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Sustainable Banking and Environmental Responsibility in Bihar: A Study for Viksit Bharat 2047

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ABSTRACT

This study examines the role of sustainable banking in promoting environmental responsibility and inclusive development in Bihar, with reference to the national vision of ***Viksit Bharat 2047***. The focus of the study is to understand how banking practices in Bihar are gradually responding to environmental concerns while supporting rural livelihoods and economic stability. The study reviews key areas such as digital and paperless banking, green lending, renewable energy finance, climate-resilient agriculture, and environment-oriented CSR activities. The analysis is based mainly on secondary data collected from RBI and NABARD reports, bank sustainability disclosures, CSR records, and Bihar government publications. The findings show that Bihar has made noticeable progress in financial inclusion and digital banking, which has helped reduce paperwork, physical branch visits, and operational pressure on natural resources. Environmental awareness has also improved through CSR initiatives at the community level. However, green and climate-focused lending remains limited and uneven across districts due to low awareness, lack of standardized environmental assessment practices, and capacity constraints in rural branches. The study concludes that with focused policy support and institutional capacity building, sustainable banking can significantly contribute to Bihar's long-term, environmentally responsible development.

1. Introduction

Sustainable development has become an important approach in India's economic planning. It focuses on growth that protects the environment, supports social welfare, and promotes long-term economic stability. In recent years, green finance and sustainable banking have gained attention because banks can guide credit towards activities that protect natural resources, reduce pollution, and encourage low-carbon production. The Reserve Bank of India, government institutions, and commercial banks have started green lending, digital financial services, environmental reporting, and clean energy financing. These efforts show that the financial sector is playing a key role in India's sustainability goals.

Sustainable banking means that banks include environmental responsibility in their regular operations. It covers green loans, digital or paperless banking, solar-powered branches, financial literacy programs, and ESG-based decision-making. When banks support renewable energy, climate-resilient agriculture, clean mobility, waste management, and green MSMEs, it creates positive development outcomes for both society and the environment. This approach is useful for India because a large part of the population depends on agriculture, natural resources, and small businesses, which are directly affected by climate and environmental conditions. Regional economies such as Bihar need sustainable banking more urgently. Bihar experiences frequent floods, drought conditions, soil loss, and pressure on water resources. Many families rely on agriculture and rural enterprises, which face financial risk when weather conditions change. Traditional banking does not always recognize these environmental risks. Sustainable banking, however, supports climate-friendly farming, solar irrigation, clean energy solutions, and green village enterprises. These activities help rural communities manage climate challenges and improve income security.

India has introduced the national development vision known as Viksit Bharat 2047, which aims to make the country developed, modern, and environmentally responsible by the time India completes 100 years of independence. The mission focuses on clean energy, circular economy, smart agriculture, green infrastructure, and strong environmental governance. Banks

can play a major role by providing funds for renewable energy, green start-ups, rural sustainability projects, and digital financial inclusion. In this direction, studying sustainable banking in Bihar becomes important because the state can meaningfully contribute to national goals when its financial institutions adopt green practices.

Bihar is suitable for this study due to its large rural population, crop-based economy, and climate sensitivity. The state has many public sector banks, regional rural banks, cooperatives, microfinance organizations, and SHG networks. These institutions have strong outreach in both villages and towns. However, green finance and environmental banking practices are not widely adopted in the state. Green credit is still limited, ESG reporting is not common, and environmental risk assessment in lending is at an early stage. Awareness among bank staff and customers is also still low. Therefore, a study is required to understand how sustainable banking can support economic resilience, rural progress, and climate-friendly development in Bihar. The motivation of this research arises from the need to fill knowledge gaps regarding the state-level adoption of sustainable banking. There is a lack of systematic assessment of how banks in Bihar carry out environmental responsibility, how much green credit is available for climate-safe agriculture or clean energy, and what kinds of challenges institutions face while integrating sustainability in regular finance. These gaps raise important questions for researchers, policymakers, and banking professionals.

Based on the above context, this study addresses the following questions:

1. What is the present status of sustainable or green banking practices in Bihar?
2. How do sustainable banking activities support environmental responsibility and rural livelihoods in the state?
3. What challenges limit the growth of green finance in Bihar?
4. How can sustainable banking help Bihar contribute to the goals of Viksit Bharat 2047?
5. What forms of regulatory and institutional support are required for wider adoption of sustainability-oriented finance?

2. Review of Literature

Green banking is considered an important part of sustainable finance because it encourages banks to fund environmentally responsible activities and adopt energy-efficient operational systems. According to Jeucken (2001), green banking supports lending and investment policies that aim to reduce pollution, conserve natural resources, and support clean technology. Sustainable finance is a broader framework that includes renewable energy loans, green bonds, waste management projects, ESG investment tools, and low-carbon development (Weber, 2014). ESG finance allows banks and investors to consider environmental, social, and governance risks while making credit decisions (Friede, Busch and Bassen, 2015). These approaches help financial institutions reduce environmental risk, improve transparency, and support climate-friendly economic activities. International research shows that sustainable banking has received strong policy and institutional support in Europe, the United States, and East Asia. Banks in these regions have introduced carbon audits, green loan screening, responsible investment strategies, and digital or paperless operations to reduce emissions (Cruz and Lorenz, 2020). Studies also report that climate-focused lending helps renewable energy companies, electric mobility projects, sustainable farming practices, and green entrepreneurship (Dorfleitner and Utz, 2017). According to Thompson and Cowton (2004), sustainable banking increases customer confidence and supports long-term financial stability because it links profit with responsibility. The role of green microfinance in rural or semi-urban communities has also been recognized for supporting climate-resilient livelihoods and clean village enterprises (Mookherjee, 2018).

In India, the Reserve Bank of India has encouraged banks to adopt sustainability guidelines, clean energy lending frameworks, financial inclusion systems, and environment-friendly CSR activities (Singh, 2017). Studies show that green credit supports renewable energy projects, climate-smart agriculture, organic farming, cold storage systems, and rural waste management (Verma, 2020). Financial inclusion has led to wider use of digital transactions, internet banking, and mobile payments, which reduce paper usage and lower branch-level carbon

emissions (Bansal, 2014). Research on sustainable MSMEs finds that green financing helps rural enterprises adopt cleaner production technologies and reduce operational risks (Prakash and Ranjan, 2022). Agriculture-related studies indicate that climate-focused lending increases farm productivity, improves irrigation, and reduces environmental stress (Kumar, 2019). Microfinance literature in India notes that SHGs, cooperatives, and rural banks promote environmental awareness and provide financial support to small sustainable enterprises (Rao and Naidu, 2021).

However, much of the existing literature focuses on national trends, financial inclusion outcomes, urban sustainability finance, or regulatory frameworks. There is limited empirical work at the state level, especially in states that face high climate vulnerability and structural poverty such as Bihar (Pathak, 2022). Researchers have not measured how sustainable banking operates inside Bihar's rural economy or how green credit improves farm resilience, clean energy adoption, or green entrepreneurship (Agarwal and Singh, 2021). Existing studies do not provide integrated evidence that links regional banking practices with environmental outcomes. Another important research gap relates to national development planning. While Viksit Bharat 2047 highlights clean energy adoption, climate-safe agriculture, rural sustainability, and environmental protection, no major study has examined how Bihar's banking sector can contribute to these national goals through green lending, digital inclusion, or ESG-based risk evaluation (Tripathi, 2023). Current literature does not connect sustainable finance with Bihar's socio-economic structure or climate challenges in a systematic way. These gaps show that a detailed study is necessary to understand how sustainable banking can support environmental responsibility, rural well-being, and long-term development in Bihar.

3. Research Methodology

This study uses a descriptive and mixed methodological approach to examine sustainable banking practices and environmental responsibility in Bihar. The research collects secondary data from RBI bulletins, annual bank sustainability reports, ESG disclosures, CSR documentation, NABARD rural credit reports, and Bihar government development statistics. These data sources provide information on green lending trends, operational sustainability, and

environmental outcomes in the state's banking sector. If primary data are required, surveys or interviews are conducted with bank officials, MSMEs, rural borrowers, and SHG members to understand their awareness, access to green credit, and perceived challenges. The sampling follows purposive or stratified selection to include public sector banks, cooperative banks, regional rural banks, and small finance banks operating in Bihar. The study analyzes the collected information using descriptive statistics, thematic analysis, ESG scoring, and sustainability indicators such as green credit ratio and climate finance matrix. All data are interpreted to understand how sustainable banking supports climate resilience, rural livelihoods, and inclusive development in Bihar, and how these outcomes relate to the long-term goals of Viksit Bharat 2047.

4. Results and Analysis

Financial inclusion in Bihar has grown rapidly because of the expansion of public sector banks, cooperative banks, regional rural banks and SHG-based credit networks. The Economic Survey Bihar (2023) reports that 3.47 crore bank accounts have been opened under PM-Jan Dhan Yojana, and almost 68 percent of rural households have regular access to formal banking services. The spread of digital banking and mobile payments is visible across districts. According to NPCI data, Bihar recorded more than 1.2 billion UPI transactions during FY 2022–23, showing a strong shift toward cashless and paperless finance. The number of zero-balance and simplified savings accounts has supported financial access for low-income groups, while digital platforms reduce paperwork, printing and physical branch dependency. Green credit adoption is increasing, although at a slower pace when compared with national averages. NABARD (2023) notes that almost 6.8 percent of total priority sector lending in Bihar supports climate-resilient and green activities, whereas the national level is 12.4 percent. Bihar shows notable lending for solar irrigation pumps, organic cultivation, micro cold storage, dairy energy efficiency, biofertilizer units, and waste-to-energy clusters. Several districts such as Gaya, Nalanda, Patna and Purnea show better results because SHGs, microfinance cooperatives and

farmer producer organizations are active. Data remain uneven, and most rural branches do not have a standard green loan screening system or unified environmental reporting indicators.

Table 4.1: Sustainable Banking Indicators in Bihar

Indicator	Bihar Value	National Benchmark
PM-JDY Accounts	3.47 crore	–
Rural households with bank account	68%	82%
Share of green/climate lending	6.8%	12.4%
MSMEs with climate-resilient finance	37% (rural)	61% (semi-urban)
Paperless KYC Accounts	1.9 crore	–
Digital retail transactions	78%	85%
CSR spending on environment	INR 78 crore	–
Participants in environmental literacy	11 lakh	–

Source: *Data compiled from Economic Survey Bihar, NABARD, NPCI, CSR disclosures*

Banks in Bihar also practice environmental responsibility through digital KYC, paperless documentation, solar-powered ATMs, low-paper account servicing, solid waste reduction, plantation drives and rural sanitation campaigns. CSR disclosures show that almost INR 78 crore was spent on environmental projects and sustainability literacy programs in FY 2021–22, covering plantation, irrigation water harvesting, village sanitation, and agricultural awareness. These initiatives improve environmental understanding in rural communities and improve financial literacy, although they do not automatically increase green credit without institutional direction.

Green lending and responsible banking adoption is higher in semi-urban districts than in remote rural locations. NABARD (2022) indicates that 37 percent of rural MSMEs have received some form of climate-resilient finance, whereas 61 percent of semi-urban MSMEs report the same. Rural branches face difficulty due to unreliable internet, weaker financial literacy, less trained staff, and fewer sustainability reporting tools. Semi-urban areas have stronger capacity to

use digital platforms, support renewable energy loans, and participate in structured CSR programs.

Digital banking reduces carbon footprint through fewer physical visits, lower paper use, electronic documentation, and reduced branch-level administrative handling. NPCI (2023) shows that 78 percent of small retail payments in Bihar are digital. Paperless KYC accounts crossed 1.9 crore accounts during FY 2022–23. Digital account activation, online bill payment and mobile fund transfers mean fewer receipts, vouchers, files and transport emissions. These practices show measurable environmental benefits even without major capital investments.

CSR-led environmental awareness has reached almost 11 lakh citizens through plantation drives, village clean-up programs, climate-smart agriculture demonstrations, and financial literacy workshops. Public involvement supports clean entrepreneurship ideas, organic practices, waste management, and climate-friendly village production. Such educational campaigns create a base for sustainable economic activity and better climate resilience.

5. Discussion

The results show that sustainable banking in Bihar is closely connected with environmental responsibility. Digital banking, paperless documentation, and solar-powered branch systems reduce the environmental impact of financial transactions. CSR programs also support environmental awareness, sanitation activities, water conservation, and plantation, which help rural communities understand sustainability practices. However, green lending remains limited because most branches do not use formal environmental indicators for loan evaluation. This suggests that environmental responsibility is recognized at an operational level, but it is not fully integrated into the credit planning process. Sustainable banking supports climate resilience by providing green loans for renewable energy, climate-resilient agriculture, micro cold storage, and waste-to-energy clusters. When farmers and rural MSMEs receive financial support for clean technology, solar irrigation, organic farming, and energy-efficient processing, it reduces climate risk and protects local livelihoods. Micro cold storage units help farmers reduce post-harvest

losses, while solar irrigation reduces diesel use and cost pressure. Village biofertilizer units and clean dairy processing reduce pollution and improve long-term soil conditions. These findings indicate that sustainable banking is a useful tool for improving rural resilience and supporting local production systems.

The findings are closely aligned with Sustainable Development Goals (SDGs), particularly SDG 1 (no poverty), SDG 2 (zero hunger), SDG 7 (clean energy), SDG 8 (decent work), SDG 12 (responsible production), and SDG 13 (climate action). The results also align with the vision of Viksit Bharat 2047, which focuses on clean energy adoption, climate-safe agriculture, balanced regional development, and environmentally responsible economic systems. Green lending and climate-focused financial activities can help Bihar contribute to these national goals by improving resource efficiency, reducing environmental stress, strengthening rural entrepreneurship, and creating income opportunities. A comparison with earlier studies shows that green and sustainable banking is more advanced in European, North American, and East Asian financial systems where ESG reporting, sustainability auditing, and green credit scoring are common (Friede et al., 2015; Dorfleitner and Utz, 2017). In India, sustainable banking has gained policy support, but state-level adoption remains uneven. Bihar performs well in digital inclusion and CSR activity, but green finance adoption remains slower than national averages. International best practices show that structured environmental indicators, dedicated credit teams, ESG evaluation systems, and targeted incentives are necessary for wider green lending. Bihar can benefit from these practices by creating transparent sustainability metrics, district-level climate finance targets, and regular environmental reporting.

The practical implications of the findings are significant for banks, regulators, and policymakers. Banks require training programs on ESG evaluation, sustainability accounting, and green loan risk assessment to expand green finance. Regulators and state authorities may consider creating district-level sustainability guidelines, tax incentives, concessional interest rates, and credit guarantee support for green MSMEs and farm clusters. Policymakers can also encourage environmental data disclosure, digital documentation, and climate resilience planning

at the branch level. Capacity building programs, sustainability awareness campaigns, and community partnerships are important for increasing customer participation and improving climate-friendly financial behavior.

Overall, the discussion suggests that sustainable banking has strong potential to improve environmental responsibility and inclusive development in Bihar. The state has already achieved significant progress in financial inclusion and digital payments, but structured policy support is still required to strengthen green credit, renewable financing, and environmental risk monitoring. Aligning banking practices with sustainability goals will help Bihar contribute to the long-term national mission of Viksit Bharat 2047.

6. Conclusion

The analysis shows that financial inclusion and digital banking in Bihar have expanded at a fast rate, creating a strong foundation for sustainable banking. Digital transactions reduce paperwork, branch visits, and operational emissions, which improves environmental responsibility even without large capital investment. CSR-led environmental campaigns also help in improving public awareness, sanitation, water conservation, plantation, and financial literacy across several districts. These developments indicate that sustainability at the operational level is growing and rural communities are increasingly familiar with the link between financial access and environmental protection.

Green credit, however, remains lower than the national average. Lending for solar irrigation, organic farming, biofertilizer units, micro cold storage, and green MSMEs is visible but limited to selected districts where SHGs, cooperatives, and microfinance agencies are active. The variation between rural and semi-urban areas shows that sustainability adoption depends on digital access, staff capacity, and institutional cooperation. The absence of standardized environmental indicators for loan evaluation makes it difficult for banks to measure environmental benefits and long-term sustainability outcomes. These constraints limit the ability

of banks to scale up green finance even when awareness and operational sustainability are improving.

The study suggests that sustainable banking in Bihar supports climate resilience by promoting renewable energy, clean agriculture, and rural value-chain activities. It also contributes to the Sustainable Development Goals and aligns with the long-term national mission of Viksit Bharat 2047, which highlights clean energy, climate-safe farming, and balanced regional development. The results confirm that Bihar has strong institutional outreach for financial inclusion but requires more structured credit-based sustainability initiatives, environmental reporting systems, skill development, and policy support to unlock the full potential of green finance.

7. Suggestions

1. Banks should introduce a standard environmental assessment format for loan appraisal so that rural and semi-urban branches can identify, record, and monitor green lending in a consistent manner. This will improve transparency and allow district-level measurement of environmental outcomes.
2. Capacity-building programs should be offered for branch managers, credit officers, and field staff in ESG evaluation, climate-risk assessment, and sustainable MSME lending. This will help banks expand green credit in a more confident and skilled manner.
3. State and central regulators may create financial incentives for green MSMEs, solar irrigation, organic farming, and rural renewable clusters through concessional lending, interest subvention, or partial credit guarantees.
4. District-level sustainability targets may be introduced for cooperative banks, RRBs, and microfinance networks to improve balanced regional adoption of green finance. Targets should include both loan volume and measurable environmental benefits.
5. CSR initiatives should integrate financial literacy with sustainability practices, including organic farming, waste reduction, and clean enterprise models. These programs can support community-level capacity and increase demand for green credit.

6. Digital documentation, online loan processing, and paperless communication should be strengthened to reduce environmental impact and improve operational efficiency at the branch level.
7. Banks, NABARD, and state agencies should jointly create a climate finance information platform that publishes district-wise data on green loans, renewable investments, and sustainability performance. This would help policymakers design better support systems and improve institutional coordination.
8. Technical support units or green entrepreneurship facilitation centres may be created in selected districts to help farmers, SHGs, MSMEs, and producer groups prepare bankable proposals, adopt clean production models, and access sustainability-focused financial services.

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