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Climate Change & Green Microfinance: The Potential Role of Microfinance Sector in Bangladesh

Suman Chakma
Joint Director, Microcredit Regulatory Authority

Abstract
Microfinance easing the access to finance, especially to marginal segments of the population who have no or limited access to formal financial services, thereby playing a significant role in reducing poverty and empowering marginalized communities. However, climate change and environmental degradation are creating new challenges not only to the sustainable operation of microfinance but also to the resilience and sustainable livelihoods of the vulnerable population. Therefore, this research explores the potential role of microfinance institutions (MFIs) in addressing the dual challenges of financial inclusion and environmental sustainability. The study investigates climate resilience efforts and policy frameworks to highlight how MFIs can scale up green financial products and services, thereby boosting climate resilience. It concludes with policy recommendations for addressing climate change through green microfinance initiatives.

Introduction

To meet the increasing demand for financial services by low-income populations, microentrepreneurs, and households, microfinance institutions emerged worldwide. Microfinance has evolved as an economic development approach intended to benefit low-income women and men (Ledgerwood, 1998). MFIs play an important role in reducing poverty by generating employment and improving living standards through better education, health facilities, and higher health expenditure (Hossain et al., 2018). A study on 87 villages in rural Bangladesh shows longer-term effects of microcredit on households's per capita income, expenditures, poverty, non-land assets, household net-worth, male and female labor supply, and schooling of children (Khandker et al., 2015). Microfinance helps to generate employment, income, and assets, as well as improve children's schooling (Khandker et al., 2016). Microcredit has a positive impact on income, expenditure, condition of dwelling house, education, health, and decision-making ability of the poor women borrowers (Pomi, 2019).

Microfinance originated as a development strategy with the goal of raising the living conditions of the impoverished by providing improved access to healthcare, education, and work opportunities, especially for women. The 1974 famine in Bangladesh inspired Muhammad Yunus to seek solutions to the pervasive poverty in rural communities, especially for women, and began an experiment by lending $27 of his own money to 42 villagers. This initiative led him to establish trust-based, collateral-free microloan service provider Grameen Bank in 1983, which aimed to empower impoverished women and break the cycle of poverty (Yunus M., 2017).

Bangladesh, being one of the most disaster-prone countries, experiences frequent and severe floods and cyclones, making it harder for low-income families to rebuild, agriculture losses, and asset damage, which leads to economic collapse, trapping them to the edges of poverty. Across the world, including Bangladesh, the livelihoods of vulnerable groups are seriously threatened by the growing effects of climate change. Roughly 3.3 to 3.6 billion people live in highly vulnerable environments, and those individuals are disproportionately affected, in spite of contributing insignificantly to climate change (Calvin et al., 2023). Bangladesh, with more than 170 million people, is one of the most densely populated countries and the worst sufferer of climate-related calamities such as floods, cyclones, droughts, and rising sea levels, which impede the advancement of economic growth and the fight against poverty. According to Global Climate Risk Index, 2021 Bangladesh ranked 7th among the most affected countries and experienced 185 devastating events between 2000 and 2019 (Eckstein et al., 2021).

Recognizing the link between financial vulnerability and climate change, MFIs are exploring green microfinance techniques and, as a result, started to promote investment in climate-resilient practices and give loans to clean energy technologies (Allet & Hudon, 2015). To address environmental challenges and financial inclusion, particularly for excluded people, policymakers are thinking towards inclusive green finance (Zetzsche et al., 2022).

This research study explores the area as to how MFIs in Bangladesh are addressing the dual issues of financial inclusion for reducing poverty and building climate resilience. The purpose of the study is to explore the essential components of green microfinance, the role of MFIs in promoting green microfinance initiatives, and evaluate the emerging regulatory landscape. Additionally, it will also emphasize the significance of developing inclusive policies that guarantee marginalized groups are not left out to build climate resilience. The study begins with conceptualizing green finance and exploring the financial inclusion landscape of Bangladesh. Next, the paper analyzes the existing policy frameworks on climate resilience and the status of microfinance sector on promoting green microfinance. Finally, the paper concludes by discussing about incorporating green finance and the need for inclusive policies within microfinance sector to promote climate resilience efforts.

Conceptualizing Green Microfinance

Microfinance has traditionally been viewed as a tool to improve the economic well-being of low-income populations, enabling them to access financial services such as loans, savings, and insurance (Hammill et al., 2008). By providing financial access, microfinance helps these individuals engage in productive activities, build assets, and manage risks, thus contributing to poverty alleviation and economic stability (Agrawala Shardul and Maëlis Carraro, 2010). In contrast, green microfinance incorporates a broader vision, addressing not only the financial needs of the poor but also encouraging sustainable economic activities that support climate change adaptation and mitigation (Forcella Davide & Allet, 2017).

Green microfinance combines financial inclusion with environmental sustainability by promoting investments in renewable energy, energy efficiency, waste management, agroforestry, and organic farming (Forcella & Huybrechs, 2016). The provision of green microcredits—small loans targeted towards environmentally friendly projects—enables low-income individuals and microentrepreneurs to adopt sustainable practices. Examples include investing in solar energy systems or employing eco-friendly agricultural techniques that enhance soil fertility and reduce environmental degradation (Allet, 2012).

Inclusive Green Finance (IGF) integrates green finance with financial inclusion to address environmental challenges while supporting vulnerable and marginalized communities. IGF recognizes that the financial sector has a critical role in advancing both environmental sustainability and social equity by providing vulnerable populations with access to financial services that promote resilience and sustainable development (Volz U.Knaack P.Nyman J.Ramos L.Moling J., 2020). Alliance for Financial Inclusion (AFI) highlights two key areas within green finance: (i) adaptation investment and insurance solutions to enhance environmental resilience, and (ii) mitigation investments, such as renewable energy and low-carbon infrastructure.

Green microfinance also encompasses broader sustainable finance principles, which involve incorporating environmental, social, and governance (ESG) criteria into financial decision-making. This includes investments in sustainable agriculture, eco-friendly CMSMEs, and other socially responsible activities that promote long-term sustainability (Bangladesh Bank, 2020). Through green microfinance, MFIs can support low-income households in adopting sustainable livelihoods, thereby enhancing their capacity to cope with environmental challenges while fostering inclusive economic growth.

Bangladesh's microfinance sector has already begun to adopt green initiatives in response to climate change. As an extension of green finance, which focuses on financing projects that promote environmental sustainability, green microfinance is particularly significant in developing countries like Bangladesh, where addressing environmental challenges is critical for sustainable economic growth (M. Hossain, 2018). Through this model, green microfinance not only contributes to poverty alleviation by providing access to capital but also fosters environmental resilience by supporting climate-adaptive and low-carbon economic activities.

Green microfinance represents an evolving financial model that addresses both economic and environmental concerns. By providing access to financial services that promote sustainable practices, MFIs in Bangladesh are uniquely positioned to contribute to climate change adaptation and mitigation efforts. As the country grapples with the impacts of climate change, green microfinance offers a viable solution to empower vulnerable populations while promoting environmental sustainability. The evolving role of MFIs in this context underscores the need for continued research and policy development to support the integration of green finance into Bangladesh's financial ecosystem.

Overview of Financial Inclusion in Bangladesh

According to Global Findex 2021, 52.8% of the adult population in Bangladesh has a formal financial account, which is less than the South Asian regional average of 67.9% and the global average of 76.2%. Bangladesh's National Financial Inclusion Strategy (NFIS), introduced in 2021, is a landmark initiative designed to advance financial inclusion throughout the country. The five fundamental principles of NFIS are commitment, cooperation, coordination, coexistence, and comprehensive development designed to address the opportunities and difficulties presented by the Fourth Industrial Revolution. The strategic goal of Bangladesh's National Financial Inclusion Strategy (NFIS) is to establish an integrated financial system to make financial products and services accessible, tailored to the needs of the populace, and regularly used to manage cash flows, sustain livelihoods, and lessen shocks at the individual, household, and business levels.

Table 1: Financial Service Providing Mapping in Bangladesh

Financial Intermediaries/ Financial Service Providers	Financial Services					
	Savings	Credit	Payments	Insurance	Capital Market Instruments	Government Issued Instruments
Banks	❖	❖	❖			❖
NBFIs	❖	❖				
MFIs	❖	❖				
MFS Operators	❖		❖			
Cooperatives	❖	❖				
Insurance Companies				❖		
Bangladesh Post Office	❖		❖	❖		❖
Specialized FSPs		❖				
Capital Market Intermediaries and Investment Banks					❖	
Government Instrument Intermediaries						❖

Source: National Financial Inclusion Strategy of Bangladesh.

Financial inclusion has been given top priority by Bangladesh Bank (BB) in order to encourage balanced and long-term economic growth. Leveraging the National Financial Inclusion Strategy (NFIS) and its Strategic Plan (2020–2024), BB is working to expand financial services for underserved and unbanked groups, particularly through creative digital platforms (BB annual report 2023).

Table 2: Financial inclusion initiatives of Bangladesh Bank

Sl	Initiatives by BB	Description
1	**Conventional Channels**	**Branch Network:** Since 2011 the urban-rural branch ratio is set to 1:1 and as of June 2023, there are 11,177 bank branches. **Sub-branches and Booths:** In 2019 BB introduced sub-branches services under a full-fledged branch's supervision with a 2:3 urban-rural ratio.
2	**Alternative Channels**	**Agent Banking:** Introduced in 2013, without setting up full branch it offers low-cost banking services in remote areas. As of June 2023, 31 banks had 15,510 agents and 21,288 outlets, with nearly 20 million accounts and BDT 334.62 billion in deposits. **ATMs:** Introduced in 1993, As of June 2023, 13,704 ATMs are enhancing financial convenience. **Electronic Payment Services:** Since 2010 BB introduced BEFTN, NPSB, and RTGS,

		Mobile Financial Services (MFS): Launched in 2011, MFS offers P2P, P2B, G2P cash transactions and remittance services. **PSPs and PSOs:** BB licensed Payment Service Providers and Payment System Operators to facilitating digital payments.
3	**Targeted Financial Inclusion Initiatives**	**No-Frill Accounts (NFA)**: Special low-cost accounts for marginalized groups, 27 million account opened by June 2023. **School Banking**: students under 18 are encouraged for saving habits. Nearly 4 million accounts with BDT 23.58 billion deposits by mid-2023. **Banking for Working Children**: Banks, with NGO support, provide no-fee accounts for street children and working youth, with 33,806 accounts opened by June 2023.
4	**Refinance Schemes**	**BDT 5.0 Billion Scheme**: Supports low-income account holders with loans up to BDT 500,000. By June 2023, 119,024 borrowers received BDT 5.93 billion. **BDT 30.0 Billion Scheme for COVID-19 Recovery**: Helped marginal people recover from the pandemic, reaching 0.73 million people, 87.04% of whom were women, before ending in June 2023. **Digital Nano Loan Scheme**: Offers digital loans between BDT 500 and BDT 50,000 to low-income individuals, benefitting 105,467 people by mid-2023.

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Microfinance started in 1970, predominated by Grameen Bank and BRAC, and during 1990, with the entrance of Association for Social Advancement (ASA) and other NGO MFIs with the support of donor funds and subsidized loans from PKSF, the microfinance sector in Bangladesh got a lot of momentum. (Khandker et al., 2016). With the entrance of a large number of MFIs, changes occurred in the nature of borrower selection, loan size, branch expansion, financing sources, and regulatory framework. Therefore, under Microcredit Regulatory Authority Act 2006, the government of Bangladesh established a statutory body named Microcredit Regulatory Authority to oversee the microfinance sector in Bangladesh. As of June 2023, 731 licensed MFIs are providing microfinance services in Bangladesh, and they have the opportunity to mobilize savings, borrow from banks or financial institutions, international financing organizations, the capital market, and use informal sources of financing. Besides loan and saving mobilization, MFIs conduct preprimary schooling and vocational training programs, scholarships, medical/health camps, establish hospitals, relief distribution and rehabilitation, guidance for fisheries and agriculture, and many more social activities from their own sources(Microcredit Regulatory Authority, 2024). Loan products offered by MFIs in Bangladesh can be categorized as ultra-poor loans, agricultural loans, loans for small-scale business activities, microenterprise loans, seasonal loans, loans for disaster management, etc.

Table 3: Microfinance sector at a glance (June 2023)								
Microfinance service providers	**Member (million)**	**%**	**Borrower (million)**	**%**	**Loan Outstanding (billion)**	**%**	**Saving (billion)**	**%**
MRA licensed MFIs (731)	40.86	61.15	31.53	69.60	1504.18	80.81	620.55	21.68
Grameen Bank (GB)	10.36	15.50	7.16	15.81	161.5	8.68	226.82	7.93
Various Government Departments Institutions/ Special Programs	13.3	19.90	6.21	13.71	121.9	6.55	39.21	1.37
Government and Non-Government Banks	2.30	3.44	0.40	0.88	73.75	3.96	15.18	0.53
Total	66.82	100	45.3	100	1861.33	100	2861.74	100

Source: Microfinance in Bangladesh (Annual Statistics-June 2023)

Policy frameworks and initiatives on climate resilience

Government of Bangladesh has shown an extensive commitment to combating climate change with a number of comprehensive policies and action plans. The Bangladesh Environment Conservation Act, 1995 set the groundwork for environmental conservation. National Adaptation Programme of Action (NAPA) was developed in 2005 and later Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009 was launched in response to the increasing challenges posed by climate change. The Climate Change Trust Fund Act, 2010 established structured financial mechanisms for adaptation and mitigation programs. Furthermore, to integrate financial policies with climate goals and assure budgetary allocation the Climate Fiscal Framework (CFF) 2014 and its update 2020 were launched. In 2018, Bangladesh's country program for the Green Climate Fund (GCF) expanded access to international financing. Concurrently, adaptation of the Bangladesh Delta Plan 2100 in 2020 presented a sustainable development strategy for addressing climatic issues through a holistic approach to water resource management. Finally, formulation of National Adaptation Plan (NAP) 2022 affirmed Bangladesh's commitment to climate adaptation for a long-term climate-resilient development. The Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009 and the National Adaptation Plan (NAP) 2022 are pivotal frameworks guiding Bangladesh's climate change response. In both plans women, children, youth, elderly people and people with diverse gender Identities, persons with disabilities, ethnic communities, socially disadvantaged groups and the private sector are integral considerations to ensure inclusive and participatory climate change adaptation and mitigation.

Table 4: National Climate resilience policies	
Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009	National Adaptation Plan 2022
six pillars: 1. Food security, social protection and health 2. Comprehensive disaster management 3. Infrastructure 4. Research & knowledge management 5. Mitigation and low carbon development 6. Capacity Building and institutional strengthening	eight distinct sectors and thematic issues: 1) Water resources; 2) Disaster, social safety and security; 3) Agriculture; 4) Fisheries, aquaculture and livestock; 5) Urban areas; 6) Ecosystems, wetlands and biodiversity; 7) Policies and institutions; and 8) Capacity development, research and innovation.

The Climate Fiscal Framework (CFF) 2020 is a framework designed to track climate-related spending and estimate long-term financing needs. It facilitates access to national and international climate funding and resources. Climate Financing for Sustainable Development Budget Report 2023-24 reveals that 42.28% is allocated for food security, social protection, and health, followed by infrastructure 28.49%, mitigation and low carbon development 13.21%, comprehensive disaster management 6.91%, capacity building and institutional strengthening 6,09%, and research & knowledge management 3.02%. From the budget allocation it is evident that Bangladesh prioritizes adaptation, focusing on solving climate vulnerabilities urgently and mitigating for long-term climate resilience.

Bangladesh Bank (BB) the central bank of Bangladesh has launched several initiatives to encourage environmentally friendly practices in the financial industry starting with Tk 2.00 billion refinance scheme in 2009. Incorporating environmental concerns into credit risk management process Bangladesh Bank introduced Green Banking Policy in 2011. The sustainable finance policy was launched in 2020 mandates bank and financial institutions to include green and sustainable finance as part of their core operations. Initially the eligible green products were started with 6 which have enhanced from 55 in FY20 to 94 in FY2024. In FY 2022-23 banks and NBFIs disbursed BDT 126.41 billion and 23.58 billion on green finance which accounts for 5.84% of all term loan disbursements.

Table 5: Green finance related Policy Initiatives by Bangladesh Bank	
Year	initiatives
2011	Guideline on Environmental Risk Management (BRPD Circular no 01; 30 January 2011) “Policy Guidelines for Green Banking” and “Guidelines on Environmental Risk Management” (BRPD Circular no 02; 27 February 2011)
2013	Policy Guideline for Green banking (GBCSRD Circular no 04; 5 September 2013)
2017	Guidelines on Environmental & Social Risk Management for Banks and Financial Institutions (SFD Circular no 02 February 2017) Eligible Product List for Green Financing of Banks & Financial Institutions (SFD Circular no 6 September 2017)
2020	Sustainable Finance Policy for Banks and Financial Institutions (SFD Circular no 5 30 December 2020)

2022	Guidelines on Environmental & Social Risk Management for Banks and Financial Institutions (SFD Circular no 03 February 2022) [updated policy of 2017]
2023	Sustainable Finance Policy for Banks and Financial Institutions (SFD Circular no 3 22 October 2023) [updated policy of 2020) Guideline on Sustainability and Climate-related Financial Disclosure. (SFD Circular no 6; 26 December 2023)
Refinance scheme for green finance	
2017	Refinance Scheme for Green Products/Initiatives (SFD Circular no 3; 16 March 2017)
2020	Refinance Scheme for Environment Friendly Products / Initiatives / Projects" (SFD Circular no 2; 30 April 2020)
2022	Refinance Scheme for Environment Friendly Products/ Projects/Initiatives (SFD Circular no 4; 24 July 2022)
2023	Refinance Scheme for Environment Friendly Products/Projects/Initiatives (SFD Circular no 2; 30 August 2023)

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Microcredit Regulatory Authority (MRA), responsible for formulating guidelines or polices for microfinance sector is yet to develop climate resilience specific policies or guidelines for microfinance sector. Since 2009 MRA has responded to severe weather events by issuing a number of circulars.

Table 6: Circulars issued by MRA to respond weather events

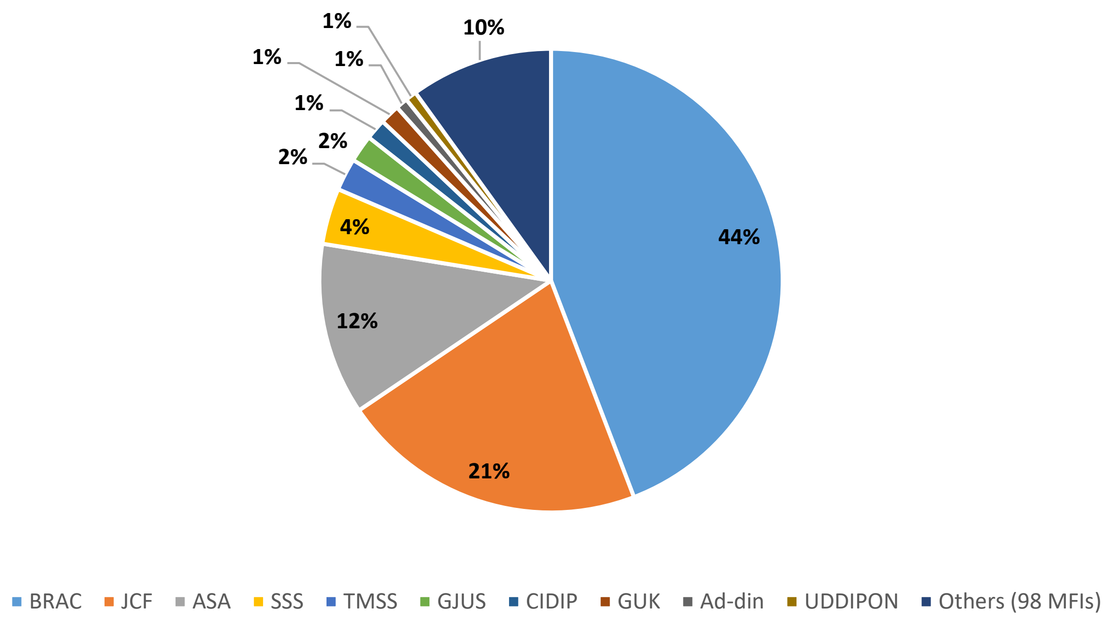
Sl	Circular no & Date	Nature of disaster	Instructions
1.	1 ; Date 1 July 2009	Cyclone	● postpone collection of loan installment for a certain period ● loan rescheduling ● relaxing loan disbursement, ● savings withdrawal opportunity, ● relief distribution, ● emergency food & clean water distribution ● medicine supply ● distribution of winter cloths
2.	2 ; Date 19 August 2009		
3.	28 ; Date 8 September 2014	Flood	
4.	38; Date 14 August 2016		
5.	42; Date 13 April 2017		
6.	43; Date 25 July 2017		
7.	44 Date 29 August 2017		
8.	72; Date 19 June 2022		
9.	78; Date 25 August 2024		
10.	45; Date 10 January 2018	Cold wave	
11.	51; Date 12 January 2020		
12.	49; Date 6 August 2019	Dengue fever	
13.	55; Date 20 April 2020	Covid-19	
14.	57 Date 9 may 2020		
15.	60; Date 2 May 2021		
16.	63; Date 25 July 2021		

Compiled by author

Microfinance institutions (MFIs) are allowed to address the climate related issues from there cumulative surplus with prior approval of MRA. Since there is no specific guideline and reporting format MFIs seek permission and address climate issues in the expenditure head of social development. In financial year 2022-23, MRA has granted permission to 108 MFIs to spend Tk 5.70 billion on the following social development activities:

● Health programs ● Water and sanitation ● Disaster response ● Educational programs ● Scholarship for educations ● Improving the quality of life for the elderly ● Adolescent programs ● Prevention of violence against women ● Gender development ● Primary healthcare services ● Agricultural education ● Religious education ● Distribution of educational materials ● Distribution of winter clothing ● Disability programs ● Assistance to flood victims	● Fire relief distribution ● Street schools and educational materials ● Community awareness programs ● School management ● Cattle fattening programs ● Livestock programs ● Fisheries programs ● Cultural programs ● Distribution of agricultural equipment ● Climate change programs ● Preservation of indigenous cultural heritage ● Eco-tourism ● Orphanage management ● Tree plantation

Chart 1: MFIs Social Development Budget (FY 2022-23)



MFIs provide blended disaster-responsive financial and technical services, and due to the lack of a specific reporting format on climate-related financing, it's a matter of further research to identify the microfinance sector's contribution to climate resilience. In FY 2022-2023, among microfinance sector social development budgets, 90% is covered by 10 MFIs and the remaining 10% by 98 MFIs. It is notable that

BRAC solely covers 44% of the total budget. As per the 2023 annual report of BRAC, 1.6 million households received disaster risk reduction services, capacity building, and preparedness interventions, while 19,000 accessed climate-adaptive solutions like rainwater harvesting, agricultural support, and tree plantation (BRAC, n.d.). JCF facilitated climate smart agriculture practice among 18907 persons for climate resilience income, manage climate related risks, and promote sustainable use, restoration and protection of watershed for resilient agriculture (JCF, n.d.) .

Table 7: BRAC social development activities & mode of actions

Social development Programs	Mode of actions
1. Climate change 2. Disaster risk Management 3. Health 4. Water, Sanitation and hygiene 5. Education 6. Urban development 7. Humanitarian crisis 8. Ultra-poor graduation	● Integrating & mainstreaming with different programmes. ● Strengthening readiness and Responding to the most urgent needs. ● Localization and strengthen community resilience. ● Gender integration and inclusiveness ● Advocating and policy reformation for vulnerable communities ● Knowledge management, innovation and awareness programs ● Partnership and alliance for system strengthening ● Proper technological adaptation ● Piloting and scaling self-sustaining models ● Capacity development

Palli Karma-Sahayak Foundation (PKSF) is a specialized development institution and key player in Bangladesh microfinance sector, established in 1990 with the goal of poverty alleviation through employment generation. As of June 2024, PKSF is providing financial and technical assistance to more than 20 million people with 200 plus partner organizations or MFIs. PKSF prioritized the climate resilience issue and established the Environment and Climate Change Unit in 2016 with an aim to mainstream climate change-related issues in every operation of PKSF. The initiatives related to climate change are: 1. The ABASON loan launched in 2019 with an aim to improve the living conditions of disadvantageous people living in remote areas, and as of June, 321.67 crore taka was disbursed among 13993 families in 29 districts and 67 upazilas. 2. BINIAD, a program combining both financial and non-financial services targeting the extremely poor, started in 2004 where participants can also borrow disaster management loans, and till June 3.67 billion has been disbursed under BUNIAD. 3. SUFOLON is an agricultural loan product with flexible repayment and seasonal payment for crop cultivation, processing, livestock, fisheries, agroforestry, agro processing, etc. 4. ENRICH (Enhancing Resources and increasing Capacities of Poor Households toward Elimination of Their Poverty) is a human-centric and integrated development program including healthcare and nutrition, education assistance, youth development, financial assistance, solar home systems, environmentally friendly cooking, vermicomposting, etc. with three types of credit for income-generating activity, livelihood improvement, and asset creation. In addition, PKSF also initiated special funds and programs that are related to climate change adaptation and mitigation, such as the Special Fund launched in 2010 to provide assistance to the poor and extremely poor during social crises or natural disasters. For safe water, sanitation, and hygiene, PKSF, with support from the World Bank, Asian Infrastructure Investment Bank, and the Government of Bangladesh, is implementing a 5-year project on Bangladesh Rural Water Sanitation & Hygiene for Human Capital Development since 2021. Other projects of PKSF include Extended Community Climate Change Project-Flood (ECCCP-Flood), Low Income Community Housing Support Project (LICHSP), Pathways to Prosperity for Extremely Poor People-European Union (PPEPP-EU), The Project for Developing Inclusive Risk Mitigation Program for Sustainable Poverty Reduction (IRMP), Strengthening Resilliance of Livestock Farmers through Risk Reducing Services (LRMP), and Sustainable Enterprise Project (SEP).

Recommendations

For developing countries like Bangladesh climate change brings disproportionate risks to resources, water and food security, infrastructure and ecosystem and by 2050 climate migrants could be 19.9 million with GDP loss may exceed 2% annually (Ministry of Environment Forest and Climate Change, 2022). Therefore, sustainable development requires incorporation of mitigation and adaptation into financial and regulatory structure (Calvin et al., 2023). Mitigation focuses limiting emissions, adaptation deals with the urgent needs of those affected by climate change (Reppey Paul, 2009). To reduce reliance on fossil fuels and limit greenhouse gas emissions, green microfinance can encourage investments in renewable energy technologies, such as solar panels and energy-efficient stoves(Volz U.Knaack P.Nyman J.Ramos L.Moling J., 2020). Inclusive Green Finance (IGF) seeks to ensure that individuals and micro, small, and medium enterprises (MSMEs) have access to financial services while promoting environmental sustainability (Zetzsche et al., 2022).

In developing countries utilizing innovative financial instruments and mechanisms enable access to financial resources from various sources, including financial institutions, private investors, institutional investors, impact investors, foundations, and philanthropists. The NAP Global Network has identified a number of innovative financial instruments to support climate change adaptation efforts including Debt instruments: green bonds, climate bonds, blue bonds, social bonds, sustainability bond and green loans, Results-based Financing tools like biodiversity credits, , conservation impact bonds, and environmental impact bonds, and Financial Risk Management Instruments such as pooled investment funds, crowdfunding and investment platforms, credit guarantees, catastrophe bonds, and green securitizations. To address the financial requirements of vulnerable populations, including women, young people, and migrant workers Bangladesh National Financial Inclusion Strategy (NFIS) encourages collaboration among regulators, banks, MFIs, insurance companies, and capital markets to align financial inclusion goals with environmental considerations. Continuous technological innovations and economic complexities is pushing to bring innovation in digital infrastructure. Therefore, Bangladesh Bank established the Regulatory Fintech Facilitation Office (RFFO) to support and advance fintech initiatives in order to coordinate between innovation, risk, and policy measures and encourage cooperation between banks, financial institutions, and regulators (Bangladesh Bank, 2024) .

MFIs can improve climate risks awareness and inform about the adaptation techniques, such as efficient water management and sustainable farming practices (Reppey Paul, 2009). MFIs can offer financing for climate-smart agricultural practices like drought-resistant crops, agroforestry, and efficient irrigation systems, helping farmers cope with erratic weather patterns and climate-induced shocks (Agrawala Shardul and Maëlis Carraro, 2010). Comparatively mature MFIs are at a comfortable level of in developing an environmental risk assessment framework that will allow them to design green financing options (Allet & Hudon, 2015). The Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009 and the National Adaptation Plan (NAP) 2022 both prioritized the importance of finance for vulnerable communities and suggested a comprehensive framework for addressing climate change. Since MFIs provide essential financial and technical services to the most marginalized segments of the society, they are in a unique position to significantly impact climate adaptation and mitigation. The following recommendations outlined the potential roles that need to be taken to promote green microfinance.

1. Review the sector and specify the climate related products & services

In Sustainable Finance Policy for Banks and Financial Institutions issued by Bangladesh Bank, 94 green products/projects/initiatives have been identified. For microfinance sector, an extensive survey evaluating the environmental impact of existing financial products and services, market potentials, and challenges will be helpful to understand the existing gaps and opportunities related to green microfinance. Hence, suitable green financial products and services need to be specified aligning with national and international climate resilience financing products and services. Specialized green microfinance products may be categorized as financing products for eco-friendly businesses, the renewable energy sector, and sustainable agriculture. Moreover, green micro insurance and green savings accounts can also be reviewed.

2. Development of specific policy/guidelines on climate finance

Climate finance policies/guidelines need to be developed in alignment with national climate resilience policies and plans through collaboration among governments, financial regulators, environmental organizations, and microfinance sector stakeholders. Microfinance service providers need to be encouraged by regulatory or policy incentives to enhance their role in disaster management. The facility of flexible loan repayment, emergency credits, and insurance schemes with tailored disaster-responsive financial products for climate-smart agriculture, resilient livestock, renewable energy, and sustainable water management will enhance the adaptability of the low-income and vulnerable populations. Therefore, specific policies or guidelines need to be formulated on climate-resilient financing, impact tracking and reporting mechanisms, adopting low-carbon technologies, institutional capacity building, and projects on environmentally friendly initiatives.

3. Innovation and diversification of green microfinance initiatives

Regulatory sandbox initiatives and piloting new financial models with technological integration will diversify the green financial instruments. Therefore, green microfinance requires collaborative efforts between financial institutions, technology providers, insurance companies, capital markets, and regulatory bodies. Innovative solutions like climate event savings plans, index-based micro insurance, and low-interest green loans will help the vulnerable groups to build resilience and recover from environmental impacts. To promote environment-friendly microfinance initiatives, funding opportunities through green bonds, sustainability bonds, climate bonds, and risk management instruments like credit guarantees and green securitization will allow financial institutions to offer affordable green financial solutions to the vulnerable groups, thus enhancing climate resilience.

4. Integrate environmental risk assessments into lending practices.

Financial institutions should be aware of the risks and possible environmental effects, including resource dependency, natural disaster vulnerability, environmental degradation, and the sustainability of business practices. Integrating environmental risk assessments into their lending framework MFIs can safeguard their financial stability and encourage client- and environmentally-friendly operations. A systematic method for assessing environmental hazards and giving training to loan officers is crucial to make well-informed lending decisions. Advocating to raise environmental awareness and including environmental covenants in loan agreements for sustainable practices might encourage clients to act in an environmentally responsible manner. MFIs can use technology and data for risk assessment and monitoring to mitigate environmental hazards. In the long run, incorporating environmental risk assessments will most certainly improve loan performance and establish MFIs as leaders in green microfinance.

5. Enhance disaster preparedness and response

A regulatory framework for disaster-response financial products is essential for increasing resilience in climate-vulnerable communities which will help MFIs to design and deliver financial or technical services for disaster recovery. Tailored insurance schemes, savings plans, and flexible loan options will not only assist in immediate disaster recovery but also promote long-term resilience for future events. MFIs may also act proactively by advocating and promoting community-based response mechanisms, collaboration with local governments to mitigate climate related risks. Allocating resources for community education and training will strengthen the community resilience. Moreover, leveraging the digital platforms such as mobile banking, SMS services, and social media platforms to share information and affordable financial services on climate risks, disaster preparedness tips, post disaster recovery resources will reduce disaster affects and help to recover immediately after disaster.

6. Promote climate resilience livelihoods and adaptation strategies

Government and regulators can support and encourage MFIs to prioritize lending in sustainable, low-carbon industries and promote green enterprises. MFIs can provide tailored financial services that encourage climate-resilient livelihoods, such as loans for agroecology, sustainable forestry, and other green business models. Client's needs adaptation strategies can help the transition to livelihoods that are both profitable and resilient to climate impacts. MFIs can also offer training programs and partnerships with local experts to educate clients on climate-smart agricultural practices, renewable energy technologies, and eco-friendly production methods.

7. Set climate finance reporting standard

A standardized reporting framework including data collection methods, impact assessment criteria, and detailed reporting procedures is essential for tracking the environmental outcomes. It will be helpful for MFIs to analyze the data, access the progress, and monitor the impact of climate finance initiatives. Transparent reporting on environmental impacts will enhance the MFIs accountability, transparency and boost stakeholder's trust. Moreover, collaboration with environmental organizations will be helpful to have idea on best practices, improve date quality and accuracy which will boosts the credibility of MFIs' climate finance reporting.

8. Overcome green microfinance challenges

Green microfinance faces a number of challenges, including limited technical capacity, insufficient access to capital, high costs associated with green projects, and regulatory and policy barriers. To overcome these obstacles, collaboration among various stakeholders is essential. Collaborative efforts between regulators, banks, and international organizations are crucial in providing technical assistance and access to funding (Forcella et al., 2017). Public-private partnerships between governments, MFIs, and private sector entities can facilitate access to funding and resources. Technical assistance and capacity building can help MFIs manage green projects effectively. Access to innovative financial instruments, such as green bonds, climate resilience bonds, green loans, sustainability-linked bonds and loans, crowdfunding platforms, pooled investment funds, and policy advocacy can provide diverse sources of capital. Governments can provide incentives, streamline regulatory processes, and create clear guidelines for MFIs engaging in

sustainable projects. Research and development can help lower costs and risks associated with green projects.
By leveraging innovative financial instruments, enhancing technical capacity, and advocating for favorable policies, MFIs can promote green finance initiatives and contribute to a more equitable and resilient financial ecosystem.

Conclusion
Microfinance has been playing a pivotal role in fostering social mobility to the vulnerable communities. Microfinance service providers has already incorporated green financial practices with traditional microfinance. However, the study identifies the lack of specific policy or guidelines on climate finance within microfinance sector in Bangladesh. Reliance on available secondary data and blended environmental microfinance data have significantly influenced the study findings. In addition, due to absence of well-established green microfinance products or services and reporting disclosure on climate finance initiatives it is difficult to explore the efficiency of green initiatives. Therefore, the study highlights the potential role of microfinance sector to promote green microfinance and the need for policy frameworks that support green microfinance. This includes formulating sector specific policies or guidelines, diversifying green financial products, structuring monitoring and reporting format, integrating climate risk assessments, leveraging technological innovations and advocating for climate resilience. Hence, microfinance sector can extend the environmental sustainability and climate resilience beyond financial inclusion.

References

1. Agrawala Shardul and Maëlis Carraro. (2010). *Assessing the Role of Microfinance in Fostering Adaptation to Climate Change* (OECD Environment Working Papers, Vol. 15). https://doi.org/10.1787/5kmlcz34fg9v-en
2. Allet, M. (2012). *Why do microfinance institutions go green?*
3. Allet, M., & Hudon, M. (2015). Green Microfinance: Characteristics of Microfinance Institutions Involved in Environmental Management. *Journal of Business Ethics*, *126*(3), 395–414. https://doi.org/10.1007/s10551-013-1942-5
4. Bangladesh Bank. (2020). *Sustainable Finance Policy for Banks and Financial Institutions*.
5. Bangladesh Bank. (2024). *Annual Report (2022-23).*
6. BRAC. (n.d.). *BRAC Annual Report 2023*.
7. Calvin, K., Dasgupta, D., Krinner, G., Mukherji, A., Thorne, P. W., Trisos, C., Romero, J., Aldunce, P., Barret, K., Blanco, G., Cheung, W. W. L., Connors, S. L., Denton, F., Diongue-Niang, A., Dodman, D., Garschagen, M., Geden, O., Hayward, B., Jones, C., … Ha, M. (2023). *IPCC, 2023: Climate Change 2023: Synthesis Report, Summary for Policymakers. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland.* (P. Arias, M. Bustamante, I. Elgizouli, G. Flato, M. Howden, C. Méndez-Vallejo, J. J. Pereira, R. Pichs-Madruga, S. K. Rose, Y. Saheb, R. Sánchez Rodríguez, D. Ürge-Vorsatz, C. Xiao, N. Yassaa, J. Romero, J. Kim, E. F. Haites, Y. Jung, R. Stavins, … Y. Park, Eds.). https://doi.org/10.59327/IPCC/AR6-9789291691647.001
8. Eckstein, D., Künzel, V., & Schäfer, L. (2021). The Global Climate Risk Index 2021. *Germanwatch e.V.*

9. Finance Division, M. of F. G. of the P. R. of B. (2023). *Climate Financing for Sustainable Development Budget Report 2023-24*. www.mof.gov.bd
10. Financial Institutions Division, G. of the P. R. of B. & B. B. (2021). *National Financial Inclusion Strategy*.
11. Forcella, D., & Huybrechs, F. (2016). *Green Microfinance and Ecosystem Services A quantitative study on outcomes and effectiveness*.
12. Forcella Davide, C. D. H. F. A. M., & Allet, M. (2017). *GREEN MICROFINANCE IN LATIN AMERICA AND THE CARIBBEAN An Analysis of Opportunities Lead author and research team leader*. www.iadb.org/pub
13. Hammill, A., Matthew, R., & McCarter, E. (2008). *Microfinance and Climate Change Adaptation*.
14. Hossain, M. (2018). *ADBI Working Paper Series GREEN FINANCE IN BANGLADESH: POLICIES, INSTITUTIONS, AND CHALLENGES Asian Development Bank Institute*. https://www.adb.org/publications/green-finance-bangladesh-policies-institutions-challenges
15. Hossain, T., Kabi, J., Nazrul, K., Islam, M. N., & Afrin, S. (2018). *Impact of Micro-Credit to Reduce Poverty: A Case Study of Mymensingh*. https://www.researchgate.net/publication/327944192
16. Jagorani Chakra Foundation(JCF). (n.d.). *JCF Annual Report 2022-2023*.
17. Khandker, S. R., Baqui, M. A., Hussain, K., & Samad, A. (2015). *Non-Borrowing Effects of Microfinance Participation: Evidence Using Long Panel Survey Data in Bangladesh*.
18. Khandker, S. R., Khalily, M. A. B., & Samad, H. A. (2016). *Beyond Ending Poverty The Dynamics of Microfinance in Bangladesh Poverty*.
19. Ledgerwood, J. (1998). *MICROFINANCE HANDBOOK*.
20. Microcredit Regulatory Authority. (2024). *Annual Report, 2022-2023*.
21. Ministry of Environment and Forests, G. of the P. R. of B. (2009). *Bangladesh Climate Change Strategy and Action Plan 2009*.
22. Ministry of Environment Forest and Climate Change, G. of B. (2022). *National Adaptation Plan of Bangladesh (2023-2050)*.
23. NAP Global Network. (n.d.). Inventory of Innovative Financial Instruments for Climate Change Adaptation. Retrieve on 31 October 2024. https://napglobalnetwork.org/innovative-financing/?category=results-based-financing#categories
24. Palli Karma Sahayak Foundation (PKSF). (n.d.). *PKSF-Annual Report 2023*.
25. Pomi, S. S. (2019). Impact of Microcredit on Rural Poverty Alleviation in the Context of Bangladesh. *International Journal of Economics and Finance*, *11*(6), 70. https://doi.org/10.5539/ijef.v11n6p70
26. Reppey Paul. (2009). *Microfinance and Climate Change: Threats and Opportunities*.
27. Volz U.Knaack P.Nyman J.Ramos L.Moling J. (2020). *INCLUSIVE GREEN FINANCE: FROM CONCEPT TO PRACTICE REFLECTION PAPER 2*.
28. Yunus M. (2017). A World of Three Zeros (The New Economics of Zero Poverty, Zero Unemployment and Zero Net Carbon Emissions). In *Journal of Rural Development*. https://doi.org/10.25175/jrd/2023/v42/i4/173304
29. Zetzsche, D. A., Buckley, R. P., Arner, D. W., Nyman, J., Ramos, L., & Moling, J. (2022). Roadmap for Inclusive Green Finance Implementation-Building Blocks to Implement IGF Initiatives and Policies Law. In *UNSW Law & Justice Research Series*.