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Priority Directions For Improving Green Financing Mechanisms In Commercial Banks

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Abstract

This study aims to identify priority directions for improving green financing mechanisms in commercial banks, with particular emphasis on financial instruments, environmental and credit risk management, funding diversification, digitalization, institutional capacity, and performance measurement. The study employs a conceptual analytical approach to examine the challenges and strategic measures associated with integrating environmental sustainability into banking operations, particularly in Uzbekistan. The analysis identifies six key priorities: diversifying green financial products, strengthening environmental and credit risk assessment, expanding access to long-term funding, implementing digital technologies, enhancing institutional capacity, and establishing measurable financial and environmental performance indicators. The proposed framework incorporates indicators such as the share and growth of green loans, non-performing green loan ratios, returns on green financing, energy and water savings, estimated greenhouse gas emissions avoided, and the proportion of projects with verified environmental data. The study also proposes a phased implementation strategy involving portfolio assessment, pilot green financing programs, and the gradual expansion of digital monitoring and environmental reporting. The findings suggest that effective green financing requires coordinated improvements in financial innovation, risk management, funding structures, technological systems, and institutional governance. Integrating transparent environmental criteria into conventional banking decisions can strengthen financial sustainability, improve accountability, and support Uzbekistan's transition toward a greener economy.

Keywords: *green financing, commercial banks, environmental risk management, sustainable banking, green financial instruments, Uzbekistan.*

1. Introduction

In the context of global climate change, environmental degradation, and the transition toward sustainable economic development, green financing has become an important strategic direction for the modern banking system. Commercial banks play a significant role in allocating financial resources to economic sectors and influencing investment decisions through their lending policies, investment activities, and risk management practices. By directing financial resources toward

environmentally sustainable projects, banks can contribute to reducing greenhouse gas emissions, improving energy efficiency, expanding renewable energy production, and promoting the rational use of natural resources.

Green financing refers to financial products and services designed to support activities that generate positive environmental outcomes. These activities include renewable energy projects, energy-efficient construction, sustainable agriculture, environmentally friendly transport, water conservation, waste management, and the modernization of industrial facilities using cleaner technologies. In contrast to conventional financing, green financing incorporates environmental considerations into project selection, credit assessment, financial monitoring, and the evaluation of long-term economic outcomes.[1]

The growing importance of green financing is associated with several structural changes in the global economy. First, climate-related risks increasingly affect the financial performance of businesses, the value of collateral, and the repayment capacity of borrowers. Second, governments and international financial institutions are expanding support for low-carbon development through preferential credit lines, guarantees, technical assistance, and sustainability-linked financial instruments. Third, businesses are increasingly required to demonstrate environmental responsibility to investors, customers, and regulatory institutions. These developments create both opportunities and challenges for commercial banks seeking to integrate environmental sustainability into their core operations.

Despite its potential, the implementation of green financing mechanisms faces a number of constraints. These include limited access to long-term and affordable funding, insufficient technical expertise in evaluating environmental projects, difficulties in verifying environmental benefits, the absence of standardized green project classification systems, and the relatively high initial costs of sustainable technologies. Furthermore, green projects may have longer payback periods than conventional investments, making their financial assessment more complex. Without appropriate risk-sharing instruments, transparent evaluation criteria, and effective monitoring systems, commercial banks may be reluctant to expand green lending.[2]

For Uzbekistan, improving green financing mechanisms is particularly relevant because the country's economic development requires the modernization of industrial infrastructure, more efficient energy consumption, the expansion of renewable energy capacity, and the sustainable management of water resources. Commercial banks can support these priorities by financing solar and wind energy installations, energy-efficient equipment, green buildings, sustainable agricultural technologies, and environmentally responsible production processes. However, the effectiveness of these initiatives depends on the availability of appropriate financial instruments, institutional coordination, reliable environmental data, and clear criteria for determining whether a project qualifies as green.

The central research problem is therefore to identify the institutional, financial, technological, and managerial measures required to improve green financing mechanisms in commercial banks. This involves examining the relationship between environmental objectives and conventional banking principles, particularly profitability, liquidity, creditworthiness, and financial stability. Green financing should not be considered solely as an environmental obligation; it can also become a source of portfolio diversification, innovation, new customer relationships, and long-term competitive advantage when projects are selected and monitored appropriately.[3]

2. Methodology

The purpose of this study is to identify priority directions for improving green financing mechanisms in commercial banks, with particular attention to financing instruments, risk assessment, institutional capacity, digital technologies, and performance measurement. The study also seeks to develop practical recommendations for integrating environmental criteria into lending decisions while maintaining the financial sustainability of banking institutions.

The research is guided by three principal questions: which financial and institutional barriers restrict the expansion of green financing; how can commercial banks improve the assessment and management of environmental and credit risks; and which organizational and technological measures can strengthen the economic and environmental effectiveness of green lending? Addressing these questions can contribute to the development of a more transparent, resilient, and environmentally responsible banking system in Uzbekistan.[4]

3. Result And Discussion

The analysis of green financing mechanisms in commercial banks indicates that their improvement requires a comprehensive approach combining financial innovation, environmental risk management, institutional development, digitalization, and the establishment of measurable performance indicators. Green financing cannot be developed effectively through the introduction of specialized loan products alone. It requires the integration of environmental sustainability objectives into the entire banking process, beginning with the identification of eligible projects and continuing through credit approval, disbursement, monitoring, and the assessment of environmental and financial results.[5]

The findings of the conceptual analysis are organized around six priority directions: the development of green financial instruments, improvement of environmental and credit risk assessment, expansion of long-term funding, digitalization of green lending, strengthening of institutional capacity, and implementation of performance monitoring systems.

One of the principal directions for improving green financing mechanisms is the diversification of financial products offered by commercial banks. Traditional lending instruments do not always adequately address the specific characteristics of environmentally sustainable projects. Renewable energy installations, energy-efficient industrial equipment, water-saving agricultural technologies, and green construction projects frequently require substantial initial investment and may generate financial returns over an extended period. Consequently, banks need to develop financial products that correspond to the investment cycles, cash-flow structures, and risk profiles of these projects.

Commercial banks can expand their green financing activities through preferential green loans, energy-efficiency credit lines, renewable energy project financing, sustainability-linked loans, green leasing, and financing programs for environmentally sustainable small and medium-sized enterprises. Each instrument serves a different purpose and should be selected according to the characteristics of the financed activity.[6]

Preferential green loans may be appropriate for projects that generate measurable environmental benefits but face relatively high initial costs. Green leasing can facilitate access to energy-efficient equipment without requiring enterprises to purchase all equipment using their own funds. Sustainability-linked loans can connect financing conditions to predefined environmental performance targets, provided that the targets are material, measurable, and independently verifiable.

Project financing is particularly relevant for large-scale renewable energy facilities and other infrastructure projects in which repayment depends substantially on the project's future cash flows. In such cases, banks need to assess electricity generation forecasts, contractual arrangements, operating expenses, technology performance, and potential regulatory changes.[7]

An important condition for the successful development of these instruments is the introduction of transparent eligibility criteria. Banks should establish clear rules for identifying green projects, including requirements concerning the intended use of funds, expected environmental outcomes, compliance with applicable environmental regulations, and the prevention of significant adverse environmental impacts.

The diversification of financial instruments can expand access to sustainable investment for different customer groups. Large enterprises may require long-term project financing, whereas small businesses and households may benefit more from standardized loans for solar panels, building insulation, energy-efficient machinery, and water-saving technologies.[8]

Environmental indicators should reflect the characteristics of financed projects. Relevant measures may include renewable energy capacity installed, estimated greenhouse gas emissions avoided, reductions in energy consumption, water savings, and the volume of waste reused or recycled.

Environmental indicators must be calculated using clearly defined baselines, consistent measurement periods, and transparent assumptions. Where emissions reductions or energy savings are estimated rather than directly measured, the methodology and limitations should be disclosed.

The Table 1. proposed framework below combines financial, environmental, and institutional dimensions.

Table 1. Proposed system of indicators for evaluating green financing mechanisms in commercial banks[9]

Evaluation dimension	Indicator	Measurement approach
Portfolio development	Green loan portfolio share	$\text{Green loans} / \text{Total loans} \times 100\%$
Portfolio growth	Annual growth rate of green loans	$\text{Annual change in green loan volume} / \text{Previous year's volume} \times 100\%$
Credit quality	Non-performing green loan ratio	$\text{Non-performing green loans} / \text{Total green loans} \times 100\%$
Financial performance	Return on green financing	$\text{Net income attributable to green financing} / \text{Relevant invested capital} \times 100\%$
Funding efficiency	Average cost of green funding	$\text{Funding expenses} / \text{Average green financing funds} \times 100\%$
Energy efficiency	Energy savings	Baseline energy use minus post-project energy use
Climate impact	Estimated emissions avoided	Baseline emissions minus project emissions
Water efficiency	Water savings	Baseline water consumption minus post-project consumption
Monitoring quality	Verified green project share	$\text{Projects with verified environmental data} / \text{Total green projects} \times 100\%$

Institutional capacity	Staff training coverage	Relevant employees trained / Total relevant employees × 100%
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Source: Author's proposed framework. The indicators should be adapted to the bank's reporting capacity and the characteristics of its green financing portfolio.

The proposed system allows banks to assess green financing from multiple perspectives. For example, an increase in the green loan portfolio may indicate stronger institutional commitment, but it does not necessarily demonstrate improved profitability or reduced environmental impact. If portfolio expansion is accompanied by deteriorating credit quality, excessive funding costs, or weak environmental verification, the bank may not achieve sustainable results.[10]

Similarly, environmental indicators should be interpreted alongside financial outcomes. A project that generates substantial emissions reductions may still require a carefully structured repayment schedule, risk-sharing support, or technical assistance. Conversely, a financially profitable project should not automatically qualify as green unless its environmental eligibility has been established.

The proposed improvements can be implemented in stages to reduce institutional costs and enable banks to build experience gradually.

At the initial stage, commercial banks should assess their existing lending portfolios, identify sectors with significant environmental financing potential, and establish internal definitions of green activities. This stage should also include an assessment of staff capacity, available data, and existing credit risk procedures.

At the second stage, banks can introduce selected green loan products, develop partnerships with external funding institutions, and incorporate environmental screening into credit assessment. Pilot programs can focus on sectors where the environmental benefits and financial returns are relatively straightforward to measure, such as energy-efficient equipment and small-scale renewable energy installations.[11]

At the third stage, banks can expand digital monitoring, introduce portfolio-level environmental reporting, and develop more advanced risk models. The results of pilot programs should be used to revise product terms, eligibility criteria, and risk assessment procedures before large-scale expansion.[12]

The following table 2. summarizes the main implementation priorities.

Table 2. Strategic directions for improving green financing mechanisms[13]

Priority direction	Main measures	Expected outcome
Financial innovation	Green loans, leasing, sustainability-linked financing	Broader access to suitable financing instruments
Risk management	Environmental screening, climate scenarios, sectoral risk assessment	Better identification and management of financial and environmental risks
Funding diversification	Green bonds, development finance, guarantees, blended finance	Improved access to longer-term funding
Digitalization	Automated screening, digital documentation, remote monitoring	Lower transaction costs and improved transparency
Institutional development	Staff training, internal policies, governance procedures	More consistent project evaluation and monitoring
Performance measurement	Financial indicators, environmental metrics, verification	Greater accountability and comparability of results

Market development	SME support, advisory services, public-private cooperation	Wider participation in green investment
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The expected outcomes should be regarded as strategic objectives rather than guaranteed results. Their achievement will depend on the cost of funding, borrower demand, project quality, environmental verification, macroeconomic conditions, and the effectiveness of implementation.[14]

A particularly important consideration is the balance between environmental ambition and financial sustainability. If green loan pricing is too high, eligible borrowers may be discouraged from investing. If pricing is too low without adequate risk assessment, banks may face losses or become dependent on continuing subsidies. Therefore, pricing decisions should reflect funding costs, credit risk, project cash flows, and the availability of guarantees or concessional resources.[15]

4. Conclusion

In addition, banks should distinguish between the environmental classification of a project and the financial performance of the borrower. A borrower may operate in an environmentally sensitive sector while investing in a demonstrably beneficial modernization project. Conversely, a borrower in a generally sustainable sector may propose an investment that fails to meet environmental criteria. Project-level assessment, supported by appropriate safeguards, can help avoid overly broad classifications.

Overall, the analysis suggests that improving green financing mechanisms requires a coordinated transformation of banking products, risk management, funding structures, digital systems, and institutional governance. The most sustainable approach is one in which environmental objectives are integrated into established financial decision-making processes and evaluated using transparent, verifiable indicators.

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