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Exploring Green Finance Practices for Advancing Sustainable Development in Nepalese Banking Sector

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Abstract

Background: Green finance represents a crucial strategy for promoting sustainability, emphasizing financial solutions that encourage environmentally friendly practices. Within Nepal's banking sector, green finance initiatives are critical for addressing climate change, fostering renewable energy, and integrating sustainable development goals.

Methods: A qualitative approach was adopted, employing structured interviews with nine finance managers from seven A-grade and B-grade Nepalese banks. Purposive sampling ensured relevance and depth. Data were analyzed thematically using NVivo 14 to extract key findings.

Results: Key findings reveal a strong commitment to diverse green financial activities. Banks play a crucial role in financing electric mobility, promoting energy-efficient housing, and

supporting renewable energy projects like hydropower. Innovative initiatives in green savings accounts, sustainable agriculture loans, and low-carbon industry financing further highlight their dedication to environmental responsibility.
Conclusion: Nepalese banks are actively fostering a transition to sustainability through diverse and impactful financial products. Their collaborative efforts with government bodies and communities amplify green initiatives, supporting eco-friendly lifestyles and practices across multiple sectors.
Novelty: This research uniquely maps the multifaceted role of Nepalese banks in enabling sustainable development through green finance, emphasizing innovative financial products and their tangible impact on environmental conservation and economic growth.
Keywords: Banks, Environment, Finance, Green, NVivo, Practices

Introduction

Green finance is an approach to funding and investment that prioritizes environmental sustainability, aiming to address climate change, reduce pollution, and improve overall ecological quality (Fu, Lu, & Pirabi, 2023). It involves financing both public and private projects that promote a clean environment and consider long-term societal benefits. Green finance supports initiatives such as reducing CO_2 emissions, promoting renewable energy, and mitigating the environmental damage caused by industrial and agricultural practices (Wu, Liu, & Cai, 2024). For instance, the adoption of green finance has influenced various industries to transition towards eco-friendly practices. In agriculture, green finance encourages reducing the use of harmful fertilizers and pesticides, which contribute to global warming and environmental degradation (Cao & Gao, 2024). Similarly, the industrial sector benefits from innovations like reduced fossil fuel reliance, aiming to counteract the negative impacts of manufacturing processes and industrial pollution (Mehmood, Zaman, Khan, Ali, & Khan, 2023). Consumers' growing preference for sustainable products has further driven sectors to adopt green practices to align with market demand. In addition to environmental advancements, green finance aligns financial resources with sustainable outcomes, highlighting the potential for profitability alongside ecological benefits (Agrawal, et al., 2024). Researchers also underscore its role in resource allocation and economic adjustments in response to climate challenges. Strategic investments in green technologies, regulatory enhancements, and environmental protection industries are vital to accelerating a global green economy (Zhang, Hou, & Geng, 2024; Ikram & Sadki, 2024).
The concept of green finance is emerging in Nepal as a vital means of advancing the country's sustainable development goals (SDGs) and addressing climate change. Nepal has demonstrated a growing awareness of the role that green finance can play in promoting sustainable business practices and financing environmentally friendly initiatives (Aryal, Dhakal, & Khanal, 2022). As of recent years, there has been an emphasis on adopting green finance instruments like green loans and bonds, especially in sectors such as renewable energy, clean transportation, and climate-smart agriculture (Paudel, Khanal, KC, Bhatta, & Chaudhary,

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2017). A major boost to green finance in Nepal came in the form of policies introduced by the Nepal Rastra Bank (NRB). The Environment and Social Risk Management (ESRM) framework was implemented in 2018 to guide financial institutions in managing environmental risks, and the 2020 inclusion of ESRM within the NRB's Unified Directives reinforced this commitment (Nepal Rastra Bank, 2022). Financial institutions in Nepal, such as NMB Bank, have begun offering green finance products tailored to renewable energy projects (Maharjan, 2023). For instance, NMB secured a USD 25 million green loan in collaboration with the International Finance Corporation (IFC) to support green infrastructure projects (International Finance Corporation, 2020). This partnership underscores the increasing role of global financial institutions in boosting the scale and reach of green finance in the country. Additionally, Nepal's Green Finance Taxonomy has been introduced to provide clear guidelines and establish standards for green investments, helping to overcome the challenges related to the definition and verification of "green" investments (Nepal, Liu, Wang, & Dong, 2024). This framework aligns with the country's broader vision to mobilize USD 28.4 billion by 2030 to fulfill its Nationally Determined Contributions (NDCs) under the Paris Agreement, targeting crucial climate mitigation and adaptation projects (Government of Nepal, 2020). However, challenges remain, such as the lack of a substantial pipeline of bankable green projects and limited access to long-term financing. Nevertheless, the government's initiatives, combined with private sector involvement, suggest a promising future for green finance in Nepal as the nation works towards a sustainable and resilient economy (Bhuju, Thapa-Parajuli, Sharma, & Arya, 2014).

In the context of Nepal's evolving commitment to sustainable development and climate change mitigation, it is increasingly significant to examine the green finance practices implemented by banks. Green finance is emerging as a critical component of Nepal's financial system, with a growing focus on environmentally responsible investment. The adoption of green finance initiatives by banks, such as the inclusion of Environmental, Social, and Governance (ESG) criteria in lending practices and the introduction of green bonds, provides an opportunity to drive economic growth while minimizing environmental impacts. Financial institutions like Nepal Rastra Bank, which have encouraged green lending policies, signal a commitment to aligning with global sustainability goals, such as those outlined in the Paris Agreement. However, understanding the current state of green finance practices, challenges in the banking sector, and their implications for long-term sustainable development is essential for developing more effective policies and financial products that meet Nepal's needs in the face of both domestic and global environmental concerns. As studies show, these practices not only aid in carbon footprint reduction but also open doors for climate-conscious investments that foster long-term prosperity in Nepal's economy.

Research Methodology

Research Methods

This study employs a qualitative research design to explore the practices of green finance in Nepalese banks. A total of nine participants were purposively selected from seven A-grade and

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B-grade banks in Nepal. The purposive sampling method was adopted to ensure detailed and relevant information regarding green finance initiatives within these banks.

Data Collection

Primary data were collected through structured interviews with finance managers and other concerned managers associated with the finance departments of the selected banks. The interviews were conducted at times that were convenient for the respondents, ensuring respect for their schedules and availability.

To ensure data security and ethical compliance, all interviews were audio-recorded using a mobile device, then transferred to a password-protected laptop. Prior to conducting the interviews, respondents were fully informed about the study's objectives, and consent was obtained.

Data Analysis

The qualitative data were analyzed using NVivo 14, with thematic analysis performed to extract and highlight key findings. This approach provided a structured means to identify patterns and themes within the interview responses, contributing to a comprehensive understanding of green finance practices in Nepalese banks.

Ethical Considerations

Ethical guidelines were strictly adhered to throughout the research process. Respondents were briefed about the study beforehand and assured of the confidentiality and privacy of their data. Interviews were conducted respectfully, ensuring compliance with ethical standards.

Results

The results section presents a short summary of interview responses and an overview of green finance practices implemented by Nepalese banks.

Summary of Interview

The researcher inquired about the specific sectors or types of projects that banks focus on in green finance, as well as the products or services they currently offer. In response, Laxmi Sunrise Bank highlighted its unique "Green Savings" initiative, where a tree is planted for every new account opened, coupled with CSR-driven tree plantation programs directly tied to these accounts. Siddhartha Bank emphasized its focus on hydropower and electric vehicles (EVs). While hydropower is excluded from international climate finance classifications due to sustainability concerns, it is recognized as renewable energy in Nepal’s context. The bank also provides EV loans at competitive rates, with additional concessions for women borrowers. Although they have considered green building projects, progress is limited due to the absence of a certification authority in the country.

Nabil Bank identified a broader range of sectors within green finance, including renewable energy projects, low-carbon industries, and energy-efficient housing. It actively promotes solar panel installations, mobilizes resources for SMEs and MSMEs in agriculture, and supports energy conservation through sustainable housing technologies. Additionally, the bank conducts entrepreneurial training programs in urban and rural areas to foster sustainable business development. Similarly, Muktinath Bikash Bank focuses on hydropower, electric

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vehicles, and climate-smart agriculture. While it previously invested in solar projects, the bank now prioritizes financing clean energy inputs in agriculture, with its portfolio concentrated on hydropower and EVs.

Nepal Bank Limited shared its focus on hydropower and solar projects, alongside plans to develop financing for EVs and charging infrastructure. Although the EV financing product is still in development, the bank is actively exploring ways to support alternative energy projects.

Global IME Bank highlighted its successful "Green Home Loan" program, which has been well-received by customers. The bank collaborates with the Nepal Government to promote EV adoption through subsidies, offering up to 80% financing for EVs with favorable interest rates compared to non-EVs. In addition to these efforts, the bank supports women entrepreneurs by providing subsidized loans of up to NPR 15 lakhs and encourages investment in SMEs within the green finance domain.

Practice of green finance

Green finance covers a wide range of initiatives aimed at promoting sustainability and reducing environmental impact. Key practices include investing in renewable energy to shift towards cleaner energy sources, financing electric vehicles (EVs) to reduce carbon emissions, and supporting sustainable agriculture to ensure eco-friendly food production. Energy efficiency measures are also prioritized to optimize resource usage. Additionally, green savings accounts encourage individuals to invest in environmentally sustainable projects, while low-carbon projects and green housing promote eco-friendly urban development. Support for SMEs and MSMEs ensures that small businesses can adopt sustainable practices, while corporate social responsibility (CSR) initiatives emphasize ethical and sustainable corporate actions. As illustrated in the figure below:

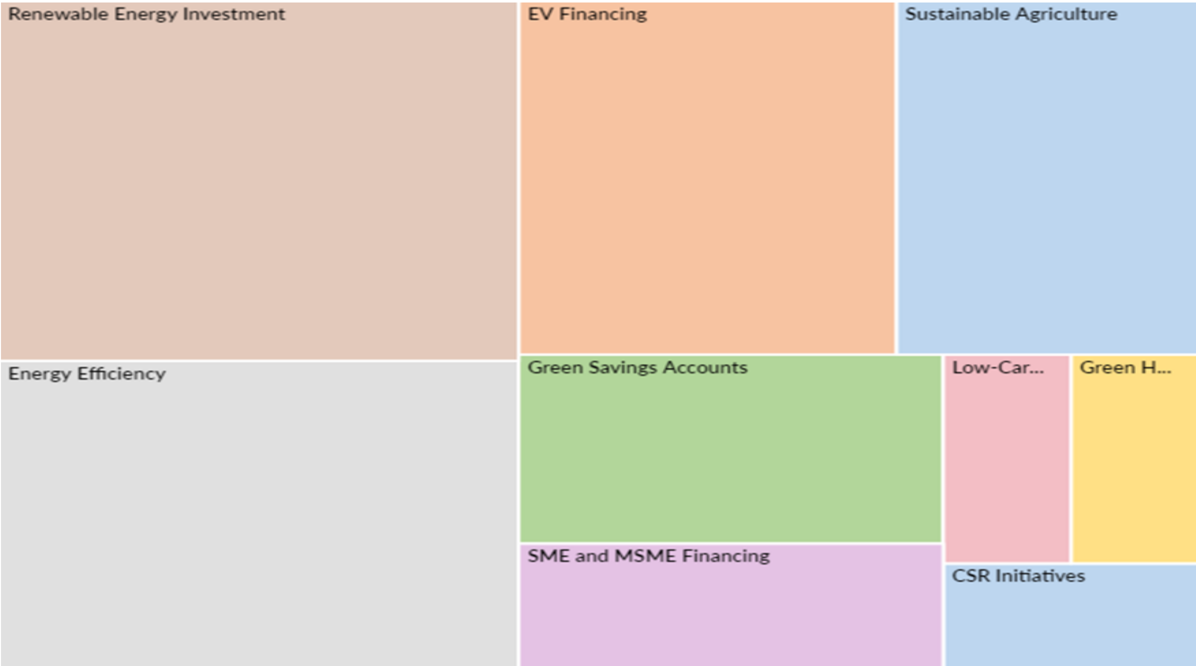

Figure 1: Treemap highlights several key areas within the broader scope of green finance

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EV Financing

Electric Vehicle (EV) financing is emerging as a key component in the drive toward sustainable transportation. As concerns about climate change and environmental degradation grow, EV financing is becoming more prominent within the broader categoryof green finance. This type of financing aims to facilitate the replacement of traditional internal combustion engine vehicles, which rely on fossil fuels, with electric alternatives that are more environmentally friendly. Banks are partnering with government agencies tooffer financial products that include subsidies and incentives for EV buyers, making it easier for both individuals and businesses to access EV loans. These loans are not limited to private cars but extend to commercial fleets, such as taxis, buses, and delivery vehicles.By financing both sectors, banks are helping to reduce greenhouse gas emissions from thetransportation industry, one of the largest contributors to global pollution. Additionally, banks are investing in the necessary infrastructure to support the EV ecosystem byoffering financing for the development of EV charging stations. These stations are criticalfor the widespread adoption of electric vehicles, as they provide the convenience and accessibility needed for consumers to make the switch from conventional vehicles. In essence, EV financing is a holistic approach that covers both the vehicles themselves and the infrastructure that supports their use, driving the transition toward electric mobility and reducing the overall carbon footprint.

Green Home Loan

The green home loan is a financial product designed to support the construction and renovation of environmentally sustainable housing. As the world shifts toward more sustainable living practices, banks are increasingly offering loans that cater to homes built with green technologies and materials. These loans are typically offered at lower interest rates than conventional home loans, making them an attractive option for consumers who are interested in reducing their environmental impact while saving on energy costs in the long run. The green criteria for these loans often include energy-efficient designs, such as homes with advanced insulation, energy-efficient windows, and solar panel installations. Additionally, sustainable building materials, like recycled wood or eco-friendly insulation, may also qualify homes for lower-rate financing. Banks are not only financing the construction of such homes but also investing in energy-efficient technology that can be incorporated into existing houses, further expanding the reach of green home loans. Solar panel installation loans, for example, allow homeowners to reduce their reliance on non-renewable energy sources, lowering their electricity bills while contributing to the use of clean energy. Overall, the green home loan initiative is part of a broader push by banks and governments to promote sustainable housing and reduce the environmental impact of the construction and housing sectors, which are traditionally energy-intensive industries.

Green Savings Accounts

Green savings accounts offer a unique fusion of financial savings and environmental stewardship. These accounts are structured to provide customers with competitive interestrates

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while simultaneously contributing to environmental conservation efforts. For every new green savings account opened, banks commit to planting a tree, symbolizing a direct contribution to sustainability. These simple yet effective initiative ties individual financialhabits to a positive environmental outcome, making customers feel that they are contributing to a larger cause. These accounts often attract environmentally conscious individuals who want to make a tangible difference while managing their finances. Beyond this direct link to tree planting, banks also engage in broader Corporate Social Responsibility (CSR) activities that complement their green savings initiatives. CSR activities such as large-scale tree plantation drives, environmental awareness programs, and community-based sustainability projects are often funded by the bank's green financial products. By offering these programs, banks position themselves as leaders in the green finance movement, encouraging customers to engage with environmental issues and contribute to conservation efforts. These savings products help to promote green banking practices, allowing financial institutions to integrate sustainability into their core offerings while enhancing their brand's environmental credentials.

Renewable Energy Investment

Hydropower project financing is a significant focus for banks in regions rich in water resources, such as Nepal. These projects are a critical component of green finance, as they provide a renewable and sustainable source of energy that helps reduce reliance on fossil fuels. Hydropower uses the energy from flowing water to generate electricity, and given its low emissions, it is considered one of the cleanest forms of energy production. Banks are increasingly directing investments toward hydropower projects because they offer long-term, sustainable solutions to the growing demand for energy. In countries like Nepal, where rivers are abundant, hydropower is seen as a key resource for economic development, and banks are financing both large-scale hydropower dams and smaller, community-based projects. Although hydropower dominates the renewable energy financing landscape, banks are also showing interest in solar energy projects, albeit on a smaller scale. The financing of solar projects complements hydropower by providing an additional renewable energy source, especially in areas where water resources are limited or where solar energy can be harnessed more effectively. By financing both hydropower and solar energy projects, banks are not only supporting clean energy initiatives but also helping to stabilize energy supply, reduce carbon emissions, and create opportunities for green growth.

Sustainable Agriculture

Climate-smart agriculture financing is an innovative approach that supports sustainable agricultural practices in the face of climate change. This type of financing encourages farmers to adopt methods that are not only productive but also environmentally friendly. Banks play a key role in providing loans for technologies and practices that make agriculture more resilient to climate change. For instance, solar-powered irrigation systems are becoming more popular, as they reduce reliance on diesel-powered pumpsand decrease greenhouse gas emissions. Climate-smart agriculture also includes practices such as crop rotation, conservation tillage,

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and the use of drought-resistant seeds, all of which help improve soil health and reduce the negative environmental impacts of traditional farming methods. By providing specialized loans for these practices, banks are helping farmers transition to more sustainable agricultural models that not only ensure food security but also contribute to environmental sustainability. Furthermore, climate- smart agriculture financing often targets smallholder farmers, helping them access the resources and technologies needed to make their farms more resilient to changing weather patterns. This type of financing is essential for long-term agricultural sustainability and aligns with global efforts to combat climate change while ensuring the viability of the agricultural sector.

SME and MSME Financing

The banking sector's investment in Small and Medium Enterprises (SMEs) and Micro, Small, and Medium Enterprises (MSMEs) is a critical component of green finance. These enterprises are often the backbone of local economies, particularly in rural and underserved urban areas, but they frequently face difficulties in accessing traditional financing. Banks are stepping in to provide targeted financing to SMEs and MSMEs, encouraging them to adopt sustainable business practices and contribute to green growth. These businesses are essential for creating jobs and fostering economic development, and by promoting environmentally friendly practices, they help reduce the overall environmental impact of industrial and commercial activities. Banks are also offering entrepreneurial programs designed to provide training and support for SMEs and MSMEs, helping them develop the skills needed to integrate sustainability into their business models. These programs are particularly important in sectors such as agriculture, manufacturing, and energy, where adopting green technologies can significantly reduce carbon emissions and improve resource efficiency. By mobilizing their branches to focus on MSME support, banks are fostering a more inclusive approach to green finance, ensuring that smaller enterprises have the resources and knowledge they need to thrive ina sustainable economy.

Low-Carbon Industries

Financing for low-carbon industries is becoming a priority for banks as global efforts to reduce carbon emissions intensify. Low-carbon industries focus on minimizing energy consumption, using sustainable technologies, and adopting eco-friendly business models. These industries are essential for achieving sustainability goals, as they produce goodsand services with a much smaller carbon footprint compared to traditional industries. Banks are increasingly offering loans and other financial products to support the development of these industries, which include sectors such as renewable energy, energy- efficient manufacturing, and sustainable construction. By providing financing for energy- efficient technologies, such as advanced machinery that reduces energy consumption or eco-friendly production methods, banks are helping businesses lower their operational costs while also contributing to environmental goals. This type of financing is aligned with global sustainability initiatives, such as the Paris Agreement, which aims to limit global warming by reducing carbon

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emissions. By supporting low-carbon industries, banks are playing a critical role in the transition to a more sustainable and energy- efficient economy, fostering innovation, and promoting the adoption of green technologies across various sectors.

The Broader Scope of Green Finance, Sustainability, and Environmentally Conscious Investment

The treemap highlights several key areas within the broader scope of green finance, sustainability, and environmentally conscious investment, with each category represented by a rectangle whose size corresponds to its relative importance or emphasis. One of the largest sections is Renewable Energy Investment, which reflects a strong commitment to financing projects that promote cleaner energy sources like hydropower, solar, and wind. This emphasis likely stems from global efforts to combat climate change by reducing reliance on fossil fuels and transitioning to more sustainable energy solutions. By focusing heavily on renewable energy, financial institutions are not only contributing to environmental sustainability but also fostering green growth and energy security.

Another significant focus is EV Financing, which highlights the growing importance of supporting electric vehicle (EV) adoption through various financial products such as loans and subsidies. This area also likely includes investments in building the infrastructure needed to support EVs, such as charging stations. As governments and industries push for the replacement of traditional fossil-fuel-powered vehicles with electric alternatives, banks, and financial institutions play a critical role in facilitating this transition through accessible financing.

Sustainable Agriculture is also a prominent area, reflecting the need to finance environmentally friendly farming practices that can mitigate the effects of climate change. Investments in climate-smart agriculture, such as solar-powered irrigation systems or sustainable farming technologies, are becoming increasingly important as the agricultural sector seeks to reduce its environmental impact while ensuring food security. This focus on sustainable agriculture not only benefits the environment but also supports long-term economic and social sustainability.

In addition to these larger themes, the tree map highlights the importance of Energy Efficiency. This category involves financing for technologies and practices that reduce energy consumption across industries and households, contributing to both environmental sustainability and cost savings for consumers and businesses. Green Savings Accounts are another area of interest, offering financial products that allow customers to save while contributing to environmental goals. These accounts are often tied to Corporate Social Responsibility (CSR) initiatives like tree planting programs, where every new account opened results in a tree being planted, directly linking banking activities to positive environmental outcomes.

Smaller but still significant sections include Low-Carbon Industry Projects and Green Home Loans. The former represents investments in industries that are focused on reducing carbon emissions and promoting sustainable technologies, while the latter provides financing for

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housing projects that meet green criteria, such as energy-efficient construction and renewable energy installations like solar panels. These categories reflect the growing recognition of the need to finance environmentally responsible business models and sustainable living practices. SME and MSME Financing is another key area, with banks increasingly focusing on supporting small and medium enterprises that engage in sustainable practices. This investment in SMEs and MSMEs helps promote entrepreneurship in green industries, particularly in underserved rural and urban areas, fostering innovation and growth in sectors that are critical to the green economy. Finally, CSR Initiatives form an integralpart of many of these green finance programs, with banks actively linking their productsto environmental and social causes. By promoting CSR activities such as tree planting and community-based environmental programs, banks are aligning their financial products with sustainability goals, further contributing to a more environmentally conscious business model.

Overall, the treemap illustrates a comprehensive approach to green finance, with a strong focus on renewable energy, sustainable transportation, agriculture, and the promotion of environmentally responsible financial products and practices.

Conclusion

The study highlights significant strides made by Nepalese banks in promoting green finance practices to support sustainable development. Banks have embraced various initiatives, such as renewable energy investments, electric vehicle (EV) financing, green home loans, and sustainable agriculture. Through these efforts, they are fostering a transition to clean energy, reducing carbon emissions, and contributing to environmental conservation. Notable examples include initiatives like "Green Savings," which link customer engagement to environmental actions, such as tree planting, alongside broader Corporate Social Responsibility programs. Banks are also addressing infrastructure gaps by financing EV charging stations, thus driving EV adoption. Hydropower remains a focal area due to Nepal's abundant water resources, complemented by investments in solar energy. Sustainable agriculture financing promotes climate-smart techniques, empowering farmers with eco-friendly technologies that ensure food security and environmental health. Additionally, banks support SMEs and MSMEs, encouraging them to adopt green practices while contributing to economic growth. These initiatives align with global sustainability goals by incorporating green technologies, reducing dependency on fossil fuels, and promoting eco-friendly urban development. By introducing tailored products like "Green Home Loans," banks not only enhance resource efficiency but also foster community awareness regarding environmental issues. Collectively, these practices signify a transformative approach in banking, integrating financial services with sustainability principles. As Nepalese banks scale these innovations, they strengthen their role in facilitating economic and environmental well-being, positioning themselves as pivotal contributors to Nepal's green finance journey.

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