Green Banking Initiatives: Study on the Nepalese Banking Sector

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ABSTRACT

Introduction: This study aims to investigate green banking initiatives in Nepal's commercial banks, emphasizing five major areas: green product development, green corporate social responsibility (CSR), green internal processes, green brand image, and green brand trust. The research seeks to understand how these factors contribute to sustainable finance within banks in a developing country context.

Methods: The study uses a quantitative, cross-sectional approach. Data was gathered from 412 bank customers and employees in Makwanpur District. Analysis was performed using SmartPLS, evaluating the relationships between green banking constructs and the adoption of sustainable practices.

Results: The findings of our study showed that all five factors significantly and positively affect green banking practices. Green product development and internal processes have the strongest impacts. The combined variables account for 61.5% of the variance in green banking adoption among Nepalese banks.

Conclusions: For policy and managerial action, banks should prioritize innovative green products and eco-friendly internal operations. Policymakers are encouraged to strengthen regulations and promote awareness to support these initiatives. This research is original in its comprehensive perspective, integrating both customer and employee views in Nepal's banking sector. Future research should expand geographically and use longitudinal methods.

Keywords: *green banking, sustainable finance, Nepal, product development, corporate social responsibility*

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INTRODUCTION

In today's rapidly changing world, climate change and environmental degradation are among the most pressing global challenges. Every sector is now under pressure to adapt, innovate, and contribute to sustainable development, not just for the planet, but for future generations. The banking industry, as a key driver of economic growth and investment, plays a crucial role in shaping our environmental future. Yet, traditional banking practices often prioritize profit over sustainability, leading to decisions that may harm the environment(Saif-Alyousfi & Alshammari, 2025). Could integrating green principles into banking help bridge the gap between economic growth and environmental protection? What if banks became active agents of change, financing sustainable projects and motivating businesses to adopt eco-friendly practices? These questions are at the heart of the green banking movement, which is rapidly gaining attention in both developed and developing countries.

Rehman et al.(2021)Green banking refers to the practice of banks adopting environmentally friendly policies and practices that promote sustainable development. This concept first emerged in the early 2000s, with the term "green banking" coined to describe banks that shift their investment strategies toward funding sustainable technologies and environmentally responsible projects(Sarma & Roy, 2021). The idea was further popularized by organizations and governments around the world seeking solutions to reduce carbon emissions and promote clean energy. Brescia et al.(2025), the first formal green bank, the Connecticut Green Bank, was established in 2011, marking a significant milestone in the institutionalization of green banking. Since then, green banks have proliferated globally, with governments and financial institutions realizing that green banking is not just about environmental responsibility, but also about long-term economic resilience and social well-being (Gulzar et al., 2024). Thus, the operational definition of green banking includes the use of innovative financing tools for green projects, adopting internal environmental management systems, and promoting awareness among stakeholders to foster a culture of sustainability.

Despite the growing interest in green banking, the sector faces significant challenges. In Nepal, while some banks have begun to support green projects such as solar energy and rainwater harvesting, there is still a lack of comprehensive policies and widespread adoption. Many banks continue to prioritize traditional lending, often overlooking the environmental impact of their investments. The limited awareness among bank employees and customers, high implementation costs, and regulatory gaps further hinder the progress of green banking initiatives in Nepal(Gulati et al., 2025). These issues create a pressing need for targeted research and policy intervention to encourage the integration of green banking practices in the Nepalese financial sector.

Existing research on green banking has largely focused on the developed world, with limited studies conducted in South Asian countries such as Nepal. Most studies have examined the financial performance of green banking or the impact of green initiatives from the perspective of banks themselves, often neglecting the role of employees and customers in driving green practices. There is also a notable gap in understanding how various dimensions of green banking, such as green product development, green CSR, green internal processes, green brand image, and green brand trust, influence the adoption and effectiveness of green banking initiatives in the Nepalese context. This research aims to fill this gap by providing a comprehensive analysis of how these dimensions interact and contribute to the success of green banking, addressing the unique challenges and opportunities present in Nepal's banking sector.

The significance of this study lies in its contribution to the existing body of knowledge and its practical implications for banks, policymakers, and stakeholders. By identifying the key factors that influence green banking initiatives, the research will help banks develop more effective strategies for promoting sustainability. The findings will inform policymakers about the necessary regulatory and institutional changes needed to support green banking and guide banks in tailoring their products and services to meet the growing demand for environmentally responsible finance. Moreover, the study will highlight the importance of employee engagement and customer awareness in driving green banking, offering practical recommendations for banks seeking to become leaders in sustainable finance.

The major objective of the study is to identify how different dimensions of green banking influence the adoption and effectiveness of green banking initiatives in Nepalese commercial banks. The specific objectives are as follows:

- To examine the impact of green product development on green banking initiatives.
- To assess the role of green corporate social responsibility (CSR) in promoting environmental sustainability.
- To evaluate the influence of green internal processes on banks' operational efficiency and sustainability.
- To analyze the effect of green brand image and brand trust on customer perception and adoption of green banking.

- To identify the challenges and opportunities that banks face in implementing green banking practices in Nepal.

By addressing these objectives, the study will provide valuable insights into the multifaceted nature of green banking and its potential to drive sustainable development in Nepal's banking sector

Understanding these connections is important for Nepal. Nepal has set a goal to become carbon neutral by 2050, which means Nepal wants to stop adding harmful gases to the air by that year. Banks are very important for reaching this goal because they control a lot of money. If banks direct their money toward green projects, Nepal can reach this goal much faster. This research will provide information to help bank leaders, government officials, and people make better decisions about green banking in Nepal.

LITERATURE REVIEW

This research paper strongly supports the Stakeholder theory and the **Resource-Based View (RBV).** Stakeholder Theory explains that banks must respond to the expectations of customers, employees, communities, and regulators, which helps clarify why green CSR, green brand image, and green brand trust positively influence green banking initiatives. When banks act responsibly toward their stakeholders, they gain support and improve their environmental performance. On the other hand, RBV highlights that internal strengths and unique resources such as innovative green products, eco-friendly internal processes, and specialized environmental capabilities help banks build competitive advantages. This theory supports the strong effects of green product development and green internal processes found in the model. Together, these two theories provide a solid foundation for the framework by showing that both external stakeholder expectations and internal environmental capabilities drive the adoption of green banking initiatives in Nepal.

Introduction to Green Banking Literature

Green banking is now recognized as a strong way for banks to support the environment and sustainable development(Khan et al., 2023). Banks using this model not only offer standard banking services but also focus on activities that save energy, reduce pollution, and help the planet(Cromwell & Peprah, 2025). This helps banks demonstrate their commitment to the environment and aligns with national and international goals for climate action.

Banks in Nepal have begun to take green banking seriously, as the government and Nepal Rastra Bank (NRB) have encouraged this approach. There are numerous research articles on this subject, focusing on various aspects of green banking and its impact on business, the community, and the environment. The literature review here shows how green product development, green CSR, green internal process, green brand image, and green brand trust all contribute to green banking initiatives, with a focus on the Nepalese context.

Green Product Development

Green product development refers to the process by which banks create financial services or products that benefit the environment(Iheanachor et al., 2021). This can include green loans, green deposits, green bonds, and special savings products for renewable energy. Many studies agree that when banks develop green products, they help both the environment and the bank's reputation. Cam.(2023)Green products attract more eco-conscious customers and can also encourage other clients to think about environmental issues.

Research shows that in Nepal, banks such as NMB Bank and Nepal Investment Bank have begun offering green deposits and eco-loans. These products support solar energy, hydropower, electric vehicles, and water conservation. Studies by Dewi and Indudewi(2024) and Siddik et al.(2024) confirm that electronic banking, green investment, and the development of green products all positively influence customers' loyalty to the bank and support for green initiatives. Besides customer loyalty, green products help reduce costs by promoting online banking, thus reducing the need for paper, fuel, and physical branches(Chandrasekaran & Narayanan, 2025). Thus, international literature suggests that the more banks focus on developing green products, the better they perform financially and operationally. The positive effects are shown in various countries.

H₁: *Green product development positively influences green banking initiatives.*

Green Corporate Social Responsibility (CSR)

CSR refers to when banks take actions to create social and environmental benefits, even if these actions are not directly profitable(Obeng et al., 2025). Green CSR projects in banking may include sponsoring environment awareness programs, tree planting, recycling drives, or energy-saving campaigns(Rahman et al., 2023). Adhikari and Gyawali(2024) studies in Nepal show that banks with strong green CSR activities are seen in a more positive light by communities and customers. Aryal et al.(2025) in Nepal, green CSR has become an important policy following the NRB's inclusion of CSR spending and reporting as a mandatory requirement.

A study by Bhandari et al.(2024) found positive results between green CSR spending and environmental performance in banks, encouraging more responsible business practices. Sharma and Choubey(2022)also point out that green banking, including green CSR activities, can greatly help banks meet wider ecological goals and set examples for other businesses. Businesses that adopt green CSR practices are found to have better relationships with their stakeholders. Customers trust these banks more, and regulators are also more satisfied when banks clearly report on their environmental activities(Thompson & Cowton, 2004). Therefore, CSR activities are also linked with greater customer loyalty and improved brand image because the public can see the real actions that banks take for society and nature.

H₂: *Green CSR positively influences green banking initiatives.*

Green Internal Process

Green internal processes refer to how banks operate their operations in a manner that has a less negative impact on the environment(Zhang et al., 2022). This can involve using less paper, recycling waste, utilizing LED lights, conserving water, raising staff awareness about environmental issues, or adopting digital record-keeping. Bukhari et al.(2020)suggest that when banks adopt green practices within their own offices and branches, it leads to less pollution and sets a good example for customers. Moreover, every bank that wants to promote green banking should start by making its internal processes eco-friendlier. These changes enhance bank performance and staff engagement. Employees feel proud to work for banks that care about the earth, which can help reduce staff turnover and make internal processes more efficient.

Studies by Tandan et al.(2025) Nepal indicate that green internal processes are improving, particularly after the NRB and the government introduced new regulations, including the use of Environmental and Social Risk Management (ESRM) frameworks for all projects. Nepalese banks are now paying closer attention to saving energy, adopting digital solutions, and reducing paper usage in their day-to-day operations(Xheneti & Madden, 2025). Therefore, these kinds of activity can both reduce cost and environmental impact.

***H_3*:** *Green internal process positively influences green banking initiatives.*

Green Brand Image

Brand image refers to how customers and the public perceive a bank(Manansala et al., 2024). A green brand image means people see the bank as a supporter of environmental protection and sustainability. Sarath Chandran(2024) shows that green brand image is a key result of visible green activities, strong CSR, and having green products.

Researchers Zafran.(2025), Rajni et al.(2025), Tandukar et al.(2021), and the 2025 ARMG Publishing study in Nepal have all found that banks with a strong and visible green image have more loyal customers. Dewi and Indudewi (2024)found that a green image plays a crucial mediating role, helping to connect green practices with customer loyalty and trust. Burhanudin et al.(2021) studies confirm that when a bank is serious about its environmental programs, the public feels more positive about using that bank. This, in turn, attracts new clients, particularly among young and environmentally conscious consumers. Thus, it also makes it easier for banks to partner with international organizations or receive foreign funding for green projects, as global partners look at brand image when selecting collaborators.

H_4: *Green brand image positively influences green banking initiatives.*

Green Brand Trust

Brand trust is the belief that a bank keeps its promises about environmental protection and green activities(Ibe-enwo et al., 2019). Trust develops over time and is at the core of lasting relationships between banks and customers. Adhikari et al.(2025) research across countries, including Nepal, reveals that trust in a brand leads people to remain loyal to the bank, even when competitors offer similar products. The link between green brand trust and customer action is supported by the work of Biswakarma (2017)and other researchers mentioned. Thus, this studies show that trust is built when banks are honest, transparent, and deliver on their green commitments.

Although these studies suggest that green banking practices can help create trust, not all green banks succeed at turning trust into loyal or repeat customers. Some customers need more proof through long-term actions before placing their full trust in green claims. This challenge is noted in both international and national research, where customers expect consistency from banks in their green activities.

H_5: *Green brand trust positively influences green banking initiatives.*

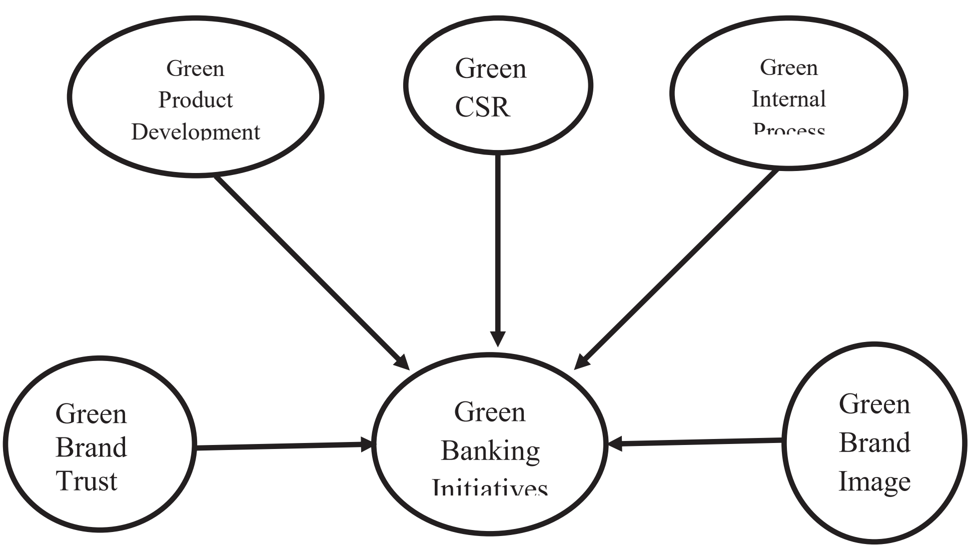
Overall Green Banking Initiatives in Nepal

The research articles discussed above demonstrate that Nepalese banks are increasingly adopting green banking principles as part of their broader sustainability and business strategies. Green product development, CSR, and internal process efforts are now supported by policies from NRB and NRB's Green Finance Taxonomy.

Despite considerable progress, the literature points out gaps and areas for improvement. Challenges like low public awareness, unclear rules, a lack of green-knowledgeable staff, and customers' mistrust about green claims still exist. Banks that align all five variables product development, CSR, internal process, image, and trust tend to have better results in successful green banking initiatives.

Nepal's progress is also helped by global banking practices, knowledge sharing with other countries, and partnerships for clean development. Several researchers recommend stronger collaboration between banks, government, and the community to expand the benefits of green banking to all of Nepal.

Figure. 1*Conceptual model of Green banking initiatives*



Sources: Sharma &Choubey, (2022)

Research Gaps

The literature confirms the positive effects of green product development, CSR, internal processes, brand image, and brand trust on green banking initiatives. However, most research is still in its early stages, especially in Nepal, and more studies are recommended, particularly on how these variables interact and which has the strongest effect.

- Few studies directly measure the influence of each variable together.
- Customer perspectives, especially outside Kathmandu Valley or in rural areas, are less studied.
- The role of digital banking in advancing green banking is growing but underexplored in local literature.
- The impact of strict regulations versus voluntary initiatives has not been clearly separated in existing studies.

METHODS

Research Design

This research follows a quantitative cross-sectional research design**.** This approach enables the researcher to collect data from multiple respondents at a single point in time, thereby understanding the relationships between five independent variables: green product development, green CSR, green internal processes, green brand image, and green brand trust, and one dependent variable: green banking initiatives. The cross-sectional design is best suited for identifying how these variables relate to each other in the Nepalese banking sector.

Study Area and Population

The study was conducted in **Bagmati Province, specifically in Makwanpur District,** located in the central region of Nepal. Makwanpur district has financial institutions offering banking services to customers. The study population comprises all customers of commercial banks operating in Makwanpur District. According to banking records, Makwanpur has numerous bank branches, including those of Himalayan Bank, Sanima Bank, Prabhu Bank, Century Commercial Bank, and other financial institutions that offer banking services and green banking products.

Sample Size and Sampling Method

The study employed a **stratified random sampling method** to select the sample. The total sample size for this research is **412 respondents**. The sample was stratified based on different commercial banks' consumers and employees operating in Makwanpur district to ensure fair representation from each bank.

The sampling frame included all customers aged 18 years and above who have accounts with commercial banks and are employed in Makwanpur District. Using stratified random sampling ensures that each bank's customer and industry employee base is properly represented in the study, avoiding bias and ensuring that the results are representative of the entire population.

Data Collection Method

Data was collected using a **structured questionnaire survey**. The questionnaire was administered face-to-face and online to respondents at bank branches in Makwanpur District. This mixed approach ensures better response rates and allows respondents to ask questions if they do not understand any item.

Measurement Variables

To examine the determinants of Green Banking Initiatives in Nepal, this study will employ a structured questionnaire as the primary research instrument. The questionnaire will be designed using validated items adapted from prior empirical studies. For **Green Product Development**, items will be adopted from Chen & Chai (2010), focusing on eco-friendly financial product innovation. **Green Internal Process** will be measured using constructs from Wahid & Rahman (2011), emphasizing paperless operations, energy efficiency, and digital transformation. **Green Corporate Social Responsibility**

(CSR) items will be adapted from Maignan and Ferrell(2001), capturing banks' environmental outreach and community engagement. **Green Brand Trust** will be assessed using scales from (Chen, 2010), reflecting customer confidence in the bank's environmental claims and ethical practices. **The green brand image will be measured using items from** Kang and Hur(2012)**focusing on the public's** perception of the bank's environmental identity. Finally, the dependent variable, **Green Banking Initiatives**, will be evaluated using indicators from (Sharma & Choubey, 2022), which assess strategic implementation, customer participation, and sustainability outcomes in Nepalese banks. All items will be rated on a five-point Likert scale to ensure consistency and ease of analysis.

Table 1:*Demographic Information*

S.No	Profile of an Entrepreneur	Number	Percentage
1	Gander		
	Male	210	50.97
	Female	202	49.03
	Total	412	100
2	Age		
	Below – 29	65	15.77
	30 – 39	209	50.72
	40 - 49	64	15.53
	50 – 60	63	15.29
	Above 60	11	2.69
	Total	412	100
3	Qualification		
	Secondary	10	2.4
	Bachelor	174	42.23
	Master	222	53.88

S.No	Profile of an Entrepreneur	Number	Percentage
	Post Graduate	6	1.49
	Total	412	100
4	Experience		
	01 - 04 Years	121	29.36
	05 - 09 Years	201	48.78
	10 - 14 Years	63	15.29
	15 - 19 Years	22	5.3
	More Than 20 Years	5	1.3
	Total	412	100
5	Bank Name		
	Himalayan Bank	93	22.57
	Prabhu Bank	120	29.12
	NMB Bank	79	19.17
	Global Bank	120	29.12
	Total	412	100
6	Profile of Bank Employee		
	Managerial Level	62	15.04
	Officer	297	72.08
	Assistant Level	53	12.88
	Total	412	100

Table 1 presents the demographic characteristics of the 412 respondents included in this study, offering a clear overview of the sample's background. The gender distribution is almost balanced, with 50.97 percent male and 49.03 percent female respondents, ensuring representation from both groups. Most respondents fall within the age range of 30–39 years 50.72 percent, followed by almost equal proportions in the age groups below 29, 40–49, and 50–60 years, while only a small portion 2.69 percent are above 60. The sample is highly educated, as more than 96 percent of respondents hold a bachelor's or master's degree, indicating that the participants are knowledgeable and capable of understanding banking practices. In terms of work experience, nearly half of the respondents have 5–9 years of experience, and a significant portion has 1–4 years, reflecting a workforce that is relatively young but professionally active. Respondents were drawn from four major commercial banks Prabhu Bank, Global Bank, Himalayan Bank, and NMB Bank providing diversity across institutions. Regarding job positions, the majority 72.08 percent are employed at the officer level, while smaller proportions work at managerial and assistant levels. Overall, the demographic profile suggests that the study is based on a well-distributed sample of experienced, educated, and actively engaged bank customers and employees, which strengthens the reliability of the findings related to green banking initiatives.

Table 2 *Descriptive Statistic and Correlation*

Constructs	No	Items	CA	FL	VIF	CR	AVE
Green Product Development(GPD)	6	GPD1	0.954	0.906	3.896	0.963	0.812
		GPD2		0.882	3.309		
		GPD3		0.913	4.488		
		GPD4		0.89	3.549		
		GPD5		0.904	3.976		
		GPD6		0.912	4.234		
Green CSR (GCSR)	6	GCSR1	0.956	0.909	4.012	0.964	0.814
		GCSR2		0.914	4.276		
		GCSR3		0.905	3.928		
		GCSR4		0.903	3.867		
		GCSR5		0.895	3.512		
		GCSR6		0.888	3.547		
Green Internal Process (GIP)	6	GIP1	0.953	0.903	3.868	0.962	0.809

Constructs	No	Items	CA	FL	VIF	CR	AVE
		GIP2		0.896	3.586		
		GIP3		0.911	4.105		
		GIP4		0.913	4.322		
		GIP5		0.876	3.105		
		GIP6		0.899	3.736		
Green Brand Trust (GBT)	6	GBT1	0.956	0.901	3.749	0.964	0.817
		GBT2		0.906	4.004		
		GBT3		0.905	3.914		
		GBT4		0.9	3.668		
		GBT5		0.909	4.102		
		GBT6		0.907	4.021		
Green Brand Image(GBI)	6	GBI1	0.955	0.909	4.198	0.964	0.817
		GBI2		0.909	4.087		
		GBI3		0.912	4.164		
		GBI4		0.911	4.258		
		GBI5		0.895	3.57		
		GBI6		0.886	3.412		
Green Banking Initiative (GB)	6	GB1	0.954	0.917	4.418	0.963	0.812
		GB2		0.895	3.641		
		GB3		0.899	3.673		
		GB4		0.893	3.586		
		GB5		0.902	3.85		
		GB6		0.9	3.692		

Table 2 shows the reliability and validity results for all six constructs used in this study. The constructs are Green Product Development (GPD), Green Corporate Social

Responsibility (GCSR), Green Internal Processes (GIP), Green Brand Trust (GBT), Green Brand Image (GBI), and Green Banking Initiative (GBI). Each construct has six items. First, the table indicates that the Cronbach's Alpha (CA) values for all constructs exceed0.95. This means all items in each construct are very consistent and measure the same concept clearly. The Composite Reliability (CR) values are also above 0.96, indicating strong internal reliability of the measurement items(W. Li & Lay, 2024).Second, the Factor Loadings (FL) of each item are all above 0.87, which means each item strongly represents its construct. This indicates that all items are reliable indicators, and there is no weak loading in the table. Third, the Average Variance Extracted (AVE) values for all constructs are above 0.80. An AVE above 0.50 means good convergent validity(Cheung et al., 2024). Since all AVE values exceed 0.80, the constructs in this study demonstrate very high validity. This means the items effectively capture the meaning of the variables. Fourth, the Variance Inflation Factor (VIF) values for all items range from 3.10 to4.48. These values are below the accepted limit of 5(Petrescu-Mag et al., 2022). This shows that there is no multicollinearity problem among the items. In simple words, the items do not overlap too much with each other.

Overall, the table indicates that the measurement model employed in this study is robust. All constructs and items are reliable, valid, and suitable for further analysis. These results confirm that the questionnaire is stable and that the data can be used for structural model testing.

Table 3 *Heterotrait-Monotrait ratio*

	GB	GBI	GBT	GCSR	GIP	GPD
GB						
GBI	0.659					
GBT	0.64	0.569				
GCSR	0.61	0.572	0.536			
GIP	0.625	0.545	0.54	0.543		

	GB	**GBI**	**GBT**	**GCSR**	**GIP**	**GPD**
GPD	0.678	0.546	0.554	0.583	0.489	

Table 3 presents the HTMT values for all six constructs used in this study. HTMT is used to check discriminant validity. It helps to confirm whether each construct is different from the others. All HTMT values in the table are below the accepted limit of 0.85. This indicates that each construct is distinct and does not overlap with any other construct. For example, the HTMT value between Green Banking Initiative (GB) and Green Brand Image (GBI) is 0.659, which is below the threshold(Ab Hamid et al., 2017). In the same way, all other pairs also fall within the safe range. These results indicate that the respondents were able to understand each construct independently, with no overlap between the concepts.

Table 4: *Fornell–Larcker criterion.*

	GB	GBI	GBT	GCSR	GIP	GPD
GB	0.901					
GBI	0.629	0.904				
GBT	0.611	0.544	0.905			
GCSR	0.584	0.546	0.512	0.902		
GIP	0.596	0.52	0.515	0.518	0.899	
GPD	0.647	0.521	0.529	0.557	0.467	0.901

Table 4 shows the Fornell–Larcker criterion results used to check discriminant validity. In this method, the square root of the AVE for each construct should be higher than its correlation with other constructs. The diagonal values in the table represent the square root of AVE, and all diagonal values are higher than the other values in their row and column. The AVE for GB is 0.901, which is higher than its correlation with GBI (0.629), GBT (0.611), GCSR (0.584), GIP (0.596), and GPD (0.647) mention threshold (Sarstedt et al., 2014). The same pattern is seen for all other constructs. This confirms that each construct is unique and measures a distinct idea. Therefore, the model has strong discriminant validity based on the Fornell–Larcker rule.

Figure 2: *Path Analysis*

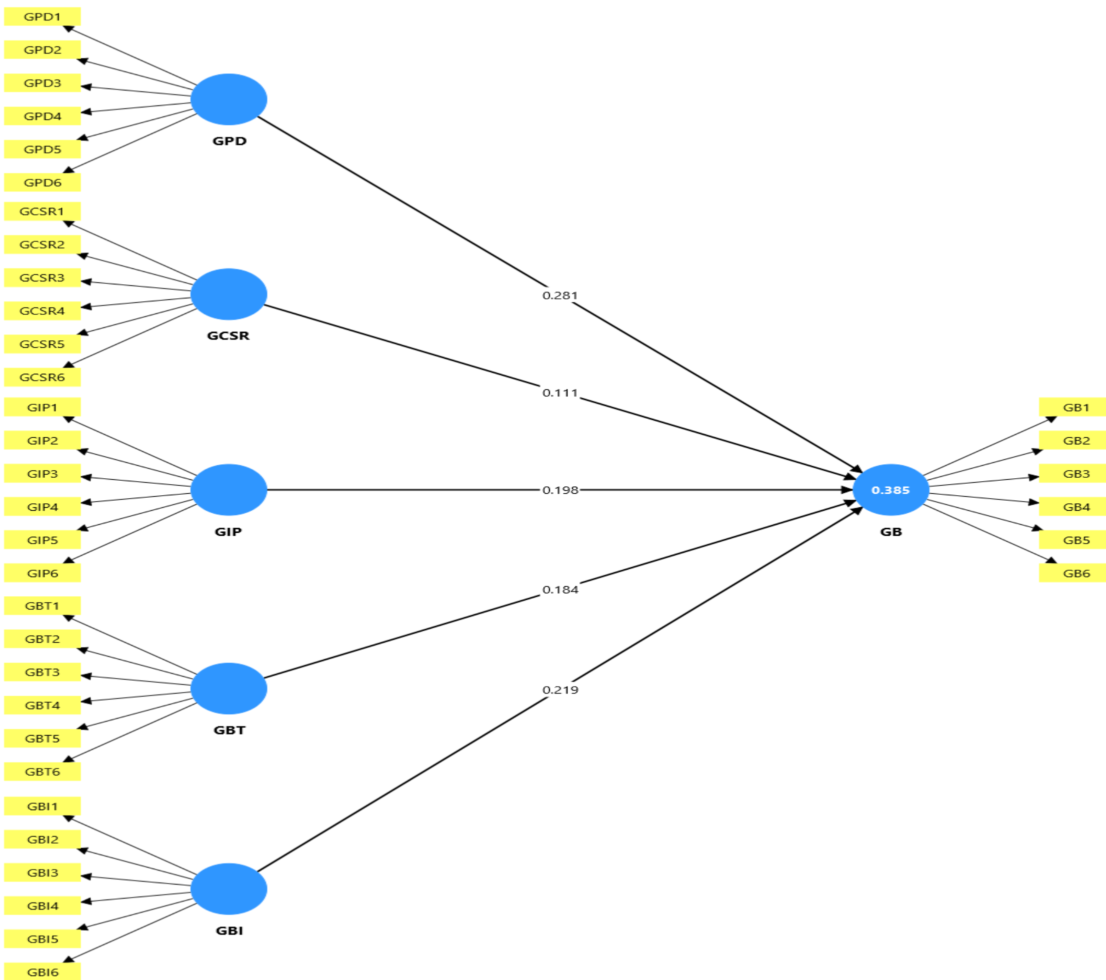


Figure 2: shows how the five main factors in the study green product development, green CSR, green internal process, green brand image, and green brand trust are linked to green banking initiatives. The diagram shows that all these factors have a positive effect, meaning each one helps to increase green banking practices. Among them, green product development has the strongest effect, followed by green brand image and green internal

process. Green brand trust also has a meaningful contribution, while green CSR has the smallest effect but is still important. The figure also shows that these five factors together explain 61.5 percent of the changes in green banking initiatives. This means the model is strong and the selected variables are useful for understanding what drives green banking in Nepal.

Table 5: *Hypothesis*

	β	**Mean**	**SD**	**T-Test**	**P-value**	**2.50%**	**97.50%**	**Decision**
GBI > GB	0.219	0.219	0.046	4.8	0.001	0.126	0.305	Supported
GBT > GB	0.184	0.184	0.041	4.478	0.001	0.102	0.264	Supported
GCSR > GB	0.111	0.11	0.037	3.022	0.003	0.039	0.182	Supported
GIP > GB	0.198	0.199	0.039	5.066	0.001	0.122	0.273	Supported
GPD > GB	0.281	0.282	0.041	6.819	0.001	0.199	0.363	Supported

The hypothesis results show how each independent variable affects Green Banking Initiatives (GB). All five variables Green Brand Image, Green Brand Trust, Green CSR, Green Internal Process, and Green Product Development have significant positive effects on Green Banking Initiatives. The p-values for all relationships are below 0.05, which means all relationships are statistically significant. This shows that all factors included in the model are important and contribute to improving green banking practices. Among all variables, **Green Product Development (GPD)** has the strongest effect on Green Banking Initiatives. The beta value is **0.281**, which is the highest among all predictors. This means that when banks develop more green products, the level of green banking initiatives also increases strongly. The result shows that customers respond positively to new and eco-friendly financial products. The second strongest effect is **Green Internal Process (GIP)** with a beta value of **0.198**. This means banks that use more environmentally friendly internal operations, such as reducing paper and saving energy, show higher levels of green banking initiatives.

The third strongest effect is **Green Brand Image (GBI)** with a beta value of **0.219**. This means that when the bank's image becomes more environmentally friendly, customers see the bank as more responsible, which increases the level of green banking activities. Green Brand Trust (GBT) also shows a positive effect on Green Banking Initiatives with a beta value of **0.184.** This means that when customers trust the bank's green claims, they support the bank's green activities more. Green CSR (GCSR) has the weakest effect among all variables, with a beta value of **0.111**. Even though the effect is smaller, it is still positive and significant. This means that CSR activities still help green banking, but not as strongly as the other factors. The results clearly show that all five variables play important roles in supporting green banking in Nepal. The strongest influence comes from green product development, and the weakest comes from green CSR. This suggests that customers value practical green products and internal green practices more than CSR activities. Overall, the model shows a strong and meaningful relationship between the independent variables and Green Banking Initiatives.

Table 6: *R^2 and Adjusted R^2*

	R-Square	**Adj R-Square**
GB	0.615	0.61

Table 6 shows the R^2 and Adjusted R^2 values for Green Banking Initiatives (GB). The R^2 value is **0.615**, which means that the five independent variables (GPD, GCSR, GIP, GBT, and GBI) together explain **61.5 percent** of the changes in Green Banking Initiatives. This is considered a strong level of explanation(Plonsky & Ghanbar, 2018). The Adjusted R^2 value is **0.610**, which is very close to the R^2 value. This shows that the model is stable and the independent variables fit well with the dependent variable. In simple words, the model used in this study has good predictive power.

Table 7: *f^2 Table*

	GBI -> GB	GBT -> GB	GCSR -> GB	GIP -> GB	GPD -> GB
Original sample (O)	0.069	0.05	0.017	0.062	0.118

Table 7 presents the f^2 effect size for each independent variable on Green Banking Initiatives. The f^2 values show how much each variable contributes to the model. The largest effect size is from **Green Product Development (GPD)** with a value of **0.118**, which means it has a meaningful contribution to the model(X. Li et al., 2020). Green Internal Process (GIP) and Green Brand Image (GBI) also show small but important effects, with values of **0.062** and **0.069.** Green Brand Trust (GBT) has a small effect of **0.05**, showing that it also contributes but at a lower level. Green CSR (GCSR) has the smallest effect size of **0.017**, meaning that its contribution to the model is very small. Overall, the table shows that GPD is the strongest contributor, while GCSR is the weakest.

Table 8: *Quadratic Test*

	GB1	GB2	GB3	GB4	GB5	GB6
Q^2predict	0.486	0.481	0.49	0.494	0.488	0.504

Table 8 shows the Q^2 values for all six items of the Green Banking Initiatives construct. All Q^2 values are above **0.48**, and the highest value is **0.504**. Since all values are greater than zero, this means the model has **good predictive relevance**(Alexander et al., 2015). In simple words, the model can predict the results well. The values also show that each item of Green Banking Initiatives has strong predictive power. This confirms that the model is suitable for prediction and gives reliable results.

RESULTS

This study examined how five variables Green Product Development (GPD), Green CSR (GCSR), Green Internal Process (GIP), Green Brand Image (GBI), and Green Brand Trust (GBT) influence Green Banking Initiatives (GB) in the Nepalese banking sector. The

SmartPLS analysis shows that all five variables have a positive and significant effect on Green Banking Initiatives.

The R^2 value for the dependent variable is 0.615. This means that the five independent variables explain 61.5 percent of the total variation in Green Banking Initiatives. This is a strong value for social science research. The adjusted R^2 value is 0.610, which shows that the model fits well and that the selected variables are appropriate.

The path coefficient results show that Green Product Development has the highest effect ($\beta = 0.281$, $p < 0.001$). This means banks that introduce more green financial products have higher levels of green banking practices. Green Internal Process also has a strong effect ($\beta = 0.198$, $p < 0.001$), showing that environmentally friendly internal practices contribute to better green outcomes.

Green Brand Image ($\beta = 0.219$) and Green Brand Trust ($\beta = 0.184$) also show significant positive relationships. This means customers' perception and trust in the bank's green activities influence how well green initiatives are adopted. Green CSR has the smallest effect ($\beta = 0.111$), but it is still significant.

The f^2 effect size values show small to medium contributions. GPD has the highest effect size (0.118), while GCSR has the lowest (0.017). The Q^2 predictive values are all above 0.48, which means the model has strong predictive power.

DISCUSSION

The findings of this study show that all selected factors play an important role in promoting green banking in Nepal. The results support previous studies and also highlight new insights in the Nepalese context.

The strongest factor influencing green banking is Green Product Development. This shows that customers respond positively when banks introduce green products such as green loans, eco-friendly savings schemes, digital banking, and renewable energy financing. Previous researchers Chen and Chai (2010) also noted that green product innovation encourages customers to participate in environmentally responsible banking. The findings from Nepal match these results and show that local consumers appreciate new financial products that reduce environmental impact. For example, loans for electric vehicles, solar panels, and energy-efficient systems attract more customers who care about sustainability. This explains why product development has the highest impact on green banking initiatives.

Green Internal Process is also found to be a strong factor. This means that when banks improve their internal environment, such as reducing paper use, saving electricity, adopting digital records, and training staff in environmental awareness, customers see the bank as more responsible. Earlier studies by Adhikari, (2024) and Mani Adhikari et al.(2025) also showed that internal green practices build the base of sustainable banking. Many banks in Nepal are now promoting paperless banking, mobile banking, and digital customer service. These actions help improve environmental performance and reduce operating costs. This study confirms that such internal efforts directly increase green banking activities.

Green Brand Image has a significant positive effect on green banking initiatives. This finding is similar to studies by Alshebami, (2021) and Sharma and Choubey (2022) which stated that when a bank is viewed as environmentally responsible, customers are more likely to trust and support its services. In Nepal, public perception is becoming more important because customers want banks that care about society and nature. A strong green image helps banks attract climate-aware customers, especially the younger generation. This study supports the idea that visible green practices help strengthen the bank's reputation and encourage customers to engage in sustainable banking services.

Green Brand Trust also plays an important role. Trust is essential in banking because customers are more likely to use products from banks they believe are honest about their environmental commitments. This finding aligns with research by Chen (2010), who stated that trust is a key factor in building strong relationships between banks and customers. In Nepal, many customers are becoming cautious because some companies claim to be “green” without real action. Therefore, consistent communication, transparency, and long-term green practices help build customer trust. The result shows that when customers trust a bank’s green promises, they support the bank’s green initiatives more.

Green CSR has the smallest effect among the five variables. This result is similar to some previous findings where CSR activities alone were not enough to influence customer behavior. CSR projects like tree planting, awareness programs, and environmental clean-up campaigns are appreciated, but customers often see them as temporary or symbolic actions. Compared to product development and internal process improvements, CSR activities may not directly influence customers’ daily banking decisions. Still, Green CSR is significant in this study, meaning it plays a supporting role. Earlier studies, such as Suresh and Bhavna(2015) showed that CSR strengthens a bank’s long-term environmental contribution, even if the effect is small. Thus, while CSR is important, it may not be the main driver of green banking initiatives in Nepal.

The overall results support international studies that show the positive impact of green practices in banking. For example, Siddik et al. (2024)reported that green internal processes and green product development improve customer satisfaction and bank reputation. This aligns with the Nepalese context, where banks are also moving toward digital and environmentally friendly operations.

The findings contribute to the literature by showing that green practices are becoming more important in developing countries. Many studies on green banking come from developed nations, but this research provides evidence from Nepal, where environmental awareness is increasing and government rules are strengthening. Nepal Rastra Bank has introduced policies such as the Environmental and Social Risk Management (ESRM) framework and the Green Finance Taxonomy. These policies have encouraged banks to adopt green practices, which is reflected in the results of this study.

Overall, the discussion shows that green banking in Nepal is influenced by a combination of internal practices, product innovation, customer perception, trust, and CSR efforts. The findings show that practical actions like product development and process improvement have stronger effects than symbolic actions like CSR. This provides useful guidance for banks in Nepal to focus more on developing green financial products and improving internal operations.

Conclusion

This study examined the factors that influence green banking initiatives in Nepal. The results show that all five variables, Green Product Development, Green CSR, Green Internal Process, Green Brand Image, and Green Brand Trust have significant positive effects on green banking practices. Green Product Development is the strongest factor, showing the importance of innovative green financial products in improving environmental performance. Green Internal Process and Green Brand Image also play major roles, while Green CSR contributes the least.

The study concludes that banks in Nepal should prioritize green product development and internal green practices to strengthen their environmental role. Improving brand image and building customer trust also help support green banking. The findings provide important insights for policymakers, bank managers, and researchers who want to promote sustainable banking in Nepal.

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Conflict of Interest:

The authors declare no conflicts of interest regarding the publication of this article.

Data Availability Statement:

The datasets generated and analyzed during this study are available from the corresponding author upon reasonable request.

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This study was conducted in accordance with ethical research guidelines. Informed consent was obtained from all participants, and their anonymity and confidentiality were maintained throughout the research process.

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