SDPI
Sustainable Development Policy Institute

FEBRUARY
2025

ROLE OF MICROFINANCE INSTITUTIONS IN CLIMATE RISK INSURANCE: A COMPARATIVE ANALYSIS OF DEVELOPED & DEVELOPING COUNTRIES AND IMPLICATIONS FOR PAKISTAN

AUTHORS: UMAR FAROOQ & ZAINAB NAEEM

A publication of the Sustainable Development Policy Institute (SDPI), Islamabad.

Sustainable Development Policy Institute is an independent, non-profit research institute on sustainable development.

First edition: February 2025

Abstract

This study investigates the pivotal role of microfinance institutions (MFIs) in delivering climate risk insurance. Utilizing a mixed-methods approach, the research draws on quantitative data from financial reports of MFIs and qualitative insights from case studies in countries, including the United Kingdom, Italy, India and Bangladesh. In addition, this study identifies key strategies related to climate sustainability adopted by Pakistani MFIs. The findings reveal that MFIs are instrumental in providing tailored climate risk insurance products to vulnerable populations, especially those underserved by traditional financial institutions. However, the effectiveness and reach of these products vary significantly across regions due to differences in regulatory frameworks, financial resources, and socioeconomic conditions.

The study highlights that in developed countries, MFIs operate within the structured environments, allowing for scalable insurance solutions whereas in developing countries, they face challenges such as limited resources and lower financial literacy among clients. Despite these challenges, MFIs in both contexts have adopted innovative strategies such as leveraging technology and community-based approaches to enhance the accessibility and affordability of climate risk insurance. Regarding the policy implications, the study emphasises the need for stronger regulatory support, capacity-building initiatives and public-private partnerships to enable MFIs to effectively expand their role in climate risk management. The study further provides valuable insights for policymakers, practitioners and researchers, aiming to enhance the role of MFIs in climate risk insurance and building more resilient communities globally. It mainly suggests that Pakistani MFIs require enhanced regulatory frameworks tailored to support the integration of climate risk insurance into their financial offerings.

Keywords: MFIs, Climate Risk Insurance, Microcredit, Climate Sustainability

JEL Code: G22: O16

Acknowledgement

The study has derived its debate from the stakeholder consultation conducted by SDPI during its 27th Sustainable Development Conference held in Islamabad from November 6-11, 2024. Participants of the consultation included representatives from public sector, microfinance institutions, State Bank of Pakistan, civil society organizations, Securities and Exchange Commission of Pakistan, and federal ministries.

We are thankful to Danish Hasan Ansari, the PhD scholar at University of Vermont, for his technical guidance and review of the study. We also express our gratitude to Mr Ghayas Haider Sajid, Mr Muhammad Mesum Abbas and Ms Momna Bashir, the research interns at SDPI, for their help in data collection.

Further, we also acknowledge the support of SDPI management, including Executive Director Dr Abid Qaiyum Suleri, Deputy Executive Director (Research) Dr Sajid Amin & Research Coordination Unit (Ms Romila), Advocacy team, MIS team, SDC Unit and Administration Unit, in the overall production and completion of this study.

Table of Contents

List Of Figures

List of Tables

1. INTRODUCTION

Over the years, the intensity of climate-related disasters has increased endangering economic stability, especially in the already vulnerable regions (Singh & Pandey, 2024). It is thus critical to ensure adequate funding for exploring projects related to climate action and environmental sustainability in the wake of adverse climatic impacts such as glacial melt, floods, heatwaves, droughts, etc. Among the actors, microfinance institutions (MFIs[1]) hereafter can play a pivotal role in enhancing resilience against climate-related disasters.

To help low-income households and small businesses adapt to and recover from climate shocks, the role of financial institutions is instrumental in ensuring financial resilience (Leite & Sá, 2024). For instance, in countries like Italy and the United Kingdom, MFIs have teamed up with governments and private insurers to reduce climate risks. However, in the Global South, including Pakistan, their role in climate risk insurance is still negligible.

MFIs' ability to increase access to climate risk insurance, especially for marginalised and vulnerable populations in Pakistan, can be fully realised by learning from the experiences of developed nations. Pakistan can better protect its vulnerable communities, maintain livelihoods, and promote climate resilience per its national and international climate commitments by implementing the models that are successful in the world.

However, it is not something simple because of differences in economic, political, and social structures. For instance, developed countries typically benefit from more robust financial systems, advanced technological infrastructure, and supportive regulatory environments (Asteriou, Spanos, & Trachanas 2024) which facilitate scalable climate resilience initiatives whereas Pakistan is faced with resource constraints, weaker regulatory frameworks, and lower financial literacy, which complicate the direct application of these models. Adapting such strategies requires careful consideration of local socio-economic conditions, governance capacities, and the unique needs of vulnerable communities.

This study examines and evaluates the role of MFIs in the developed countries like UK and Italy and offers a comparative analysis with developing nations like India and Bangladesh and assesses their applicability to Pakistan. It further provides a tactical guide for strategically implementing these solutions.

Assessing role of MFIs in climate risk insurance

The role of MFIs is crucial in promoting financial inclusion, particularly in developing countries, where they empower low-income individuals especially women and rural populations. MFIs enable them to start or expand small businesses, improve their livelihoods and manage financial risks (Hammill & Matthew 2008). On the flip side, climate risk insurance is a specialised form of insurance designed to mitigate the financial impact of climate-related risks such as extreme weather events, natural disasters and other environmental hazards (Nobanee & Nghiem 2024). This insurance helps individuals, businesses and governments manage the economic consequences of climate change by providing financial protection against losses resulting from climate-related events. For example, climate risk insurance covers damages from floods, hurricanes, droughts and other extreme weather conditions, ensuring that affected parties can recover and rebuild more quickly. This type of insurance is increasingly important in a world facing growing climate uncertainties and is often integrated into broader strategies for climate adaptation and resilience.

1 MFIs are the credit institutions that provide small loans, saving accounts and insurance products to people and businesses which lack access to traditional banking services.

MFIs are uniquely positioned to address the dual challenge of financial inclusion and climate vulnerability. With deep-rooted connections already established within marginalised communities, particularly in rural and semi-urban areas (Sarker & Khan 2024), MFIs can act as key intermediaries in delivering climate risk insurance. Their existing infrastructure and trust within these communities make them an ideal candidate for promoting and distributing insurance products that can be tailored to the specific risks associated with climate change. In developed countries, MFIs have evolved beyond traditional microcredit institutions, by integrating climate risk insurance into their offerings, enabling low-income households and small businesses to safeguard against environmental shocks. This model ensures that when disasters strike, clients can access payouts that help them recover faster, stabilise incomes, and rebuild livelihoods. MFIs in these countries also often collaborate with insurance providers, governments and international organisations to develop and promote affordable, accessible insurance products, fostering a comprehensive approach to climate risk management.

"The term microfinance usually implies very small loans to low-income clients for self-employment, often with the simultaneous collection of small amounts of savings."

(**Source:** *The World Bank*)

In Pakistan where climate risks are becoming more acute, the integration of climate risk insurance into the services provided by MFIs could be transformative. With frequent floods, droughts and other natural disasters, millions of people are at risk of losing their livelihoods and assets. By leveraging the developed-country model, MFIs in Pakistan may not only reduce the financial vulnerability of their clients but also ensure the sustainability of their own operations by minimising default risks. A comprehensive framework that incorporates climate risk insurance into Pakistan's microfinance sector could also contribute to broader national climate adaptation strategies. Such an approach would align with Pakistan's commitment to the Paris Agreement and the Sustainable Development Goals (SDGs), particularly those related to poverty reduction (SDG 1), climate action (SDG 13), and sustainable economic development (SDG 8).

In Pakistan, MFIs can contribute significantly to climate resilience and financial inclusion through various initiatives. For example, integrating climate risk insurance into loan products — as done by Kashf Foundation — helps protect vulnerable populations from environmental shocks. MFIs like the Mobilink Microfinance Bank, have also pioneered renewable energy financing, promoting sustainable practices such as solar energy. Initiatives like large-scale tree plantation drives by Khushhali Microfinance Bank are aligned with national environmental goals while empowering women entrepreneurs through climate-focused financial products further enhances climate adaptation and economic stability. These efforts demonstrate the potential of MFIs in addressing Pakistan's climate and financial challenges.

By providing a safety net for the country's most vulnerable populations, MFIs can help build climate resilience at grass-roots level, ensuring that communities can thrive even when facing environmental challenges (Figure 1).

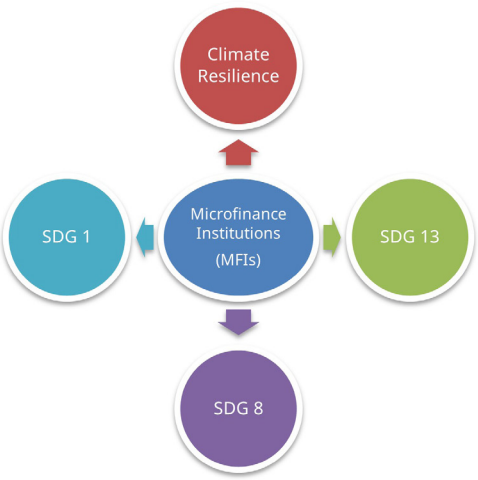


Figure 1: MFIs' potential role in Pakistan through climate risk insurance

2. LITERATURE REVIEW

Microcredit provided by microfinance institutions and savings help mitigate risks associated with climate change, but no single microfinance model provides a holistic solution for community's financial capacity-building during rehabilitation (Ullah and Khan 2017). Kamran and Omran (2023) examined the role of MFIs in reducing disaster risks in Pakistan with their focus on strategies like disaster preparedness, loan funds and new product designs. Their study highlights how MFIs support community resilience as well as industry sustainability post-disaster while contributing to poverty alleviation through diversified income sources and rehabilitation efforts.

Drawing upon the qualitative research, Leite and Sá (2024) assessed the perception of MFIs managers related to environmental threats and the potential role of green microfinance in addressing them in Cabo Verde[2]. They observed that, while managers are motivated to engage in green activities, financial and technical constraints limit their response capacity. This suggests that MFIs have potential to leverage the environmental sustainability of a country (Pérez, Izquierdo & Torres 2020). Haque, Khan and Choudhury (2024) explored how formal, quasi-formal, and informal institutions in two coastal communities in Bangladesh influence the adoption of climate adaptation technologies. According to the findings of their study, local institutions foster partnerships and innovation in disaster risk reduction but institutional fragmentation hinders the sustainable implementation of climate-related programmes. Their study emphasised the role of institutions in accelerating sustainable development; a similar role by MFIs can be expected.

Nuruzzaman, Graham and Barnett (2024) found that microfinance organizations engagement decreases vulnerability through savings, vocational training, and social participation, but challenges like climate hazards and limited access for marginalised groups hinder their full potential. Penabad et al. (2024) examined how corporate social responsibility (CSR) is incorporated into MFIs to align with SDGs. Using a systematic literature review and bibliometric analysis of 281 Scopus-indexed articles, they identfied seven key thematic clusters, highlighting emerging areas like digital-fintech innovations and climate change, etc. Notably, they observed the significant role of MFIs in climate sustainability. Hussain and Ahmad (2024) highlighted the relationship between microfinance and climate change, showing how the growth of small enterprises impacts environmental conditions and contributes to global warming. They discussed how increased commercial activities drive resource consumption and exacerbate climate challenges. Their study emphasised the role of microfinance in providing financial tools to support climate adaptation and risk mitigation, especially in vulnerable regions like Pakistan.

Researchers like Ullah and Khan (2017) and Kamran and Omran (2023) emphasize the role of MFIs in resilience-building through financial tools like microcredit and disaster preparedness, hpwever, there is a lack of comprehensive frameworks that address long-term, sustainable climate risk management. Most research focuses on specific strategies or isolated case studies without exploring how MFIs can holistically integrate climate risk insurance into their financial products across different contexts. Furthermore, there is limited discussion on the scalability of successful MFI-led climate initiatives and how they can be tailored to different regions' socio-economic and environmental conditions. This suggests more in-depth cross-country research to design innovative, inclusive, and scalable models for MFIs to address climate risks effectively.

Various studies highlights the diverse roles and challenges of MFIs in both developing and developed economies in addressing climate risks. For instance, studies from Pakistan, Bangladesh, and Cabo Verde reveal common challenges such as financial and technical constraints, institutional fragmentation, and limited access for marginalised groups which hinder MFIs from fully realising their potential in climate risk insurance. Despite these obstacles, successful strategies like disaster preparedness, green microfinance, and climate adaptation technologies have emerged as promising solutions. In addition, the review highlights that, while

2 Cabo Verde is an island and archipelagic state of West Africa in the central Atlantic Ocean.

MFIs contribute to resilience building and sustainability, a one-size-fits-all model is ineffective. Some tailored approaches such as integrating CSR and leveraging local partnerships have proven effective in fostering community resilience and reducing social vulnerabilities. These insights emphasise the critical role MFIs can play in climate risk insurance, offering valuable lessons for both developed and developing economies in addressing climate challenges.

Types of climate risk insurance schemes relevant to MFIs

Micro-level climate risk insurance protects low-income individuals and households from various risks, including weather-related disasters, through small regular premiums (IPCC, 2012; UNFCCC, 2008). It covers assets like livestock and crops and can be linked to microloans to protect lenders and encourage resilience. Group contracts help reduce costs, and this approach offers faster, more targeted compensation than macro-level schemes. However, challenges include insurer insolvency risks due to widespread claims after disasters and the need for consumer education in developing countries (IPCC, 2012).

Meso-level insurance targets intermediaries such as credit unions, microfinance institutions, and NGOs operating in rural areas, protecting them from losses incurred by their clients or members due to extreme weather events like farmers defaulting on loans after a drought. This level of insurance reduces administrative costs and expands reach by dealing with intermediaries familiar with financial products, thereby reducing the need for consumer education (Hazell & Rahman 2014). It also enables insurance bundling with credit to encourage smallholders to adopt insurance. However, challenges arise when payouts to intermediaries are delayed or portions of funds are retained before reaching clients, further prolonging the process.

3. METHODOLOGY

Sample description

This study utilizes a comprehensive dataset (2010-2022) collected from multiple sources to analyse the role of MFIs in providing climate risk insurance across developed and developing countries. The rationale for choosing underlying countries stems from the need to examine a diverse range of contexts where MFIs play a role in climate risk insurance. The United Kingdom and Italy represent developed economies with structured regulatory environments and scalable insurance solutions, providing a benchmark for best practices whereas India and Bangladesh are developing countries with socio-economic similarities to Pakistan, facing challenges such as limited resources and lower financial literacy. By comparing these distinct regions, the study aims to draw insights as to how MFIs in Pakistan can overcome challenges and adapt successful strategies to integrate climate risk insurance effectively.

The data, comprising quantitative and qualitative information, was derived from the annual reports of MFIs and banks. The financial performance, climate risk insurance initiatives and sustainability efforts of MFIs and banks were extracted from their annual reports. This data includes total loan amounts, specific climate risk insurance products, and investments in sustainability projects. Figure 2 presents the criteria for selecting the specific MFIs across sampled countries. For instance, we choose MFIs offering sizeable climate risk insurance and other environment-related products, size, and market access. In addition, data was accessed from government and regulatory bodies publications. For instance, official documents and reports from financial regulators and government agencies provided insights into policy frameworks guiding the operations of MFIs and their engagement in climate risk insurance. In brief, data was systematically collected and organised into structured datasets for each country and institution.

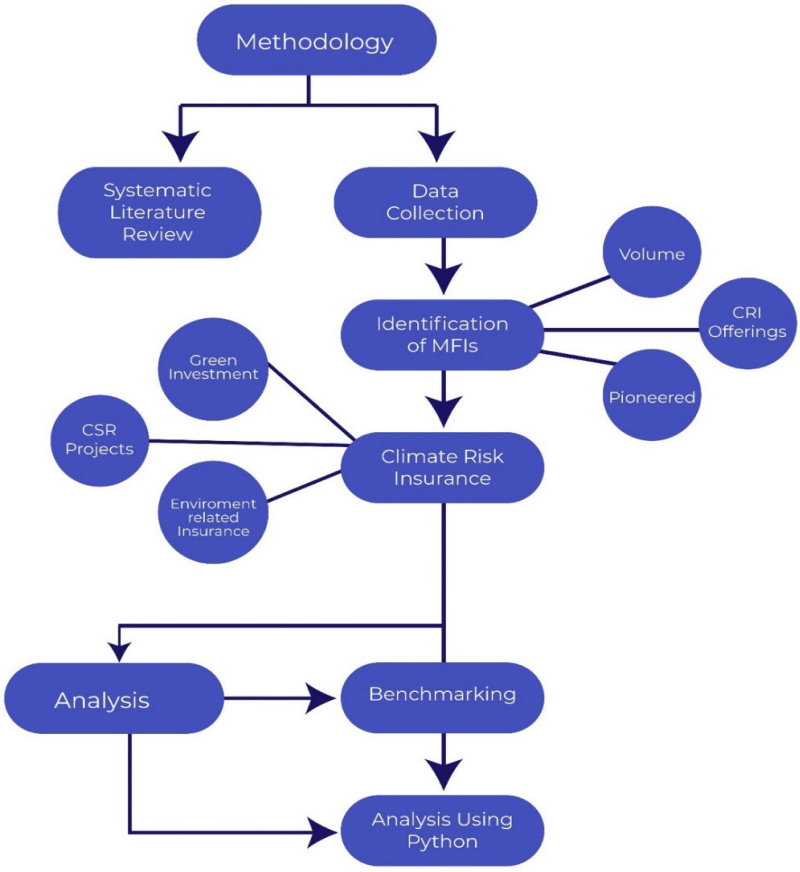


Figure 2: Flow chart of methodology

Source: Self-articulation. Note: This figure shows the methodology flow adopted in the study.

Figure 2 provides a detailed illustration of the methodology employed in the study, offering a clear and systematic flow of the research process. The methodology begins with systematic literature review and data collection where financial data related to climate risk insurance from institutions like Hong Kong and Shanghai Banking Corporation (HSBC), Royal Bank of Scotland (RBS), and Aldermore is gathered from their official publications and reports. Table A1 shows the details of MFIs across sampled countries. This is followed by data preprocessing which involves cleaning, organising, and structuring the data to ensure its accuracy and relevance for analysis. Next, the study employs Python for data analysis and visualisation to enhance the theoretical understanding.

Data description

The data collection process involved a series of subsequent techniques such as identifying relevant institutions through review and case studies. In this way, MFIs, banks and other financial institutions involved in climate risk insurance and sustainability initiatives were identified based on their prominence and reported activities. For each institution, data on total loan disbursements, climate risk insurance offerings, and investments in green projects were compiled. Initially, the sample span covered the years 2010 to 2022. However, MFIs from some countries did not report the full information, limiting the span to specific years; (for instance, Fusion Microfinance has limited year information such as 2016-17). This included both historical data (spanning several years) and the most recent figures. Climate risk insurance and related activities were categorised by type such as disaster relief, environmental sustainability projects, and community development programs. Data from multiple sources was cross verified to ensure accuracy and consistency. Discrepancies were resolved by referring to the most credible and up-to-date information available. In addition, Python was utilized to create visual representations of the data specifically pie charts that illustrate the distribution of climate insurance finance across different years for institutions like HSBC, RBS, and Aldermore. The use of Python not only aids in the visual analysis of complex financial data but also enhances the overall understanding of trends and patterns in climate risk finance.

4. FINDINGS AND RESULTS

In this section, we will explore the key findings that emerged from our analysis, focusing on the impact of microfinance institutions on climate risk insurance in different regions.

Microfinance in provisions of climate risk insurance: analysis of MFIs in UK

The United Kingdom (UK) climate crisis may cause severe weather conditions, an increase in sea level, or changes in precipitation practices (Kong & Sun 2021). These risks mean higher costs for businesses, households and government, and hence add the element of risk and instability. The microfinance industry is gradually progressing in this context by offering green energy loans and climate risk insurance products to those in need (Dorfleitner, Forcella and Nguyen 2020). It has been established that many microfinance institutions in the UK are already involved in activities aimed at responding to the effects of climate change. Here are some notable examples:

HSBC (Hong Kong and Shanghai Banking Corporation) Holdings is a British universal bank and financial services group headquartered in London. As one of the world's largest banking institutions, HSBC operates in over 60 countries and plays a pivotal role in global finance. With a strong commitment to sustainability, it integrates climate risk considerations into its financial products and services, including climate risk insurance. For this study, HSBC was selected due to its offerings for assessing the environmental impact, financial risk exposure and sustainability objectives. It is also involved in supporting microfinance institutions for climate risk insurance through partnerships, investments and CSR initiatives at a global scale. Another reason for the selection was the availability of data in the context of climate risk insurance in the UK.

Table 1: Climate risk insurance offered by HSBC

Year	Name	Total lending	Climate Insurance Finance	Net ratio
2023	HSBC	$1,051,437 million	$105 million	0
2022	HSBC	$1,029,736 million	$93000 million	1
2021	HSBC	$1,128,950 million	$82.4000 million	1
2020	HSBC	$1,119,603 million	$44.1000 million	0
2019	HSBC	$1,105,946 million	$52.4000 million	0
2018	HSBC	$1,053,863 million	Data Not Provided	N/A
2017	HSBC	$1,053,357 million	$10.5000 million	0
2016	HSBC	$949,630 million	Data Not Provided	N/A
2015	HSBC	$1,014,855 million	$554 million	0
2014	HSBC	$1,086,809 million	Data Not Provided	N.A
2013	HSBC	$1,112,128 million	$100 million	0
2012	HSBC	$998 000 million	$100 million	0
2011	HSBC	$940000 million	$100 million	0

Source: The statistics reported in the table were collected from the financial publications available on HSBC's official website.

Note: *The 'net ratio' in the table represents the proportion of climate insurance finance relative to the total lending for each year. It is calculated by dividing the amount allocated to climate insurance finance by the total lending amount for that year. A ratio of 1 (we report 1 when the yielded amount is greater than) indicates that a substantial portion of lending is associated with climate insurance finance, suggesting significant alignment between lending activities and climate risk management. A ratio of 0 (we mention 0 when the yielded amount is nearer to 0) suggests that the climate insurance finance is minimal or insignificant relative to the total lending, indicating that the lending activities are not strongly focused on climate risk insurance.*

The Royal Bank of Scotland (RBS), part of the NatWest Group and headquartered in Edinburgh, Scotland is a prominent British bank committed to sustainable finance and environmental responsibility. RBS has made significant contributions in advancing climate-related initiatives, particularly through its green finance products and climate risk insurance solutions. It was selected for this study due to its leadership in integrating climate risk management into its financial services and its proactive approach in supporting clients' transitions to sustainable practices. In the case of the UK, RBS serves as an ideal example of how financial institutions can play a pivotal role in addressing climate risks, particularly within the structured regulatory environment of a developed economy. Its efforts to align with local and global climate goals made it a key institution for analysis.

Table 2: Climate risk insurance offered by RBS

Year	Name	Total lending	Climate Insurance Finance	Net ratio
2023	RBS	£35,864 million	£17,090 million	5
2022	RBS	£38,738 million	£18,641 million	5
2021	RBS	£80,849 million	£43,587 million	5
2020	RBS	£51,526 million	Not Provided	N/A
2019	RBS	£55,054 million	Not Provided	N/A
2018	RBS	£62,865 million	Not Provided	N/A

Source: The statistics reported in the table were collected from the financial publications on RBS's official website.

Aldermore, known for its innovative financial solutions, is a British bank primarily serving small and medium-sized enterprises (SMEs), homeowners and savers. It has increasingly prioritised sustainability and environmental initiatives, especially in electric vehicle (EV) financing and low-carbon projects. It was selected for this study due to its targeted approach towards green finance, particularly in supporting the transition to a low-carbon economy through specialised climate insurance and financing products. Aldermore's focus on sustainability, combined with its growing role in facilitating green projects, makes it a relevant case for understanding how smaller financial institutions contribute to climate risk management in the UK.

Table 3: Climate risk insurance offered by Aldermore

Year	Name	Total lending	Climate Insurance Finance	Net ratio
2016	Aldermore	£7.5bn	£400k (EV transport)	0.001
2017	Aldermore	£9.0 billion	Data not provided	N/A
2019	Aldermore	£10.6 billion	Data not provided	N/A

2020	Aldermore	£12.4 billion	Data not provided	N/A
2021	Aldermore	£13.4 billion	£10 million	0.007
2022	Aldermore	£14.7 billion	£8.4 million	0.006
2023	Aldermore	£15.2 billion	100% low-carbon fleet goal by 2024, ISO 14001 certification	N/A

Source: The statistics reported in the table were collected from the financial publications available on the official website of Aldermore.

Apart from these multinational banks with a very effective climate risk insurance approach, they also support many MFIs through different schemes and partnerships for delivering climate risk insurance products. Some of the products by prominent MFIs are listed in Table 4.

Table 4: Climate risk insurance products offered by other MFIs in the United Kingdom

Year	Name	Products	Investments
2023	Allica Bank	Green asset finance/ electric vehicle market	£640m
2023	Barclays	Financed emissions for the energy sector	Emissions dropped by 44% between 2020 and 2023.
2024	Barclays	Sustainable and transition financing, climate tech investments	$123.8 billion in sustainable and transition financing, £166 million in over 20 innovative companies
2024	Barclays	Project finance policy	Barclays will no longer provide project finance or direct finance to energy companies for new upstream oil and gas projects or related infrastructure.
Up to 2030	Barclays	Energy clients' transition plans or decarbonisation strategies; investment in climate tech companies	From 2025, energy clients must have transition plans; up to £500 million in investment in climate tech companies, $1 trillion in sustainable and transition financing.
2023	Beverley Building Society	Mortgage Lending	Assessed flood and subsidence risks; EPC remediation risks
2021	Lloyds Banking Group	Sustainability and ESG financing	£2.3bn in green funding; expanding to £5bn for green finance
2022	Lloyds Banking Group	Climate change training	Training 800 colleagues in climate risks and opportunities

Source: The statistics reported in the table were collected from the financial publications available on the MFIs' official websites.

Table 1 details the HSBC's climate risk insurance financing from 2011 to 2023. Despite fluctuations in total lending, with figures exceeding $1 trillion annually, HSBC's climate insurance finance varied significantly, peaking in 2022 at $93 billion. However, the net ratio of climate insurance finance to total lending remained at either 0 or 1, indicating inconsistent integration of climate risk insurance in their lending portfolio.

Table 2 focuses on RBS where substantial investments in climate insurance finance are evident from 2021 to 2023. The net ratio consistently remained at 5, demonstrating a more robust commitment compared to HSBC though data gaps in 2020, 2019 and 2018 highlight the areas where transparency could be improved.

Table 3 covers Aldermore's contributions from 2016 to 2023, showing relatively small but gradually increasing investments in climate insurance, such as a notable £10 million in 2021. While Aldermore's total lending also grew steadily, the net ratio remained low, indicating a more modest focus on climate-related initiatives compared to larger institutions like HSBC and RBS.

Table 4 compiles climate risk insurance products offered by various MFIs in the UK. Institutions like Allica Bank and Barclays have made significant investments, with Barclays committing up to $1 trillion in sustainable and transition financing by 2030. Smaller players like Beverley Building Society and Lloyds Banking Group are also engaged in mortgage lending for flood risk assessments and green finance respectively. These tables collectively illustrate the varying degrees of commitment and strategic approaches by different financial institutions in the UK towards integrating climate risk insurance into their operations.

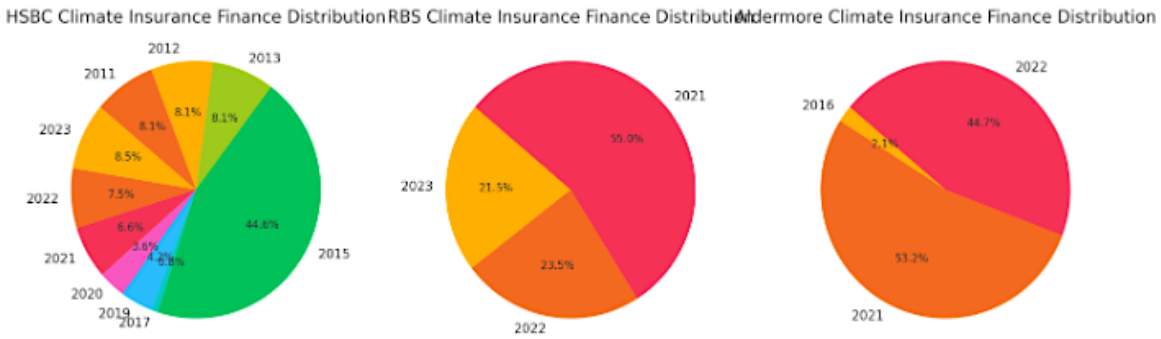


Figure 2: Presentation of statistics across various MFIs of the UK

Note: *The articulation of the figures above is based on the data reported in Table 1, 2, 3, and 4.*

Source: self-calculation by using Python.

Figure 2 illustrates the distribution of climate insurance finance across different years for HSBC, RBS and Aldermore, highlighting the varying levels of investment over time. The HSBC chart shows a diverse spread with the most significant allocation occurring in 2015, where $554 million was invested, making it the largest slice of the pie. Other years such as 2023, 2021, and 2022 also feature notable investments, albeit on a smaller scale. On the contrary, RBS's climate insurance finance is heavily concentrated in a few key years, with 2021 dominating the chart, as approximately £43.6 billion was allocated, followed by substantial investments in 2022 and 2023 respectively. Interestingly, Aldermore's distribution is more modest, reflecting its smaller operations with the most significant investment being £10 million in 2021. Overall, these charts highlight the different strategies and scales of commitment to climate insurance finance by each institution.

Role of MFIs in delivering climate risk insurance in Italy

MFIs have been identified as a potential solution to combat the effects of climate change, especially when it comes to climate risk insurance. Oostendorp et al. (2019) observed that credit is an important input that allows farmers, especially women, to adapt to climate change. MFIs are in a good position to meet this need since they operate in the remotest stretches of the world and are flexible in offering products and services which are suitable for farming communities. The low unit prices and use of cell phones in the delivery of climate risk insurance make it easier to access these populations (Huyer et al. 2021). In recent years, the global transition towards a sustainable future has become a pressing concern and climate financing has emerged as a critical component in achieving this goal. Italy as a developed economy has a significant role to play in this transition, and understanding the dynamics of climate financing within the country is crucial where several MFIs are in place.

Table 5: Climate risk insurance products offered by multiple MFIs in Italy

Year	Name	Products	Investments
2021	Banca d'Italia	Thematic equity portfolio; green bonds	Reviewing portfolio composition based on decarbonisation commitments and plans. Enlarging green bonds portfolio for government and supranational bonds
2023	Intesa Sanpaolo	Financing and consulting products dedicated to environmental sustainability	Approximately €3.7 billion (6.2% of all group loans)
2021-2024	UniCredit	ESG advisory services; environmental lending, sustainability bond framework; climate risk management policies	€150 billion cumulative ESG volumes (2022-2024), €25 billion in new environmental lending[18]
2023	Cassa Depositi e Prestiti (CDP)	Investment in EGO (Amundi Planet-Emerging Green One) Fund, promoting green bonds	€70 million investment in a $1.5 billion green bond fund
2021-2023	Deutsche Bank	Climate Risk Management Framework; NZBA membership; Decarbonisation targets for carbon-intensive sectors	Loan exposure reduction in carbon-intensive sectors; financed emissions disclosures; Net Zero Banking Alliance commitments
2023	PerMicro	Inclusive & Sustainability-Linked Financing (ISLF+); collaboration with BNP Paribas and JuST Institute	Assessment of environmental effects and climate sensitivity of supported projects

Source: The statistics reported in the table were collected from the financial publications available on the MFIs' official websites.

Table 5 summarises the climate risk insurance products and investments by multiple microfinance institutions (MFIs) in Italy from 2021 to 2024. The Banca d'Italia, the central bank in Italy, focused on reviewing its portfolio to align with decarbonisation commitments and expanding its green bonds portfolio. Intesa Sanpaolo offered financing and consulting products dedicated to environmental sustainability, with approximately €3.7 billion invested, representing 6.2 per cent of the group's total loans. UniCredit introduced various ESG advisory services and environmental lending initiatives, amassing €150 billion in cumulative ESG volumes and €25 billion in new environmental lending from 2022 to 2024. The Cassa Depositi e Prestiti (CDP) invested €70 million in a $1.5 billion green bond fund while Deutsche Bank implemented a Climate Risk Management Framework, set decarbonisation targets, and reduced loan exposure to carbon-intensive sectors.

Finally, PerMicro launched inclusive and sustainability-linked financing (ISLF+) in collaboration with BNP Paribas and JuST Institute, focusing on assessing the environmental impact and climate sensitivity of supported projects. These efforts collectively demonstrate an enhanced and diverse approach by Italian MFIs towards integrating climate risk insurance into their financial strategies.

Role of MFIs in delivering climate risk insurance in South Asian countries

THE CASE OF INDIA:

Indian MFIs, including Equitas Small Finance Bank, Fusion Microfinance Private Limited, Ujjivan Small Finance Bank, and Janalakshmi Financial Services, reveal a consistent pattern of substantial loan portfolio growth from 2016 to 2023. This growth highlights the increasing demand for microfinance services in India and the potential of MFIs to drive financial inclusion. While these institutions have demonstrated varying degrees of engagement in sustainability initiatives such as disaster relief, environmental sustainability, and community development, a significant gap persists in climate risk management. Data indicates a limited focus on climate risk insurance, highlighting a systemic lack of preparedness within the Indian MFI sector to address climate-related financial challenges. This highlights the urgent need for policy interventions to strengthen the climate resilience of MFIs and protect the interests of their clients.

Table 6: Climate risk insurance products offered by Bandhan Bank

Year	MFI	Total Loans	Total Climate Risk Insurance
2016	Bandhan Bank	12,437.55 Crores	NA
2017	Bandhan Bank	16839.08 Crores	NA
2018	Bandhan Bank	29713.04 Crores	NA
2019	Bandhan Bank	39643.39 Crores	Provide funding for a bio-shield at Tankari Village, Jambusar, Bharuch, Gujarat, making available safe drinking water by three RRWHS and two SWMS, Kawardha district, Chhattisgarh, Development of Water Harvesting Structures at Rapar Block, Kutch District
2020	Bandhan Bank	66629.95 Crores	Drinking water; sanitation; water conservation; fforestation
2021	Bandhan Bank	81612.88 Crores	Water conservation; afforestation

2022	Bandhan Bank	93974.92 Crores	Climate Action Programme (https://bandhanbank.com/beyond-banking) (₹ 1,05,00,952INR)
2023	Bandhan Bank	1,04,756.77 Crores	Climate Action Programme; water conservation; afforestation

Source: The statistics reported in the table were collected from financial publications available on the official website of Bandhan Bank.

Table 6 shows positive financial growth, with a consistent increase in its total sales/lendings/loans portfolio from 2016 to 2023. This suggests expansion and potential profitability. The bank's commitment to sustainability, as evidenced by its involvement in water conservation and afforestation initiatives, aligns with growing environmental concerns and corporate social responsibility trends.

Table 7: Climate risk insurance products offered by Fusion Microfinance Private Limited

Year	MFI Name	Total Loans	Total Climate Risk Insurance
2016-17	Fusion Microfinance Private Limited	₹830.84 Crores INR	Donation for biodiversity construction (5,00,000 INR)
2017-18	Fusion Microfinance Private Limited	₹1670.58 Crores INR	Plantation programme (₹17100); relief and welfare work for flood victims (₹141181 I),
2018-19	Fusion Microfinance Private Limited	₹2782.1 Crores	Environmental programme (₹43,400),
2019-20	Fusion Microfinance Private Limited	₹3572.85 Crores	Flood relief work (₹1077102); solar lights distribution (₹107056); Cyclone Fani relief work (₹285362),
2020-21	Fusion Microfinance Private Limited	₹3710.3 Crores	Flood relief work (₹17,99,939); solar light distribution programme (₹13,771); Project Beej: An Agriculture Initiative (₹89,350)
2021-22	Fusion Microfinance Private Limited	₹6179.78 Crores	Flood relief work (₹13,94,361); sapling plantation (₹3,30,225); Project Beej: An Agriculture Initiative (₹8,18,000)
2022-23	Fusion Microfinance Private Limited	₹8,375.16 Crores	Offering bicycles to more than 7,000 people; provision of close to ₹9.70 lakh inverter bulbs to rural households; sustainable farming programme; plantation programme

Source: The statistics reported in the table were collected from the financial publications available on the official site of Fusion Microfinance Private Ltd.

Table 7 exhibits rapid portfolio growth from 2016-2017 to 2022-2023, with accelerated expansion in the latter period. The company demonstrates a commitment to sustainability through investments in biodiversity, disaster relief, and community development. The integration of climate risk insurance programmes would further enhance the company's resilience and contribute to the well-being of its clients.

Table 8: Climate risk insurance products offered by Equitas Small Finance Bank

Year	MFI Name	Total Loans	Total Climate Risk Insurance
2016	Equitas Small Finance Bank	₹22.27 billion	No Information
2017	Equitas Small Finance Bank	₹57.02 billion	No Information
2018	Equitas Small Finance Bank	₹77.07 billion	No Information
2019	Equitas Small Finance Bank	₹115.95 billion	No Information
2020	Equitas Small Finance Bank	₹153.67 billion	No Information
2021	Equitas Small Finance Bank	₹179.25 billion	No Information
2022	Equitas Small Finance Bank	₹205.97 billion	No Information
2023	Equitas Small Finance Bank	278.61 billion	No Information

Source: The statistics reported in the table were collected from the financial publications on Equitas Finance Bank's official site.

Table 8 shows that no information is available about the total climate risk insurance provided by the bank during this period. The table shows a steady increase in the total loans of the bank from 2016 to 2023.

Table 9: Climate risk insurance products offered by Ujjivan Small Finance Bank

Year	Name	Total Loans	Total Climate Risk Insurance
2016-2017	Ujjivan	₹572850.44 Crores	NA
2017- 2018	Ujjivan	₹732261.73	NA
2019-2020	Ujjivan	₹14,153 Crores	Flood relief activities (₹4,714,411); environment sustainability & others (₹2,829,650)
2021-2022	Ujjivan	₹18,162 CR	Disaster relief – flood and winter relief (₹17,91,641)
2022-2023	Ujjivan	₹ 15520.66	Disaster relief; Project Swachh Neighborhood

Source: The statistics reported in the table were collected the financial publications available on official site of Ujjivan Small Finance Bank.

Table 9 provides a year-wise overview of Ujjivan Small Finance Bank's financial performance and climate risk initiatives from 2016-2017 to 2022-2023. It gives details about the bank's total loan disbursements for each financial year, indicating substantial growth over the period. While the table includes a column for climate risk insurance, it primarily outlines various climate risk mitigation activities undertaken by the bank, such as flood relief and environmental sustainability projects.

Table 10: Climate risk insurance products offered by Janalakshmi Financial Services

Year	MFI	Total Loans (Sourced from annual reports)	Total Climate Risk Insurance
2017-18	Janalakshmi Financial Services	₹ 11903 Crores	NA
2018-19	Janalakshmi Financial Services	₹ 7908.45 Crores	The bank has incurred losses for two consecutive financial years 2017 -78 and 2018-19 and so has not earmarked funds for CSR initiatives during the financial year.
2019-20	Janalakshmi Financial Services	₹ 4220.05 Crores	Solid waste management and disposal; maintenance and upkeep of one park (₹ 17.01lakh)
2020-21	Janalakshmi Financial Services	₹ 4082.59 Crores	NA
2021-22	Janalakshmi Financial Services	₹ 5,772.00 Crores	NA
2022-23	Janalakshmi Financial Services	₹ 6534.56 Crores	Chief Ministers Relief Fund- Disaster Management (5,00,000)
2023-24	Janalakshmi Financial Services	₹2,311,127,390	Maintaining quality of soil, air and water (₹ 13,75,700); safe drinking water (₹. 10,61,580); disaster management, including relief activities (₹ 5,63,354)

Source: The statistics reported in the table were collected from the financial publications available on the official site of Janalakshmi Financial Services.

Table 10 presents data on Janalakshmi Financial Services from FY2017-2018 to FY2023-2024. It displays the total loans disbursed by the company in rupees crores for each financial year. It also provides information on the company's climate risk initiatives. However, climate risk insurance data is missing for most years, with specific details only available for the years 2019-2020, 2022-2023 and 2023-2024. These initiatives include solid waste management, park maintenance, disaster relief, and environmental sustainability efforts. Figure 3 shows the statistics of India MFIs across the sampled years.

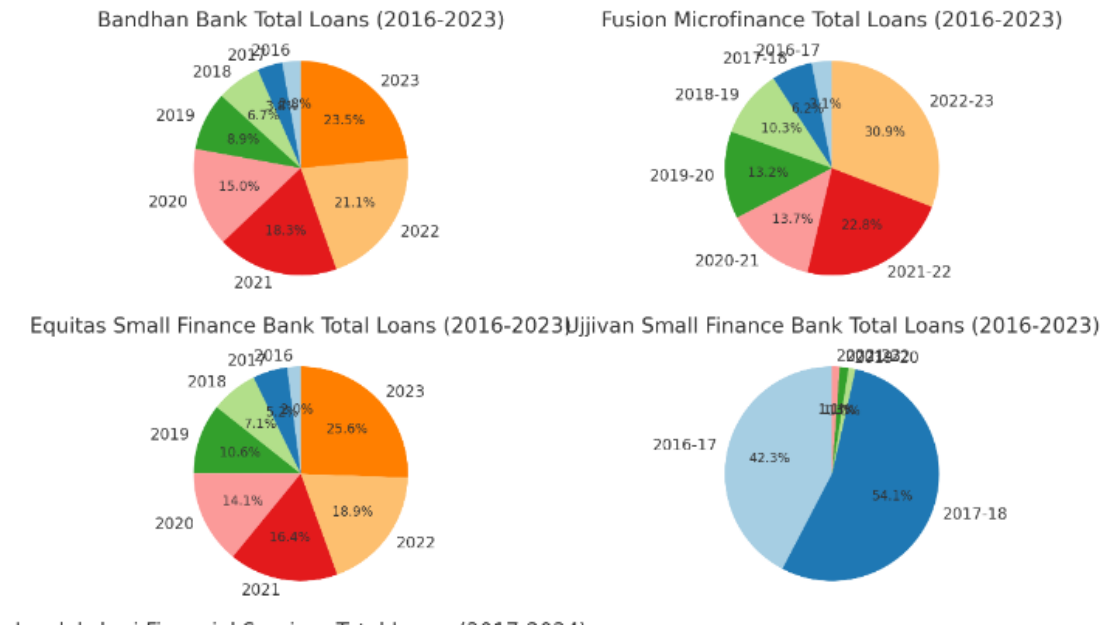
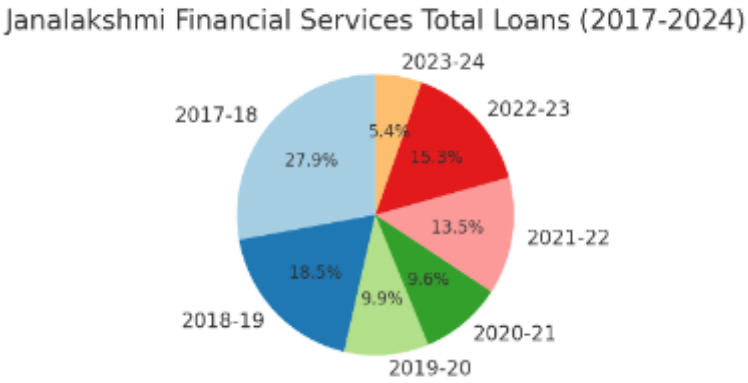


Figure 3: Presentation of Indian MFIs statistics by using Python



THE CASE OF BANGLADESH

An analysis of loan disbursement data from the Association for Social Advancement (ASA), Buro Bangladesh, Shakti Foundation, TMSS, and Uddipan indicates a sustained growth trajectory in lending operations over the specified periods. While all institutions demonstrate a shared commitment to expanding financial inclusion, the degree of integration of climate risk management strategies varies markedly. ASA's data is devoid of climate risk insurance particulars, and Buro Bangladesh offers limited information in this domain. Conversely, Shakti Foundation, TMSS (Thengamara Mohila Sabuj Sangha) and Uddipan exhibit proactive engagement in climate risk insurance, with initiatives encompassing sustainable environmental practices, renewable energy adoption, disaster preparedness, and community resilience building. Also, the data suggests a nascent awareness of climate-related financial risks among a subset of MFIs.

Table 11: Climate risk insurance products offered by ASA

Year	MFI Name	Total Loans	Total Climate Risk Insurance
2015-16	ASA	$2.68 billion	No information about any such project in their annual report
2016-17	ASA	$3.4 billion	No information about any such project in their annual report
2017-18	ASA	$3.54 billion	No information about any such project in their annual report
2018-19	ASA	$3.36 billion	No information about any such project in their annual report
2019-20	ASA	$2.97 billion	No information about any such project in their annual report
2020-21	ASA	$3.37 billion	No information about any such project in their annual report
2021-22	ASA	$4.22 billion	No information about any such project in their annual report
2022-23	ASA	$4.48 billion	No information about any such project in their annual report

Source: The statistics reported in the table were collected from the financial publications available at ASA.

Table 11 presents data on the Association for Social Advancement (ASA) from FY2015-2016 to FY2022-2023. It outlines the ASA name for each year, the corresponding total loan amount in USD billions (sourced from annual reports), and indicates the absence of climate risk insurance projects within the same period based on available annual reports. In addition, we demonstrate the statistics in Figure 4.

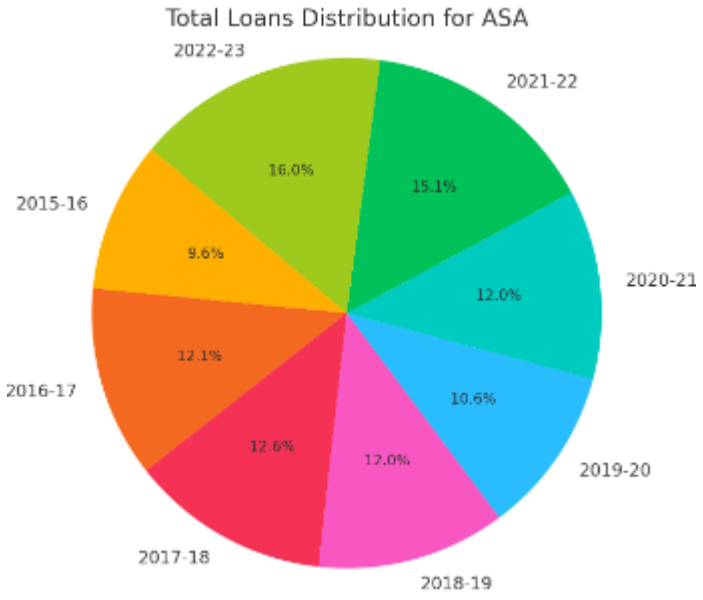


Figure 4: Total Loans Distribution by ASA

Table 12: Climate risk insurance products offered by Buro Bangladesh

Year	MFI Name	Total Loans	Total Climate Risk Insurance
2015-16	Buro Bangladesh	39,515	No specific information
2016-17	Buro Bangladesh	54,394	No specific information
2017-18	Buro Bangladesh	63,346	Disaster loan
2018-19	Buro Bangladesh	91,485	No specific Information
2019-20	Buro Bangladesh	70,029.58	Water and sanitation loan amounting BDT 1,022.50 million

Source: The statistics reported in the table were collected from the financial publications available with Buro Bangladesh.

Table 12 provides data on 'Buro Bangladesh' from FY2015-2016 to FY2019-2020. It outlines the total loans provided in BDT million, sourced from annual reports. It also details the specific nature of loans, such as the 'disaster loan' in 2017-2018 and the 'water and sanitation loan' amounting to BDT 1,022.50 million in 2019-2020. Figure 5 shows the total loans distributed by Buro across the sample years.

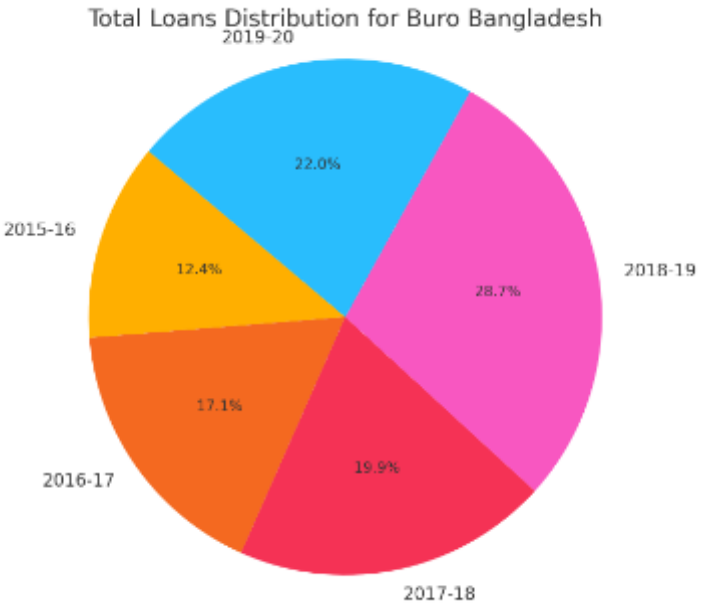


Figure 5: Total loan distribution by Buro Bangladesh

Table 13: Climate risk insurance products offered by Shakti Foundation

Year	MFI Name	Total Loans	Total Climate Risk Insurance
2017-18	Shakti Foundation	12,276.48	No reports published on website
2018-19	Shakti Foundation	15,194.16	No reports published on website
2019-20	Shakti Foundation	14,235.03	No reports published on website
2020-21	Shakti Foundation	14,881.14	Solar programme
2021-22	Shakti Foundation	26,023.75	Solar initiative; green public spaces; Ez Bike Battery Project; action research project on selling electricity from Shs to the national grid
2022-23	Shakti Foundation	36,647.45	Solar initiative; Smart Energy for a Smart Bangladesh; nature-based solution project; Muktir Shobujayon Project (Greening for Liberation),

Source: The statistics reported in the table were collected from the financial publications available with the Shakti Foundation.

Table 13 presents data on the Shakti Foundation from FY2017-2018 to FY2022-2023. It shows the total loans provided in million BDT, sourced from annual reports. It also details the specific nature of loans, such as the 'solar programme' in 2020-2021 and various initiatives related to solar energy, green spaces, and research projects in the subsequent years. Figure 6 shows the total amount of loans distributed by the Shakti Foundation.

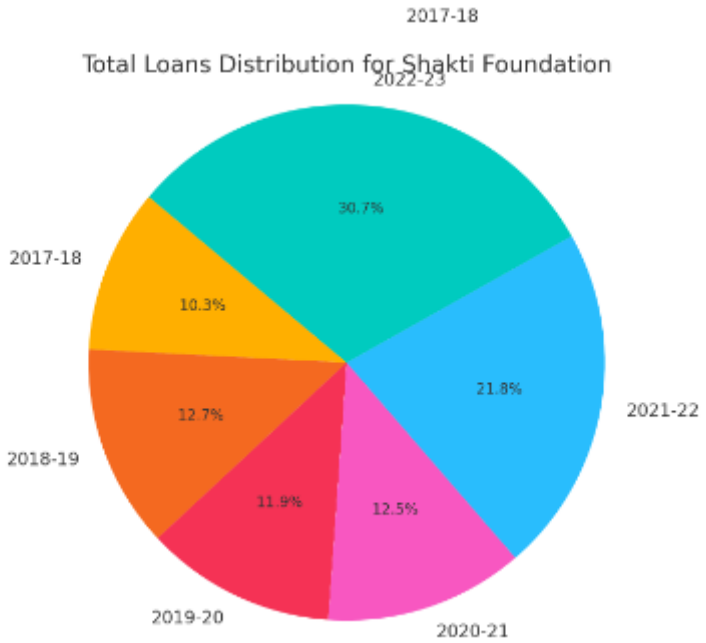


Figure 6: Total loans distribution by Shakti Foundation

Table 14: Climate risk insurance products offered by TMSS

Year	Name	Total Loans (Millions)	Total Climate Risk Insurance
2016	TMSS	2620,73,16,66 0 BDT	Disaster management programme (Sahos) (38153000BDT)
2017	TMSS	771216000 BDT	Sustainable environment development project
			Social forestry programme
			Tree deposit scheme
			Participatory adaptation to climate change of vulnerable community (PACCVC) under community climate change project (CCCP)
2018	TMSS	35287081003 BDT	Disaster management programme (Sahos) (37762000BDT)
			TMSS renewable energy programme
			Land filling project
			Sustainable environment development project
			Tree deposit scheme
2019	TMSS	48,177,050,961 BDT	Sustainable environment development project
			Social forestry programme
			Tree deposit scheme
			Land filling project
			TMSS renewable energy programme
2020	TMSS	42,449,070,154 BDT	Sustainable environment development project
			Social forestry programme
			Tree deposit scheme
			Land filling project
			TMSS renewable energy programme
2021	TMSS	53435855482 BDT	Sustainable environment development project
			Social forestry programme
			Tree deposit scheme
			TMSS renewable energy programme
			Extended community climate change project
			Ecosystem-based development management and conservation of the Saint Martine Island project
			TR/Kabita project
			Land filling project

Source: The statistics reported in the table were collected from the financial publications available with the TMSS.

Table 14 presents data on TMSS (Thengamara Mohila Sabuj Sangha) from FY2016–2021. It outlines the total loans provided in Bangladeshi Takka (BDT), sourced from annual reports. Additionally, it details the specific nature of loans such as the disaster management programme, social forestry programme, land filling project, and various other environmental and community development initiatives.

Table 15: Climate risk insurance products offered by Uddipan

Year	MFI Name	Total Loans (BDT In Million)	Total Climate Risk Insurance
2013-14	Uddipan	38,761.89	Green energy (solar project) (23.55 million BDT)
			Rehabilitation of SIDR-affected coastal fishery small business & livestock (RESCUE) (101.09 million BDT)
			Special Assistance for Housing of SIDR Affected Borrowers (SAHOS)(40.27 Million BDT)
2014-15	Uddipan	48,918 million	Disaster Management Loan (DML/SAHOS) (197.76 million BDT)
			UDDIPAN Green Energy Project (Solar Home System-SHS) (4,46,76,254 BDT)
			Community Climate Change Project (CCCP)
			UDDIPAN Nursery
			Special Assistance for Housing of SIDR Affected Borrowers (SAHOS - OLD) (5.18 million BDT)
			Rehabilitation of SIDR-affected coastal fishery small business & livestock (RESCUE) (5.95 million BDT)
2015-16	Uddipan	61,097.67million	SAHOS (Disaster Management) (2.39 Crore BDT)
			Green Energy Project (1.86 Crore BDT)
			Special Assistance for Housing of SIDR Affected Borrowers (SAHOS - OLD (40.28 million BDT)
			Rehabilitation of SIDR-affected coastal fishery small business & livestock (RESCUE) (101.09 million BDT)
2016-17	Uddipan	74,685.91 million	Green Energy Project (2.70 Crore BDT)
			SAHOS (Disaster Management) (1.37 Crore BDT)
			Land Leasing Under (LIFT) Program (18.35 million BDT)
			Special Assistance for Housing of SIDR Affected Borrowers (SAHOS - OLD) (40.28 million BDT)
			Rehabilitation of SIDR-affected coastal fishery small business & livestock (RESCUE) (101.09 million BDT)

2017-18	Uddipan	89117.39 million	UDDIPAN Renewable Energy Project
			Community Climate Change Project (CCCP)
			Special Assistance for Housing of SIDR Affected Borrowers (SAHOSH) Loan (7,272,283 BDT)
			Rehabilitation of SIDR-affected coastal Tk. 5,347,110 Fishery, Small Business and Livestock Enterprises (RESQUE) (5,347,110 BDT)
			Emergency 2007 Flood Restoration and Recovery Assistance Program (EFRRAP) Loan (121,783 BDT)
2018-19	Uddipan		Renewable Energy Project (816,606 BDT)
2019-20	Uddipan	119,846.45 million	Renewable Energy Project (6779,528 BDT)
			Risk Management
			Green Energy Project (19,109,459 BDT)
2020-21	Uddipan	142,369 million	Land Leasing under (LIFT) Program (19.06 million BDT)
			Renewable Energy Project
			Climate Change and Adaption (CCA) Project.
2021-22	Uddipan	177,405 million	Land Leasing Under (LIFT) Program (19.35 million BDT)
			climate change and adaptation (CCA) project
			UDDIPAN Renewable Energy Project

Source: The statistics reported in the table were collected from the financial publications available at Uddipan.

Table 15 offers a longitudinal overview of Uddipan's financial activities from FY2013-2014 to FY2021-2022. Total loans disbursed quantified in millions of Bangladeshi Taka are itemised annually. Particular emphasis is placed on climate risk mitigation and green energy initiatives, as evidenced by the detailed breakdown of projects such as disaster management, fisheries rehabilitation, solar energy deployment, community-based climate adaptation measures, land management, and renewable energy development. These figures are derived from the organisation's annual reports.

THE CASE OF PAKISTAN

Box 1:

The regulatory framework related to insurance and risk management in Pakistan has been summarised in Table A.

Table A: The regulatory framework related to insurance and risk management in Pakistan

Category	Name/Description	Year/Status	Key Objectives
Primary insurance law	Insurance Ordinance	2000	Regulates all insurance activities in Pakistan. The SECP's draft amendment aims to enhance standards.
Proposed amendment	Insurance Ordinance (Amendment) Bill	2020 (Draft)	Aims to align with international standards, emphasising digitisation, innovation, disaster risk finance and microinsurance.
Recent rules	Insurance Rules	2017	Most recent rules and guidelines for the insurance sector.
	Takaful Rules	2012	Governs Islamic insurance (Takaful).
	Regulatory Sandbox Guidelines	2019	Framework for testing new insurance innovations.
Microinsurance framework	Microinsurance Rules	2014	Establishes a regulatory framework for microinsurance, focusing on low-income individuals.
National strategy	National Financial Inclusion Strategy (NFIS)	Introduced in 2015	Aims to enhance financial inclusion, including the development of the Crop Loan Insurance Scheme (CLIS), digital payments, SME and agricultural finance, and Islamic banking.
Recent developments	Digital-Only Insurers Amendment	Recent (part of ongoing reforms)	Amendment to allow registration of digital-only insurers and dedicated microinsurers.
	Memorandum of Understanding (MOU)	2021	Between IAP and CDC for digital aggregation of insurance products via Emlaak Financials.
	Risk-Based Capital Regime	Proposed (part of Insurance Ordinance (Amendment) Bill 2020)	To align minimum capital requirements with risk exposure.
	Five-Year Insurance Road Map	Recent	Proposes regular consultations with stakeholders, including insurtechs and digital intermediaries.

Box 2:

Table B: Pakistan's climate vulnerability snapshot.

Impact Area	General Impact	Regional Specifics
Temperature	Significant increase in temperatures nationwide.	Northern regions to experience more severe temperature increases.
Water availability	Decline in per capita water availability by 2080 due to increased evaporation, reduced precipitation, and rising drought conditions.	Northern Balochistan and Sindh may face critical water shortages.
Precipitation	Increase in rainfall intensity and changes in precipitation patterns.	Northern and eastern parts may see increased precipitation; Balochistan may experience reduced rainfall.
Sea level rise	Rising sea levels with a potential increase of up to 40 cm by 2080.	Coastal regions, especially the Indus Delta, are at risk of saline intrusion and adverse impacts on livelihoods.
Drought conditions	Increased frequency and severity of droughts affecting agriculture and water resources.	Extreme drought conditions expected across various parts of the country.
Infrastructure sector	Climate-induced extreme weather events are expected to strain infrastructure systems, leading to increased damage and degradation.	Infrastructure systems nationwide are at risk of increased damage.
Agriculture & food scarcity	Threats to food systems, causing long-term crop damage and food scarcity.	Agriculture-dependent regions will face significant challenges, affecting food security and livelihoods.
Ecosystems	Altered ecosystems affect plant and animal populations, increasing risks of invasive species, and impacting ecological succession.	Disruption of ecosystems and biodiversity loss across various regions.

Source: Pakistan Climate Change Profile 2022 by GIZ.

For Pakistan, three MFIs — the Khushhali Microfinance Bank (KMB), Kashf Foundation and the Mobilink Microfinance Bank Limited (MMBL) — have been assessed and compared based on the data provided in their annual reports.

The Khushhali Microfinance Bank, established in 2000, is the largest microfinance bank in Pakistan, focusing on providing financial services to underserved and low-income populations. The bank's motivation for selection in the study arises from its strong emphasis on climate-related CSR initiatives, including large-scale tree plantations, clean drinking water projects, and disaster relief efforts. Khushhali Bank's proactive engagement in sustainability and environmental protection makes it a critical player in promoting climate resilience and supporting Pakistan's broader climate adaptation goals.

Table 16: Climate-related initiatives projected by Khushhali Microfinance Bank Limited

Year	Mark-up/Interest Earned (Rs.)	Non-Mark-up/ Interest Income (Rs.)	Total Income (Rs.)	Awards & Certifications	Key CSR Initiatives
2012	1,499,355,808	585,324,025	2,084,679,833		
2013	2,278,272,669	583,893,920	2,862,166,589		
2014	3,129,490,001	694,696,876	3,824,186,877		
2015	4,406,621,934	845,830,965	5,252,452,899		
2016	5,926,210,005	1,118,659,175	7,044,869,180		
2017	8,740,749,552	1,339,898,069	10,080,647,621		
2018	11,926,025,000	1,638,551,000	13,564,576,000	Best Microfinance Award 2018, Green Office Certification	Tree plantation (5,500+ trees)
2019	15,258,718,000	1,973,457,000	17,232,175,000	Best Microfinance Award 2019	
2020	18,670,291,000	1,542,971,000	20,213,262,000	Best Microfinance Award 2020	Botanical Garden at Margalla Hills; 5,000+ trees planted; fruit orchards in KP
2021	18,652,795,000	1,994,559,000	20,647,354,000	Best Microfinance Award 2021	40+ CSR initiatives; 5,000+ trees planted in 40+ cities; 5,000+ clean drinking water beneficiaries
2022	20,099,705,000	2,194,767,000	22,294,472,000		Assisted 3,000+ flood affectees; provided clean drinking water to 2,900+ people; planted 3,550+ trees; contributing to SDGs 11, 13, and 15

Source: The statistics reported in the table were collected from the financial publications available with KMBL.

Table 16 demonstrates the CSR initiatives of KMBL. In 2018, KMBL received 'Green Office Certification' from the Worldwide Fund for Nature (WWF). KMBL collaborated with WWF to reduce its carbon footprint through energy conservation, waste management and staff training. It also launched a large-scale tree plantation drive, planting over 5500 trees. In collaboration with 'We Care Society', KMBL planted fruit trees and developed orchards throughout Khyber Pakhtunkhwa (KP). In collaboration with the Islamabad Wildlife Management Board IWMB, KMBL established a Botanical Garden at Margalla Hills National Park. To fight deforestation, KMBL launched a country-wide tree plantation drive on its 20th anniversary, planting over 5000 trees. Under KMBL's 2021 CSR highlights, KMBL launched 40+ CSR initiatives and contributed towards 6+ SDGs which included 5000+ clean drinking water beneficiaries and 3000+ trees planted across 40+ cities of Pakistan. Under KMBL's CSR initiatives 2022, KMBL assisted over 3000 flood-affected people, provided drinking water to 2900+ people and planted 3550+ trees, contributing to SDGs 11,13 and 15.

Another important MFI, Kashf Foundation, is renowned for its focus on empowering women and promoting financial inclusion in underserved communities. Since its inception in 1996, Kashf has been playing a critical role in providing microloans and financial services to marginalised women, enabling them to start small businesses and improve their livelihoods. The foundation's commitment to addressing climate risks is evident through its integration of climate risk insurance into its livestock loan products, protecting vulnerable populations from environmental shocks. Kashf was selected for this study due to its innovative approach in combining financial inclusion with climate resilience, particularly through its targeted support for women entrepreneurs, making it an exemplary model for microfinance institutions in Pakistan.

Table 17: Climate-related initiatives projected by Kashf Foundation

Year	Income (Rs)	CSR Initiatives
2011	696,957,646	
2012	915,648,502	Provided food relief to 14,950 families in KP, Sindh, and Punjab; built 512 permanent houses; disbursed 312 loans to flood victims
2013	1,201,031,551	
2014	1,506,651,242	Set up a rehabilitation unit in Kot Addu during floods; served 2,832+ households; disbursed Rs68 million in loans to micro-entrepreneurs
2015	1,821,833,842	
2016	2,136,044,526	
2017	2,598,123,520	
2018	3,642,511,289	Integrated climate risk insurance into livestock loans; disbursed 15,770 loans to over 90,000 women, with 84 insurance claims settled
2019	4,998,277,090	
2020	5,856,130,797	
2021	5,702,520,004	
2022	7,529,551,258	

Source: (Kashf Foundation, no date)

Table 17 presents the CSR initiatives of Kashf Foundation. During the 2010 and 2011 floods, Kashf provided food relief to 14,950 families in KP, Sindh and Punjab. It built 512 permanent houses for flood-devastated households and disbursed 312 loans to women victims of the floods. Kashf also set up a rehabilitation unit in Kot Addu during floods, served over 2,832 households and disbursed Rs68 million in loans to micro-entrepreneurs. Since 2018, Kashf has integrated climate risk insurance into its livestock loan product. The foundation has disbursed approximately 15,770 loans to over 90,000 women providing coverage against climate shocks. The effectiveness of this approach is demonstrated by the settlement of 84 insurance claims due to livestock losses.

Mobilink Microfinance Bank, established in 2012, is Pakistan's largest digital microfinance bank. It offers a wide range of financial services aimed at enhancing financial inclusion, particularly through its mobile banking platform. The motivation for selecting Mobilink Microfinance Bank in this study lies in its innovative approach to leveraging digital technology to expand financial access while actively engaging in climate-related initiatives. With a focus on promoting sustainability, Mobilink has integrated environmental considerations into its operations, making it a significant example of how digital banking can contribute to climate resilience and disaster risk management.

Table 18: Climate-related initiatives projected by Mobilink Microfinance Bank

Year	Markup/Interest Earned (Rs)	Non-Markup/Non-Interest Income (Rs)	Total Income (Rs)
2012	109,619,773	1,310,917	110,930,690
2013	130,068,536	188,009,101	318,077,637
2014	224,924,256	1,404,855,274	1,629,779,530
2015	353,307,829	2,651,072,334	3,004,380,163
2016	1,241,070,085	707,516,078	1,948,586,163
2017	2,616,677,423	541,249,438	3,157,926,861
2018	3,356,863,523	513,589,246	3,870,452,769
2019	5,303,981,442	158,990,648	5,462,972,090
2020	6,682,987,564	(105,591,895)	6,577,395,669
2021	11,081,740,887	(363,894,819)	10,717,846,068
2022	17,334,927,752	6,513,369,930	23,848,297,682

Source: (Publications Financials-https://mobilinkbank.com/news-and-resources/publications-financials | News and Resources | Mobilink Microfinance Bank - Pakistan's largest digital bank, no date)

Table 18 shows Mobilink Bank's statistics. It has launched its sustainability programme, 'Change to Sustain', with Rs2.5 billion allocated towards renewable energy financing. The bank plans to solarise 15 branches and lead a large-scale tree plantation drive. The initiative aims to promote green business practices, climate action, and women-led climate resilience solutions. Mobilink Bank supports small businesses and women, focusing on green financing and solar financing, to ensure sustainability is accessible to all).

Mobilink Microfinance Bank conducted a nationwide plantation drive to improve forest cover and mitigate climate change impact. Teams from all 109 branches planted around 5000 saplings as part of 'Change to Sustain', aiming for a sustainable, prosperous Pakistan (Associated Press of

Pakistan, 2024, April 22). VEON, a global digital operator, announced that its Pakistani financial services company, Mobilink Bank, participated in the 28th Conference Of Parties (COP28) in Dubai. Mobilink Bank has invested over Rs1.6 billion ($5.6 million) in green financing, primarily focusing on loans for solar applications in agriculture to promote renewable energy. The bank is also a strong advocate of gender diversity and inclusion, having allocated over Rs12 billion ($42.2 million) of subsidised financing to over 66,000 women entrepreneurs (VEON, 2023). Figure 7 shows Pakistani MFIs' statistics.

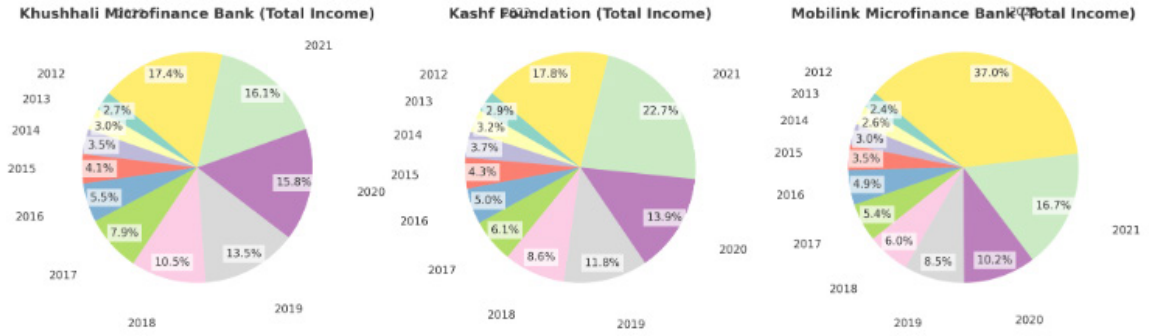


Figure 7: Presentation of statistics of Pakistan MFIs by using Python

5. DISCUSSION AND ANALYSIS

Comparative analysis of the status of climate risk insurance through MFIs in UK and Italy

Data indicates that while banks supporting MFIs in the UK such as HSBC and RBS have begun incorporating climate risk insurance and related financial support into their portfolios, their overall engagement is still relatively low compared to their total lending amounts. HSBC's net ratio of climate risk insurance relative to its total loans remains at or near zero for most years with slight increases in recent years. RBS, on the contrary, shows a more significant commitment with a net ratio of 5 out of 10 in recent years, indicating a stronger emphasis on climate risk insurance.

For HSBC, the data shows a gradual but minimal increase in climate risk insurance with a notable spike in 2022. However, the net ratio remains low, indicating limited integration of climate risk insurance into their overall operations. For RBS, the data displayed a consistent commitment to climate risk insurance with a significant portion of its lending directed towards this cause, especially in recent years. Similarly, Aldermore, although smaller in scale, has shown some engagement in climate risk-related initiatives, focusing on low-carbon transport and achieving a 100 per cent low-carbon fleet goal by 2024. While there is a positive trend, the UK MFIs' engagement in climate risk insurance remains modest with room for significant improvement.

Italy's microfinance institutions such as Banca d'Italia, Intesa Sanpaolo and UniCredit appear more proactive in integrating climate risk insurance and sustainability into their portfolios than their UK counterparts. These institutions have made substantial investments in green bonds, environmental lending and sustainability frameworks, indicating a stronger commitment to climate resilience. The MFIs in Italy have not only invested heavily in green initiatives but also embedded climate risk management frameworks into their operations. For example, UniCredit has committed €150 billion towards ESG volumes, and Banca d'Italia is actively reviewing its portfolio for decarbonisation. In contrast, MFIs in the UK are still in the early stages of integrating climate risk insurance, with some institutions like RBS showing more progress than others. This comparison suggests that Italian MFIs are currently leading in climate risk insurance and sustainability initiatives, offering a more robust framework for managing climate-related financial risks.

Comparative analysis of the status of climate risk insurance through MFIs in India and Bangladesh

A critical comparison of the MFIs performance in terms of loan volume and climate risk insurance or CSR activities reveals significant differences in their approaches and growth trajectories. Bandhan Bank has shown robust loan growth, increasing from ₹12,437.55 crores in 2016 to ₹1,04,756.77 crores in 2023, with climate initiatives focusing on water conservation, afforestation, and a comprehensive Climate Action Programme from 2019 onwards. Fusion Microfinance also exhibited rapid growth, with loans rising from ₹830.84 crores in 2016-17 to ₹8,375.16 crores in 2022-23. Fusion's CSR initiatives include flood relief, biodiversity conservation, and sustainable farming, demonstrating a strong community-oriented focus on climate risk management.

In contrast, Equitas Small Finance Bank's loan portfolio expanded steadily, reaching ₹278.61 crore in 2023, though there is no available information on its climate risk insurance activities. Ujjivan Small Finance Bank, with its significant loan growth from ₹5728.50 crores in 2016-17 to ₹18,162 crores in 2021-22, has undertaken various climate risk mitigation projects, including

flood relief and disaster management, but lacks a dedicated climate risk insurance product. Janalakshmi Financial Services, meanwhile, experienced fluctuating loan volumes, from ₹11,903 crores in 2017-18 to ₹6,534.56 crores in 2022-23. Its CSR focus is on disaster management, waste management, and safe drinking water initiatives, but its financial struggles in certain years limited its ability to allocate funds for climate-related CSR activities.

Overall, Bandhan Bank and Fusion Microfinance demonstrate a more structured approach to integrating climate initiatives into their operations, while other institutions like Equitas and Ujjivan are still in the process of fully incorporating climate risk insurance and CSR into their growth strategies.

The performance of Bangladeshi MFIs in addressing climate risk insurance and sustainable development varies significantly across different institutions, as highlighted in Tables (11-15). Though the ASA (Table 11) shows impressive financial growth with loans increasing from $2.68 billion in 2015-16 to $4.48 billion in 2022-23, it has not incorporated any specific climate risk insurance or sustainability initiatives in its reports. In contrast, Buro Bangladesh (Table 12) demonstrates a more targeted approach, introducing a disaster loan in 2017-18 and a water and sanitation loan in 2019-20, despite some gaps in reporting specific climate-related programmes.

The Shakti Foundation (Table 13) stands out for its gradual integration of climate risk initiatives. Starting with a solar programme in 2020-21, the foundation expanded into multiple green initiatives, such as smart energy projects and the 'Muktir Shobujayon' project in subsequent years, demonstrating a growing commitment to sustainability. The TMSS (Table 14) is another strong performer, consistently engaging in climate-related activities such as the Disaster Management Programme (Sahos), social forestry, and renewable energy projects. It has also implemented participatory adaptation initiatives and ecosystem-based management programs, making it a leader in climate resilience among MFIs.

Uddipan (Table 15) shows a robust commitment to climate risk management and adaptation. Over the years, Uddipan has steadily expanded its renewable energy projects, disaster management loans, and community climate change projects, showing an innovative approach to tackling environmental challenges. Uddipan's extensive portfolio of green energy, disaster management, and adaptation initiatives positions it as a critical player in climate risk insurance in Bangladesh's microfinance sector. In summary, while ASA has achieved significant financial growth, it lags in climate risk management whereas Buro Bangladesh, Shakti Foundation, TMSS, and Uddipan are more proactive, with Uddipan and TMSS demonstrating leadership through diverse and large-scale climate-related projects.

Comparison of Pakistani MFIs in delivering climate risk insurance

The climate-related initiatives and financial performance of Khushhali Microfinance Bank Limited (KMBL), Kashf Foundation, and Mobilink Microfinance Bank Limited (MMBL) reflect their distinct approaches to addressing environmental challenges while also expanding financial services. KMBL with its growing loan portfolio and consistent income increases has significantly integrated environmental sustainability into its operations. From 2018 onwards, KMBL's initiatives include tree plantations, clean drinking water projects, and collaboration with the WWF for Green Office Certification. In 2021 and 2022, KMBL expanded its efforts, assisting flood-affected populations and contributing to various SDGs.

In contrast, the Kashf Foundation has been active in integrating climate risk insurance into its loan offerings, particularly through its livestock loans. This integration, launched in 2018 has benefited over 90,000 women and settled 84 insurance claims. Kashf Foundation's response to floods in 2010 and 2011 highlights its focus on disaster relief including the provision of food, shelter and loans for affected households. On the contrary, MMBL with its rapidly growing

income particularly in 2021 and 2022, has focused on digital banking and financial inclusion but lacks significant climate risk insurance activities compared to KMBL and Kashf. While MMBL's total income has surged due to an increased mark-up and non-mark-up earnings, its climate-related CSR activities are less pronounced. Thus, KMBL and Kashf exhibit more structured approaches towards climate risk insurance and CSR whereas Mobilink emphasises financial expansion with limited environmental integration.

Challenges for MFIs in Delivering Climate Risk Insurance

Delivering climate risk insurance has been somewhat challenging globally wherever MFIs are operating. Some of the challenges have been discussed below based on the data analysis.

a. Affordability of insurance premiums

One of the biggest challenges as regards is the affordability of insurance premiums. Low-income populations, which are the primary clients of MFIs, often find it difficult to afford insurance. Premiums are often perceived as an unnecessary expense, especially when immediate needs take precedence. As a result, despite the potential benefits, the uptake of climate risk insurance remains low not only in South Asia but also in other developed regions of the world.

b. Awareness and understanding of insurance

Many MFI clients are unfamiliar with insurance products, especially climate-specific insurance. Low levels of financial literacy, combined with the complexity of insurance contracts, make it challenging for clients to understand the benefits. People in rural areas are especially more vulnerable to climate risks but are unaware of the insurance products they can utilise due to a lack of literacy.

c. Climate data and risk modelling

Accurate climate data is essential for designing effective insurance products. Many countries, especially in rural and remote areas, lack reliable weather data or risk modelling systems. This results in challenges in setting appropriate premiums and payout triggers, leading to overpricing or underpricing of insurance products. The MFIs need to collaborate with organisations such as meteorological and disaster management departments that can provide forecasted data.

d. Regulatory and policy barriers

Regulatory frameworks for microinsurance, especially climate-specific products, are still underdeveloped in many countries. Without clear regulations or incentives, MFIs may be hesitant to venture into climate risk insurance. In many developing countries, insurance markets are underdeveloped, and regulatory bodies lack the expertise or resources to oversee climate-specific products. MFIs are also not included in the policy planning process, which affects the long-term sustainability of climate-related policies as well.

e. Payouts and trust in the insurance system

One of the main factors limiting the uptake of climate risk insurance is the mistrust surrounding insurance payouts. In many countries, clients have had negative experiences with general insurance, where claims were either delayed or rejected. Index-based insurance products, while innovative, may lead to dissatisfaction if clients experience losses but do not receive payouts due to the index not being triggered. Building trust is essential for the success of these programmes.

f. Cultural barriers and religious considerations

In many parts of the world, including Pakistan, cultural or religious beliefs can be barriers to adopting insurance products. Many people view insurance as incompatible with Islamic principles, despite the availability of Takaful (Islamic insurance). Overcoming these barriers requires extensive education and tailored product offerings that are Shariah-compliant.

g. Dependence on government relief

In many countries of the Global South, including Pakistan, communities often rely on government disaster relief funds after extreme weather events rather than proactive risk management through insurance. This dependency culture undermines the demand for climate risk insurance, as people may expect post-disaster aid instead of paying premiums upfront for insurance protection.

h. Underdeveloped insurance sector

The insurance sector is still relatively underdeveloped, especially in South Asia. Few insurance companies offer climate-specific products, and those that do are concentrated in urban centres. This lack of competition and product variety makes it difficult for MFIs to find suitable partners to develop and deliver climate risk insurance. The underdeveloped nature of the sector also limits innovation and the customization of products for local needs.

Limitations of the Study

The study acknowledges certain limitations, including data availability, comparability, and subjectivity in qualitative analysis: In some cases, data on climate risk insurance was not available for all years or institutions, leading to gaps in the analysis. Similarly, differences in reporting standards, currency, and measurement units across countries posed challenges in comparing data directly. Moreover, there are limitations in the interpretation of qualitative data that involved some level of subjectivity, which could influence the findings of the study.

The analysis is limited to the year 2022 to ensure consistency and account for data limitations. It may be mentioned that many financial institutions publish their financial reports one or two years after the fiscal year, and some institutions delay the same by one or two years that may influenced the scope of the study.

6. LESSONS LEARNED AND IMPLICATIONS FOR PAKISTAN

Pakistan can draw several lessons from the comparative analysis of climate risk insurance (CRI) integration through microfinance institutions (MFIs) in the UK, Italy, India, and Bangladesh. By examining how these countries are tackling climate risk insurance through their MFIs, Pakistan can shape its approach to make CRI more effective and inclusive, considering the country's specific challenges, such as vulnerability to floods, heatwaves, and other climate-related disasters.

KEY LESSONS

a. Develop dedicated climate risk insurance products:

- The analysis highlights that both India (Bandhan Bank, Fusion Microfinance) and Bangladesh (Uddipan, TMSS) have successfully developed specific climate risk insurance products. Pakistan can emulate these institutions by developing targeted CRI products that cater to the needs of vulnerable populations, especially in rural areas where agriculture is heavily impacted by climate change.
- Kashf Foundation has already initiated CRI for livestock loans, benefiting women borrowers. This could be expanded to include agriculture loans and other sectors at risk from climate disasters.

b. Strengthen public-private partnerships (PPPs):

- Italy's MFIs have leveraged public-private partnerships and embedded climate risk management frameworks into their operations, a model that Pakistan could adopt. The collaboration of Pakistani MFIs with government bodies (e.g., State Bank of Pakistan, Ministry of Climate Change), NGOs, and international organisations (e.g. UNDP) can help pool resources, expand CRI programmes, and build institutional capacity.
- The collaboration of Khushhali Microfinance Bank with WWF Pakistan for green office certification is a successful example of public-private collaboration. However, there is potential for much more comprehensive partnerships that focus on building resilience through financial solutions.

c. Expand ESG and climate-focused lending:

- Italy's UniCredit has committed billions towards Environmental, Social and Governance (ESG) and sustainability volumes, reflecting a long-term vision of aligning financial institutions with environmental goals. India's Bandhan Bank and Bangladesh's Shakti Foundation also reflect the growing emphasis on climate action through CSR and lending practices.
- Pakistani MFIs, such as Mobilink Microfinance Bank, have so far focused more on financial inclusion without embedding climate risk strategies into their core operations. Learning from Italy and Bangladesh, MMBL and others can incorporate climate risk assessments into lending processes and expand green financing.

d. Comprehensive climate adaptation programmes:

- India's MFIs (Bandhan Bank, Fusion Microfinance) and Bangladesh's Uddipan and TMSS show the importance of integrating climate adaptation measures like disaster loans and water and sanitation projects. Pakistani MFIs should adopt a multi-sectoral approach, offering loans for renewable energy, water management, and climate-resilient agriculture.
- They can also implement disaster relief loans and participatory adaptation initiatives like those seen in Bangladesh. This will not only offer immediate financial relief post-disaster but also build long-term climate resilience.

e. Embed climate risk into core operations:

- The UK's RBS and Italy's Banca d'Italia have started embedding climate risk into their core portfolios, rather than treating it as an isolated CSR activity. Pakistan's MFIs should follow suit by integrating climate risk insurance as a core element of their lending portfolios.
- For example, the Kashf Foundation has shown that integrating CRI into loan offerings for livestock has successfully benefited tens of thousands of borrowers. However, to significantly scale up, CRI should become part of all types of loan offerings, particularly agriculture and housing loans in flood-prone areas.

f. Enhance digital integration for climate risk insurance:

- Italy's digital platforms for climate insurance and Bangladesh's Uddipan demonstrate the importance of using technology for financial products focused on climate risk. Pakistan, with its rapid growth in digital banking (Mobilink Microfinance Bank), has the potential to digitally integrate climate risk insurance products.
- These platforms could enable real-time climate risk assessments, automatic premium adjustments based on climate events, and swift payouts to affected individuals. The government can play a role by creating incentives for digital CRI platforms.

g. Incorporate CSR as a pathway for CRI:

- Bangladesh's TMSS and Shakti Foundation have used their CSR programmes to build climate resilience, from disaster management to renewable energy projects. Similarly, Pakistani MFIs could enhance their CSR programmes to include more comprehensive climate initiatives, such as tree plantations, clean energy financing, and post-disaster rehabilitation efforts.
- CSR activities should be designed with a focus on sustainable development and climate risk mitigation, allowing for an alignment with Pakistan's national climate action goals (e.g., Nationally Determined Contributions under the Paris Agreement).

IMPLICATIONS

1. Policy-level support: To encourage MFIs to adopt climate risk insurance, the government should introduce incentives such as tax breaks for institutions that implement CRI products or regulatory frameworks that encourage sustainable lending. The State Bank of Pakistan could introduce guidelines for CRI integration into microfinance practices, similar to what Italy has done through its central banking policies.

2. Targeted financial inclusion programmes: Pakistan's MFIs, particularly those focused on women and rural communities (like the Kashf Foundation), should expand their outreach with tailored financial products that combine microcredit with climate insurance. This will ensure that the most vulnerable populations, often impacted disproportionately by climate events, are financially safeguarded.

3. Building institutional capacity: Training and capacity building within Pakistani MFIs is critical. Institutions need to develop expertise in climate risk assessment, insurance product development, and sustainability frameworks. Collaboration with international development agencies (e.g., UNEP, UNDP) can provide necessary technical support and global best practices.

4. Scaling up public awareness campaigns: Just as Uddipan and Bandhan Bank have integrated community-level climate education into their operations, Pakistani MFIs could scale up public awareness campaigns about the benefits of CRI and climate-resilient practices, helping both rural and urban populations better prepare for and mitigate climate risks.

7. POLICY RECOMMENDATIONS

- Governments and financial regulators should strengthen frameworks that support the integration of climate risk insurance within the microfinance sector. This includes incentives for MFIs to develop and scale innovative insurance products, and conducive regulatory environments for the growth of such initiatives.
- Furthermore, capacity-building initiatives are essential to enhance the ability of MFIs to design, implement and manage effective climate risk insurance products. This includes training for MFI staff, developing financial literacy among clients, and fostering partnerships with technology providers and environmental organisations.
- Collaboration between public and private sectors can also play a pivotal role in expanding the reach of climate risk insurance. Public-private partnerships can help pool resources, share risks, and leverage the strengths of both sectors to develop comprehensive and scalable insurance solutions.
- MFIs should integrate climate risk insurance with other development initiatives such as sustainable agriculture, renewable energy projects, and community-based conservation efforts. This approach can enhance the overall impact of MFIs on climate resilience and sustainable development.
- Collaboration between the institutions concerned (i.e. Pakistan Meteorological Department, Ministry of Climate Change, Global Climate-Change Impact Studies Centre, etc.) will ensure that MFIs have affordable access to reliable climate data for risk modelling and product customization.
- There is a need to embed climate-related risks in SBP's prudential regulations for MFIs, ensuring that risk management frameworks account for climate impacts on borrowers and institutions.
- A regulatory framework, specifically for climate risk insurance, needs to be established, enabling MFIs to design and deliver microinsurance products tailored to climate vulnerabilities such as floods, droughts, and heatwaves.
- It is necessary to prepare guidelines for risk assessment, premium pricing, and claims management.
- There is a need to collaborate with public private partners to develop a climate risk matrix for insurance companies and MFIs. It will help in shaping up related financial products.

Policy matrix based on the findings of the study

Policy Initiative	Objective	Key Actions	Expected Outcomes	Regulators
Integrate Climate Risk Insurance into MFI Service	Reduce financial vulnerability of marginalised populations in Pakistan.	Develop and offer climate risk insurance products through MFIs	Increased resilience of vulnerable communities against climate-related disasters.	MFIs; insurance providers; government.
Leverage Technology and Digital Platforms	Enhance accessibility and affordability of climate risk insurance.	Implement digital solutions for the distribution and management of insurance products.	Broader reach of insurance products, especially in rural areas.	MFIs; fintech providers

Strengthen Public-Private Partnerships	Improve the scale and effectiveness of climate risk insurance.	Facilitate collaboration between MFIs, insurance companies, and government agencies.	Scalable insurance solutions with greater impact across regions.	Government; MFIs; private sector.
Enhance Financial Literacy and Awareness	Increase the uptake of climate risk insurance among vulnerable populations.	Conduct educational campaigns on the benefits and usage of climate risk insurance.	Higher participation in insurance schemes, reducing economic losses from disasters.	MFIs; NGOs; community leaders.
Implement Regulatory Support for Climate Insurance	Create a conducive environment for the growth of climate risk insurance.	Establish regulations that incentivise MFIs to offer climate risk insurance products.	Strengthened MFI capabilities to deliver insurance, leading to better risk management.	Government; financial regulators.
Tailor Insurance Products to Local Needs	Ensure insurance products address specific climate risks in different regions.	Design climate risk insurance offerings based on regional climate profiles and vulnerabilities.	More effective risk coverage and increased relevance of insurance products.	MFIs; insurance companies; local authorities.
Promote Capacity-Building Initiatives	Enhance the skills and knowledge of MFI staff on climate risk management.	Provide training and resources on climate risk insurance to MFI staff.	Improved delivery and management of climate risk insurance products.	MFIs; training institutes; government.
Develop National Climate Risk Insurance Framework	Align MFI activities with national climate adaptation strategies.	Integrate climate risk insurance into national policies and development goals.	A coherent and comprehensive national approach to climate risk management.	Government; policymakers; MFIs.
Foster International Collaboration	Leverage global expertise and resources to strengthen climate risk insurance.	Engage with international organisations and partners to share best practices and access funding.	Enhanced effectiveness and innovation in climate risk insurance offerings.	MFIs; government; international organisations.

Note: This matrix outlines a strategic approach for enhancing the role of MFIs in delivering climate risk insurance in Pakistan, drawing from developed-country experiences and aligning with national and global climate goals.

8. CONCLUSION

This study underscores the crucial role of microfinance institutions (MFIs) in bridging the gap between financial inclusion and climate resilience. By highlighting the challenges and opportunities in delivering climate risk insurance, it provides valuable insights into how MFIs can serve as catalysts for sustainable financial solutions. These findings contribute to the growing discourse on climate finance and risk mitigation, encouraging further exploration of innovative financial mechanisms that can enhance the resilience of vulnerable communities. This research invites policymakers, practitioners, and scholars to rethink the integration of climate risk strategies within microfinance, fostering a more adaptive and inclusive financial ecosystem.

References

Associated Press of Pakistan (2024) 'Mobilink Bank carries out nationwide plantation drive to boost safeguards against climate change', Associated Press of Pakistan, 22 April. Available at: https://www.app.com.pk/national/mobilink-bank-carries-out-nationwide-plantation-drive-to-boost-safeguards-against-climate-change (Accessed: 8 August 2024).

Asteriou, D, Spanos, K Trachanas, E 2024, Financial development, economic growth and the role of fiscal policy during normal and stress times: Evidence for 26 EU countries. International Journal of Finance & Economics, vol. 29, no. 2, pp. 2495-2514.

Dorfleitner, G, Forcella, D and Nguyen, AQ 2020, Microfinance and Green Energy Lending: First Worldwide Evidence, Credit and Capital Markets – Kredit und Kapital, vol. 53, no. 4, p. 427–460.

Intergovernmental Panel on Climate Change 2012, Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, Edited by C.B. Field, V. Barros, T.F. Stocker and Q. Dahe, Cambridge: Cambridge University Press, viewed 02 January 2025, https://doi.org/10.1017/CBO9781139177245

Hammill, A & Matthew, R 2008, Microfinance and Climate Change Adaptation, s.l.: s.n.

Haque, CE, Khan, SA & Choudhury, M 2024, Role of multi-level institutions in facilitating innovation and adaptation technologies for reducing climate risk and impact: Evidence from coastal communities of Bangladesh, International Journal of Disaster Risk Reduction, vol. 111.

Hazell, P and Rahman, A 2014 New Directions for Smallholder Agriculture, Oxford: Oxford University Press, viewed 02 January 2025, https://doi.org/10.1093/acprof:oso/9780199689347.001.0001

Hussain, R & Ahmad, R 2024, Nexus Between Microfinance and Climate Change in Pakistan, International Research Journal of Social Sciences and Humanities, vol. 3, no. 1, pp. 486-514.

Huyer, S, Simelton, E, Chanana, N, Mulema, AA and Marty, E

2021, Expanding opportunities: A framework for gender and socially-inclusive climate resilient agriculture, Frontiers in Climate, vol. 3.

Kamran, HW & Omran, A 2023, Role of Microfinance in Mitigating Disasters in Pakistan. Journal of Environmental Management and Tourism, vol. 14, no. 1, pp. 150-159.

Kong, F & Sun, S 2021, Better understanding insurance mechanism in dealing with climate change risk, with special reference to China, International Journal of Environmental Research and Public Health, vol. 18, no. 6.

Leite, ZN & Sá, ES 2024, Microfinance institutions managers' motivation towards environment protection through green microfinance: the case of the developing country of Cabo Verde, International Journal of Bank Marketing, vol. 42, no. 4, pp. 725-744.

Nobanee, H Nghiem, XH 2024, Climate catastrophe insurance for climate change: what do we know and what lies ahead?, Current Opinion in Environmental Sustainability, vol. 66.

Nuruzzaman, A, Graham, S & Barnett, J 2024, Reducing social vulnerability to climate change: the role of microfinance organisations, Climate Policy.

Oostendorp, R, van Asseldonk, M, Gathiaka, J, Mulwa, R, Radeny, M, Recha, J, Wattel, C & van Wesenbeeck 2019, Inclusive agribusiness under climate change: a brief review of the role of finance, Current Opinion in Environmental Sustainability, vol. 41, pp. 18-22.

Penabad, MCL, Sanfiz, JMM, Agha, Y & Iglesias-Casal , A 2024, Microfinance Institutions and Corporate Social Responsibility, A scientometric study, Future Business Journal, vol.10.

Pérez, I G, Izquierdo, MÁF & Torres, MJM 2020, Microfinance Institutions Fostering Sustainable Development by Region, Sustainability, vol. 12, no. 7

Sarker, D & Khan, MA 2024, Microfinance and economic and social empowerment of people with disabilities: Lessons from Bangladesh, Development Policy Review, vol. 42, no. 5.

Singh, G & Pandey, A 2024, Climate change induced disasters and highly vulnerable infrastructure in Uttarakhand, India: current status and way forward towards resilience and long-term sustainability, Sustainable and Resilient Infrastructure, vol. 9, no. 2, pp. 145-167.

(United Nations Framework Convention on Climate Change 200, Kyoto Protocol Reference Manual on Accounting of Emissions and Assigned Amounts. Bonn: United Nations Framework Convention on Climate Change, https://unfccc.int

Ullah, I & Khan, M 2017, Microfinance as a tool for developing resilience in vulnerable communities, Journal of Enterprising Communities: People and Places in the Global Economy, vol. 11, no. 2, pp. 237-257.

VEON (2023) 'VEON's Mobilink Bank participates in COP28, emphasizes the role of gender inclusivity in climate finance', VEON Newsroom, 5 December. Available at: https://www.veon.com/newsroom/press-releases/veons-mobilink-bank-participates-in-cop28-emphasizes-the-role-of-gender-inclusivity-in-climate-finance (Accessed: August 08, 2024).

Annexures

Table A1: List of MFIs

Developed Countries		Developing Countries		
Italy	United Kingdom	India	Bangladesh	Pakistan
Banca d'Italia	HSBC (Hong Kong and Shanghai Banking Corporation)	Bandhan Bank, India	ASA (Association for Social Advancement)	Khushhali Microfinance Bank (KMB),
Intesa Sanpaolo	RBS (Royal Bank of Scotland)	Fusion Microfinance Private Limited	Buro Bangladesh	Kashf Foundation
UniCredit	Aldermore	Equitas Small Finance Bank	Shakti Foundation	Mobilink Microfinance Bank Limited (MMBL).
Cassa Depositi e Prestiti (CDP)	Allica Bank	Ujjivan Small Finance Bank	TMSS (Thengamara Mohila Sabuj Sangha)	
Deutsche Bank	Barclays	Janalakshmi Financial Services	Uddipan	
PerMicro	Lloyds Banking Group			

Appendix

Stakeholder Consultation

We conducted a stakeholder consultation on 27th SDC (Sustainable Development Conference) organized by Sustainable Development Policy Institute (SDPI), held from 4 – 7 November 2024 in Islamabad, Pakistan.

The policy recommendations of the sessions can be accessed through following link.

https://sdpi.org/sdconference/from-fragility-to-resilience-enhancing-sustainable-development/b-1-role-of-microfinance-institutions-for-climate-risk-insurance/policy-recommendation-details

The photo's of the session can be accessed through following link

Https://drive.google.com/drive/folders/1D3f9OPxmxbv4d-z52pDWJX6z8p-QlC7K

Python Code for UK MFIs Analysis

```
import matplotlib.pyplot as plt

# Data for HSBC, RBS, and Aldermore
hsbc_data = {
    'Year': [2023, 2022, 2021, 2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013, 2012, 2011],
     'Climate Insurance Finance (millions)': [105, 93, 82.4, 44.1, 52.4, None, 10.5, None, 554, None, 100, 100, 100],
}

rbs_data = {
    'Year': [2023, 2022, 2021, 2020, 2019, 2018],
    'Climate Insurance Finance (millions)': [17090, 18641, 43587, None, None, None],
}

aldermore_data = {
    'Year': [2016, 2017, 2019, 2020, 2021, 2022, 2023],
    'Climate Insurance Finance (millions)': [0.4, None, None, None, 10, 8.4, None],
}

# Create pie charts for each year where data is provided
fig, axs = plt.subplots(1, 3, figsize=(18, 6))

# HSBC pie chart
hsbc_pie_data = [value for value in hsbc_data['Climate Insurance Finance (millions)'] if value is not None]
hsbc_labels = [f"{year}" for year, value in zip(hsbc_data['Year'], hsbc_data['Climate Insurance Finance (millions)']) if value is not None]
axs[0].pie(hsbc_pie_data, labels=hsbc_labels, autopct='%1.1f%%', startangle=140)
axs[0].set_title('HSBC Climate Insurance Finance Distribution')
# RBS pie chart
rbs_pie_data = [value for value in rbs_data['Climate Insurance Finance (millions)'] if value is not None]
rbs_labels = [f"{year}" for year, value in zip(rbs_data['Year'], rbs_data['Climate Insurance Finance (millions)']) if value is not None]
axs[1].pie(rbs_pie_data, labels=rbs_labels, autopct='%1.1f%%', startangle=140)
axs[1].set_title('RBS Climate Insurance Finance Distribution')
# Aldermore pie chart
aldermore_pie_data = [value for value in aldermore_data['Climate Insurance Finance (millions)'] if value is not None]
aldermore_labels = [f"{year}" for year, value in zip(aldermore_data['Year'], aldermore_data['Climate Insurance Finance (millions)']) if value is not None]
axs[2].pie(aldermore_pie_data, labels=aldermore_labels, autopct='%1.1f%%', startangle=140)
axs[2].set_title('Aldermore Climate Insurance Finance Distribution')
plt.show()
```

Python Codes for India MFIs Analysis

```
import matplotlib.pyplot as plt

# Data for each microfinance institution (MFI) - Bandhan Bank
years_bandhan = ['2016', '2017', '2018', '2019', '2020', '2021', '2022', '2023']
loans_bandhan = [12437.55, 16839.08, 29713.04, 39643.39, 66629.95, 81612.88, 93974.92,
104756.77]

# Data for Fusion Microfinance
years_fusion = ['2016-17', '2017-18', '2018-19', '2019-20', '2020-21', '2021-22', '2022-23']
loans_fusion = [830.84, 1670.58, 2782.1, 3572.85, 3710.3, 6179.78, 8375.16]

# Data for Equitas Small Finance Bank
years_equitas = ['2016', '2017', '2018', '2019', '2020', '2021', '2022', '2023']
loans_equitas = [22.27, 57.02, 77.07, 115.95, 153.67, 179.25, 205.97, 278.61]

# Data for Ujjivan Small Finance Bank
years_ujjivan = ['2016-17', '2017-18', '2019-20', '2021-22', '2022-23']
loans_ujjivan = [572850.44, 732261.73, 14153, 18162, 15520.66]

# Data for Janalakshmi Financial Services
years_janalakshmi = ['2017-18', '2018-19', '2019-20', '2020-21', '2021-22', '2022-23', '2023-24']
loans_janalakshmi = [11903, 7908.45, 4220.05, 4082.59, 5772, 6534.56, 2311.127]

# Plotting pie charts
fig, axs = plt.subplots(3, 2, figsize=(12, 10))

# Pie chart for Bandhan Bank
axs[0, 0].pie(loans_bandhan, labels=years_bandhan, autopct='%1.1f%%', startangle=90,
colors=plt.cm.Paired.colors)
axs[0, 0].set_title('Bandhan Bank Total Loans (2016-2023)')

# Pie chart for Fusion Microfinance
axs[0, 1].pie(loans_fusion, labels=years_fusion, autopct='%1.1f%%', startangle=90, colors=plt.
cm.Paired.colors)
axs[0, 1].set_title('Fusion Microfinance Total Loans (2016-2023)')

# Pie chart for Equitas Small Finance Bank
axs[1, 0].pie(loans_equitas, labels=years_equitas, autopct='%1.1f%%', startangle=90, colors=plt.
cm.Paired.colors)
axs[1, 0].set_title('Equitas Small Finance Bank Total Loans (2016-2023)')

# Pie chart for Ujjivan Small Finance Bank
axs[1, 1].pie(loans_ujjivan, labels=years_ujjivan, autopct='%1.1f%%', startangle=90, colors=plt.
cm.Paired.colors)
axs[1, 1].set_title('Ujjivan Small Finance Bank Total Loans (2016-2023)')

# Pie chart for Janalakshmi Financial Services
axs[2, 0].pie(loans_janalakshmi, labels=years_janalakshmi, autopct='%1.1f%%', startangle=90,
colors=plt.cm.Paired.colors)
axs[2, 0].set_title('Janalakshmi Financial Services Total Loans (2017-2024)')

# Remove the empty subplot
fig.delaxes(axs[2, 1])

# Adjust layout
plt.tight_layout()

# Show the pie charts
plt.show()
```

Python Codes for Bangladesh MFIs Analysis

```
# Reducing the size of the pie charts for each MFI to match the smaller format requested

# Setting figure size smaller for compact pie charts
fig, axes = plt.subplots(2, 3, figsize=(12, 8))

# Pie chart for ASA
axes[0, 0].pie(asa_data, labels=asa_labels, autopct='%1.1f%%', colors=colors)
axes[0, 0].set_title('ASA')

# Pie chart for Buro Bangladesh
axes[0, 1].pie(buro_data, labels=buro_labels, autopct='%1.1f%%', colors=colors)
axes[0, 1].set_title('Buro Bangladesh')

# Pie chart for Shakti Foundation
axes[0, 2].pie(shakti_data, labels=shakti_labels, autopct='%1.1f%%', colors=colors)
axes[0, 2].set_title('Shakti Foundation')

# Pie chart for TMSS
axes[1, 0].pie(tmss_data, labels=tmss_labels, autopct='%1.1f%%', colors=colors)
axes[1, 0].set_title('TMSS')

# Pie chart for Uddipan
axes[1, 1].pie(uddipan_data, labels=uddipan_labels, autopct='%1.1f%%', colors=colors)
axes[1, 1].set_title('Uddipan')

# Hide the unused subplot
axes[1, 2].axis('off')

plt.tight_layout()
plt.show()
```

Python Codes for Pakistan MFIs Analysis

```
import matplotlib.pyplot as plt

# Data for Khushhali Microfinance Bank
khushhali_years = ['2012', '2013', '2014', '2015', '2016', '2017', '2018', '2019', '2020', '2021', '2022']
khushhali_income = [2084679833, 2862166589, 3824186877, 5252452899, 7044869180,
10080647621, 13564576000, 17232175000, 20213262000, 20647354000, 22294472000]

# Data for Kashf Foundation
kashf_years = ['2011', '2012', '2013', '2014', '2015', '2016', '2017', '2018', '2019', '2020', '2021', '2022']
kashf_income = [696957646, 915648502, 1201031551, 1506651242, 1821833842, 2136044526,
2598123520, 3642511289, 4998277090, 5856130797, 5702520004, 7529551258]

# Data for Mobilink Microfinance Bank
mobilink_years = ['2012', '2013', '2014', '2015', '2016', '2017', '2018', '2019', '2020', '2021', '2022']
mobilink_income = [110930690, 318077637, 1629779530, 3004380163, 1948586163,
3157926861, 3870452769, 5462972090, 6577395669, 10717846068, 23848297682]

# Plotting the pie charts
fig, axs = plt.subplots(1, 3, figsize=(12, 4))
```

```
# Khushhali Microfinance Bank pie chart
axs[0].pie(khushhali_income, labels=khushhali_years, autopct='%1.1f%%', startangle=90)
axs[0].set_title('Khushhali Microfinance Bank (Total Income)')

# Kashf Foundation pie chart
axs[1].pie(kashf_income, labels=kashf_years, autopct='%1.1f%%', startangle=90)
axs[1].set_title('Kashf Foundation (Total Income)')

# Mobilink Microfinance Bank pie chart
axs[2].pie(mobilink_income, labels=mobilink_years, autopct='%1.1f%%', startangle=90)
axs[2].set_title('Mobilink Microfinance Bank (Total Income)')

# Show the pie charts
plt.tight_layout()
plt.show()
```