Business Performance (SP). This indicates that the Path a (effect of GF on SP) is met in the mediation process.

The unstandardized regression coefficient (B) is 0.28, which means that for every unit increase in GF, the SP increases by 0.28 units. The standard error suggests that there might be ±0.071 uncertainty around this estimate, which reflects a moderate precision.

Model 3: Dependent Variable (BP) on both Independent Variable (GF) and mediating variable (SP)

For Path b (effect of SP on BP), the findings demonstrated a significance level (p- value) of 0.015 ($p<0.05$). Therefore, we reject the null hypothesis, implying that SP has a statistically significant effect on Business Performance (BP). This finding is consistent with the expectations of Path b.

The unstandardized regression coefficient (B) is 0.203, which means that for every unit increase in SP, the BP increases by 0.203 units. The standard error suggests that there might be ±0.082 uncertainty around this estimate, which reflects a moderate precision.

According to (Baron & Kenny, 1986), in Path c', a condition of perfect mediation occurs if the independent variable has no effect when the mediator is controlled, which serves as our null hypothesis. The findings demonstrated a significance level of 0.153 (more than 0.05), which means we accept the null hypothesis, i.e. there is a perfect mediation. The direct effect (c'= 0.102) is smaller than our Total effect (c= 0. 159), which further reinforces the mediating relationship.

Hence, this analysis suggests a full mediation i.e. SP perfectly explains the relationship between GF and BP.

Figure 2

Mediation Analysis Summary (Effects of GF on BP with SP as a Mediating Variable)

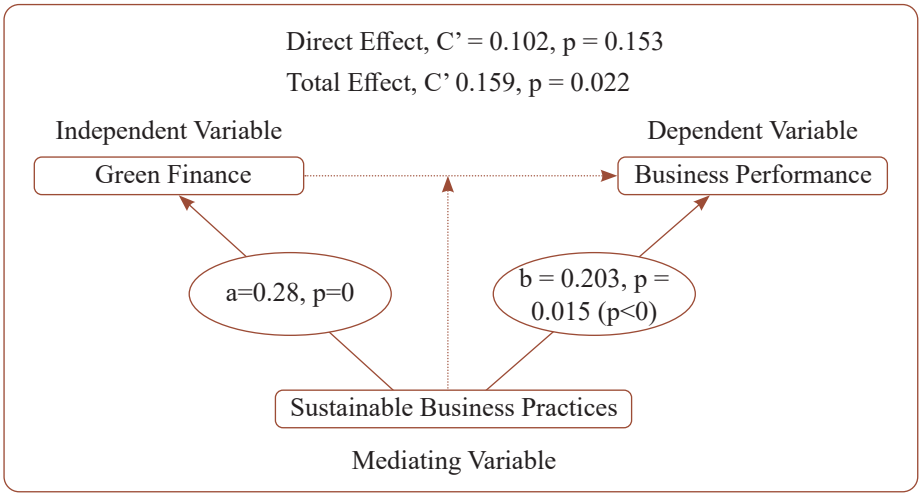


Table 8

Sobel Test (Green Finance)

Description		Notation	Value
Input	B-coefficient for GF onto SP	a	0.28
	Standard error for a	se(a)	0.071
	B-coefficient for SP onto BP	b	0.203
	Standard error for b	se(b)	0.082
Output	Indirect effect from GF onto BP via mediator	ab	0.057
	Standard error indirect effect	se(ab)	0.028
	Z-value under null hypothesis	z	2.050
	P-value under null hypothesis	p(2-tailed)	0.040

A SOBEL Test was conducted to further validate the mediation and assess the significance of indirect effect (ab). The Sobel test is utilized to examine the hypothesis in which the relationship between the independent (X) and dependent (Y) variables is mediated by a third variable (Y); that is, X and Y have an indirect relationship (Abu-Bader and Jones, 2021).

Based on the above findings, we have full mediation, composed of two effects, a (GF on SP) and b (SP on BP). Thus, a total effect was calculated as a product of these two effects in Table 5.

i.e. indirect effect (ab)= a.b (0.28*0.203= 0.057)

The results of the SOBEL Test shows the significance level (p- value of 0.040, less than 0.05 which shows that the effect is significant, and there is a full mediation of Sustainable Business Practices between indirect variable Green finance and dependent variable Business Performance.

This finding is consistent with the third hypothesis of the study: Sustainable business practices plays a mediating role in the relationship between green finance and SMEs business performance.

Table 9

Correlation (Digitalization)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.325a	0.105	0.099	0.55471
2	.065a	0.004	-0.003	0.62967
3	.403a	0.162	0.15	0.53885

In Model 1, the correlation coefficient (R) was 0.325, indicating a moderate positive linear relationship between D and BP. The adjusted coefficient of determination (Adjusted R^2) between the two variables is 0.099, meaning only 9.9% of the variance in BP is explained by D alone. Although modest, this value meets the first condition for establishing a mediation pathway, provided the relationship is statistically significant.

In Model 2, the relation between our mediating variable (SP) and independent variable (D), the correlation coefficient is R= 0.065, which shows a very weak relation between both variables. The adjusted coefficient of determination (Adjusted R^2) is -0.003, suggesting that D does not explain the variance in SP.

In Model 3, the R value is 0.403, indicating that the combination of D and SP had a stronger relationship with BP than D alone. The Adjusted R^2 for this model was 0.15, showing that the combined model explains 15% of the variance in BP.

Table 10

ANOVA (Digitalization)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.824	1	4.824	15.678	.000b
	Residual	40.924	133	0.308		
	Total	45.748	134			
2	Regression	0.225	1	0.225	0.568	.452b
	Residual	52.732	133	0.396		
	Total	52.958	134			
3	Regression	7.421	2	3.71	12.779	.000b
	Residual	38.327	132	0.29		
	Total	45.748	134			

In Model 1, the ANOVA table tests whether the independent variable (D) significantly predicts the dependent variable (BP). The F-statistic is 15.678 with a corresponding significance value (p = 0), which is below the 0.05 threshold. This rejects the null hypothesis (H0) which means that the regression model is statistically significant and fit for study, and GF does explain a moderate portion of the variance in BP.

In the Model 2, the ANOVA tests whether D significantly predicts the mediator SP. The F-value is much lower at 0. 568, with a significance (p-value (p= 0.45, more than 0.05). This does not reject the null which means that this regression model is not statistically significant.

In Model 3, it examines whether the mediator (SP), while controlling for D, contributes to predicting BP. The F-statistic is 12.779, with a significance (p-value= 0.004, less than 0.05) which shows this model is statistically significant and fit for study.

Table 11

Coefficients and Hypothesis Testing

Model	Heading	DV	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Path (Effects)
			B	Std. Error	Beta			
1	(Constant)	BP	2.813	0.261		10.766	0	Path c (TOTAL)
	Avg_D		0.259	0.065	0.325	3.96	0	
2	(Constant)	SP	3.079	0.297		10.381	0	Path a
	Avg_D		0.056	0.074	0.065	0.754	0.452	
3	(Constant)		2.129	0.341		6.236	0	
	Avg_D	BP	0.246	0.064	0.309	3.872	0	Path c' (DIRECT)
	Avg_S		0.222	0.074	0.239	2.991	0.003	Path b

Model 1: Between the Independent Variable (D) and Dependent Variable (BP)

The findings demonstrated a significance level (p- value) of 0, which is less than conventional threshold of 0.05. Thus, we reject the null hypothesis, implying that Green Finance (D) has a statistically significant effect on Business Performance (BP). This indicates that the Path c (TOTAL effect)

between independent and dependent variables is met in the mediation process.

This finding is also consistent with the second hypothesis of the study: Digitalization has a positive impact on SMEs business performance.

The unstandardized regression coefficient (B) is 0.259, which means that for every unit increase in D, the BP increases by 0.259 units. The standard error suggests that there might be ±0.065 uncertainty around this estimate, which reflects a moderate precision.

Model 2: Between the Independent variable (D) and Mediating Variable (SP)

The findings demonstrated a significance level (p- value= 0.452), more than 0.05. Thus, we reject the null hypothesis and understand that Digitalization (GF) does not have any significant effect on Sustainable Business Performance (SP). This indicates that the Path a (effect of GF on SP) is not met in the mediation process.

The unstandardized regression coefficient (B) is 0.056, which means that for every unit increase in GF, the SP increases by 0.056units. The standard error suggests that there might be ±0.074 uncertainty around this estimate, which reflects a moderate precision.

Model 3: Dependent Variable (BP) on both Independent Variable (D) and mediator (SP)

For Path b (effect of SP on BP), the findings demonstrated a significance level (p- value) of 0.003 ($p<0.05$). Therefore, we reject the null hypothesis, implying that SP has a statistically significant effect on Business Performance (BP). This finding is consistent with the expectations of Path b.

The unstandardized regression coefficient (B) is 0.222, which means that for every unit increase in SP, the BP increases by 0.222 units. The standard error suggests that there might be ±0.074 uncertainty around this estimate, which reflects a moderate precision.

According to (Baron & Kenny, 1986), in Path c', partial mediation is suggested when the direct effect (Path c′) remains significant but is smaller than the total effect (Path c). In this analysis, the direct effect (c'= 0.246) is slightly lower than the Total effect (c= 0.259)

A further SOBEL Test can be conducted to further validate the relationship, which suggests that the mediator accounts for part of the relationship between the independent and dependent variables, but not all. Thus, this supports the presence of partial mediation. To further validate the relationship, a SOBEL Test was conducted.

Figure 3

Mediation Analysis Summary (Effects of Digitalization on BP with SP as a Mediating Variable)

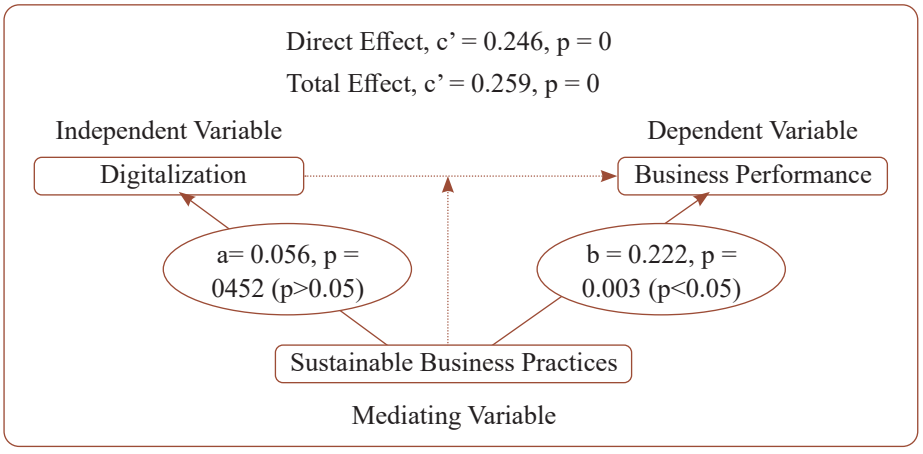


Table 12

Sobel Test (Digitalization)

Description		Notation	Value
Input	B-coefficient for D onto SP	a	0.056
	Standard error for a	se(a)	0.074
	B-coefficient for SP onto BP	b	0.222
	Standard error for b	se(b)	0.074
Output	Indirect effect from D onto BP via mediator	ab	0.012
	Standard error indirect effect	se(ab)	0.018
	Z-value under null hypothesis	z	0.698
	P-value under null hypothesis	p(2-tailed)	0.174

A SOBEL Test was conducted to further validate the mediation and assess the significance of indirect effect (ab). The Sobel test is utilized to examine the hypothesis in which the relationship between the independent (X) and dependent (Y) variables is mediated by a third variable (Y); that is, X and Y have an indirect relationship (Abu-Bader and Jones, 2021).

Based on the above findings, we have full mediation, composed of two effects, a (D on SP) and b (SP on BP). Thus, a total effect was calculated as a product of these two effects in Table 11.

i.e. indirect effect (ab) = a.b (0.056*0.222= 0.012)

The results of the SOBEL Test shows the significance level (p- value of 0.174), more than 0.05 which shows that the effect is not significant, and there is no mediation of Sustainable Business Practices between indirect variable Digitalization and dependent variable Business Performance.

This finding is not consistent with the third hypothesis of the study:

H4: Sustainable business practices plays a mediating role in the relationship between Digitalization And SMEs business performance.

This study investigates the influence of green finance and digitalization on the business performance of SMEs in Nepal, with sustainable business practices serving as a mediating factor. Using primary data collected from 135 SMEs across Kathmandu Valley, findings reveal that both green finance and digitalization positively impact SME business performance. Notably, sustainable business practices fully mediate the relationship between green finance and business performance, indicating that green financial resources encourage firms to adopt sustainable practices, which subsequently enhance their performance. Conversely, no significant mediation effect was detected between digitalization and business performance, suggesting that while digital technology adoption improves operational outcomes, it has yet to integrate effectively with sustainability efforts. This may reflect the current emphasis of digital adoption in Nepalese SMEs on transactional efficiencies such as digital payments and sales expansion rather than on embedding sustainability agendas.

These results resonate with prior research. For instance, Khababa and Jalingo (2023) demonstrated that green finance, investment, and technology stimulate CSR activities that promote sustainability, supporting the mediation found between green finance and business performance in this study. Similarly, Sumastuti et al. (2024) reported significant enhancements in sustainability and financial outcomes through green finance among Indonesian MSMEs. On the other hand, the absence of a mediation effect for digitalization contrasts with findings by Appiah-Kubi et al. (2024) and Nepal et al. (2024), who

found that digitalization significantly strengthens pro-environmental behavior and green investment adoption, respectively, suggesting that the level of digital integration with sustainability varies by context.

Managerial Implications

The findings highlight the growing importance of green finance and digitalization for Nepalese SMEs. The rapid increase in mobile banking users—surpassing 21 million by mid-2023 (Nepal Rastra Bank, 2023) reflects widespread digital adoption that SMEs must leverage. Adoption of green finance and digital solutions such as e-commerce and digital payments can improve profitability while reducing costs. Furthermore, sustainable operational practices like energy efficiency and waste recycling not only attract eco-conscious customers but also bolster corporate reputation. Leadership development and governance quality are critical for successfully transitioning towards sustainable business models. Managers should align with regional initiatives such as the Digital Nepal Framework to enhance digital infrastructure and market competitiveness domestically and internationally.

Conclusion

This study concludes that green finance and digitalization both positively influence the business performance of SMEs in Nepal. Sustainable business practices serve as a vital mediating mechanism in the relationship between green finance and SME performance, underscoring the importance of integrating environmental and social responsibility into financial strategies to achieve competitive advantage. However, digitalization's impact on business performance appears to operate independently of sustainability adoption, reflecting the current stage of digital integration where operational gains are prioritized over environmental considerations. These findings highlight the need for policymakers and business leaders to promote stronger alignment between digital innovation and sustainable practices to maximize the benefits for SME growth. As Nepal's SMEs continue to expand their digital capabilities and access green financial resources, fostering governance, leadership, and supportive frameworks will be critical to leveraging these factors for sustainable and resilient economic development.

Future Scope of the Study

This study's focus on SMEs within Kathmandu Valley limits the generalizability of findings across Nepal's diverse regions. The sample size of 135 SMEs may also constrain representation of sectoral and geographic variability. Future research should consider larger, more representative samples that include rural and underrepresented areas to uncover regional disparities in green finance access and digitalization. Sector-specific analyses, especially in agriculture, tourism, and manufacturing, would provide more targeted insights. Longitudinal studies are needed to assess long-term impacts of green and digital adoption on SME sustainability. Comparative studies across South Asia and research exploring behavioral and institutional determinants could further enrich the evidence base, aiding the formulation of inclusive policies and interventions to bolster SME growth sustainably.

References

Appiah-Kubi, E., Koranteng, F. O., Dura, C. C., Mihăilă, A. A., Drigă, I., & Preda, A. (2024). Green financing and sustainability reporting among SMEs: The role of pro-environmental behavior and digitization. *Journal of Cleaner Production*, *478*, 143939. https://doi.org/10.1016/j.jclepro.2024.143939

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182. https://doi.org/10.1037//0022-3514.51.6.1173

Budisaptorini, A. T., & Wibowo, A. (2024). Integrating green finance and environmental practices to enhance SMEs' business and sustainable performance. *Jurnal Ekonomi Dan Bisnis Digital*, *3*(3), 499–518. https://doi.org/10.55927/ministal.v3i3.11043

Celestin M, Mishra A K. (2024). The evolution of green bonds and sustainable finance in public sector budgeting and development projects. *Journal of Advanced Research in Humanities and Social Sciences*, *12*(1), 7–16. http://dx.doi.org/10.2139/ssrn.5215437

Daoud, J. I. (2017, December). Multicollinearity and regression analysis. *Journal of Physics: Conference Series*, *949*(1), 012009. https://doi.org/10.1088/1742-6596/949/1/012009

Friedrich Naumann Foundation for Freedom. (2024, May 16). *The critical role of SMEs in Nepal's economic development*. FNF.

Gautam, T. P., Mishra, A. K., & V T, S. (2025). Enhancing digital transformation and green HRM through human-AI collaboration: A supply chain-inspired framework for institutional quality support in community colleges of Bagmati province, Nepal. *NPRC Journal of Multidisciplinary Research*, *2*(7), 105–137. https://doi.org/10.3126/nprcjmr.v2i7.80610

Government of Nepal, Department of Industry. (2020). *Industrial enterprises act*, 2076 (2020).

Hair, J. F., Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed). Pearson.

Ihsan, I., Shahid, A., & Naseer Ahmed, N. (2024). The relationship between access to finance and green performance of SMEs in developing economies: corporate social responsibility as mediating. *Remittances Review*, *9*(4), 85–98. https://doi.org/10.33282/rr.vx9i2.07

Joshi, P. R., & Karmacharya, B. (2024). Effect of fintech adoption, green finance and green innovation on sustainability performance of Nepalese financial institutions. *Far Western Review*, 2(1), 265–288. https://doi.org/10.3126/fwr.v2i1.70543

Kaplan, R. S., & Norton, D. P. (2015). *Balanced scorecard success: The Kaplan-Norton collection*. Harvard Business Review Press.

Khababa, N., & Jalingo, M. U. (2023). Impact of green finance, green investment, green technology on SMEs sustainability: role of corporate social responsibility and corporate governance. *International Journal of Economics and Finance Studies*, *15*(3), 438–461.

Liberto, D. (2022, November 3). *Small and mid-size enterprise (SME) defined: Types around the world*. Investopedia.

Mishra, A. (2024, June 17). Embracing Green Technology for a Sustainable Future through Talent Management. *Proceeding of International Conference on Green Technology and Talent Management, Nepal*. https://doi.org/10.5281/zenodo.11966459

Mishra, A. K. (2025). Discussion on the impact of the green innovation strategy on corporate f inancial performance in the automotive sector. *SAIM Journal of Social Science and Technology*, *2*(1), 1–5. https://doi.org/10.5281/ zenodo.16886100

Mishra, A. K., & Aithal, P. S. (2022). An imperative on green financing in the perspective of Nepal. *International Journal of Applied Engineering and Management Letters (IJAEML),* *6*(2), 242–253. https://doi.org/10.5281/zenodo.7221741

Mishra, A. K., & Aithal, P. S. (2023). Assessing the association of factors influencing green banking practices. *International Journal of Applied Engineering and Management Letters (IJAEML),* *7*(3), 36–54. https://doi.org/10.5281/zenodo.8234076

Mishra, A. K., & Rai, S. (2017). Comparative performance assessment of eco-friendly buildings and conventional buildings of Kathmandu Valley. *International Journal of Current Research,* *9*(12), 62958–62973.

Mishra, A. K., Thakur, R. K., & Dhakal, S. (2024). The influence of environmental sustainability orientations on organizational performance: A review. *Journal of Productive Discourse*, *2*(1), 121–136. https://doi.org/10.3126/prod.v2i1.65730

Nepal Rastra Bank. (2025, January 9). *Payment system department payment oversight report 2080-81*.

Nepal, R., Liu, Y., Dong, K., & Jamasb, T. (2024). Green financing, energy transformation, and the moderating effect of the digital economy in developing countries. *Springer Nature*, *87*, 3357–3386. https://doi.org/10.1007/s10640-024-00922-6

Oke, J., Akinkunmi, W. B., & Etebefia, S. O. (2019). Use of correlation, tolerance and variance inflation factor for multicollinearity test. *GSJ*, *7*(5), 652–659.

Organisation for Economic Co-operation and Development. (2021). *The SME test: Taking SMEs and entrepreneurs into account when regulating*. OECD

Organization for Economic Cooperation and Development. (2021). The Digital Transformation of SMEs. *OECD Digital for SMEs Global Initiative.* https://doi.org/10.1787/bdb9256a-en

Popescu, C. R. G., & Popescu, G. N. (2019). An exploratory study based on a questionnaire concerning green and sustainable finance, corporate social responsibility, and performance: Evidence from the Romanian business environment. *Journal of Risk and Financial Management*, *12*(4). https://doi.org/10.3390/jrfm12040162

Sumastuti, E., Harahap, S., & Sianipar, G. (2024). Exploring the impact of green finance, financial literacy, and social capital on the performance and financial sustainability of Indonesian MSMEs. *Journal of Economic, Business and Accounting (COSTING)*, *7*(4), 10869–10886. https://doi.org/10.31539/costing.v7i4.9719

Tamang, S., & Mishra, A. (2022). Green-HRM Trends and their effects on educational institutions workplace. *Journal of Advanced Research in HR and Organizational Management*, *9*(3&4), 1–5.

United Nations Development Programme (UNDP). (2022, May 31). *A background policy paper on green financing in Nepal*.

World Bank Group. (2025, April 8). *Nepal: Supporting Local Businesses to Thrive*. World Bank Group.

World Bank. (2019). *Small and medium enterprises (SMEs) finance*.