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# Financial Inclusion for Disaster and Climate Resilient Households and Communities

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# Financial Inclusion for Disaster and Climate Resilient Households and Communities

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# Financial Inclusion for Disaster and Climate Resilient Households and Communities

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## Acronyms and Abbreviation

| | |
|---|---|
| AIC | Agricultural Insurance Company |
| ADP | Annual Development Programme |
| ADB | Asian Development Bank |
| ARBAN | Association for Realisation of Basic Needs |
| BCCRF | Bangladesh Climate Change Resilience Fund |
| BCCSAP | Bangladesh Climate Change Strategy and Action Plan |
| BCCT | Bangladesh Climate Change Trust |
| BCCTF | Bangladesh Climate Change Trust Fund |
| BFD | Bangladesh Forest Department |
| BFIDC | Bangladesh Forest Industries Development Corporation |
| BFRI | Bangladesh Forest Research Institute |
| CCA | Climate Change Adaptation |
| CBO | Community Based Organisation |
| CCCP | Community Climate Change Project |
| DDJ | Dak Diye Jai |
| DAE | Department of Agriculture Extension |
| DoE | Department of Environment |
| DoF | Department of Fisheries |
| DIISP | Developing Inclusive Insurance Sector Project |
| DMF | Disaster Management Fund |
| DRR | Disaster Risk Reduction |
| DECC | Disaster, Environment and Climate Change |
| EFRRAP | Emergency 2007 Flood Restoration and Recovery Assistance Programme |
| FPAB | Family Planning Association of Bangladesh |
| FD | Forest Department |
| GIC | General Insurance Company |
| GIS | Geographic Information Systems |
| GWR | Geographically-Weighted Regression |
| HCB | Hospital Cash Benefit |
| IDCOL | Infrastructure Development Company Limited |
| IGES | Institute for Global Environmental Strategies |
| IDRA | Insurance Development and Regulatory Authority |
| ICR | Intelligent Character Recognition |
| JCF | Jagorani Chakra Foundation |
| JJS | Jagrata Juba Shangha |
| JFPR | Japan Fund for Poverty Reduction |
| KDE | Kernel Density Estimation |
| LDM | Lead District Manager |
| LRP | Livelihood Rehabilitation Programme |
| LRP | Livelihood Restoration Project |
| LGD | Local Government Division |
| LGED | Local Government Engineering Department |

| | |
|---|---|
| LCD | Low Carbon Development |
| MRA | Microcredit Regulatory Authority |
| MFI | Microfinance Institutions |
| MIME | Microinsurance for Mutual Enabling |
| MoEF | Ministry of Environment and Forests |
| MoFDM | Ministry of Food and Disaster Management |
| MoI | Ministry of Industries |
| MoWR | Ministry of Water Resources |
| MDTF | Multi-Donor Trust Fund |
| MBA | Mutual Benefit Associations |
| NAP | National Adaptation Plan |
| NCFE | National Centre for Financial Education |
| NFLAT | National Financial Literacy Assessment Test |
| NISM | National Institute of Securities Markets |
| NSS | Nazrul Smriti Sangsad |
| NGF | Nowabenki Gonomukhi Foundation |
| OLS | Ordinary Least Squares |
| PKSF | Palli Karma-Sahayak Foundation |
| PO | Partner Organisation |
| POS | Point-of-Sale |
| PMFBY | Pradhan Mantri Fasal Bima Yojana |
| PRIME | Programmed Initiatives for Monga Eradication |
| RNOA | Return on Net Operating Asset |
| ROSCA | Rotation Savings ans Credit Association |
| RRF | Rural Reconstruction Foundation |
| SUS | Satkhira Unnayan Sangstha |
| STLI | Simple Term Life Insurance |
| SDF | Social Development Foundation |
| SRLP | Socio-Economic Rehabilitation Loan Programme |
| SW | South-Western |
| SA | Spatial Accessibility |
| SAHOS | Special Assistance for Housing of Sidr Affected Borrowers |
| TLIE | Term Life Insurance with Endowment |
| WARPO | Water Resources Planning Organisation |
| WBCI | Weather-Based Crop Insurance |

# Executive Summary

## Background

1.1 Bangladesh, being one of the most vulnerable countries to natural disasters and global climate change, faces different individual and catastrophic shocks creating severe impact on the lives and livelihoods of the marginal segment of the population. To cushion the shocks, these households borrow from formal/informal sources, withdraw their savings, or sell productive and other assets. Moreover, availability of even these unfavourable coping mechanisms is inadequate and unreliable especially during times of natural disasters. Thus, a major constraining factor of the current efforts for sustainable poverty reduction and development at the grassroots level is the absence of adequate formal institutional mechanisms of risk mitigation for the poor and low-income households.

The impacts of climate change are already being felt in Bangladesh, with significant variation across the country. It was found that *Ex ante* access to microfinance increases household adaptive capacity and builds resilience. However, the impacts of *Ex ante* access to microfinance on household wellbeing are not uniform across Bangladesh. Microinsurance products are highly relevant to climate change adaptation even though these are not widely available in Bangladesh. Various studies conducted by InM show that full use is needed of NGO-MFI 'social assets' – trust and community relationships, extensive network of delivery services, culture of experimentation and learning, and expertise in rural development for disaster risk reduction and climate change adaptation.In the context of climate change, action research within an experimental design is needed to identify effective institutional and operational arrangements and intervention packages to build adaptive capacities at household and community levels.

## Scope and Objectives of Study

1.2 In the context of climate change, action research within an experimental design is needed to identify effective institutional and operational arrangements and intervention packages to build adaptive capacities at household and community levels. An experimental testing of different sets of interventions for different locations will generate scientific knowledge with generalisable conclusions for applications in other countries with similar environmental conditions. Therefore, the *basic purpose of this research is to design a comprehensive action research based on some background studies.* Activities required to design such action research are as follows:

*Component 1: Comprehensive stocktaking analysis of MFI and NGO engagement in disaster risk reduction and climate change adaptation*

*Component 2: Design action research to pilot test interventions for building household adaptive capacity and resilience*

Component 1 has three sub-components: (i) Intervention Stocktaking, (ii) Balance Sheet and Contingency Stocktaking, (iii) Spatial Analysis.

## Objectives of Intervention Stocktaking

2.1 A comprehensive stock taking analysis will be undertaken which will characterise the adopted interventions and quantify their significance in relation to contributions from other sectors, as well as identify gaps and good practices. The types of NGO-MFI interventions are wide ranging and include standalone financial services (microcredit, savings products, and to a lesser extent insurance); combined financial services (e.g. loans for livestock fattening packaged with insurance); packaging of financial services with non-financial services (e.g. loans packaged with training on crab cultivation in areas affected by salinisation, etc.); cash-for-work programmes to support recovery after climate disasters; grants to build climate-resilient household and community-level infrastructure (e.g. raising homestead plinths, rainwater harvesting, etc.); disaster relief; support for education, health and sanitation; community institution building; hazard assessments and disaster preparedness; etc.

This stock taking assessment has three objectives:

- Objective 1: Provide a stock taking of NGO-MFI interventions that are relevant to climate change adaptation and disaster risk reduction
- Objective 2: Provide a review of community institutions and households and how they have contributed to climate change adaptation in the study areas.
- Objective 3: Provide a stock taking of adaptation planning and support initiatives in the study areas.

## Methodology of Intervention Stocktaking

2.2 Considering the objective of the intervention stocktaking, following activities were initiated to collect necessary primary data

***Household survey***: The research team has identified several districts from South-Western region of Bangladesh which are more vulnerable to climate change for conducting a household survey to map the vulnerability of the households. The survey will identify their existing coping mechanism and how much the people residing in the disaster prone areas are prepared for the potential climate change effect. Using statistical sample size calculation method, total sample size become 2,250.

For the purpose of the research, 9 districts have been selected using both purposive and random sampling method. Total of 18 upazilas are selected from these 9 districts (3 upazilas from one district, 2 upazilas from seven districts and 1 upazila from one district. We have selected one union randomly from the selected upazila. From each union, 4 villages were selected randomly. So total number of village surveyed were 72.

***Focus group discussion (FGD)***: The purpose of FGD has been to understand how individual, community and the institutions are working to build resilience among the climate vulnerable people. Accordingly, the research team organised several FGDs in different location of the study area. FGD location has been selected in such a way that it covers diversification in terms of nature of climate change hazard and level of intensity. Two types of FGD were conducted in each location: (i) FGD with village people; (ii) FGD with representatives of local government (such as UNO, upazila/union chairman and members of upazila/union council).

Total of 12 FGD were conducted in different locations of 6 districts. These FGDs basically focus on to assess the contribution of community-level institutions to climate change adaptation. This also focuses on understanding the community adaptation planning at the household and institutional level.

## Loss and Damages from Natural Shocks

2.3Using the household survey data, we analyse the extent of loss and damage of the households in the event of two devastating cyclone Sidr and *Aila* that took place in this region in 2007 and 2009 correspondingly. Some districts in our study area were mostly affected by Sidr (various districts of Barisal division mostly) while some were mostly affected by *Aila* (mostly the districts of Khulna division) and some areas were affected by both Sidr and *Aila*.

Various types of assets were damaged due to Sidr and *Aila*. But the most common was the damage of their housing. Almost 88% of Sidr affected households and 75% of *Aila* affected households reported that their houses were damaged to some extent during the cyclone. During the Sidr, loss amount of housing was about 49% of total loss. Other major loss during Sidr was destruction of trees and garden. During the *Aila*, major loss was in housing and fisheries. Both amount of loss and type of loss has its implication in future action research designing.

Another important issue to be considered is whether there is any area specific pattern of the loss due to cyclone. Upazilas nearest to the sea-shore were found to be more affected than those distant from the sea-shore. During *Aila*, areas that were more close to sea-connecting rivers were found more affected than those situated in the distant in the same districts. Even though the cyclone path is determined completely exogenously, still we can conclude that the upazilas or areas closest to sea-shore or sea-connecting rivers are more likely to be affected by such type of cyclone. Such findings also have its implication in identifying programme placement area in the future action research.

## Review of Climate Change Adaptation Strategy and Programmes in Bangladesh

2.4 In Bangladesh, major actors in climate change adaptation can be categorised as: (1) National and local government, (2) Development partners and International Financial Institutions, (3) Civil society organisations (CSOs), (4) Media, and (5) Private sector. All these actors are contributing in climate change adaptation through formation of policies, creating fund and implementing climate change adaptation related activities. In the government sector, Ministry of Environment and Forest is primarily responsible for work on climate change issue. Local Government such as Union Parishads (UPs) and municipalities are working the implementation level. UPs incorporate disaster risk management into their local development plans as the part of "Integration of Adaptation in Local Planning" project. Among the development partners World Bank, DFID, UNDP and few more international development organisations are contributing in climate change adaptation through creating fund and managing the fund for various climate change adaptation activities. Contribution of CSOs such as NGO/MFIs and Community Based Organisations (CBOs) are also contributing in the process through creating awareness and the community level and implementing various adaptation activities.

**Role of GoB:** The GoB has formulated 'Bangladesh Climate Change Strategy and Action Plan (BCCSAP)' in 2008 which was revised in 2009 again. BCCSAP has identified six thematic areas for climate change adaptation namely: (i) Food Security, Social Protection, and Health, (ii) Comprehensive Disaster Management, (iii) Infrastructure, (iv) Research and Knowledge

Management, (v) Mitigation and Low Carbon Development (vi) Capacity Building and Institutional Strengthening. The Sixth Five-Year Plan (2011-2015) pays significant attention to climate change issues. Sixth five year plan has formulated various target/objective in three major area of intervention: (1) Disaster Risk Reduction (DRR), (2) Climate Change adaptation (CCA), and (3) Low Carbon Development (LCD).

The contribution of GoB, Development partners and NGO/MFIs can be better understood in terms of their role in developing funds for climate change adaptation programmes and their role at implementation level. There are two major funds to advance climate change related activities. These include:

(a) The*Bangladesh Climate Change Trust Fund (BCCTF)* – a fund created with budgetary allocation from Bangladesh's revenue sources.

(b) The*Bangladesh Climate Change Resilience Fund (BCCRF)*– a fund created as a Multi-Donor Trust Fund (MDTF) to draw bilateral and multilateral donations from development partners. This fund is currently administered by the World Bank with a further provision for Palli Karma Sahayak Foundation (PKSF) to operate the NGO financing window of the BCCRF (the NGO-funding mechanism accounts for 10 percent of the total fund)

**Role of MFIs-Financial Services**: climate related disasters in Bangladesh present immense obstacles to households lifting themselves out of poverty and remaining above the poverty line.Access to financial products and services is vital to the poor for risk management and reducing vulnerability to climate-induced disasters and shocks. However, in Bangladesh a significant segment of the low-income group remains excluded from the formal financial system. A massive microfinance sector led by developmental NGOs (non-governmental organisations) has emerged to fill this vacuum in financial service delivery. Their financial service includes credit, savings, insurance, and other related services, and they deliver these in the villages, almost to the door of the households. Financial services provided by the MFIs following the disaster are as follows:

***Credit****:* Microcredit contributes to climate change adaptation by enabling households to develop and diversifying their asset base. It also allow the borrowers to invest in some non-productive purposes, such as dealing with emergencies, home improvement and education, which may also reduce household vulnerability to climate-related and other shocks. During and immediately after a disaster, MFIs reschedule existing loans to reduce the burden of repayment and provide new and rapid emergency loans for households to substitute the sources of income they lost temporarily due to the disaster. Being mostly development-oriented NGOs, many MFIs also provide food, clothing, medicine, or other relief goods during the relief phase. Some MFIs offer short-term loans carrying zero percent or negligible interest rate to help their borrowers during the disaster. However, not all MFIs can offer such services because of their limited financial capability.

***Savings*****:** Micro savings act as insurance particularly in disasters. In order to expedite the pace of micro savings, MFIs require all their members to save regularly (e.g., weekly or fortnightly) as Compulsory savings, in addition to voluntary savings. The introduction of voluntary and flexible savings schemes by some MFIs popularise it to many poor households. Some MFIs have modified their savings products to make them more useful for their members in dealing with shocks. One such example is, BURO Bangladesh has introduced contractual term savings that require its clients to make regular savings deposits for a certain period in exchange for the

guarantee that they will be able to withdraw up to three-quarters of the accumulated balance without penalty during a disaster.

***Microinsurance*:** Microinsurance is now recognised as an instrument of disaster risk management, as it saves own resources for coping and quick reconstructions of the assets damaged including houses (Churchill 2006). Although formal insurance companies can offer insurance services to the low income households, but they can not reach to this group of clients because of high transaction cost and delay in claims settlement. On the other hand, MFIs cannot offer legally insurance products to the public. Nevertheless, MFIs do offer informal insurance, popularly known as credit-life insurance, to its borrowers. The basic objective is to protect default in case of damages caused to the property financed by loans and/or death of head of the family or the borrower. Some other types of microinsurance offered by MFIs include health, life and livestock coverage.

***Disaster management fund:*** Some MFIs have developed special funds, either supported by donors or from their own income, to provide assistance to communities during and in the aftermath of disasters. These disaster management funds help the MFIs protect themselves from liquidity crises when there is a sudden run on savings deposits during a natural disaster. The PKSF, the largest microfinance wholesaler in Bangladesh, requires all partner MFIs to contribute one per cent of the interest from their income to a Disaster Management Fund (DMF). PKSF then provides additional funds to its partner organisations to cope with disasters.

***Role of MFIs-non-financial services**:* Ten percent of BCCRF fund is channelled through NGOs for community-level climate actions through a separate project titled "Community Climate Change Project (CCCP)". The Governing council of BCCRF designated PKSF for implementing the community-level climate change adaptation activities through CCCP. In the study area, 16 MFIs are implementing various adaptation related activities in different areas, particularly to address vulnerability due to salinity and flood. Various activities under CCCP project include:

1. Raising homestead plinth;
2. Provision for safe drinking water through:
    i. Installation of tube-wells and deep tube-wells;
    ii. Rain Water Harvesting;
    iii. Establishing desalination plant;
    iv. Pond re-excavation for safe drinking water;
3. Canal re-excavation for irrigation;
4. Installation of improved/environment-friendly cooking stove;
5. Installation of sanitary latrine;
6. Demonstration of climate resilient crop;
7. Repairing of road/embankment with tree plantation;
8. Production of renewable energy;
9. Implementation of various Income Generating Activities (crab fattening, goat rearing, poultry farming, duck rearing, sheep rearing, homestead gardening, fodder production, vermi-compost production etc.)

## Coping Mechanism and Role of Ex anteAccess to Finance

2.5 It has been almost 10 to 8 years since Sidr and *Aila* has taken place in the South-Western region of Bangladesh. Extent of loss was quite high in many areas. Now we need to understand whether the affected people could recover from the loss and what coping strategies they adopted to cope with the loss. From the household survey we found that households adopt multiple strategies, formal borrowing, informal borrowing, use of household savings, and grants. The costly measure is informal borrowing. Use of savings is less costly from the perspective of not assuming any financial burden. Given our ultimate objective of improving adaptation ability and resilience building through financial inclusion, we attempt to discuss the coping and adaptation measures by *Ex ante* access to microfinance.

Use of savings as a means of coping is found to be major coping strategy of all affected households after Sidr and *Aila* (61 percent of Sidr affected households and 55 percent of *Aila* affected households). Taking informal loan is found to be second most practiced coping strategy to recover from the loss. However, this is important to observe that households with *Ex ante* membership are less likely to take informal loan than the non-member households. Taking loan from NGO or receiving grant from NGO appears to be one of the major coping strategies of *Ex ante* members which help them depend less on informal borrowing and grant from government than the non-member households.

Next we look at the amount of coping by source. Sidr affected households with *Ex ante* membership had borrowed more or less same amount from informal credit market, and also sold some of the assets to cope with the adverse impacts of disasters, compared to the non-member households. Despite higher amount of savings utilised and borrowing from MFIs, these households borrowed comparatively higher amount from informal source and fetched more funds by selling assets. This is probably because average loss from Sidr was comparatively high among *ex ante* member households so they need to look for diverged source to cope with the loss amount. This also indicates that with such higher amount of loss, only having access to credit and savings from MFIs may not be sufficient to recover fully or at least majority of the loss. This suggests the need for some additional financial services for the disaster affected households and such need will be addressed in the future action research.

Another way of looking at the recovery process is whether the households could recover from the loss fully or partially or no recovery was possible. Only around 28 percent of Sidr-affected households fully recovered. Most importantly, 50 percent of the affected households could not recover at all or recover less than fifty percent of the loss. Almost same recovery status holds for *Aila*. One important observation is those who have *ex ante* or ex-post membership are more likely to recover fully from the loss than those who do not have any membership with formal institutions. These findings indicate that *ex ante* membership with MFIs or Bank may increase the coping ability of the households. To confirm the assumption, we used some econometric techniques namely: Tobit model and Endogenous Switching Regression, to see the impact of *ex ante* membership on the amount of recovery.

From the Tobit regression model, we find that *ex ante* access to finance has positive sign both in case of Sidr and *Aila*. The marginal coefficient of Tk.2,689 in case of Sidr suggests that compared to the non-member households, the households with *ex ante* access to microfinance had higher amount of recovery by Tk.2,689. In the case of *Aila*, the marginal effect is even bigger, which is Tk.4,311.

From the Endogenous Switching Regression model, we find that in general *ex ante* membership has positive significant impact on recovery amount both in Sidr and *Aila*. We also looked at from which source (coping strategy) the households would have collected the fund for recovery. We find that during Sidr *ex ante* membership has positive impact on collecting the fund from NGO/MFI loan and Grant from NGO/MFI (which is quite obvious). On the other hand, *ex ante* membership has negative impact on accumulating fund from informal loan, sell of asset, grant from government and own savings. During *Aila*, these findings on source of fund changed a little. Loan from NGO/MFIs and grant from NGO/MFIs still remain the major source of fund for recovery for the households with *ex ante* membership. Still, *ex ante* membership has negative impact on collecting fund from informal loan. One major difference is *ex ante* membership has positive impact on sell of asset. The impact of *ex ante* membership on use of own savings is unclear, with different switching model specification, it gives contradictory result.

As evident from all the findings reported above, ability to fully recover from such disaster is quite low even among the microfinance/bank members. Question is, why. It is because of loss and damages to physical assets like houses that constituted almost 40 percent of the loss. If recovery process is left to the market mechanism of credit and savings, full recovery will take even longer period. The process of full recovery can be expedited through microinsurance for houses (property insurance). This does not exist now.

The positive outcome of *ex ante* access to microfinance clearly suggest that adaptation capability can be improved through ensuring access of the households in the disaster-prone areas through financial inclusion, particularly for credit and savings. How can they be ensured? This can be ensured through expanding network of microfinance institutions. The critical issue is, do the MFIs locate their programmes in more vulnerable areas. We have shown that amount of loss due to cyclone is higher for the households very close to the sea. Therefore, locating branch-network in the most vulnerable areas might be costly for the MFIs. However, locating branch may not be an issue because MFIs operate through their field assistants at the village level although physical location of the branch may be in the less vulnerable areas. The question then is, do the MFIs extend their financial services in most vulnerable areas? More vulnerability of the areas may have adverse impact on economic outcomes of the households and thereby financial transactions as well as sustainability of MF branches. Does it really hold? This needs to be examined from the perspective of spatial analysis of location of branches. This was one issue that was separately examined.

## Objectives of Balance Sheet Analysis

3.1 The purpose of balance sheet analysis of the financial "health of MFIs" is to understand (i) how climate disasters such as Sidr and *Aila* affected their balance sheets, and (ii) their contingency plans for future climate shocks. It is important that MFIs are able to sustainably provide a wide range of financial and non-financial services, and continue to evolve these services, as climate change progresses. Climate change adaptation is a continual process; hence, MFIs have to be engaged continuously with households and communities to support adaptation at these levels. Continuity in the provision of services is only possible when NGOs have a sound financial base, which requires sufficient provisioning for bad loans, access to disaster funds and contingency plans.

Climate change poses a serious threat to this continuity. Climate change could increase the frequency and severity of extreme weather events, reduce the predictability of seasonal weather patterns and through long-term changes in rainfall, temperature and other regimes, reduce

agricultural productivity. All of these impacts would make it difficult for the borrowers investing in agriculture to repay their loans. MFIs could also incur direct damages from climate change, such as when a storm or cyclone destroys some of their physical assets, such as buildings. Information on how MFIs can best prepare for future climate change scenarios is required. A study of MFI financial preparedness for climate change will be undertaken.

The objectives of this component will be to (i) assess impact of past extreme weather events on financial health of MFIs, and (ii) assess and present options for MFI preparedness for future climate risks

### Methodology of Balance Sheet Analysis

3.2 To understand how extreme weather events, such as *Aila*, Sidr and Mohasen, have impacted the financial health of MFIs, the study will collect information of various financial indicators of branches of MFIs operating in the climate hazards areas. Information on selected financial indicators will be collected for current period as well as for pre and post disaster period.

Other than the financial indicators, the study will also collect information on number of borrowers affected, length of time they cannot repay loans, amount of loan write-off required, amount of savings released, access of MFIs to soft finance, etc.

A two-part methodology has been adopted. Part 1 considers how extreme weather events, such as *Aila*, Sidr and Mohasen, have impacted the financial health of MFIs. Analysis will include operating cash flow before and after disasters (increased operating costs and decreased operating revenues would be expected). The analysis would consider whether Internationally Accepted Accounting Standards for cash flow reporting are being applied. Another useful indicator would be "times interest cover" ratio (e.g. a ratio of X times interest cover to net profit before interest expense). Other ratios will be considered for any costs that might have been impacted by the disaster, e.g. net profit to wages. The indicators would be able to uncover whether a worsening financial position is occurring.

Part 2 considers how well MFIs are resourced to withstand future extreme weather events. Scenario analysis will be conducted with plausible scenarios developed as a Stress Test for MFI cash flows. The scenarios will present assumptions on number of borrowers affected, length of time they cannot replay loans, amount of loan write-off required, amount of savings released, access of MFIs to soft finance, etc. Scenarios will also consider multiple disasters at various time intervals, with reference to IPCC climate scenarios.

A sample of NGO-MFIs will be selected for the analysis. A number of meetings will be arranged in the study area with the MFIs where officials from both main office and branch offices will participate.

The study will conduct a branch level survey to gather information on the necessary indicators. The MFIs operating in the selected districts constitute the population. Sample MFIs will be selected from this population. MFI selection criteria are as follows:

1. Select both local and national MFIs.

2. Select MFIs of various sizes. Small MFIs, however, should be avoided since they have limited scope and capacity currently to implement climate adaptation programme in the near future.

**Branch selection criteria are as follows:**

1. Select 250 branches from the selected MFIs

2. Branch should be selected based on the size of the branch and vulnerability of the location.

***MFI survey***: Based on the selection criteria mentioned above, we have selected total of 22 MFIs. From each of the MFIs, we have collected the location of all branches operating in the selected. Total number of branches operating in this area from the selected MFI is 1,094.

While selecting sample branches to be surveyed, we have considered that the action research will be designed based on the findings of all three components. So it is important to ensure that the study areas of all three components are common so that the component level information can be easily matched. In the intervention stocktaking component, we mentioned that the study will be conducted in 18 upazilas of 9 districts. So, for the balance sheet analysis, we choose those branches of 22 MFIs which are operating in these 18 upazilas. Accordingly, the total number of branches is found to be 275 in number.

From the MFIs, we collected the names/addresses of the branches operating in the selected 18 upazilas. After receiving the list of branches, we communicated with the MFIs with the request to fill-in the branch questionnaire. We finalised the branch questionnaire during the first quarter. We also prepared a guideline for the questionnaire and shared it with the MFIs.

From these 275 branches we finally received data from 250 branches. So the balance sheet analysis will be conducted on these 250 branches.

***Meeting with MFIs***: The purpose of the meeting with MFIs is to understand the practice and preparedness of the MFIs operating in the climate distressed areas. InM Research Team has organised several meetings in different study location. Some of these meeting were held with the CEO of the organisation while some others were with the branch level staffs. Total of 10 meeting was conducted in different location of the study area.

Issues discussed with MFIs comprises: (1) Impact of natural disasters on the financial health of MFI branches, (2) Whether exposure to hazards plays a role in decisions related to branch location (3) Reasons for branch closure (if any) and whether exposure to natural disasters plays any role (4) Changes in branch operations to ensure their sustainability in the face of natural disasters and climate change (including contingency plans) (5) Any innovative approaches/interventions to support communities on climate change adaptation or disaster risk reduction. These include, for example, community vulnerability assessments, support for climate-resilient livelihoods, disaster resilient housing, health or disaster-related insurance, etc.

## Financial Statement Analysis and Performance Evaluation of MFIs

3.3 A structured questionnaire was used for eliciting financial and non-financial data for the sample MFI branches. An MFI branch was considered a separate entity from accounting point of view. In addition to income and expenditures data, the survey therefore collected detailed information about branch-level assets, liabilities and equity. The non-financial data included information about microfinance activities, human capital, changes in the number of borrowers, local attributes, and vulnerability to natural disasters.

As a measure of what we call “efficiency,” we consider the accounting value of a branch’s net interest income divided by total assets, or the net interest margin (NIM). This is an ex post measure of spread and likely to be influenced by loan defaults due to disasters. Return on equity as

a measure of profitability is inappropriate because many branches operate with extremely low equity capital.

From the balance sheet analysis this is evident that natural disaster adversely affects the financial performance of the MFI branches. This is because their clients are affected and they cannot repay loan after the disaster. Financial performance of the branches worsens because of the increasing bad loans.

Now question is how such vulnerability of branches can be reduced? If the risk of the clients can be reduced this will also reduce the operational vulnerability of the branches. Various types of microinsurance could be an effective risk minimising financial instrument for the people living in disaster prone area. If their loss due to disaster is covered through insurance then their transaction with MFIs will not be affected. This in turn will ensure less vulnerability in the operation of branches.

## Objectives of Spatial Analysis

4.1 Accessibility to goods and services often varies across space due to differences in population, demographics, transportation infrastructure, etc., at different geographic locations. The analysis will be based on geographic variations in the spatial accessibility (SA) to a particular service – i.e. the number of service providers available at a location and the spatial connectivity (distance or travel time) between the location and the potential financial service providers. This study will investigate the relationships between climate vulnerability and SA to microfinance services, with a focus on the southwestern region of Bangladesh. Climate vulnerability will be assessed in terms of extent of flood and salinity.

Our hypothesis is that SA to microfinance is lower in areas with high flood vulnerability and high soil salinity because it is more difficult for MFIs to generate enough income to cover their working costs in these areas (e.g. due to risks of loan non-repayment after severe floods or crop losses). Other aspects of this study are: (1) we employ multiple SA measures (distance to nearest branch, a gravity model-based measure, and a kernel density estimation-based measure) to reduce uncertainties caused by adopting an overly narrow definition of SA, and (2) we compare global (OLS) and local (geographically-weighted regression (GWR)) modelling approaches to determine which better explains the relationships between SA and the spatial determinants.

In short, the stock taking analysis will examine:

- How vulnerability to climate change is affecting the financial performance of MFI branches. It is hypothesised that an inverse relationship exists between MFI branch vulnerability to climate change and financial performance.
- How vulnerability to climate change and natural hazards is influencing the spatial distribution of NGO-MFI services and how this spatial distribution has changed over time. It is hypothesised that MFIs will be less active in areas most vulnerable to climate change, unless they have climate change adaptation as one of their programmed objectives.
- How vulnerability to climate change and natural hazards impacts microfinance products and how they are used. It is hypothesised that both slow and rapid onset climate changes will impact the size of loans and how they are invested/used by households, with average loan sizes and per member savings being lower in climate vulnerable locations than other areas.

## Methodology of Spatial Analysis

4.2 Several geospatial data sets related to MFI branch locations and spatial determinants of SA to microfinance were collected for this study. First, a field survey was conducted to obtain the GPS locations of all MFI branches in the 18 selected upazilas, and these branch locations were mapped using Geographic Information Systems (GIS) software. Other important data collected from the secondary sources are: (i) population data (ii) locations of paved (*pucca*) roads (iii) boundaries of major rivers and the Bay of Bengal, and (iv) soil salinity information.
Three types of SA measure has been used – (a) Euclidean distance to the nearest branch, in Km, measured from each consumer point, (b) GM-based SA measure, (c) KDE-based measure.

## Exploring the Relationships between Climate Vulnerability and Spatial Accessibility to Microfinance

4.3 For analysis of the spatial determinants of SA to microfinance, couple of maps were generated. We first generated a map of potential microfinance consumer locations (points). Next, information related to each potential spatial determinant of SA was assigned to the consumer points and different maps were produced for each determinant. These determinants are: (i) population per $km^2$ at each consumer point (ii) distance from each consumer point to the nearest road, in m (iii) distance from each consumer point to the nearest major river, in m (iv) percent of the land area (per $km^2$) with high soil salinity levels. After generating all these maps, OLS and GWR regression modelling approaches were used to analyse the spatial determinants of SA to microfinance.

Maps of SA to microfinance for each of the three SA measures, generated using the branch location data (number of branches = 763). In all three maps, it is clear that areas located near rivers typically had lower SA to microfinance. The southeastern part of the study area in particular had quite low SA values. This area, in addition to being located near rivers and the Bay of Bengal, also has quite high soil salinity.

The relationships between SA and these explanatory variables were investigated using ordinary least squares (OLS) regression and geographically-weighted regression (GWR) modellingapproaches. The GWR models were better able to predict SA based using these explanatory variables, and the GWR model predicting "distance to nearest branch" had the highest prediction accuracy. In all of the GWR models (and two of the three OLS models), high flood vulnerability (measured by "distance to nearest river") and high soil salinity (measured by "percent of land with soil salinity > 4 dS/m") negatively affected SA to microfinance, indicating that access to microfinance is lacking in these climate-vulnerable areas.

## Purpose and Methodology of Action Research

5.1 The experimental design of the action research will provide effective institutional and operational arrangements and intervention packages to build adaptive capacities at household and community levels. The action research is elaborated to reflect the impacts of climate change on different parts of Bangladesh, e.g. draught in the North-West vs. sea level rise and greater weather extremes in the South-West. An experimental testing of different sets of interventions for different locations will generate scientific knowledge with generalisable conclusions for applications in other countries with similar environmental conditions.

The interventions selected for the action research will be based on the results of the stock-staking and other background studies and the exposure visits to selected countries to identify progressive practices. The following activities will be considered in designing the experimental action research.

- Network and institutional development
- Customised and flexible savings and loan products
- Appropriate and effective micro-insurance
- Financial services packaged with training and outreach
- Community-based environmental literacy

## Lesson Learnt from International exposure trips

5.2 Southern region of Bangladesh is exposed to various natural disasters like cyclone, flood, salinity and water logging. These events mostly affect their properties (particularly the housing), health and agriculture adversely. As mentioned earlier, the action research will design certain insurance products–particularly housing, agriculture and health insurance. These insurance products do not exist in Bangladesh for the poor and vulnerable people. However, similar type of microinsurance products has already been implemented in some other countries.

Some countries in Africa, Latin America and Asia are currently implementing microinsurance through MFIs for the climate vulnerable people. Exposure visits to selected countries have been made to design appropriate microinsurance products for the vulnerable poor in Bangladesh.Considering the objective of the action research and relevancy in the context of Bangladesh, the research team, in consultation with JICA, decided to visit Philippines and India.

Lessons and observations from Philippines and India exposure visits:

- **Microinsurance needs an appropriate regulatory and institutional framework to flourish.** The regulations define microinsurance, establish product parameters, regulate the disaggregation of premiums, identify the entities with the right to underwrite and deliver microinsurance, relax some requirements in order to make microinsurance more attractive to the insurers, and provide some protection to the policy holders.
- **Regulations on microinsurance are best developed through a multistakeholder approach.** It is important to develop microinsurance regulations through dialogues and consultations that bring out stakeholder interests, and technical groups involving the financial regulators, the insurance industry, MFIs, the financial intermediaries, etc.
- **Regulations can be introduced after some experience is accumulated and should not be too rigid.** This is importantto developregulations based on lessons from early initiatives as well as keeping the initial regulations flexible to encourage experimentation. It may be best to begin with a set of basic regulations that allow microinsurance to get off the ground, with preparedness to elaborate the regulations at a later point in time.
- **Regulations should permit the provision of microinsurance by various types of entities and a through a variety of distribution channels.**
- **Mandating a body at national level to promote microinsurance may accelerate the development of the sector.**
- **A national microinsurance strategy and literacy programme can also contribute significantly to the development of the sector.**Without a large investment in literacy at all levels; microinsurance for the low income sector will not succeed. In the Philippines, the Microinsurance Literacy Roadmap consists of: 1) the formulation of key messages on the role of stakeholder groups in the development of the microinsurance market; 2) the development

of training and communication materials to be used by various stakeholders, 3) training of microinsurance advocates, and 4) roadshows and public seminars in key cities across the country. In India, the Centre for Financial Education owned by all the regulators provides financial literacy for bank account holders, while the Reserve Bank of India supports financial literacy in schools. There are now more than 1,300 financial literacy centres across the country.

- **While the partner-agent model is widely promoted, the MFI-MBAs, self-help groups (SHGs) and co-operatives have been more successful than commercial companies in developing and delivering microinsurance.**
- **Numbers can be achieved when insurance rides on other financial services.**This will be possible when insurance product is integrated with other financial products like receiving loan or opening bank account or becoming member of MFIs etc.
- **Some promising examples of micro health insurance can now be observed, but micro health insurance and improvements in primary health care service need to go hand-in-hand.**
- **Some weather-based index insurance products exist but the concept is yet to prove itself**
- **There are a few examples of calamity cover that provide a pay-out to support recovery. They do not indemnify for total losses.**
- **Product bundling is becoming more common**
- **Microinsurance can be incorporated into a package of inputs to support livelihood development**

**Proposed framework for Experimental Research on Improving Adaptive Capacity and Building Resilience**

6.1Based on the survey findings, literature review, and international exposure visits, the following policy implications can be drawn:

**First,** climate change related literacy along with financial literacy should be promoted. PKSF can establish a Centre for climate change and financial literacy to promote literacy in a structured manner. This Centre will implement literacy programmes both for MFIs and participants and non-participants at the field level through InM and PKSF-POs.

**Second,** participating POs should design specialised credit policies with provision for large loans, and also design special savings scheme to expedite the pace of savings.

**Third,** microinsurance products particularly health insurance and asset insurance should be designed and offered to the microfinance members and borrowers through POs.

**Fourth,** participating POs should work closely with the community and local government to support community level adaptation planning and interventions.

**Fifth,** special schemes should be developed for the most vulnerable poor households, such as those who could not recover at all even ten years after Sidr and eight years after *Aila*. The vulnerable poor households are likely to include beggars, female-headed households and wage-labour dependent families. In all these efforts, InM can play supportive roles especially through sharing technical and knowledge products.

6.2 The recommendations that we have drawn from the findings of the household survey will improve adaptive capacity and resilience of the households. But, this requires a well-structured approach that can ensure coordination of households, MFIs, community level institutions and local government. The most convenient approach would be through a single entity that can deliver and implement all the components in coordination with or participation of the local governments and

community level organisations. PKSF has been implementing a programme called ENRICH (Enhancing Resources and Increasing Capacities of Poor Households towards Elimination of their Poverty) that is being implemented through PKSF POs in coordination with local government and community level institutions. ENRICH is an appropriate vehicle for our recommendations as it not only promotes participation of local government and community level leaders, its programme components include larger loan size, special savings, primary health care, special programmes for the ultra-poor, such as beggars, education, and a community Centre - the ENRICH Centre.

Given the existing network of ENRICH and PKSF POs, ENRICH components can be extended to include climate change and financial literacy and microinsurance. This will also facilitate PKSF to implement the next phase of the project with the existing network and following the guidelines of ENRICH. Although ENRICH is an on-going programme, the extended programme could be experimented using randomised controlled trials (RCT) in the southern part of Bangladesh for effective implementation at a large scale in future.

# Chapter 1

# Introduction

## 1.1 Background

Bangladesh has made large strides in increasing incomes and reducing poverty levels. However, climate change poses new and serious threats that could undermine this hard-won progress, as well as continued delivery of services to the poor. In Bangladesh, the projected climate change impacts include increased risk of extreme weather events such as cyclones and tornados; less predictable and more intense rainfall; higher risk of drought, especially in northern parts of the country; coastal and riverbank erosion; storm damage of mangrove forests resulting in biodiversity loss; loss of land and intrusion of salt water into soils and aquifers due to sea level rise; and sedimentation of riverbeds (UNDP n.d., 1). During the past two decades, the southern region of Bangladesh has experienced three severe cyclones. Three major studies of InM show that the affected households are yet to fully recover from the colossal damage caused by these disasters.

While Bangladesh is both highly exposed and sensitive to the impacts of climate change, it does have some "assets" that can help it adapt to climate change. One of these is a diverse and professionalised microfinance sector with extensive outreach infrastructure. After four decades of experimentation and practice, microfinance is now an established norm (part of regular social and economic life) in over 70,000 villages in the country. About 26 million people are actively participating in microfinance operations as of December 2010 (CDF/InM, 2010, p. 3), of which over 85% are women. The sector is regulated by the Microcredit Regulatory Authority (MRA), which as of May 2014 had approved 742 licenses for non-governmental organisations (NGOs) to provide microfinance services.

The delivery of services almost to the doors of poor rural households by NGOs with developmental agendas distinguishes this sector from other delivery channels especially in the rural areas of the country. In addition to microfinance services, many of these NGOs provide a variety of home-grown non-financial services to poor rural households, including training on income generating activities, institution building, non-formal education, health and sanitation, awareness on social issues, disaster relief and reconstruction, and in other essential areas.

### 1.1.1 Background studies on research proposal

Several studies, conducted earlier by the Institute for Inclusive Finance and Development (InM), Institute for Global Environmental Strategies (IGES) and by Palli Karma-Sahayak Foundation (PKSF) provide important background information for designing the present project to promote financial inclusion for disaster and climate resilient households and communities. Among others, these studies assessed the impacts of microfinance on household wellbeing in disaster prone areas, developed concepts for analysing and promoting the relationship between microfinance and climate change adaptation, and surveyed the demand for microinsurance among low income households.

### 1.1.2 Empirical studies on impact of *ex ante* access to microfinance on coping strategies

Two studies, jointly conducted by InM and IGES, investigated the impact of *ex ante* access to microfinance on the strategies used by poor households to cope with climate-related shocks and stresses. One study used InM-PKSF census data of 480,918 poor households in Greater Rangpur to investigate whether *ex ante* access to microfinance had any impact on the strategies employed by households to cope with *monga*, or seasonal starvation, in North-Western Bangladesh. Employing the switching regression method, the study found that without *ex ante* access to finance, households would have resorted more to "erosive" coping strategies that put long-term household wellbeing at risk. Specifically, without *ex ante* access to microfinance, they would have sold 73,803 more labour days in aggregate in advance; on average they would have sold Tk. 1,663 more in assets; and on average they would have borrowed around Tk. 3,951 more from the informal market. The second study examined how access to microfinance impacted coping and recovery in response to three catastrophic cyclones – Sidr, *Aila*, and Mahasen – that struck South-Western Bangladesh in 2007, 2009 and 2013, respectively. The data for this study was collected through a sample survey conducted in February and March 2014 by InM. A total of 3,687 households (which represented a statistically representative sample of households) in three districts – Khulna, Patuakhali and Satkhira – were surveyed.The study showed that damages to the household dwellings followed by loss of income generating activities were major consequences of cyclones. Households who experienced damage to their houses and income generating activities took a long time to recover from the losses, and eight years after the disaster some had yet to recover to pre-disaster levels. The study also found that access to microfinance through Programmed Initiatives for *Monga* Eradication (PRIME) contributed to recovery.[1] The study found that twice as many PRIME households as control households used current income and savings for coping, whereas the reverse was true for informal loans. The studies showed that having greater savings had a higher impact on poverty alleviation than access to credit, and that with access to savings as well as credit and insurance services, households were even better off and more resilient.

### 1.1.3 Studies to conceptualise adaptation-oriented microfinance

Two other studies reviewed the literature, focusing on how microfinance services had evolved over time and the disaster risk reduction and climate change adaptation programmes that MFIs were implementing. The studies found that microfinance institutions (MFIs) had been making an important contribution to disaster risk reduction and adaptation both indirectly through financial services and directly through their relief, recovery and adaptation programmes. The concept of "adaptation-oriented" microfinance, i.e. microfinance that retains its focus on poverty reduction but is engineered to maximise its adaptation benefits has been used to emphasise these dimensions of MFI activities (see InM Working Paper No.39). It suggests that key elements of adaptation-oriented microfinance include: flexibility and customisation, including voluntary savings products; sufficient access to liquidity for MFIs to support their members through extreme weather events; loans packaged with training and extension on adaptation technologies (e.g. agricultural products and production methods suited to the increasing drier conditions in the north and areas experiencing salinisation in the south); appropriate financing for physical infrastructure (e.g. hazard-resistant housing, rainwater harvesting,

[1]PRIME is a support programme designed by PKSF and implemented by its partner NGO-MFIs for ultra-poor households. It includes emergency loans and food-for-work, microcredit, micro savings and training on income generating activities.

water filtration systems, etc.) at household and community levels; micro-insurance products with acceptable premiums that cover real risks faced by households and that incentivise risk mitigation; and a focus on outreach to the most climate-vulnerable groups, especially those in remote, ecologically fragile areas.

### 1.1.4 Market assessment survey on microinsurance

Another study that serves as important preparation for the present proposal on financial inclusion for disaster and climate resilient households and communities is a market assessment survey on microinsurance conducted by PKSF. This study was motivated by the understanding that idiosyncratic and catastrophic shocks severely impact the lives and livelihoods of the marginal segment of the population in Bangladesh. Even shocks that would only mildly affect upper- and middle-income households can dramatically reduce the assets of poorer households, eliminate their income sources, reduce consumption, and thus adversely affect their ability to improve their social and economic welfare. These households have almost no access to formal insurance; so to cushion the shocks, they borrow from formal/informal sources, withdraw their savings, or sell productive and non-productive assets. However, these strategies are insufficient and over the long-term can lead to deeper poverty.

The microinsurance market assessment survey was one component of a microinsurance project titled 'Developing Inclusive Insurance Sector Project (DIISP)' which PKSF implemented with the support of the Japan Fund for Poverty Reduction (JFPR) and the Asian Development Bank (ADB). The project was implemented by PKSF's disaster management and microinsurance programme, which is under the fold of its social protection programme. In addition to the market assessment survey, the project prepared draft regulatory guidelines, worked for awareness creation and capacity building and, through PKSF partner MFIs, introduced poor-friendly microinsurance services (e.g. credit-life, livestock, hospital cash benefit etc.) in 2013-14 with promising results. The number of policy holders in the credit-life insurance, livestock insurance and hospital cash benefit insurance policies were 5.08 million, 0.42 million and 33,770, respectively.

### 1.1.5 Critical findings

The critical findings of the preliminary studies cited above can be summarised as follows:

(i) **The impacts of climate change are already being felt in Bangladesh, with significant variation across the country.**
The North-Western region, which is prone to flash flooding, is becoming increasingly drier. Changes in river hydrology and morphology are likely to be substantial and will require continuous adaptation. The cyclone and tornado prone South-Western region will also experience major changes in river hydrology and morphology, but will also have to contend with greater exposure to extreme weather events and salinisation due to changes in climate patterns and sea level rise. Damage to property induced by climate change is more manageable in the North-Western region, while protecting property from extreme weather events poses an immense challenge in the South-Western coastal belt.

(ii) ***Ex ante*** **access to microfinance increases household adaptive capacity and builds resilience**. Impacts on poverty alleviation and resilience building are greatest when households have access to savings, credit and insurance services, and when microfinance is provided as part of a support package that includes non-financial interventions.

(iii) **The impacts of *ex ante* access to microfinance on household wellbeing are not uniform across Bangladesh**. The impacts are relatively larger in the flood-prone North-Western region than the cyclone and tornado prone South-Western region. This appears largely because households in the South-Western region have been exposed to extensive repeated covariate climate shocks and have relatively lower savings to draw upon during periods of hardship due to the lack of appropriate savings instruments and the low level of economic activities.

**(iv) Microinsurance products are not widely available, but are highly relevant to climate change adaptation.** Acquiring and creating productive assets and increasing income are instrumental for the poor and low-income segment of population for coming out of poverty sustainably. Access to microcredit can assist households in building their assets and increasing income, but idiosyncratic shocks including accidental death, illness, asset loss, etc. cause severe setbacks in the process of asset accumulation, and often force poor households deeper into poverty. There are very limited alternative formal institutional mechanisms of risk mitigation available to the poor and lower-income households. The mainstream insurance market of Bangladesh is fragmented. As per National Insurance Policy 2014, the insurance penetration rate of Bangladesh is around 0.9% (0.7% life, 0.2% non-life) which is among the lowest in the world. The conventional insurance companies in Bangladesh mainly focus on middle or richer segment of the population. The low-income segment is almost untapped by the mainstream insurance market due to lack of insurers' self-interest, infrastructure deficiency, distribution challenges and the absence of a separate regulatory framework for microinsurance.

The basic conclusion that can be drawn from the studies described above is that ***full use should be made of NGO-MFI "social assets" – trust relationships with the communities, extensive delivery infrastructure across much of the country, culture of experimentation and learning, expertise on rural development – for disaster risk reduction and climate change adaptation.***

## 1.2 Scope and Objectives of Study

While some understanding of good practices for microfinance exists, to effectively support climate change adaptation microfinance must continually evolve in response to the changing conditions that households experience as well as the future projected impacts of climate change. In the context of climate change, action research within an experimental design is needed to identify effective institutional and operational arrangements and intervention packages to build adaptive capacities at household and community levels. The action research needs to be elaborated to reflect the impacts of climate change on different parts of Bangladesh, e.g. drying in the North-West vs. sea level rise and greater weather extremes in the South-West. An experimental testing of different sets of interventions for different locations will generate scientific knowledge with generalisable conclusions for applications in other countries with similar environmental conditions.

Given the need for an experimental action research on household and community level adaptation, a comprehensive framework for action research has to be designed. Such a design has to be made based on some background studies.

Therefore, the basic purpose of this research is to design a comprehensive action research based on background studies under the present JICA funded proposal.

The following research activities will be conducted under the present project to contribute to realising the full potential of microfinance and the microfinance sector to facilitate disaster risk reduction and climate change adaptation.

***Component 1: Comprehensive stocktaking analysis of MFI and NGO engagement in disaster risk reduction and climate change adaptation***

The stocktaking will focus on, but not limited to Bangladesh. Identification of best practices in other countries with similar exposure to disaster and climate change related risks will be useful for designing broad policy parameters for an effective framework for adaptation and resilience building at the household and community levels. Knowledge and experiences are diverse. Creation of new knowledge and exchange of existing knowledge through such a stock taking will pave the way for designing an action research project to generate knowledge with wide applicability across the globe.

The stocking analysis will have three sub-components: Intervention Stocktaking, Balance Sheet and Contingency Stocktaking, Spatial Analysis.

***Component 2: Design action research to pilot test interventions for building household adaptive capacity and resilience***

The interventions selected for the action research will be based on the results of the stock-staking and other background studies and the exposure visits to selected countries to identify progressive practices. The experimental action research will be designed considering network and institutional development, customised and flexible savings and loan products, appropriate and effective microinsurance, required training, and community based environmental literacy.

# Chapter 2

# Intervention Stocktaking

## 2.1 Objectivesof Intervention Stocktaking

In Bangladesh, NGO-MFIs and NGOs in general are already making an important contribution to disaster risk reduction and climate change adaptation. A comprehensive stock taking analysis will be undertaken which will characterise the adopted interventions and quantify their significance in relation to contributions from other sectors, as well as identify gaps and good practices. The types of NGO-MFI interventions are wide ranging and include standalone financial services (microcredit, savings products, and to a lesser extent insurance); combined financial services (e.g. loans for livestock fattening packaged with insurance); packaging of financial services with non-financial services (e.g. loans packaged with training on crab cultivation in areas affected by salinisation, etc.); cash-for-work programmes to support recovery after climate disasters; grants to build climate-resilient household and community-level infrastructure (e.g. raising homestead plinths, rainwater harvesting, etc.); disaster relief; support for education, health and sanitation; community institution building; hazard assessments and disaster preparedness; etc. Data and information for the stocktaking analysis will be drawn from the literature and from an extensive field survey of NGO-MFI interventions, especially in climate change vulnerable areas. The specific numbers and targeted locations will be specified in the detailed proposal to be submitted as inception report.
This stock taking assessment has three objectives:

- Objective 1: Provide a stock taking of NGO-MFI interventions that are relevant to climate change adaptation and disaster risk reduction
- Objective 2: Provide a review of community institutions and households and how they have contributed to climate change adaptation in the study areas.
- Objective 3: Provide a stock taking of adaptation planning and support initiatives in the study areas.

## 2.2 Methodology

For objective one the Research Team has (i) conducted a thorough literature review to categorise NGO-MFI interventions relevant to climate change adaptation; (ii) selected locations with contrasting exposures to climate vulnerability and/or with contrasting interventions from NGO-MFIs as the study sites; (iii) used secondary information and field surveys (household survey, key informant interviews and focused-group discussions); (iv) provided a descriptive profile of each location that explains its exposure to climate change, how climate change has impacted the communities, their adaptation needs, and the adaptation practices they have adopted; and (v) provided an inventory of NGO-MFI interventions at the study locations, including how these have evolved over time. The analysis will identify possible strengths and gaps in NGO-MFI programmes in terms of building household and community adaptation capacity based on best practices that are available globally.

### 2.2.1 Sample frame for household survey

The research team has identified several districts from South-Western region of Bangladesh which are more vulnerable to climate change for conducting a household survey to map the vulnerability of the households. The survey will identify their existing coping mechanism and how much the people residing in the disaster prone areas are prepared for the potential climate change effect. Total of 2,250 households will be surveyed under this study[2].

For the purpose of our research, 9 districts have been selected using both purposive and random sampling method. From each district we have selected number of upazilas and unions randomly. From most of the districts, we have selected two upazilas. Exception is in Bagerhat and Madaripur, where we have selected three upazilas from Bagerhat and one upazila from Madaripur. We have selected one union from selected upazila. In total, there are 18 unions from 18 upazilas in selected 9 districts. Table 1 summarises the sample distribution by districts.

**Table 1: Sample Distribution**

| District | No. of upazila | No. of union | No. of villages | Sample size |
|---|---|---|---|---|
| Satkhira | 2 | 2 | 8 | 250 |
| Khulna | 2 | 2 | 8 | 250 |
| Bagerhat | 3 | 3 | 12 | 375 |
| Barguna | 2 | 2 | 8 | 250 |
| Pirojpur | 2 | 2 | 8 | 250 |
| Barisal | 2 | 2 | 8 | 250 |
| Madaripur | 1 | 1 | 4 | 125 |
| Patuakhali | 2 | 2 | 8 | 250 |
| Bhola | 2 | 2 | 8 | 250 |
| **Total** | **18** | **18** | **72** | **2,250** |

Source: Study Survey 2017

For objective 2, the Research Team recognises that institutions at community-level can play an important role in climate change adaptation. However, NGO-MFIs do not engage much with community institutions; they usually create their own groups in the communities and deliver their services to households via these groups. Therefore, we plan to assess the contribution of community-level institutions to climate change adaptation separately, using focused-group discussions (FGDs) of the stakeholders and households. The best practices will also be documented in the process.

For objective 3, a stock taking of adaptation planning and support initiatives will be undertaken in the study locations. Progressive initiatives outside the study locations to promote community-based adaptation would also be reviewed. FGDs will be required to meet the objective.

[2] Following formula is used for calculating the sample size:

$$n = p(1-p)(\frac{Z}{E})^2$$

where,
p=proportion=0.5 (assumed 0.5 for maximum sample size)
Z=1.96 (significant value at 95% confidence level)
E=error level= 2% (rounded)
Considering the values above, sample size would be 2,241. We round it up t 2,250 for the convenience.

### 2.2.2 Primary data collection

***Questionnaire finalisation***

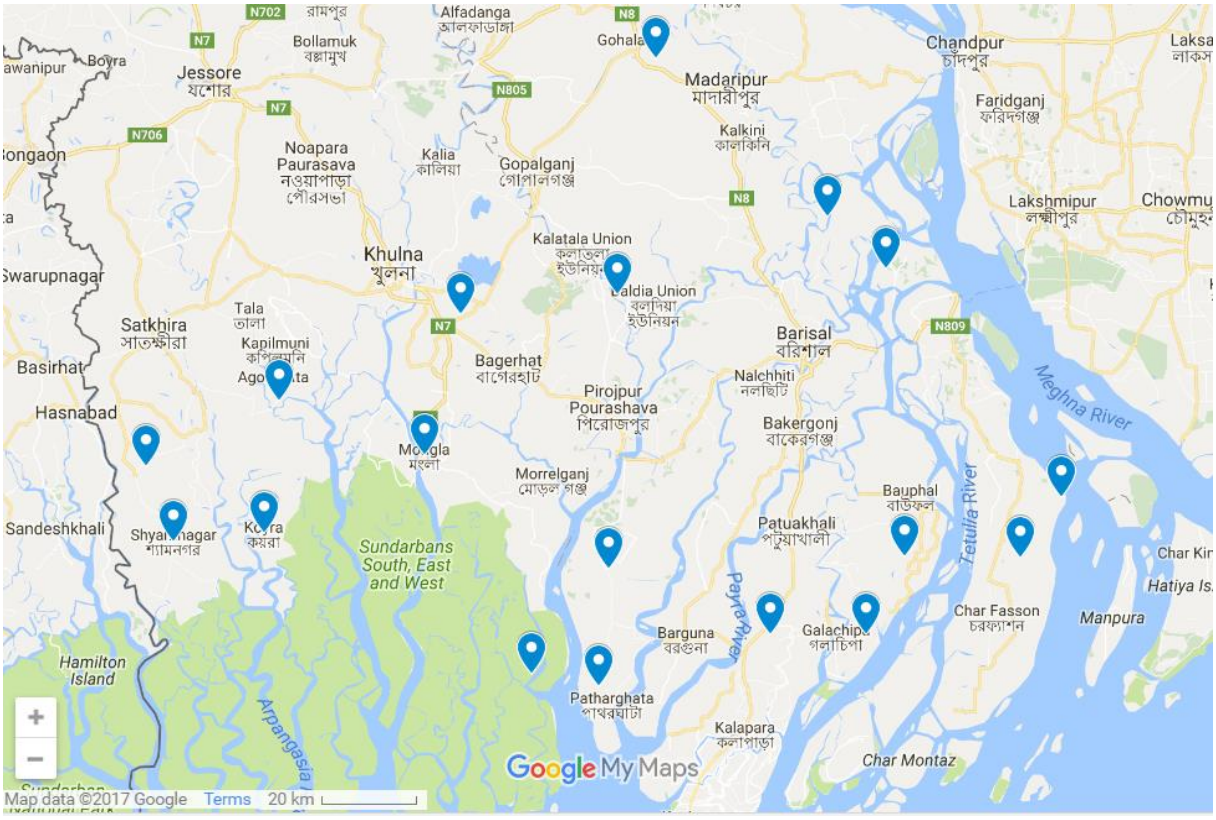
Household survey questionnaire was prepared and pretested in December 2016. The questionnaire was finalised in the first week of January upon receiving comments from the field staffs during the pre-testing and training. After finalising the questionnaire, it was sent to a firm who designed the questionnaire in the ICR (intelligent character recognition) format. ICR technology can recognise the handwriting for data capturing and hence no manual data entry is required. This reduces the data entry error substantially. After questionnaire designing and printing, the questionnaires were distributed to the field staffs.

The household survey questionnaire was prepared taking into account the objectives of intervention stocktaking analysis. Major modules in the questionnaire include: (i) demographic information; (ii) economic indicators; (iii) food security; (iv) migration; (v) access to financial services; (vi) disaster and coping mechanisms; and (vii) climate change knowledge and preparedness for the future. Other than the household questionnaire, there was another short two pages questionnaire to collect relevant basic information on the survey villages. Such village level data will be used to control for village level characteristics in the analysis.

***Training of field enumerators***

For the household survey, InM involved selectedexperienced and reliable field enumerators from its roster, having good work record in the past. The training for the filed enumerators was conducted by the Research Team in the first week of January 2017. The training covered, among others, the purpose of the survey and details on the survey questionnaires. The participants also went through a number of short tests to improve their understanding on the questionnaire and the contexts. Finally, all field staffs were assigned for certain study area and the survey plan (date, place, travel plan etc.) was discussed with them.

**Figure 1: Study Location in the Google map**




***Field survey***

Field staffs were organised into 8 groups to conduct the survey in different districts. The total number of field enumerators was 18. We also employed two field supervisors for continuous monitoring of data collection by the enumerators. Each of the supervisors monitored four groups.

To ensure the quality of data, the supervisors cross checked the filled-in questionnaires by visiting the surveyed households. Supervisors then discussed with the enumerators if any problem was encountered to help correct any errors and improve the interview quality. The intensive follow up by the supervisors substantially improved the quality of data collection.

The InM Research Team visited survey areas in several districts such as Satkhira, Khulna, Pirojpur and Barguna. Researchers observed the interviews conducted by the enumerators, held discussions with the respondents and villagers, cross checked the filled-in questionnaires, provided required guidelines to supervisors and enumerators and took notes from the field staffs on their experience on issues in the study areas.

The field enumerators submitted the filled-in questionnaires to InM Office after completion of data collection first the villages. The members of the Research Team checked the questionnaires thoroughly; communicated back if necessary to further review the filled-in questionnaires and correct any inconsistencies and errors. Moreover, the Research Team communicated with the field staffs and field supervisors on a daily basis. Once all questionnaires were received, InM Research Team conducted a detailed and finalcheck of all filled-in questionnaires prior to sending those for data capturing. These efforts were taken to ensure the maximum quality of the collected data.

***Data entry/capturing***

After carefully checking all filled-in questionnaires, the questionnaires were sent to the firm for data capturing. The firm has submitted the captured data to InM on 16 March 2017. The data are in *.mdb* format. InM also receivedpdf files for all scanned questionnaires. Such pdf files help a lot in the process of data checking.

***Data processing***

The InM Research Team were involved in data processing. Data processing and analysis are being done using statistical software STATA. Initially, all data have been transferred into .dta file format. There is one separate file for each of the section in the questionnaire. All files and the variables within are beinglabelled properly.

After completing these initial tasks, each of the file was checked for data consistency. Finally, a combined/aggregate file have been generated which consist of all major variables from different sections in one file. This file has been used for all further analysis.

***Focus group discussion (FGD)***

The purpose of FGD is to understand how individual, community and the institutions are working to build resilience among the climate vulnerable people. Accordingly, the research team organised several FGDs in different location of the study area. FGD location has been selected in such a way that it covers diversification in terms of nature of climate change hazard and level of intensity. Two types of FGD are conducted in each location: (i) FGD with village people; (ii) FGD with representatives of local government (such as UNO, upazila/union chairman and members of upazila/union council). Table 2 provides detailed information on the conducted FGDs.

**Table 2: Information on FGDs**

| Serial Number | FGD type | Location | Date | Participants |
|---|---|---|---|---|
| 1 | FGD with local government representatives | District: Satkhira<br>Upazila: Shayamnagar<br><br>Venue: Upazila Chairman office | January 30, 2017 | (i) Upazila Chairman, Shayamnagar<br>(ii) Vice chairman, Shayamnagar<br>(iii) Union Chairman, Atulia Union<br>(iv)Union Chairman, Burigoalini Union<br>(v)Union Chairman, Munshiganj Union<br>(vi)Number of Members of union parishad of above three unions.<br><br>Total Number of Participant: 17 |
| 2 | FGD with village people | District: Satkhira<br>Upazila: Shayamnagar<br>Union: Munshiganj<br><br>Venue: Union parishad office | January 31, 2017 | Female and Male individuals from four villages. Participants were from different occupation groups. Some of them have membership with MFIs and some do not have such membership.<br><br>Total number of participants: 21 |
| 3 | FGD with local government representatives | District: Khulna<br>Upazila: Koyra<br><br>Venue: UpazilaNirbahiPorishod | February 01, 2017 | (i) UNO, Koyra<br>(ii) Upazila Chairman, Koyra<br>(iii) Union Chairman, Koyra<br>(iv) Union Chairman, Moharajpur<br>(v) Number of Members of union parishad of above two unions.<br><br>Total number of participants: 25 |

| | | | | |
|---|---|---|---|---|
| 4 | FGD with village people | District: Khulna<br>Upazila: Koyra<br>Union: Moharajpur<br><br>Venue: Motbari village | February 02, 2017 | Female and Male individuals from two villages. Participants were from different occupation groups. Some of them have membership with MFIs and some do not have such membership.<br><br>Total number of participants: 24 |
| 5 | FGD with village people | District: Barguna<br>Upazila: Patharghata<br><br>Venue: Padda village | February 13, 2017 | Female and male individuals from one village.<br><br>Total number of participants: 10 |
| 6 | FGD with local government representatives | District: Barguna<br>Upazila: Patharghata<br><br>Venue: UpazilaNirbahiPorishod | February 13, 2017 | (i) UNO, Patharghata<br>(ii) Upazila Chairman, Patharghata<br>(iii) Union Chairman, Raihanpur<br>(iv) Members of upazilaparishad<br><br>Total number of participant: 17 |
| 7 | FGD with local government representatives | District: Pirojpur<br>Upazila: Mathbaria<br><br>Venue: UpazilaNirbahiPorishod | February 14, 2017 | (i) UNO, Mathbaria<br>(ii) Union Chairman, Mathbaria<br>(iii) Union Chairman, Dashhalia<br>(iv) Members of union parishad of above two unions<br>Total number of participants: 24 |
| 8 | FGD with village people | District: Pirojpur<br>Upazila: Mathbaria<br><br>Venue: DokkhinMithakhali | February 14, 2017 | Female individuals from DokkhinMithakhali village. The participants were both from MFI member and non-member.<br><br>Total Number of participant: 24 |
| 9 | FGD with village people | District: Madaripur<br>Upazila: Rajoir<br>Union: Amgram<br><br>Venue: Union Parishad office | March 13, 2017 | Female individuals from three villages. The participants were both from MFI member and non-member.<br><br>Total number of participants: 27 |
| 10 | FGD with local government representatives | District: Madaripur<br>Upazila: Rajoir<br><br>Venue: Upazila Chairman office | March 13, 2017 | (i) Upazila Chairman, Rajoir<br>(ii) Upazila vice chairman, Rajoir<br>(iii) Union chairman, Amgram<br>(iv) Union Chairman, Khalia<br>(v) Union Chairman, Bajitpur<br>(vi) Number of members of union parishad of above three unions<br><br>Total number of participants: 18 |
| 11 | FGD with local government | District: Patuakhali<br>Upazila: Golachipa<br><br>Venue: Union Parishad office, Golachipa | March 20, 2017 | (i) Union chairman, Golachipa<br>(ii) Union chairman, Chiknikandi<br>(iii) Union chairman, Panpotti<br>(iv) Number of members of union parishad of above three unions<br><br>Total number of participants: 13 |
| 12 | FGD with village people | District: Patuakhali<br>Upazila: Golachipa<br>Union: Chiknikandi<br><br>Venue: Uttor Pan Khali | March 21, 2017 | Male and female individuals of Uttor Pan Khali village.<br><br>Total number of participants: 31 |

Source: Study Survey 2017

**Discussion Topics in FGDs**

**FGDs with Local Government Representatives**

OBJECTIVE 1. COMMUNITY INSTITUTIONS

- What are the key community level institutions?
- How are they involved in disaster risk reduction and climate change adaptation?
- Who are key actors supporting community institutions?
- If relevant disaster risk reduction or climate change adaptation interventions exist at community level, what are these interventions, their objectives, design, funding, participation and impacts?
- What are the potential and constraints of community institutions for disaster risk reduction and climate change adaptation? (Any weaknesses in existing community institutions. How they can be strengthened)
- Is there any engagement of MFIs with community institutions?

OBJECTIVE 2. STOCKTAKING OF ADAPTATION PLANNING AND SUPPORT INITIATIVES

- Has adaptation planning or other adaptation support initiatives at any level been undertaken?
- Is there any networking of local actors involved in adaptation?

**FGDs with Village People**

- What adaptation strategies have households implemented and how effective are they?
- Is there any role for MFIs is supporting these strategies?
- How do households feel that financial services could more effectively build their adaptive capacity?
- Are households participating in community-wide disaster risk reduction and climate change adaptation initiatives?

OTHER ISSUES

- Are there any particularly progressive MFI interventions to support climate change adaptation or disaster risk reduction?

### 2.2.3 Demographic and economic characteristics of surveyed households[3]

Average sample size of the surveyed households is 4.5. About 48 percent of total population are females. However, female headed households are 8 percent of total households. About 59 percent of total population is adult while 6 percent fall into the aged groups (65+) and rest of the population are not adult yet. More than 68 percent of total population has some level of education. About 45 percent of household heads do not have any formal education. If we look at the primary occupation of the population, 34 percent are involved in some income generating activities. Wage labour and farm activities are the major occupations of those who are involved in income generating activities. Large portions of the population are student and housewife who are involved in domestic work.

Average annual household income is Tk. 117,727. Income from wage employment is the major source of income. Income from business and transport related activities are also important sources of income.

[3] See Appendix A for detailed tables on demographic and economic characteristics of surveyed households.

Average annual expenditure of the surveyed household is Tk. 85,580. Food expenditure comprises the major share (63 percent) of their total annual expenditure. Average annual investment of the households is Tk. 13,296. Investment in business and reconstruction of houses is their major investment category.

Land value comprises the major share of total value of physical assets. Other than land, housing and livestock comprise major share of physical asset. Among financial assets of the households, average savings in banks is much higher than savings in MFIs. Even though more people have membership with MFIs and very few people have access to banks, still households who have access to banks actually savemuch larger amounts in banks.

## 2.3 Trend in Covariate Shocks in Bangladesh

In Bangladesh, various types of storms such as tropical cyclones, tornadoes, thunderstorms, and tropical depressions are quite common. The most devastating is cyclones that hit the coastal areas of Bangladesh almost every year with high-speed winds, high waves and water surge causing collateral and physical damages to property and life. The following two figures show the cyclone affected areas and the areas with riverbank erosion.

Figure 2: Cyclone Affected Area

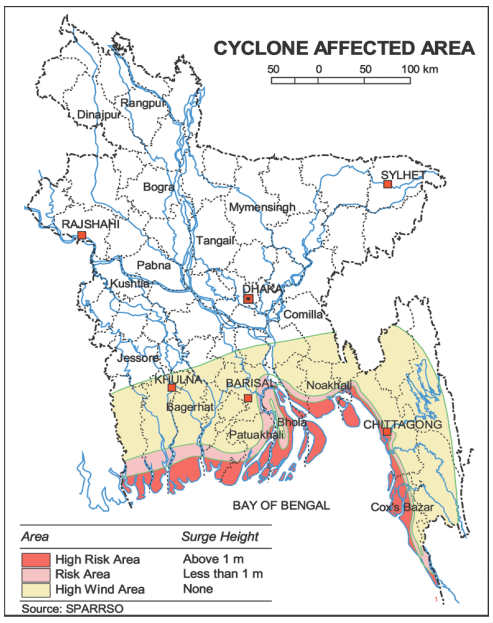
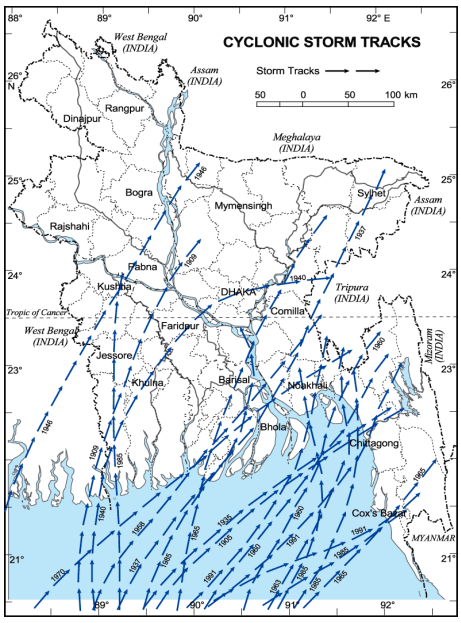



Figure 3:Riverbank Erosion




During the past fifty years, Bangladesh has experienced some major cyclones and flood with devastating effects (Table 3). The 1970 cyclone (12-13 November) with a cyclonic surge of 6m to 10m and a wind speed of 222 km per hour occurred during high tide claimed over 0.5 million human lives. The cyclone of 29 April 1991 hit Chittagong, Cox's Bazar, Barisal, Noakhali, Patuakhali, Barguna and Khulna along with a tidal bore (6.1m to 7.6m), killing 140,000 people.

The most deadly and devastating cyclonic storm happened in 1970. Chittagong was badly affected. Other areas such as Barguna, Khepupara, Patuakhali, North of Char Burhanuddin, Char Tazumuddin and south of Maijdi, Haringhata are also affected. It caused heavy loss of lives and damage to crops and property. Officially the death figure was put at 500,000. A total of 38,000 marine and 77,000 inland fishermen were affected by the cyclone. Some 46,000 inland fishermen operating in the cyclone affected region lost their lives. More than 20,000 fishing boats were destroyed; the damage to

property and crops was colossal. Over one million cattle-head were reported lost. More than 400,000 houses and 3,500 educational institutions were damaged.

Some minor and moderate cyclonic storms occur between 1971 and 1988. The 1974 storm with high-speed wind of 161 km/hr and storm surge of 2.8-5.2m causes death of 200 people, 1000 cattle and destroyed 2300 houses. The 1983 cyclone was disastrous. It killed 300 fishermen, destroyed 2000 houses. After 1.5 years of 1983, another disastrous storm passed through Chittagong, Cox's Bazar, Noakhali and their offshore islands (Sandwip, Hatiya, and Urirchar). Due the storm, 11069 persons died, 94379 houses damaged, 135033 livestock lost and 74 km road damaged. The cyclone of 1986 killed 14 persons and damaged 97200 ha of paddy field as well as building and infrastructure. In 1988, the cyclone became too much destructive. It had the surge of 4.5m and killed 5708 persons and lot of wild animals (15000 deer, 9 Royal Bengal Tiger, 65000 cattle) and damaged crops worth about 9.41 billion.

The Great Cyclone of 1991 crossed the Bangladesh coast during the night. The central overcast cloud had a diameter exceeding 600 km. The maximum wind speed estimated about 240 km/hr. The maximum storm surge height during this cyclone was estimated to be about 5 to 8m. The loss of life and property was colossal. The loss of property was estimated at about Tk. 60 billion. The death toll was estimated at 150,000; cattle-head killed 70,000.

**Table 3: Major Cyclonic Storms in Bangladesh**

| Year | Wind speed (KM/H) | Storm surge height | Property loss | Life loss | Area affected |
|---|---|---|---|---|---|
| 1970 | 222 | 10.6m | 20000 fishing boat; 3500 educational institution damage | 46000 fishermen; over 1 million cattle | Chittagong, Patuakhali, Barguna, etc |
| 1974 | 161 | 2.8-5.2m | 2300 houses | 200 people; 1000 cattle | Coastal belt |
| 1983 | 122 | - | 6 fishing boat, and a trawler; 20% Aman crop | 23 people | Offshore islands and chars Chittagong |
| 1983 | 136 | 1.52m | 50 boats; 2000 houses | 300 fishermen | Cox Bazar, Barisal, etc |
| 1985 | 140-154 | 3-4.6m | 94379 houses; 74 KM road damage | 11069 people; 135033 livestock | Cox Bazar, Noakhali |
| 1986 | 110 | - | 97200 ha paddy field; buildings | 14 people | Chars of Chittagong, Barisal … |
| 1988 | 162 | 4.5m | Crop damage worth of 9.41 billion taka | 5708 people; 15000 deer; 9 tigers; 65000 cattle | Jessore, Faridpur, and offsore islands, chars |
| 1991 | 160-240 | 5-8m | Property loss worth of 60 billion taka | 150000 death (animal and human) | Chittagong, Cox Bazar, Bhola, .. |
| 1994 | 210 | - | - | 400 people; 8000 cattle | Offshore island and char of Cox Bazar |
| 1997 | 225 | 3.05m | | 126 people | ,, |
| 1998 | 150 | 1.83-2m | | - | - |

Source: Banglapedia

The cyclone of 1994 (29 April 3 May) was also severe with maximum wind speed of 210 km/hr. It killed about 400 people, 8,000 cattle, whereas the cyclone of 1995 (21-25 November) with maximum wind speed of 210 km/hr killed 650 people, perished 17,000 cattle-head.

As stated earlier, cyclones are linked to warmer oceans. Bangladesh is getting warmer, so is the Bay of Bengal. Super cyclone Sidr formed in the Bay of Bengal, and swept through the southwestern coastal areas of Bangladesh in November 15, 2007 with high tidal surge and wind speed of up to 260

km/hr. The strong inundation and wind speed caused a tide surge that exceeded 10 meters in certain areas and breached coastal and river embankments, flooding low-lying lands and causing extensive physical destruction. Cyclone SIDR affected 30 districts of Bangladesh in varying degrees; however it created most havoc in 12 districts (MoFDM, 2012).

Cyclone Sidr was followed by cyclone *AILA*, which made landfall in the south western regions of Bangladesh on May 25, 2009. Wind was at maximum speed of 92 km/hr during the landfall. A storm surge of 3 m (10 ft) swept overcoastal Bangladesh, submerging numerous villages. While the cyclone *Aila* was not as strong as cyclone SIDR, the cyclone has had a devastating long-term impact. The main damage has been caused by flood water breaching the already weakened embankments throughout the affected districts. The damage to embankments extended to an area of 1743 km (NFPCSP, 2012), causing extensive flooding. Numerous villages were either completely submerged in floodwaters or destroyed. Several rivers broke through embankments, causing widespread inland flooding.

Cyclone Mahasen (Viyaru) struck southern Bangladesh on 16 May 2013. Wind was at maximum speed of 95 km/hr during the landfall. The storm was accompanied by heavy rainfall. It impacted the districts of Chittagong, Bhola, Barguna, Patuakhali, Satkhira, Pirojpur, Noakhali and Laxmipur. In spite of initial concerns about the potential impact of Mahasen, successful early warning and evacuation by the GoB together with a reduction in the speed of the cyclone meant that the damage to property and infrastructure, as well as the human cost in terms of deaths and injuries, were not as bad as expected.

Apart from cyclone, flood, a recurring phenomenon in Bangladesh, causes problems for inhabitants, crops and vegetation. Floods are more or less within tolerable limits, but occasionally they become devastating. In recent decade, there is little flow down-stream water from India. But occasionally, the pressure of flood in India causes flood in the downstream Bangladesh. During severe floods, the affected area may exceed 55% of the total area of the country. Floods in Bangladesh can be divided into three categories: (a) monsoon flood - seasonal; (b) flash flood; and (c) tidal flood.

In every century, the Bengal delta witnessed the visit of nearly half a dozen floods, almost equal to the magnitude and intensity of those in 1987, 1988 and 1998 and as many with lesser magnitude. Statistical analysis of available records revealed that severe floods can occur every 7 years, and catastrophic floods every 33-50 years. Some severe monsoon floods of this region starting from the late 18th century are described here chronologically

**Figure 4: Intensity of floods, 1954-1999**

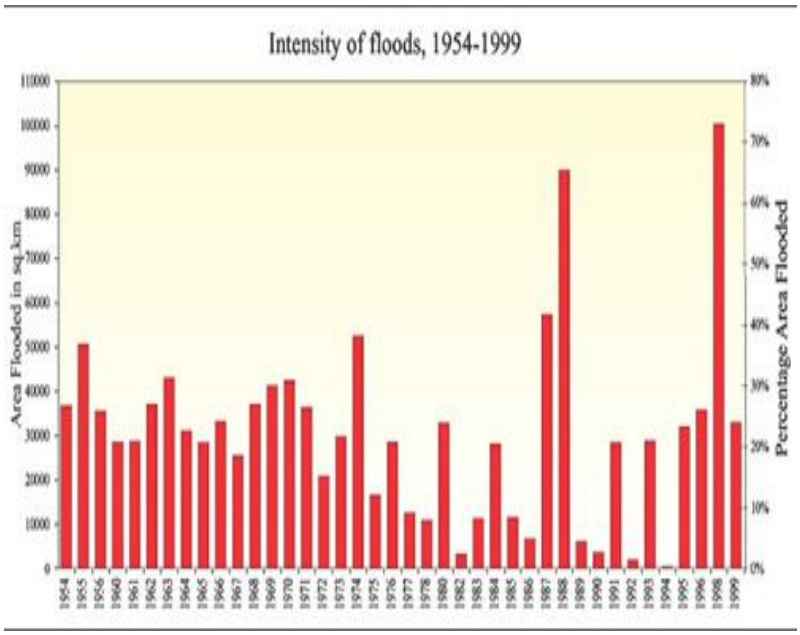
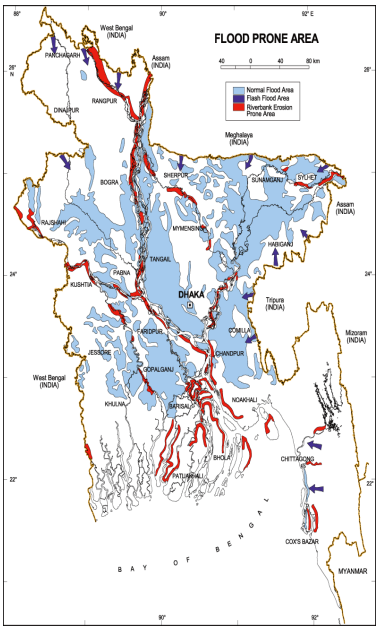



**Figure 5: Flood prone area**




Four floods during the last fifty years were extensive and devastating, and these are the floods of 1974, 1987, 1988, and 1998. The flood in 1974 mostly occurred in Mymensingh covering about 10360 sq km and destroyed more than 100000 houses. Catastrophic flood of 1987 occurred in July-August. This affected 57,300 sq km. Excessive rainfall both inside and outside of the country was the main cause of the flood. After one year, flood reappeared with larger inundation about 82000 sq km about 60% of the area. The flood lasted 15 to 20 days. Over two-thirds of the total area of the country was flooded in 1998 similar in nature of the flood of 1988. The flood lasted for more than two months. A combination of heavy rainfall within and outside the country, synchronisation of peak flows of the major rivers and a very strong backwater effect coalesced into a mix that resulted in the worst flood in recorded history.

**Figure 6: Flood 1955**

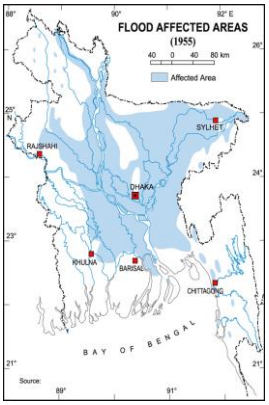



**Figure 7: Flood 1974**

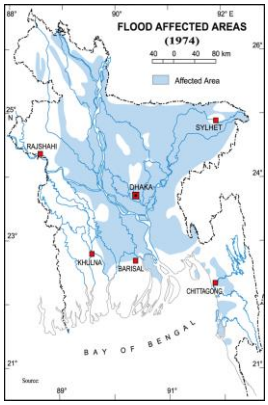



**Figure 8: Flood 1988**

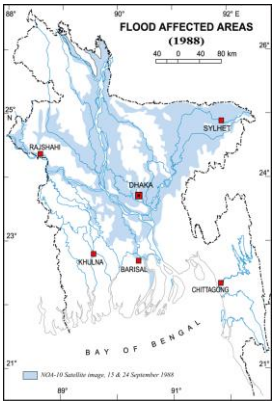
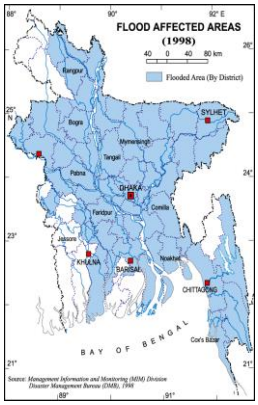



**Figure 9: Flood 1998**




Every year millions of people of the country are affected by riverbank erosion that destroys standing crops, farmland and homestead land. It is estimated that about 5% of the total floodplain of Bangladesh is directly affected by riverbank erosion.

***Earthquake*** is the trembling or shaking movement of the earth's surface. Most earthquakes are minor tremors, while larger earthquakes usually begin with slight tremors, rapidly take the form of one or more violent shocks, and end in vibrations of gradually diminishing force called aftershocks. Earthquake is a form of energy of wave motion, which originates in a limited region and then spreads out in all directions from the source of disturbance. It usually lasts for a few seconds to a minute.

**Figure 10: Earthquake Zone 1**

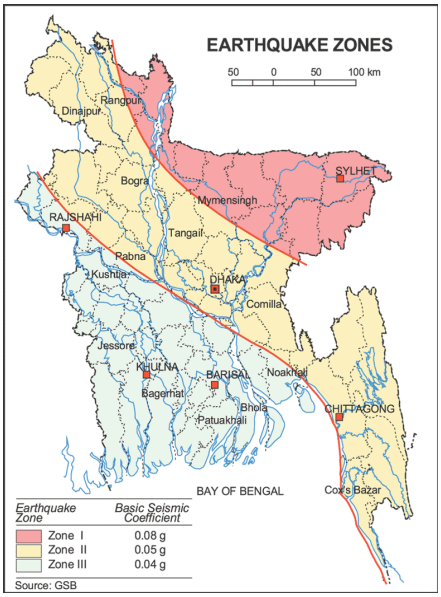
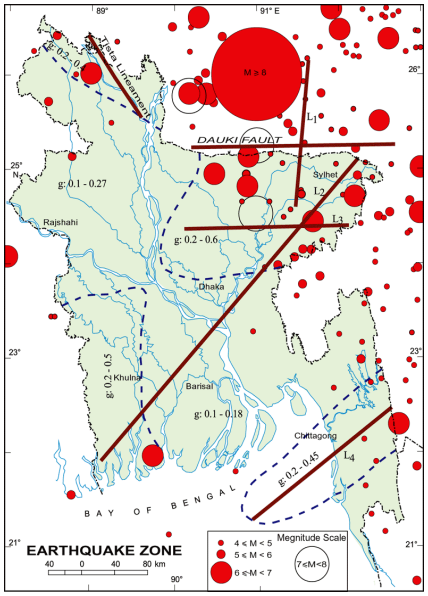



**Figure 11: Earthquake Zone 2**




Although Bangladesh is extremely vulnerable to sismic activity, the nature and the level fo this activity is yet to be defined. In Bangladesh, complete earthquake monitoring facilities are not available. The Meteorological Department established only sismic observatory sometime in 1954 that may be lagging in terms of technological advancement.

Bangladesh is divided into three seismic zones. The northern part of the country that includes the greater districts of Rangpur, Mymensingh, and Sylhet are in the Zone-I where earthquake shock of maximum intensity of IX of the Modified Mercalli Scale is possible. The Zone-II includes the greater districts of Dinajpur, Bogra, Dhaka and Chittagong and the shocks of intensity of VIII are possible. The southern part of the country, the least active region, where the maximum intensity is not likely to exceed VII, is in the Zone-III.

Some major earthquakes, measured in terms of magnitude, occurred in Bangladesh. On November 22, 1997, an earthquake, with a magnitude of 6.0, caused minor damages. On July 22, 1999, an earthquake of magnitude 5.2 struck Maheshkhali Island causing damages to houses. on July 27, 2003, at Kolabunia union of Barkal upazila, Rangamati district with magnitude 5.1.

The occurrence of earthquakes cannot be prevented, but a prediction, with limited scope, and a warning can minimise the loss of life and property. The earthquake disaster mitigation approach should be followed by (i) pre-disaster physical planning of human settlements, (ii) building measures for minimising the impact of disaster and (iii) management of settlements. (Chowdhury and Khan 2014)

***Landslide:*** It is common in the hilly areas of southeastern Bangladesh, especially in Bandarban, Rangamati, Khagrachhari and Cox's Bazar. Every year especially in the rainy season landslides take

place. Very recently in June, 2017, a serious landslide due to heavy rainfall affected the hilly regions in both Chittagong Hill Tract (CHT) and Sylhet causing loss of life. In CHT, the landslide caused huge collateral damages and loss of 160 lives. In Sylhet some five persons were killed, along with damage to physical assets.

A major landslide occurred in July 1997 at Charaipada of Bandarban affecting about 90,000-sq m. Two big landslides, one in Bandarban and the other one in Chittagong, occurred on 11 and 13 August 1999 respectively claiming the life of 17 people. Out of 17 fatalities, 10 were in Chittagong and the rest in Bandarban district. Heavy and incessant rainfall at that time was one of the causes of sliding. Landslide badly affected the villages of Chittaputti, Monargiri, Meounda, Muslimpara, Sonaisari, Bazapara, Kalargiri, Maishkata, Aungratali, Chionipara, Kariungpara. The 11 August landslide was followed again on 15 August at Chittaputti area. At least 50 houses were completely vanished under the solid earth and 300 houses were partly damaged. About 283.50 ha of cultivated land, 810 ha of household garden, and 50 km unmetalled road were crushed.

### 2.3.1 Why all these frequent covariate shocks?

Increase in average temperature is an indicator of climate change. We investigated the trend of average maximum and minimum temperatures of Bangladesh. Bangladesh has become warmer over the last five decades. Both the maximum and minimum temperature of the seven divisions of Bangladesh got up in the period 1948-2013.

***Maximum temperature***

The average maximum temperatures of the seven divisions of Bangladesh show an increasing trend over a period of 65 years (Table 4). Maximum temperature shot up for all the divisions but Rajshahi had the highest increase in temperature. It also shows that Khulna had the highest maximum temperature at 31.44 degree Celsius. The coastal divisions got warmer in the last sub-period. Although their maximum temperatures increased in the in 1970s and 1980s, the growth became steeper in the last two decades. However, Dhaka and Rajshahi had consistent increase in temperature.

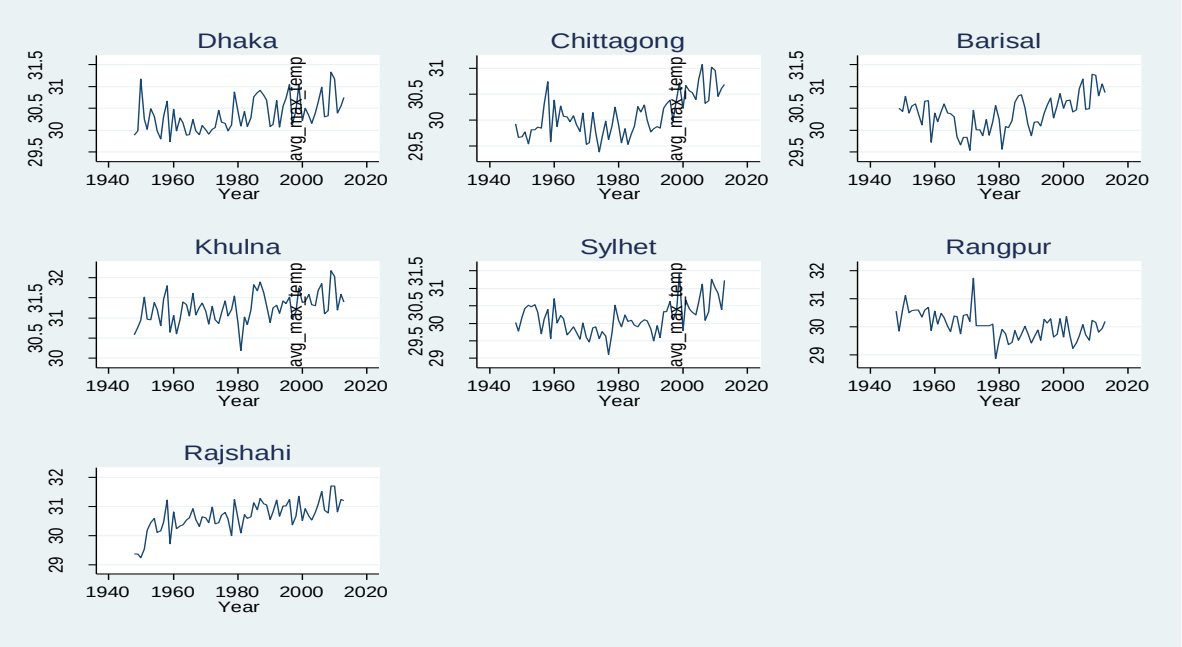
**Table 4: Average Annual Maximum Temperature (in °C) in the Seven Divisions of Bangladesh**

| | Maximum Temperature | | | | | | |
|---|---|---|---|---|---|---|---|
| | Dhaka | Chittagong | Barisal | **Khulna** | **Sylhet** | **Rangpur** | **Rajshahi** |
| 1948-1969 | 30.15 | 29.86 | 30.19 | 31.13 | 29.86 | 29.89 | 30.33 |
| 1970-1991 | 30.37 | 29.98 | 30.26 | 31.18 | 30.04 | 29.89 | 30.70 |
| 1992-2013 | 30.58 | 30.47 | 30.67 | 31.44 | 30.50 | 30.33 | 30.99 |

Source: Bangladesh Agricultural Research Council (BARC) and author's own calculations

In Dhaka division, the maximum temperature started increasing from the 1990s (Figure 12). Overall, there is a leap of at least 0.5 degree Celsius since 1948. However, the maximum temperature of Chittagong division (at the south-east of Bangladesh) has a U-shaped pattern for the period. There is no doubt that it has gone up; it has varied by 0.5-1 degree Celsius. There is a sharp increase from 1980s. Barisal, which is in the southern part of Bangladesh, follows a pattern similar to that of Chittagong. Rise in maximum temperature implies that the summers are getting warmer, as the temperature is at the maximum during that season.

**Figure 12: Average maximum temperature (in °C) in the seven divisions of Bangladesh over the period 1948-2012**




Source: Bangladesh Agricultural Research Council (BARC) and author's own calculations

***Minimum temperature***

If we consider the three equal time periods 1948-1970, 1971-1990 and 1991-2013, minimum temperature of seven divisions in Table 5 has increased in each of the periods. Dhaka and Sylhet had clear increase in their minimum temperatures; if we consider the average of the sub-periods there is similar increase in temperature. Sylhet had the highest increase in temperature. However, the southern divisions like Barisal and Khulna had faster rise in temperature in the 1990s and 2000s (referring to Figure 13). Even the northern divisions like Rangpur and Rajshahi similar pattern of increase in minimum temperature. Nonetheless, Chittagong's minimum temperature did not change much in the last two sub-periods.

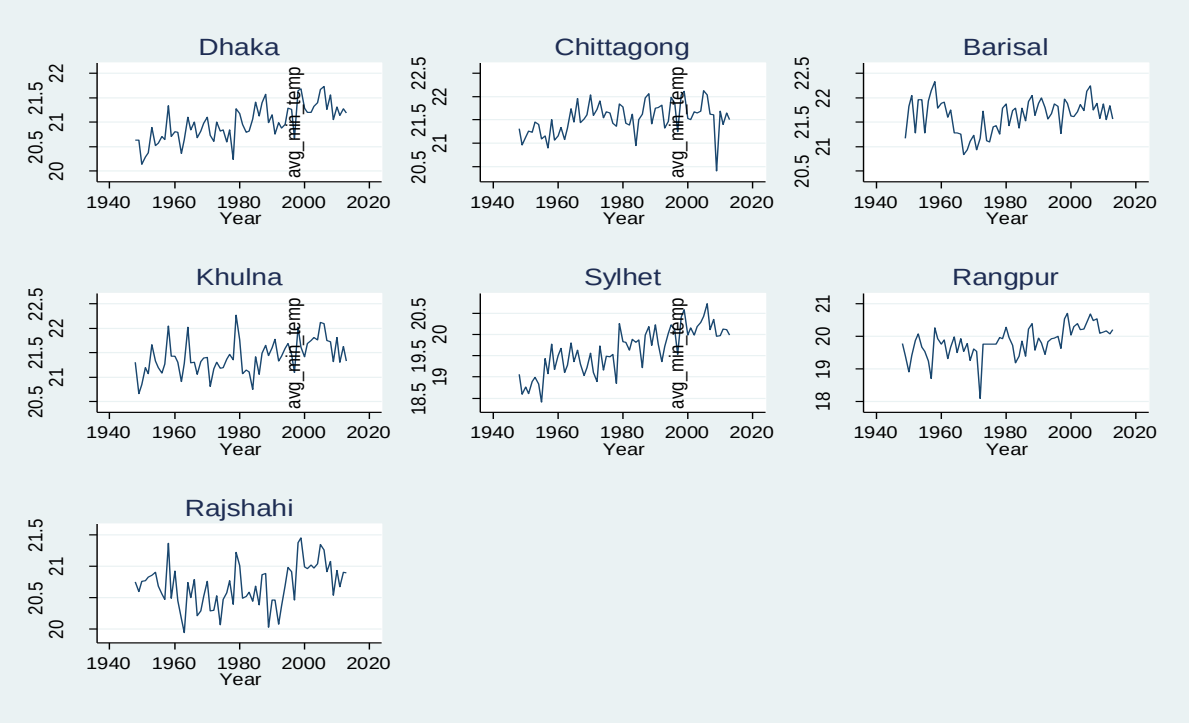
**Table 5: Average Annual Minimum Temperature (in °C) in the Seven Divisions of Bangladesh**

| | Dhaka | Chittagong | Barisal | Khulna | Sylhet | Rangpur | Rajshahi |
|---|---|---|---|---|---|---|---|
| **1948-1969** | 20.74 | 21.37 | 21.51 | 21.30 | 19.25 | 19.63 | 20.55 |
| **1970-1991** | 21.00 | 21.63 | 21.59 | 21.37 | 19.64 | 19.72 | 20.57 |
| **1992-2013** | 21.27 | 21.63 | 21.77 | 21.62 | 20.10 | 20.19 | 20.90 |

Source: Bangladesh Agricultural Research Council (BARC) and author's own calculations

Dhaka, Sylhet and Rangpur have similar trends of minimum temperature; there is a sharp and steady increase in their minimum temperatures. Chittagong also got warmer but relative slowly and gradually. The warming of most of the states speeded up from the 1980s, and it continued the trend afterwards. Since the minimum temperature is showing an overall increase, we can say that it got warmer in 65 years. This also implies warmer winters than it used to be earlier.

**Figure 13: Average minimum temperature (in °C) in the seven divisions of Bangladesh over the period 1948-2012**




**Source: Bangladesh Agricultural Research Council (BARC) and authors' own calculations**

As we have seen that the maximum and minimum temperature of Bangladesh is on the rise, we need to understand how it will impact the people of Bangladesh. As Bangladesh is getting warmer, its winters and summers are getting warmer, which could impact its seasons. An increase in Sea Surface Temperature (SST) would likely to cause an increase in the probability of cyclone formation. Cyclone tracks may shift under climate change. It means that an increasing number of cyclonic storms will be likely to hit Bangladesh and the possibility of an increase in peak intensities of cyclones may be 5–10% higher. Erosion can also be accelerated by factors such as intense rainfall events (e.g. cyclones).

## 2.4 Review of Climate Change Adaptation Strategies and Programmes in Bangladesh

In Bangladesh, major actors in climate change adaptation can be categorised as: (1) National and local government, (2) Development partners and International Financial Institutions, (3) Civil society organisations (CSOs), (4) Media, and (5) Private sector. All these actors are contributing in climate change adaptation through formation of policies, creating fund and implementing climate change adaptation related activities. In the government sector, Ministry of Environment and Forest is primarily responsible for work on climate change issue. Local Government such as Union Parishads (UPs) and municipalities are working the implementation level. UPs incorporate disaster risk management into their local development plans as the part of "Integration of Adaptation in Local Planning" project. Among the development partners World Bank, DFID, UNDP and few more international development organisations are contributing in climate change adaptation through creating fund and managing the fund for various climate change adaptation activities. Contribution of CSOs such as NGO/MFIs and Community Based Organisations (CBOs) are also contributing in the process through creating awareness and the community level and implementing various adaptation activities. In this subsection, we will limit our discussion on the role of government, development partners and MFIs in building resilience against adversity of climate change. Table 6summarises the climate change adaptation strategy and programmes in Bangladesh.

**Table 6: Review of Climate Change Adaptation Strategies and Programmes in Bangladesh**

| Major actor | Name of the fund | Type of activities/intervention | Features of the interventions | Implementing institution | Spatial distribution of interventions |
|---|---|---|---|---|---|
| GoB | | Formulation of climate change related policies | Two major policies of GoB:<br>1. Bangladesh Climate Change Strategy and Action Plan (BCCSAP)<br>2. Sixth five year plan | 1. Ministry of Environment and Forest<br>2. Planning Commission | |
| GoB and various international development partners | | Allocating/generating funds | Two major Finds:<br>(a) The ***Bangladesh Climate Change Trust Fund (BCCTF)*** – a fund created with budgetary allocation from Bangladesh's revenue sources.<br>(b) The ***Bangladesh Climate Change Resilience Fund (BCCRF)*** – a fund created as a Multi-Donor Trust Fund (MDTF) to draw bilateral and multilateral donations from development partners. | 1. Bangladesh Climate Change Trust<br>2. World Bank | |
| GoB | BCCTF | Implementing various adaptation related activities | Major projects:<br>1. construction of embankments and river bank protective work,<br>2. building cyclone resilient houses,<br>3. excavation /re-excavation | • Ministry of Water Resources<br>• Ministry of Local Government | See Box 3 for the spatial distribution of BCCTF fund in the south western region |

| | | | | | |
|---|---|---|---|---|---|
| | | | of canals,<br>4. construction of water control infrastructures including regulators/sluice gates,<br>5. waste management and drainage infrastructure,<br>6. introduction and dissemination of stress tolerant crop varieties and seeds,<br>7. afforestation,<br>8. installation of solar panels | • Ministry of Disaster management and relief<br>• Ministry of Environment and Forest | of Bangladesh |
| GoB and World Bank | BCCRF | Implementing various adaptation related activities | Major projects funded/approved for funding under BCCRF are:<br><br>1. Emergency 2007 Cyclone Recovery and Restoration Project (Multipurpose Cyclone Shelter Construction Project)<br>2. Secretariat for BCCRF Phase I (Capacity Building Project Phase I)<br>3. Community Climate Change Project (CCCP)<br>4. Supporting Agriculture Adaptation to Climate Change<br>5. Climate-Resilient Participatory Afforestation and Reforestation Project<br>6. Rural Electrification and Renewable Energy Development Project II (Solar Irrigation Project)<br>7. Modern Food Storage Facilities | • Local Government Engineering Department (LGED)<br>• Ministry of Environment and Forests<br>• Palli Karma-Sahayak Foundation<br>• Department of Agriculture Extension (DAE)<br>• Bangladesh Forest Department (BFD)<br>• Infrastructure Development Company Limited (IDCOL)<br>• Ministry of Food and Disaster Management | |
| Palli Karma-Sahayak Foundation (PKSF) | BCCRF | Community Climate Change Project (CCCP) | 1. Raising homestead plinth;<br>2. Installation of tube-wells and deep tube-wells;<br>3. Rain Water Harvesting;<br>4. Establishing desalination plant;<br>5. Pond re-excavation for safe drinking water;<br>6. Canal re-excavation for irrigation;<br>7. Installation of improved/environment-friendly cooking stove;<br>8. Installation of sanitary | Various NGO/MFIs in Bangladesh.<br><br>For details, see Table 2.9. | For details, see Table 2.9. |

| | | | | | |
|---|---|---|---|---|---|
| | | | latrine;<br>9. Demonstration of climate resilient crop;<br>10. Repairing of road/embankment with tree plantation;<br>11. Production of renewable energy;<br>12. Implementation of various Income Generating Activities (crab fattening, goat rearing, poultry farming, duck rearing, sheep rearing, homestead gardening, fodder production, vermi-compost production etc.) | | |
| Various NGO-MFIs in Bangladesh | | Financial Product for climate change adaptation and disaster | **Credit**: some disaster specific programme of PKSF allow for disaster loan. Most of the MFIs reschedule loan after disaster. Very few loan product corresponding to climate change adaptation exist<br>**Savings**: No climate change or disaster specific savings products exist. Some MFIs allow withdrawing savings after disaster.<br>**Insurance**: currently most of the MFIs practice credit-life insurance. PKSF, through its DIISP project, provide credit-life, livestock and health insurance. Grameen Bank have insurance scheme for micro-enterprises against losses caused by natural disasters | For details, see Table 2.8. | |

### 2.4.1 Role of government in climate change adaptation

GoB is contributing in the climate change adaptation process through: (1) formulation of climate change related policies, (2) allocating/generating funds, and (3) implementing various adaptation related activities.

One of the critical elements in adaptation and resilience building is The GoB has formulated 'Bangladesh Climate Change Strategy and Action Plan (BCCSAP)' in 2008. The policy was again revised in 2009. BCCSAP has identified six thematic areas for climate change adaptation. Apart from climate change adaptation policy of GoB, the Sixth Five-Year Plan (2011-2015) pays significant attention to climate change issues and dedicates an entire chapter to adaptation and mitigation strategies for addressing climate change, "Chapter 8: Environment, Climate Change, and Disaster Management for Sustainable Development."

**BOX 1: Six Thematic Areas Identified in BCCSAP**

• ***Food Security, Social Protection, and Health***: The area relates to ensuring food and livelihood security, especially for the poorest and most vulnerable in society, including women and children. It focuses on the needs of this group for food security, safe housing, employment, and access to basic services, including health.

• ***Comprehensive Disaster Management***: This is to further strengthen the country's already proven disaster management systems to deal with increasingly frequent and severe natural calamities.

• ***Infrastructure***: This Action Plan is to ensure that existing assets (e.g. coastal and river embankments) are well-maintained and fi t-for-purpose, and that urgently needed infrastructure (e.g. cyclone shelters and urban drainage) is put in place to deal with the likely impacts of climate change.

• ***Research and Knowledge Management***: This is to predict the likely scale and timing of climate change impacts on different sectors of the economy and socioeconomic groups; to underpin future investment strategies; and to ensure that Bangladesh is networked into the latest global thinking on science, and best practices of climate change management.

• ***Mitigation and Low Carbon Development***: This is to evolve low carbon development options and implement these as the country's economy grows over the coming decades and the demand for energy increases.

• ***Capacity Building and Institutional Strengthening***: This is to enhance the capacity of government ministries and agencies, civil society, and the private sector to meet the challenge of climate change and mainstream them as part of development actions.

The Sixth Five Year Plan formulated various target/objective in three major area of intervention: (1) Disaster Risk Reduction (DRR), (2) Climate Change adaptation (CCA), and (3) Low Carbon Development (LCD). Box 2 summarises targets/objectives of the Sixth Plan and achievements in the period. It also shows the achievements and challenges in implementation.

**BOX 2: Achievements and Challenges in Attaining Targeted Objectives in Sixth FYP**

| Relevant areas of intervention | Targets/Objectives of the Sixth Plan | Achievements | Expert opinion and challenges |
|---|---|---|---|
| DRR | Integrated disaster risk reduction and CCA approaches | Mainstreaming efforts being undertaken/ initiated | PECM has been a good start, however needs a second phase for capacity building of actors/stakeholders and to facilitate implementation |
| | Community based programming for DRR and CCA | | Needs programme development and implementation, focusing on Loss and Damage. Emphasise on participatory monitoring and evaluation to improve upon MRV for global compliance. |
| | Create legal and institutional framework for effective response management | Constitutional amendment addressed legal issues with emphasis on GOB compensation for the disaster victims. Insurance against flood given new impetus. | The SSN allocation needs to be aligned with constitutional provisions. Limited trial on flood insurance has been given in Sirajganj char areas. |
| | Strengthening search and rescue capabilities | Coast Guard has been given charge to perform better towards rescue of storm victims | Equipment procured and given to Coast Guard. The early warning system needs to be improved for low intensity events. |
| | Improve cyclone and storm surge warning | Review underway. | Needs immediate programme, especially to address warning for low intensity events that affect fisher folks lives and livelihoods. |

| | | | |
|---|---|---|---|
| | Awareness raising on public dissemination | | Not much progress since both BCCTF and BCCRF avoided programmes on awareness raising. It was limited to NGO-led projects/programmes. |
| | Risk assessment against loss of income and property | BCCRF initiated/ completed a few studies. Livelihood-specific studies are yet to be undertaken/ launched. | Limited understanding on scenario-specific impacts of various (dominant) livelihoods groups. Needs immediate attention in future research. |
| | Repair and maintenance of existing flood embankments | A few projects are being launched | Needs improved monitoring, especially to understand the efficacy of embankments in medium- to major floods. |
| | Repair and maintenance of existing cyclone shelters | Projects ongoing. | A significant proportion of the existing shelters are in dilapidated condition, needs immediate attention. |
| | Repair and maintenance of existing coastal polders | Projects launched/ ongoing. | Results yet to be seen. *Aila* affected polders have been refurbished. |
| | Urban drainage capacity building | Need assessment are being carried out for Dhaka and Khulna cities. | Major emphasis should be given on this issue to create healthy living condition in future cities/ urban centres. |
| | Construction of new embankments/ shelters | BCCRF and other allocations have been utilised to build new cyclone shelters. | Many more new shelters need to be built, based on population density across the coastal zone. |
| | Adaptation against tropical cyclones and storm surges through land use planning | Activities yet to be launched | Needs immediate attention under the seventh plan |
| | Resuscitation of rivers and khals, river training works | A few projects being undertaken | Need massive mobilisation of funds, needs coordinated action across sectors and geographical areas |
| | Professionalising DM system | Graduate level DRR/DM courses being offered in about 18 universities under CDMP | Human capacity needs to be continuously enhanced |
| | Strengthening DM system | DM Act has been promulgated | Specific by-laws are yet to be enacted, therefore the DMA has largely remained ineffective |
| CCA | Mainstream poverty, environment, climate nexus in national planning process (including planning, budgeting and implementation) | Process has been initiated by undertaking PECM project. A manual has been produced (GED, 2014c). Budgetary allocations for CCA have been made. | In line with GOB Perspective Plan and commitments to UNFCCC and HFA. Needs immediate capacity building programme to facilitate implementation. |
| | Promote indigenous and scientific strategies for adaptation to CC | Institutionally driven CCA projects have been initiated/ undertaken. | Most of the projects are still being rolled out, their collective efficacy towards resilience building is yet to be evaluated. |
| | BCCSAP to be implemented | Over 300 CCA+LCD projects have been initiated/ implemented | Partial implementation has started. However, no significant projects on research and knowledge management, capacity building and institutional strengthening has been undertaken. |
| | Improving productivity, resilience and adaptability of local, sectoral, national and global social and economic systems | Over 300 projects have been launched/ implemented under BCCTF and BCCRF | More projects are needed, based on location specific needs, focusing on affected communities and marginal groups across the country |
| | Ensuring a culture of resilience in all development activities across sectors | Process has been initiated by undertaking PECM project. A manual has been produced (GED, 2014c). | The process has just been initiated. Institutions must be made capable of delivering the commitment. |
| | Ensuring capacity building of poor and vulnerable group and local government in | Sporadic projects, mostly driven by NGOs, have been undertaken. | NO major GOB effort has been observed. BCCTF largely avoided financing projects with similar objectives. Needs immediate attention. |

| | | | |
|---|---|---|---|
| | sustainable natural resource management, CCA and DRR | | |
| LCD/ Mitigation | Promote indigenous and scientific strategies for mitigation to CC | A few projects have been initiated during the Sixth Plan period. Emphasis given on promoting renewable technologies. | Instead of emission reduction, the major focus has so far been on carbon capture through afforestation programmes. |
| | Promoting 3R (Reduce, Reuse and Recycle) strategy for waste management | A few projects have been rolled out under BCCTF and BCCRF. | Heavily focused on afforestation, coastal green belt, and promotion of renewable technologies. Needs attention in energy efficiency and demand side management. |
| | Reduce dependency on fossil fuel by promoting solar/green energy | Solar technologies have been promoted in both rural and urban areas.<br>Green tax introduced for cars, in order to impose disincentive for emitting technologies. | GOB committed natural gas as the primary source of producing secondary energy (i.e., electricity), also committed to supercritical technologies for future coal fire power plants.<br>Green energy pricing policy needs special attention during 7th FYP. |
| | Ensure greater contribution of forestry sector in the economic development | Afforestation programme undertaken in GOB forest areas and also promoted for social forestry.<br>People from all walks of life have been involved in tree plantation. Agro-forestry technologies have been promoted. Forestry extension service strengthened. | A culture of tree plantation across the nation has been established.<br>Private plantation of rubber, teak has'nt been successful yet, however orchard plantation has been increased significantly.<br>Mass initiative for CDM and REDD has not yet been taken, as promised in the Sixth Plan. |
| | Managing urban wastes | Two CDM projects being undertaken, several are in the pipeline | New sources of funding needs to be searched. Needs immediate actions in GCF readiness programme, INDC and MRV (as per UNFCCC guidelines) |
| | Rapid expansion of energy saving devices | CFLs are distributed to promote | People have accepted energy efficient products, however tax structures are not yet conducive to attract low income energy users. |
| | Improve energy efficiency in transport sector | Green tax imposed | Tax structure needs to be made conducive to promote adoption of hybrid cars and LED technologies (i.e., TVs and lights) |

Source: Ahmed *et. al*. (2015)."Climate Change and Disaster Management (Sectoral inputs towards the formulation of Seventh FYP (2016-2021), Planning Commission, GoB.

### 2.4.2 Climate Change Issues inthe 7th Plan

The main objectives relating to climate change, environment and disaster management under the 7th Five Year Plan (2016-2020) are:

| |
|---|
| 1. Attain good governance in environmental sustainability |
| 2. Eradicate extreme poverty and achieve national food security |
| 3. Address environmental health |
| 4. Ensure cities are sustainable and more efficient, with development following appropriately structured plans |
| 5. Establish the quality of life for the rural people of all regions |
| 6. Preserve agricultural land and to ensure production growth for food security with minimum environmental degradation |
| 7. Hold water of wetlands including jalmohals and rivers in dry season |
| 8. Meet national air and water quality standards |
| 9. Achieve tree cover over 20% of the land surface (with tree density > 70%) and ecologically healthy native forests are restored and protected in all public forest lands (about 16% of land) |
| 10. Ensure no new extinctions of globally and nationally threatened species |
| 11. Meet energy demands of development through a low carbon strategy |
| 12. Reduce potential economic losses due to Climate Change (particularly from floods, drought and salinity) |

**Institutions**

Institutions that are identified as crucial in supporting policies and plans in Bangladesh are as follows: (1) The Ministry of Environment and Forests (MoEF); (2) The Department of Environment (DoE); (3) Forest Department (FD); (4) Bangladesh Forest Industries Development Corporation (BFIDC); (5) Bangladesh Climate Change Trust (BCCT); (6) Bangladesh Forest Research Institute (BFRI); (7) The Bangladesh National Herbarium; (8) Water Resources Planning Organisation (WARPO); (9) The Department of Fisheries (DoF); (10) Ministry of Water Resources (MoWR); (11) Ministry of Industries (MoI); (12) Local Government Division (LGD).

**Addressing Climate Change**

Climate Change Management under the Seventh Plan will be addressed on two fronts: adaptation and mitigation. The adaptation strategy encompasses various measures to adequately prepare for the inevitable consequences of climate change, whereas mitigation efforts cover activities aimed at reducing carbon footprint.

**Climate Change Adaptation (CCA)**

Activities under the 7th Plan for CCA are as follows:

| |
|---|
| Issue 1: Promote a whole-of government approach for climate change readiness |
| Issue 2: Enhance understanding, knowledge, capacity and coordination |
| Issue 3: Prioritise programmes and projects |
| Issue 4: Improved Implementation, Monitoring and Shared learning |
| Issue 5: Enhance CCA financing |
| Issue 6: Integrate Gender Sensitivity in project design |
| Issue 7: Food security, social protection and Health |
| Issue 8: Managing hazards and disasters |
| Issue 9: Infrastructural functioning and maintenance |
| Issue 10: Curbing internal migration and displacement |

To ensure a nation resilient to climate change and to facilitate the process of CCA, several steps are identified for implementation during the Seventh Plan period:

(1) Revising BCCSAP; (2) Complete NAP; (3) Consider a planned development approach, integrating CCA into development; (4) Revitalise and strengthen institutional leadership for improved coordination; (5) Develop community based adaptation; (6) Establishing a Climate Fiscal Cell; (7) Disseminating and Implementing GAP.

The government will give attention to knowledge generation concerning climate change in the Seventh Plan in the field of (i) gender sensitivity to disasters and climate change; (ii) food security; and (iii) health care

***Climate Change Mitigation (CCM)***

To ensure an effective strategy on mitigation and LCD, the government has identified the following activities under the Seventh Plan.

| |
|---|
| Issue 1: Enhance understanding on LCD |
| Issue 2: Improve capacity in analysing available opportunities |
| Issue 3: Enhance capacity of energy saving sectors |
| Issue 4: Improvement in Coordination and Communication among Institutions |
| Issue 5: Ensuring investment in research and innovation |

To address knowledge gap for improving CCM, the government has identified some issues which are worth considering in this context: (i) impact of climate change effects on men and women; (ii) articulating non-price interventions; and (iii) examining changes in energy efficiency.

The Seventh Plan has also identified the issues and required activities regarding **Environmental Management, Green Growth Strategy** and **Delta Plan**.

**Financing**

The financing strategy involves mobilisation of international funding especially for climate change adaptation and mitigation. The Seventh Plan seeks to build on this progress working closely with NGOs and international development partners to strengthen sustainable development. Accordingly, the Seventh Plan proposes a significant increase in the annual development proggramme (ADP) allocations for the three core ministries dealing with sustainable development programmes.

ADP Allocation for Environment and Climate Change during 7th Plan Taka billion (Constant Prices FY16)

| Ministry /Sector | FY16 | FY17 | FY18 | FY19 | FY20 |
|---|---|---|---|---|---|
| Ministry of Environment and Forests | 4.8 | 6.8 | 7.7 | 8.6 | 9.6 |
| Sector Total | 4.8 | 6.8 | 7.7 | 8.6 | 9.6 |

## 2.4.3 Major funds for climate change programming

The contribution of GoB, Development partners and NGO/MFIs can be better understood in terms of their role in developing funds for climate change adaptation programmes and their role at implementation level. There are two major funds to advance climate change related activities. These include:

(a) ***The Bangladesh Climate Change Trust Fund (BCCTF)*** – a fund created with budgetary allocation from Bangladesh's revenue sources.

(b) ***The Bangladesh Climate Change Resilience Fund (BCCRF)*** – a fund created as a Multi-Donor Trust Fund (MDTF) to draw bilateral and multilateral donations from development partners. This fund is currently administered by the World Bank with a further provision for Palli Karma Sahayak Foundation (PKSF) to operate the NGO financing window of the BCCRF (the NGO-funding mechanism accounts for 10 percent of the total fund)

**Bangladesh Climate Change Trust Fund (BCCTF)**

In 2009-2010, the Government of Bangladesh provided US$100 million of budgetary resources to establish the BCCTFand established a Board of Trustees to administer the fund. The Climate Change Unit at the MoEF functions as the Secretariat for the BCCTF. For three successive fiscal years starting from 2009-10, the government has committed BDT 2,100 crore (approximately US$250 million) to the BCCTF (MoF2011). Box 3 shows distribution of BCCTF financed climate change projects

particularly in the current JICA study areas. Box 4 reports the number and type of the climate change projects.

**BOX 3: Allocation of Funds for Financing CCPs by District**

| Allocation of fund | Value (in million Tk.) |
|---|---|
| …by district | |
| Pirojpur | 1,401 |
| Bhola | 1,377 |
| Barisal | 1,098 |
| Patuakhali | 1,070 |
| Khulna | 681 |
| Satkhira | 612 |
| Madaripur | 543 |
| Bagerhat | 139 |
| Barguna | 75 |
| …by ministry | |
| Ministry of Water Resources | 3,706 |
| Ministry of Local Government | 2,361 |
| Ministry of Disaster Management and Relief | 488 |
| Ministry of Environment and Forest | 191 |
| Ministry of Women and Children affair | 130 |
| Ministry of Education | 120 |
| …by implementing agencies | |
| Bangladesh Water Development Board | 3,706 |
| Various Pourashova/ZilaParishad/City Corporation | 1,259 |
| Local Government Engineering Department | 992 |
| Department of Relief and Rehabilitation | 488 |
| Department of Forests | 171 |
| Department of Women and Child Affair | 130 |
| Education Engineering Department | 120 |
| Public Health Engineering Department | 110 |
| Bangladesh Forest Research Institute | 10 |
| Department of Environment | 10 |

Source: BCCT. Retrieved from the website http://www.bcct.gov.bd/

**BOX 4: Type of Climate Change Adaptation Projects by District**

| District | Number of project | Type of project |
|---|---|---|
| Pirojpur | 21 | • Protection from river erosion<br>• Infrastructure development<br>• Build cyclone shelter<br>• Build cyclone tolerant house<br>• Construction/protection of dam<br>• Social safety of women and children<br>• Mitigate water logging problem<br>• River/canal excavation<br>• Improvement of drainage<br>• construction of sanitary latrine |

| | | |
|---|---|---|
| | | • Eco-park construction/renovation<br>• Forestation |
| Bhola | 21 | • Protection of island<br>• Infrastructure development<br>• Water supply and social security<br>• Canal and pond renovation/development<br>• Protecting River erosion<br>• Miscellaneous development project<br>• Protection of dam<br>• Protection of river bank<br>• Mitigate water logging problem<br>• Road construction/re-construction/rehab |
| Barisal | 20 | • Protecting river erosion<br>• Mitigate water logging problem<br>• Build cyclone tolerant house<br>• Build polder<br>• Road construction<br>• Revision of the draft National Conservation Strategy<br>• Research Study<br>• Protecting River erosion<br>• Water supply<br>• Infrastructure development |
| Patuakhali | 12 | • Build polder<br>• Infrastructure development of dam<br>• Development of irrigation, floods control and drainage system<br>• Infrastructure development<br>• Reclamation of land<br>• Pond re-excavation<br>• Mitigate water logging problem<br>• Supply pure water |
| Khulna | 8 | • Build cyclone tolerant Home<br>• Communication infrastructure development<br>• Maintenance/re-construction of dam<br>• Construction of house<br>• Protection from river erosion<br>• Rehabilitation of polder<br>• Studies on honey bees |
| Satkhira | 6 | • Construct disaster resistance house<br>• Installation of PSF<br>• Rehabilitation of polder<br>• River excavation |
| Madaripur | 7 | • Canal re-excavation<br>• Mitigate water logging problem |
| Bagerhat | 4 | • Canal re-excavation<br>• House construction<br>• Infrastructure development and tree plantation<br>• Mitigate water logging problem |
| Barguna | 2 | • Ecotourism and biodiversity conservation<br>• Build drainage system and installation of solar light |

Source: BCCT. Retrieved from the website http://www.bcct.gov.bd/

**The Bangladesh Climate Change Resilience Fund (BCCRF)**

In September 2008, the Government of the United Kingdom pledged £75 million (US $117 million) as a grant to promote climate change adaptation in Bangladesh. This funding along with contributions from other donors led to the establishment of the Bangladesh Climate Change Resilience Fund

(BCCRF). The GoB invited the World Bank to administer this fund for at least the initial three years. Major projects funded/approved for funding under BCCRF are reported in Box 5.

**BOX 5: Major CCPs Approved for Funding under BCCRF by District**.

| Project | Division | District |
|---|---|---|
| 1. Emergency 2007 Cyclone Recovery and Restoration Project (Multipurpose Cyclone Shelter Construction Project) | Barisal | Barguna, Pirojpur |
| | Khulna | Khulna, Patuakhali, Satkhira |
| 2. Secretariat for BCCRF Phase I (Capacity Building Project Phase I) | Dhaka | Dhaka |
| 3. Community Climate Change Project (CCCP) | Barisal | Barisal, Patuakhali, Barguna |
| | Chittagong | Cox's Bazar |
| | Dhaka | Jamalpur, Mymensingh |
| | Khulna | Satkhira, Khulna, Jessore, Bagerhat, Chuadanga |
| | Rajshahi | Kurigram, Nilphamari, Rajshahi, Natore, Naogaon |
| 4. Supporting Agriculture Adaptation to Climate Change | | |
| 5. Climate-Resilient Participatory Afforestation and Reforestation Project | Barisal | Barisal, Pakuakhali, Barguna, Bhola |
| | Chittagong | Cox's Bazar, Chittagong, Feni, Noakhali, Lakshmipur |
| 6. Rural Electrification and Renewable Energy Development Project II (Solar Irrigation Project) | Barisal | Barisal, Barguna, Jhalakhati, Patuakhali |
| | Chittagong | Bandarban, Chandpur, Chittagong, Comila, Cox's Bazar, Feni, Khagrachari, Noakhali |
| | Dhaka | Dhaka, Faridpur, Gazipur, Jamalpur, Kishoregong, Mymensingh, Narsindi, Sherpur |
| | Khulna | Bagerhat, Chuandanga, Jessore, Jhenaidah, Khulna, Kushtia, Magura, Meherpur, Satkhira |
| | Rajshahi | Bogra, Naogaon, Pabna |
| | Rangpur | Dinajpu, Gaibandha, Kurigram, Lalmonirhat, Nilphamari, Panchagarh, Rangpur, Thakurgoan |
| | Sylhet | Habiganj |
| 7. Modern Food Storage Facilities | Dhaka | Narayanganj |

Source: BCCRF Annual Report 2013

### 2.4.4 Review of role of MFIs in natural disasters adaptation

According to Mahfuzet.al, climate-induced disasters impact a poor household's income and assets in four distinct ways:

a) Temporary inability to earn: Rapid-onset disasters, particularly floods, can prevent poor households from taking part in the activities that traditionally act as wellsprings of earnings.

b) Increased basic expenditures: Transporting assets and other items from the household's residence to a safe place, expanded wellbeing risks, and increased costs for essential nourishment and fuel all incidentally build the sum required for a family to merely survive (Ahmed and Ahmed, 1999).

c) Damage to or destruction of income-generating assets: Apart from their transitory inability to earn wages, households' income-generating assets (like crops, livestock, or brick-making kilns) may be destroyed or lost due to disaster (Huda and Barua, 1999).

d) Damage to or destruction of household assets: Disasters can destroy household belongings, including the home itself (Brown and Nagarajan, 2000).

When a disaster strikes, factors one and two results in a rapid decline in net income, the size and duration of which depends, to a large extent, on the size of the catastrophe and its impact on the household. The third and fourth effects tend to have more profound impacts on post-disaster recovery. The combined effect of these various impacts is that climate related disasters in Bangladesh present immense obstacles to households lifting themselves out of poverty and remaining above the poverty line.Access to financial products and services is vital to the poor for risk management and reducing vulnerability to climate-induced disasters and shocks. However, in Bangladesh a significant segment of the low-income group remains excluded from the formal financial system. A massive microfinance sector led by developmental NGOs (Non-Governmental organisations) has emerged to fill this vacuum in financial service delivery. Their financial service includes credit, savings, insurance, and other related services, and they deliver these in the villages, almost to the door of the households.

#### *2.4.4.1 Financial services of MFIs*

In the subsequent pages, we review the financial services provided by the MFIs following the disaster.

***Credit:*** Microcredit contributes to climate change adaptation by enabling households to develop and diversifying their asset base. In addition to their regular loans, Bangladesh's MFIs provide credit for non-productive purposes, such as dealing with emergencies, home improvement and education, which may also reduce household vulnerability to climate-related and other shocks. MFI developed disaster-related loans and made adjustments in their credit delivery services. These include (i) pre-disaster or pre-emptive measures, (ii) emergency relief operations, and (iii) reconstruction or asset replacement initiatives.

***Emergency response:*** During and immediately after a disaster, MFIs reschedule existing loans to reduce the burden of repayment and provide new and rapid emergency loans for households to substitute the sources of income they lost temporarily due to the disaster. Being mostly development-oriented NGOs, many MFIs also provide food, clothing, medicine, or other relief goods during the relief phase.

Following the 1998 flood, many MFIs rescheduled some repayments on their existing loans, based on the needs and intensity of adverse impacts of flood.Now most MFIs allow their borrowers to do this sorts of adjustment. This is a common practice for the concerned MFIs to reschedule instalments during floods or other major disasters. It reduces borrowing from moneylenders and works as a safety net to prevent the borrower from falling further into poverty (Shoji 2007). Several MFIs adopted different strategies including rescheduling of loans to provide short run relief to the borrowers and contribute in their process to recover from shocks and disaster. Rescheduling of loans appears to have been a major initiative for GrameenBankin times of difficulty to repay and covariate shocks (Dowla and Barua 2006).

However, not in all cases, MFIs could offer loans rescheduling as an option during disasters for the sake of discipline. Instead, they offered short-term loans carrying zero percent or negligible interest rate to help their borrowers during the disaster. Not all MFIs can offer such services because of their limited financial capability. Several MFIs have created their own disaster loan funds to provide an easily accessible source of liquidity during disasters.

***Savings:*** Micro savings act as insurance particularly in disasters. In order to expedite the pace of micro savings, MFIs require all their members to save regularly (e.g., weekly or fortnightly) as Compulsory savings, in addition to voluntary savings. Until the 1988 flood, withdrawal was restricted.

But the massive flood of 1988 that inundated almost two-third of the country made it difficult for the members to cope with situation. The growing demand from the members led to the introduction of the provision of withdrawal from their savings. Voluntary savings have surfaced the amount mobilised as compulsory on regular basis.

The introduction of voluntary and flexible savings schemes by some MFIs has proved very popular, indicating that poor households have a need for savings services, and not just credit services. For example, after providing members open access to withdraw their funds in the first year, BURO Bangladesh recorded a 52 per cent increase in average savings balances per member. The Grameen Bank also noted a similar positive response from its members when it introduced several contractual savings schemes (Dowla and Barua 2006). Other MFIs also introduced diversity and flexibility into their savings products, making them more relevant to coping and recovery during floods (Meyer, 2002). The voluntary savings products offered by MFIs thus appear to be making an important contribution to disaster risk reduction.

MFIs have also modified their savings products to make them more useful for their members in dealing with shocks. BURO Bangladesh has introduced contractual term savings that require its clients to make regular savings deposits for a certain period in exchange for the guarantee that they will be able to withdraw up to three-quarters of the accumulated balance without penalty during a disaster (Dowla 2011). This type of arrangement can help the clients of other MFIs self-insure and pursue riskier and potentially more profitable livelihood activities. However, this may involve more risk-taking activities through pursuing enterprise or income-generating activities in trade, production or services, which would build a household's asset base if profitable (Hammill*et al*. 2008). Flexible and diverse saving products may thus be contributing in various ways, both directly and indirectly, to climate change adaptation.

***Microinsurance:*** Microinsurance is now recognised as an instrument of disaster risk management, as it saves own resources for coping and quick reconstructions of the assets damaged including houses (Churchill 2006). Although formal insurance companies can offer insurance services to the low income households, but they cannot reach to this group of clients because of high transaction cost and delay in claims settlement. On the other hand, MFIs cannot offer legally insurance products to the public. Nevertheless, MFIs do offer informal insurance, popularly known as credit-life insurance, to its borrowers. The basic objective is to protect default in case of damages caused to the property financed by loans and/or death of head of the family or the borrower. The product is not oriented towards losses due to cyclone and flood. The challenges of promoting insurance to disaster prone low income rural households are not unique to Bangladesh. Microinsurance is widely viewed as an important and effective mechanism to mitigate natural hazard risks (Botzen and van den Bergh 2008) and disaster risk insurance programmes have thus been introduced in many developing countries (Mechler et al. 2006).

Despite the many and serious challenges, some MFIs do provide some types of insurance. The types of microinsurance and quasi microinsurance products in Bangladesh include credit, health, life and livestock coverage. In terms of credit-linked insurance, MFIs have demonstrated significant interest offering insurance as a way to insure their outstanding loans (Alderman and Haque 2007). While there has been significant progress bundling credit and insurance for livestock fattening, there is a risk that compulsory insurance schemes that are bundled with micro-credit or savings schemes could limit the ability of low-income households to access credit facilities as such schemes increase the costs of borrowing or reduce the returns from savings (Akter et al. 2011).

Despite wide expansion of bundling of credit and microinsurance, none of the MFIs in Bangladesh provides insurance against disaster-related losses.

**How have MFIs responded to disasters?**

The 1988 flood warranted the MFIs in Bangladesh to take appropriate measures for minimising risk and better coping with the disaster. Several important developments took place. First, as noted earlier, flexible savings with provision for withdrawal was introduced. Second, MFIs, particularly the larger MFIs and PKSF partner MFIs under the guidance of PKSF, adopted to prepare both short and long run disaster management action plans. Third, the MFIs with or without contribution of donors have created separate fund called 'Disaster Management Fund'.

Some MFIs have developed special funds, either supported by donors or from their own income, to provide assistance to communities during and in the aftermath of disasters. These disaster management funds help the MFIs protect themselves from liquidity crises when there is a sudden run on savings deposits during a natural disaster. When invested in government bonds or long-term deposit schemes in the banks, these funds can be disbursed within 48 hours and distributed among the affected clients on soft terms. The PKSF requires all partner MFIs to contribute one percent of the interest from their income to a Disaster Management Fund (DMF). PKSF then provides additional funds to its partner organisations to cope with disasters.

**MFI approaches to disasters and climate change adaptation**

MFI are engaged in climate change and disaster management through their long-term policies, awareness building at the community level and financing resilience building measures at the household or client level. As noted earlier, PKSF through its partner organisations, and large MFIs have developed separate financial products with flexible terms and conditions. Different organisations have adopted different measures and approaches. We put below several examples of approaches adopted by different institutions including PKSF for better understanding the approaches that the MFIs in Bangladesh have adopted in climate change disaster risk reduction and adaptation.

## Palli Karma-Sahayak Foundation (PKSF)

PKSF, established by the Government of Bangladesh in 1990, is a "not-for-profit" organisation for supporting the extension of microfinance services to achieve sustainable poverty reduction through employment generation. In the initial stage, its activities were basically limited to financing income generating activities of the poor member-households through MFIs who are registered as its "partner organisations" (POs). It has diversified its programmes responding to the diversified needs of the poor households. However, PKSF has emerged as a development agent that targets sustainable poverty alleviation and integrated approach to development. In the last decade, PKSF has implemented several projects and programmes to support disaster-affected households like PRIME both in the NW and SW regions, and ENRICH for integrated development throughout the country.In the specific cyclone-prone areas, it has undertaken community-level initiatives like safe drinking water through installing deep tube well and developing saline-prone crops etc.

With support from PKSF, POs are packaging financial and non-financial services to bring adaptation technologies to households in climate affected areas. . Some of its POs already provide technical and financial assistance for rainwater harvesting and water filtration in the southern part of Bangladesh affected by salinity intrusion and frequent storm surges; however, greater support is needed to scale up these efforts and reduce costs to households. PKSFhas establisheda separate division to more effectively support climate change adaptation. During the past decade, PKSF has implemented many projects. In Table7, we present the list of programmes/projects for better understanding:

**Table 7: PKSF Programmes to Support Disaster Affected Households**

| Year | Name of Project | Main features | Support |
|---|---|---|---|
| 2002 | Socio-Economic Rehabilitation Loan Programme (SRLP) | Financing the disaster-stricken people | ADB |
| 2004 | Livelihood Restoration Project (LRP) | Loan for recovery from disaster | World Bank |
| 2007 | Emergency 2007 Flood Restoration and Recovery Assistance Programme (EFRRAP) | Loan for recovery from disaster | World Bank |
| 2007 | Special Assistance for Housing of Sidr Affected Borrowers (SAHOS) | Finance for recovery from disaster | GoB |
| 2007 | Rehabilitation of Sidr Affected Coastal Fishery, Small Business and Livestock Enterprise (RESCUE) | Finance for recovery from disaster | GoB |
| 2006 | Programmed Initiatives for *Monga* Mitigation (PRIME) in NW region | Financial and non-financial services to the *monga*-affected households . | DFID-PKSF |
| 2010 | PRIME in SW region | Financial and non-financial services for the cyclone affected households | DFID-PKSF |
| 2010 | ENRICH | Integrated development for sustainable poverty alleviation | PKSF |

The following specialised programmes are notable in terms of their support for disaster management and climate change adaptation:

PKSF implemented in 2008 *Emergency 2007 Flood Restoration and Recovery Assistance Programme (EFRRAP) with* the financial support of the GoB and the World Bank. The EFRRAP was undertaken following the flood of 2007 that directly affected over 13 million people in 47 districts. The World Bank allocated a grant of US$15 million to PKSF through the Ministry of Finance and the Social Development Foundation (SDF). The Fund was used for livelihood restoration activities of the PO members under the existing Disaster Management Loan Policy. It provided quick and flexible financial assistance to minimise flood losses by improving and upgrading the livelihoods of the poor households. It was limited to flood prone, recurrently distressed, river-erosion, *char* and extremely disadvantaged areas.

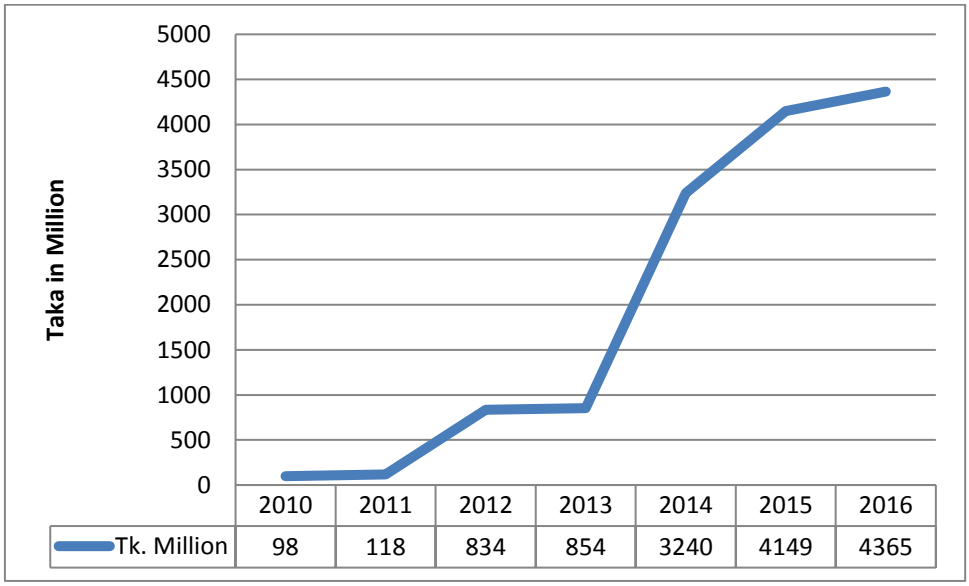
PKSF implemented under the BCCSAP and is funded under the Bangladesh Climate Change Resilience Fund (BCCRF), which is a multi-donor trust fund. Ten percent of the accumulated fund of the BCCRF is assigned for NGO programmes aimed at enhancing the ability of people to adapt to the adverse effects of climate change. PKSF manages this budget window and transfers funds on to its PO for climate change adaptation interventions at household or community level.

Following the disastrous effects of Sidr and *Aila*, based on successful experience of PRIME in NW region, PKSD decide to replicate the PRIME in South-western (SW) districts in 2010. The PRIME was first implemented in north-western districts of the country to address *monga*. The long-run empirical impact studies show that the programme has contributed to sustainable graduation from *monga*.Under the programme in SW region, PKSF has also provided relief after disasters. During 2010 and 2011, PRIME supplied about 140,000 litres of safe drinking water per day to *Aila*victims for nearly 150 days. It also re-excavated 15 ponds contaminated by saline water to preserve fresh water in Shayamnagarupazila in Satkhira district. Under PRIME-3, a total of 3,959 beneficiaries were involved

for 60 days in work programmes in *Aila*-affected area. The programmes provided a total of 240,117 workdays worth Tk.36 million. The PRIME in SW districts contains elements of skill and vocational training, technical services, primary health care, disaster management services, flexible microcredit and emergency loans.

Following the 1998 flood, PKSF recognised that poor households are always vulnerable to disasters like cyclone and flood. As such, it formulated a policy to create fund for supporting disaster affected poor households. Under the policy, PKSF requires its partner organisations to contribute 10 percent of its surplus in disaster management fund (DMF). Similarly, PKSF has created a separate DMF out of its own surplus.The DMF provides quick financial assistance to poor households to cope with and recover from disasters, prevent them resorting to advanced sale of labour and enable them to smooth consumption even from idiosyncratic shocks. It is utilised in times of disaster or afterwards for restoration of livelihoods, rehabilitation, urgent medical services, water and sanitation, and to meet emergency consumer needs. PKSF mobilised this fund from its own income and also from other organisations. The DMF has increased rapidly since it was launched.

**Figure 14: Trend in PKSF Disaster Management Fund, 2010-16**




Source: Based on Annual PKSF Reports.

Apart from PKSF and its partner MFIs, there are other MFIs (outside the network of PKSF) that address adaptation and resilience building of the affected households.

## BRAC

BRAC, the largest NGO-MFI in Bangladesh, does not have any specialised loan product targeting climate change; it offers the same set of financial products. However, when households face covariate shocks, it suspends all loan repayments after any disaster.After Sidr, it suspended repayments through to March 2008. It also keeps a separate sanctioned loan, which a client can take immediately after any disaster, no matter whether they have multiple loans in effect. However, it offers different package of services for reconstruction, rehabilitation, emergency relief and adaptation.

BRAC usually responds to any major disaster by providing food, medical and water services through its local infrastructure in the affected region. During Sidr, it delivered healthcare, water and sanitation services, partnering with government departments, other emergency relief agencies and local NGOs. After*Aila*, BRAC initially provided emergency food and shelters, followed by water and sanitation

facilities, and then livelihood support. It has introduced a series of food-for-work schemes, which focus on repairing roads, schools and public clinics damaged by disasters.

BRAC has undertaken a range of activities aimed at rehabilitation after disasters. These include rebuilding educational infrastructure, re-establishing social forestry, replacing poultry and livestock, agricultural rehabilitation, replacing fishing boats, repairing water filters, constructing additional cyclone shelters and creating long-term livelihoods. In addition to writing-off loans outstanding amounting to US$4.8 million affected members, BRAC has undertaken programme for restoration and rehabilitation.In 2008, it initiated the post-Sidr Livelihood Rehabilitation Programme (LRP) to restore the livelihoods of the disaster-affected households.

Salinity is a very common problem particularly for crop cultivation in SW districts following any disaster that accompanies tidal surge. As such, BRAC in 2010 introduced the salt-tolerant rice variety *BRRIdhan*-47, fish cultivation and crab fattening in areas affected by salinisation after *Aila* struck. It has also introduced the 'mound technique' for growing vegetables in submerged soil in the coastal areas affected by Sidr and *Aila*. In addition, after Sidr, a total of 66,034 small women farmers received a grant of Tk.4, 000per acre for land preparation, and purchase of agricultural inputs. It also provided assistance for replanting trees after Sidr.

BRAC's disaster, environment and climate change (DECC) programme uses an early warning system. By using data collected from Bangladesh and Indian meteorological departments, BRAC provides real-time information to the potential affected areas before disasters. It has prepared standard operating procedures (SOPs) that are used as guideline to respond to natural disasters.

Adaptation and resilience building requires interventions both at the household and community level. Disaster management training is provided to clients of BRAC's major programmes for enhancing capacity at the community-level. BRAC's community health volunteers and health workers receive first aid training to apply during and after disasters. Under the DECC, it has constructed 43 disaster-resilient houses and one disaster resilient school at Shyamnagarupazila in Satkhira district using local materials and knowledge, which work as community cyclone shelters and save people's lives and assets during emergencies.

## BURO Bangladesh

BURO Bangladesh, one of the large national MFIs, has introduced several adaptation measures for its affected clients. This includes disaster loans, emergency disaster support from its Emergency Disaster Fund constituted with donor contribution, disaster awareness programme, and disaster management programme.

The disaster loans are intended to reduce the effect of shocks to households' financial and physical assets immediately after natural disasters with loan size between Tk. 3,000-5,000 carrying an interest rate of 10 percent, repayable in one year. The disaster fund now stands at Tk. 106.54 million. It enables BURO to extend loans with lower charges to assist affected households in rebuilding their livelihoods after a disaster.

BURO conducts awareness programme in disaster-prone areas. The awareness programme includes pre-disaster and post-disaster preparedness. Activities include raising public awareness for minimising disaster loss, and encouraging households to construct disaster resilient houses and hygienic toilets.The disaster management programme is intended to reduce income erosion of BURO clients by providing services related to disaster preparedness and response. To promote disaster preparedness, it provides technical assistance aimed at building institutional capacity and encourages existing indigenous practices.

## ASA

ASA is one of the large MFIs in Bangladesh. It is uniquely identified as microfinance institution. Until recently, it was more focused on pure financial services. However, it does offer some services to support disaster risk reduction. In addition to building awareness in the disaster-prone areas, it has provided debt relief during disasters, training its members to cope with the new conditions they are facing, etc. To promote rehabilitation after disasters ASA defers repayments and offers housing loans. Other programmes to assist disaster-affected households include stipends for school children from poor and disadvantaged households, especially in cyclone Sidr and *Aila* affected areas, and programmes on drinking water and irrigation, especially in *Aila* affected areas where salinity is a major problem for small and marginal farmers.

In brief,the approach of the MFIs in disaster management includes programmes:

- Microcredit
- Flexible savings
- Rescheduling of loans
- Informal microinsurance
- Debt-waiver
- Creation of separate fund for disaster management
- Promotion of salinity-prone crops and disaster-prone area specific income generating activities
- Training and awareness building at the household and community levels
- Limited scale of reconstruction of roads
- Temporary employment opportunities
- Housing loans at low interest
- Building capacity at the community level
- Emergency loans for immediate relief and consumption smoothening

MFIs are implementing various programmes and projects related to disaster risk reduction and climate change adaptation. Most appear to have specific programmes or strategies for the disaster relief phase, including providing basic necessities, adjusting their financial products to reduce the burden on households and make deposits and emergency soft loans available to their members during disasters.

Some MFIs are providing financial and non-financial services, and a combination of both, directly aimed at promoting adaptation to climate change. A variety of non-financial adaptation interventions aimed at household and community level are being implemented by MFIs under PKSF's Community Climate Change Project. BURO Bangladesh's support for summer tomato production is an example of how MFI's are assisting households to adapt their livelihoods to altered climate conditions. The activities that we have discussed are presented in Table 8.

**Table 8: MFIs in Disasters and Climate Change Adaptation**

| Products/Services | PKSF | Grameen Bank | BRAC | ASA |
|---|---|---|---|---|
| Credit | Under PRIME, PKSF POs provide flexible microfinance services to households vulnerable to seasonal starvation. Disaster related loans provided under the SAHOS and RESCUE programmes. | Borrowers can renegotiate the repayment schedule after a disaster. They can exit if they face problems in repayment | ▪ Zero-interest loan under Agricultural Credit Programme for climate adaptive crops (e.g. beans, corns and sunflower)<br>▪ Suspended all loan repayments in the cyclone affected areas<br>▪ Regular loan repayments can be suspended for a period. Interest rates can be reduced significantly for up to two months.<br>▪ Loans can be restructured for clients with marginal disaster losses (based on field visits).<br>▪ Loans can be refinanced for clients with high disaster losses (based on field visits).<br>▪ New loans are offered for productive asset replacement of up to 12 months at 15 percent interest. | Micro-credit programme for the flood affected people on pilot basis in the late eighties |
| Savings | No disaster specific savings item | Before flood season the borrowers are suggested to put extra money as savings so that they can withdraw during and after flood | Clients can withdraw savings up to a specific pre-established amount. BRAC provides full access to borrower's own emergency savings | None |
| Insurance | Under PKSF's Developing Inclusive Insurance Sector Project (DIISP), POs are providing credit-life, livestock and health insurance | ▪ Insurance scheme for micro-enterprises against losses caused by natural disasters<br>▪ Livestock insurance for its members | None | None |

| | | | | |
|---|---|---|---|---|
| Disaster plan | Maintains a disaster management fund for livelihood restoration, rehabilitation, urgent medical services, water and sanitation, and to meet emergency consumption needs during and after disasters | ▪ At first prepares borrowers at the beginning of flood season<br>▪ Bank staff visit borrowers at home or in shelters, distribute some relief items during the flood period | Have no specific disaster plan but operate relief operation and rehabilitation programmes after disasters | Stipend programme for poor and disadvantaged school children and programme on safe water for drinking and irrigation purposes in Sidr and *Aila* affected areas |
| Support during and after disaster | During Disaster:<br><br>Conducts relief operations<br><br>After Disaster: POs<br><br>supply safe drinking water, repair houses, tube wells and latrines | During Disaster:<br><br>Staff visit borrowers at home or in shelters, distribute water purification tablets and oral rehydration solution<br><br>After Disaster:<br><br>Makes cash transfers | During Disaster: Provides relief<br><br>After Disaster:<br><br>Extensive efforts in health, water and sanitation<br><br>Medical teams work in remotest affected areas. Introduces a number of agricultural and non-agricultural interventions | During Disaster: Provides relief<br><br>After Disaster:Assesses the losses and provides credit support for rehabilitation |
| Other direct adaptation support | Through the Community Climate Change Programme, supports various adaptation measures through small grants to households and communities. The measures include rainwater harvesting, training on climate-resilient livelihoods such as crab fattening, home gardens, etc. | Awareness programme before disaster | | |

**Table 8: MFIs in Disasters and Climate Change Adaptation (Cont'd)**

| Products/Services | BURO Bangladesh | Proshika | JCF | BDS |
|---|---|---|---|---|
| Credit | Loan repayment is rescheduled and repayment period is extended | No specific credit programme but loan repayment is rescheduled and repayment period is extended, depending on severity of impacts | No specific credit programme but loan repayment is rescheduled and repayment period is extended, depending on severity of impacts | No specific credit programme but loan repayments are postponed after disaster |
| Savings | None | None | Affected clients have access to their savings when disaster strikes | Affected clients have access to their savings when during disasters |
| Insurance | None | Compulsory group-based insurance since 1997 | Credit insurance | None |
| Disaster plan | None | Used to deliver software services stressing on preventive measures to improve the knowledge of the community on comprehensive risk reduction | None | Provide training to its members to cope up with adversities |
| Support during and after disaster | Relief operation during disaster and rehabilitation after disaster | Used to conduct relief operation during disaster and rehabilitation after disaster | Provides basic goods such as candle, water, oral rehydration saline, biscuits, etc. during disaster, and provides loan to repair houses and to rebuild toilets after disaster | Provided loans to rebuild houses after Sidr |
| Other direct adaptation support | | | Field officers talk about sanitation, family planning, etc. during the general meetings | Provides some general guidance to reduce the losses arising from disaster |

Source: Extracted from: CCCP-PKSF. Various publications

#### *2.4.3.2 Community Climate Change Project (CCCP): Non-Financial Intervention of MFIs at Community Level*

As we have pointed earlier, ninety percent of BCCRF fund has been allocated for the public sector projects, while ten percent is channelled through NGOs for community-level climate actions through a separate project titled "Community Climate Change Project (CCCP)". The Governing council of BCCRF designated PKSF for implementing the community-level climate change adaptation activities through CCCP.

Types of interventions along with the budget and objectives that have been undertaken in the study areas under the CCCP project are presented in Table 9.

**Table 9: Interventions Summary of CCCP Project in the Study Area**

| Sl no | Project Implementing Partners | Sub-project | Working area | Duration | Beneficiaries (HHs) | | Budget | Intervention |
|---|---|---|---|---|---|---|---|---|
| | | | | | Individual | Community | | |
| 1 | Family Planning Association of Bangladesh (FPAB) | Reducing adverse effect of climate change on human health in flood prone area | Dist: Khulna Upazila: Dhighalia | October 2014 to December 2016 | 200 | 4,500 | 1,29,93,020 | 1. Installation deep tube well with platform for safe drinking water<br>2. Satellite medical camp<br>3. Construction of sanitary latrines |
| 2 | SatkhiraUnnayanSangstha (SUS) | Ensuring food security and saline resilient livelihood through community based adaptation | Dist: SatkhiraUpazila: Kaliganj, Assasuni | July 2013 to December 2016 | 2,600 | 9,300 | 5,30,52,816 | 1. Community consultation<br>2. Homestead plinth raising<br>3. Connecting road repairing<br>4. Desalination plant<br>5. Pond re-excavation and PSF installation<br>6. Sanitary latrine installation<br>7. Rain water harvesting system (RWHS) at house level<br>8. Rain water harvesting system (RWHS) at community level<br>9. Crab fattening<br>10. Poultry rearing in semi-bound way<br>11. Duck rearing<br>12. Sheep rearing at slatted shelter<br>13. Goat rearing at slatted shelter<br>14. Vegetable demonstration plot and vegetables cultivation at HH<br>15. Nursery establishment |
| 3 | NazrulSmritiSangsad (NSS) | Community participation to thrive climate change through adapting | Dist: BargunaUpazila: Amtali | August 2013 to December 2016 | 815 | 6,957 | 1,95,42,831 | 1. Cultivating salinity-tolerant crops<br>2. Fingerling support for short growing monosextelapia<br>3. Homestead gardening<br>4. Slatted housing system for goat/sheep rearing and capacity |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | innovative sustainable mechanisms in life | | | | | | building<br>5. Duck rearing in semi-scavenging method<br>6. Installation of sanitary latrines<br>7. Deep hand tube well installation for community water supply<br>8. Canal re-excavation |
| 4 | DakDiye Jai (DDJ) | Promoting grassroots capacity to reduce vulnerability to increasing salinity in bagerhat district | Dist:<br>BagerhatUpazila: Morelganj | August 2013 to December 2016 | 770 | 380 | 2,67,30,453 | 1. Homestead plinth area raising<br>2. Installation of improved cooking stoves<br>3. Pond re-excavation and PSF installation<br>4. Sanitary latrine installation<br>5. Training on duck rearing<br>6. Duck rearing<br>7. Duck vaccination campaign |
| 5 | Jagrata Juba Shangha (JJS) | Enhance livelihood of coastal community for adaptation to climate change | Dist:<br>Khulna Upazila: Dacope | August 2013 to December 2016 | 966 | 2,766 | 2,55,09,078 | 1. Plinth raising<br>2. Goat/sheep rearing in slatted house<br>3. Installation of sanitary latrine<br>4. Crab culture<br>5. Duck rearing in semi-scavenging method<br>6. Pond re-excavation with PSF |
| 6 | UDDIPAN | Strategic adaptation to reduce effects of salinity due to climate change | Dist: PatuakhaliUpazila: Kolapara | January 2014 to December 2016 | 1,221 | 438 | 2,34,85,841 | 1. Plinth level and courtyard raising<br>2. Duck/poultry rearing in semi-scavenging method<br>3. Goat/sheep rearing in slatted house<br>4. Promotion of improved cooking stoves (ICS)<br>5. Promotion of medical plant cultivation<br>6. Installation of hygienic latrines<br>7. Installation of deep tube well with platforms |
| 7 | Unnayan | Adaptation to climate change for food security and | Dist:<br>Khulna Upazila: | January 2014 to December | 1,471 | 200 | 1,83,33,304 | 1. Duck rearing in semi-scavenging method<br>2. Goat/sheep rearing in slatted sheds<br>3. Homestead plinth raising |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | livelihood in saline affected area | Batiaghata | 2016 | | | | 4. Construction of environment friendly sanitary latrines<br>5. Construction of community based Pond Sand Filter (PSF)<br>6. Construction of community Rain Water Harvesting (RWH) system<br>7. Homestead gardening<br>8. Vaccination campaign |
| 8 | SANGRAM | Adaptation with alternative livelihood opportunity-AALO | Dist:<br>BargunaUpazila: Bargunasadar | January 2014 to December 2016 | 483 | 2,675 | 2,13,71,298 | 1. Plinth raising<br>2. Environment-friendly ICS distribution<br>3. Goat shed distribution<br>4. Duck shed distribution<br>5. Pond re-excavation and PSF<br>6. Deep tube well installation<br>7. House level latrine installation<br>8. Community latrine installation<br>9. H.S natural water plant |
| 9 | UnnayanProchesta | Climate resilient community development project | Dist:<br>SatkhiraUpazila: Assasuni | January 2014 to December 2016 | 717 | 3,023 | 2,16,67,199 | 1. Plinth raising<br>2. Slatted house for goats and sheep<br>3. Installation of sanitary latrine<br>4. Pond re-excavation with PSF<br>5. Homestead gardening |
| 10 | NowabenkiGonomukhi Foundation (NGF) | Ensuring food security and improving health condition through adaptation to climate change | Dist:<br>SatkhiraUpazila: Shyamnagar | January 2014 to December 2016 | 2,028 | 2,028 | 3,55,05,056 | 1. Plinth raising<br>2. Establishment of desalination plant<br>3. Establishment of Pond Sand Filter (PSF)<br>4. Goat rearing in slatted house<br>5. Crab fattening in pen & cage culture method<br>6. Pigeon rearing<br>7. Sheep rearing in slatted house<br>8. Poultry rearing in semi-scavenging method<br>9. Duck rearing in semi-scavenging method<br>10. Installation of sanitary latrines<br>11. Homestead vegetable gardening |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 11 | Dhaka Ahsania Mission | Build resilience of the sundarbans-dependent poor and extreme poor communities to climate change through empowerment and livelihood support | Dist:<br><br>SatkhiraUpazila: Shyamnagar | January 2014 to December 2016 | 1,055 | 1,184 | 2,61,93,314 | 1. Fuel efficient low-carbon emitting ovens<br>2. Connecting road construction<br>3. Installation of sanitary latrines<br>4. Rain water harvesting<br>5. Pond re-excavation with PSF<br>6. Household plinth raising<br>7. Goat rearing in slatted houses<br>8. Poultry rearing in semi-scavenging method<br>9. Short time crab culture<br>10. Homestead vegetables gardening<br>11. Vaccination campaign |
| 12 | Rural Reconstruction Foundation (RRF) | Community based climate change adaptation programme | Dist:<br><br>BagerhatUpazila: Sarankhola | August 2014 to December 2016 | 483 | 119 | 2,25,19,610 | 1. Plinth & courtyard raising<br>2. Identification remote households and building water reservoirs<br>3. Goat rearing in slatted house<br>4. Duck rearing in semi-scavenging method<br>5. Promotion of vermin-compost<br>6. Homestead vegetable gardening |
| 13 | Jagorani Chakra Foundation (JCF) | Strengthening the capacity of poor & ultra-poor community in saline affected region to adapt with the adverse effect of climate change | Dist:<br><br>BagerhatUpazila: Sarankhola | August 2014 to December 2016 | 500 | -- | 1,92,34,150 | 1. Plinth raising<br>2. Duck rearing<br>3. Vaccination campaign<br>4. Water reservoirs |
| 14 | NGO Forum for Public Health | Adaptation to climate change for sustainable water supply and sanitation services | Dist: PatuakhaliUpazila: Galachipa | August 2014 to December 2016 | 37 | 1,819 | 1,70,68,582 | 1. Installation of sanitary latrine<br>2. Installation of tube well with platforms<br>3. Installation of HH based RWHS<br>4. Plinth raising |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | and community resilience building in coastal areas | | | | | | |
| 15 | Shaplaful | Increasing resilience to salinity and climate change induced disaster risks and impacts among vulnerable households through disaster management and adaptation | Dist:<br><br>BagerhatUpazila: Fakirhat | September 2014 to December 2016 | 605 | 590 | 1,34,06,500 | 1. Plinth raising<br>2. Installation of tube well with platforms<br>3. Poultry rearing (Training & Technical support)<br>4. Goat rearing in slatted house |
| 16 | Association for Realisation of Basic Needs (ARBAN) | Improving water & sanitation condition for the people of the coastal areas of Bangladesh vulnerable to climate change | Dist: PatuakhaliUpazila: Dashmina | October 2014 to December 2016 | 690 | 1,650 | 1,33,75,199 | 1. Homestead gardening using vermin-compost<br>2. Installation of sanitary latrine<br>3. Installation of tube well with platform for safe drinking water. |

Source: PKSF Reports 2015-17

## 2.5 Adaptation Strategies: How Do Affected Households Cope with Shocks?

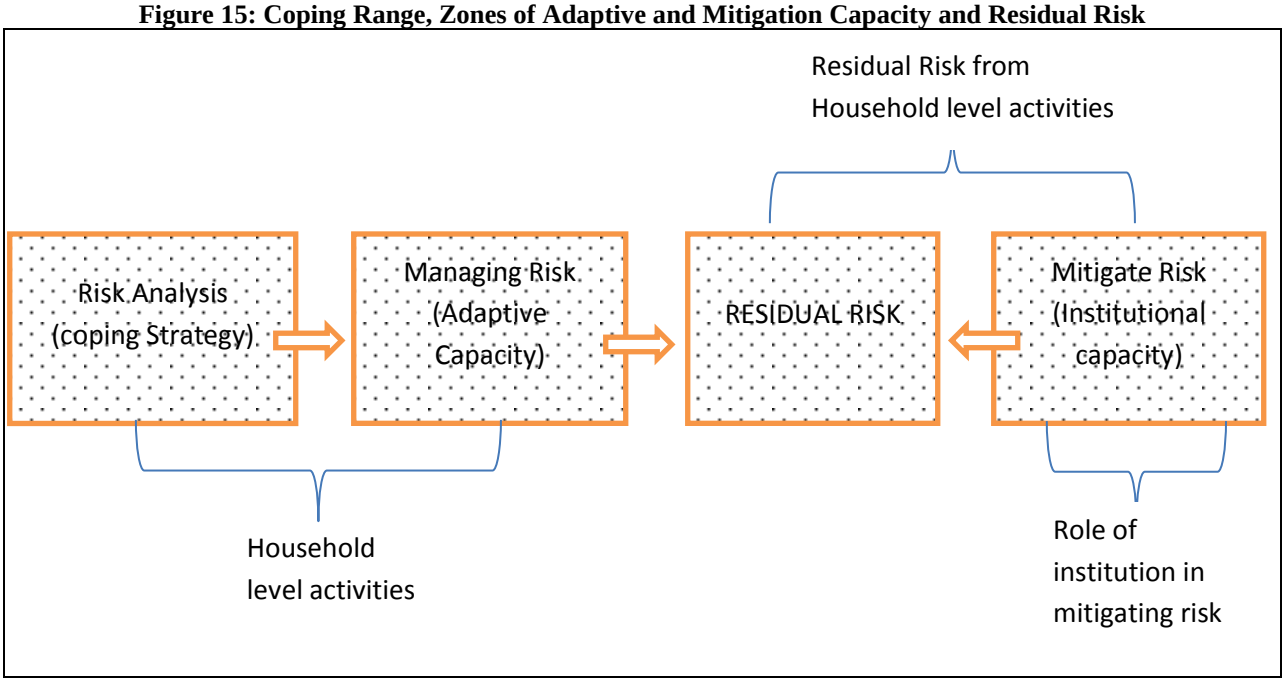
We have overviewed an in-depth investigation of various risks, natural/covariate or idiosyncratic, in chapter two. The scenario was in macro frame – the aggregated loss, general reason of those risks, and general view of mitigating the risks. The analysis of various risks at household level is important to disclose the internal and external coping strategies or alternatively the erosive and non-erosive measures or the ex-post or *ex ante* measures. Household surveys are a good source of information, although typically they only contain information on a limited number of risks.

Households or individuals often need to take some coping strategies to mitigate the impact of the occurred risk. The literature on such responses of households is growing over time. The earlier studies investigate whether specific risk-coping strategies are responsive to shocks (Pan 2007; Udry 1995; Rosenzweig and Wolpin 1993; McPeak 2004; Kochar 1999), or whether consumption can be smoothed in relation to transitory income changes (Paxson 1992; Gertler and Gruber 2002; Kazianga and Udry 2004; Jalan and Ravallion 1997). Asset holding and labour play important rolesin coping with shocks. Some evidence shows that below a given asset threshold, households reduce consumption in order to preserve their stock of assets (asset smoothing), while above that threshold assets are sold to protect consumption (consumption smoothing) (Barrett and Carter 2005; Zimmerman and Carter 2003). Hoddinott (2006) shows that the probability of selling assets in the face of a negative income shock depends on the prior level of assets. Savings as a financial asset are used as key coping instrument (Deaton, 1997). Studies also showed that households cope with shocks by adjusting labour supply (Kochar 1999; Maitra 2001; Cameron and Worswick 2003) and that ex-post income smoothing helps to smooth consumption (Morduch 1995; Dercon 2002). In particular, Cameron and Worswick (2003) study the way in which labour supply responses enable Indonesian households to smooth consumption in the face of a crop loss. Morduch (2004) found that around 21% of the households in Honduras response to Hurricane Mitch by employing consumption rationing as their key coping strategy. It has also been pointed out that in developing countries households traditionally depend on social networks including the extended family, friends, and neighbours to mitigate the effects of shocks as ex-post coping strategies (Rosenzweig 1988; Urdy 1994).

### 2.5.1 Conceptual framework

Risk management is a structured process that aims to limit harm in an environment of uncertainty (AS/NZS 2004). Risk can be broadly understood as the likelihood of an event and its consequences (e.g. Schneider 2002; Patwardhan et al. 2003). The structure of risk can differ depending on the overall activity, but generally involves one or more hazards with outcomes being measured according to criteria representing specific levels of harm. Risk treatment aims to reduce the likelihood of a harmful event, its consequences, or both. In this analysis, the links between adaptation and mitigation are crucial. Adaptation and mitigation are complementary with regard to the components of risk that they manage (see, e.g., Wheaton and MacIver 1999; Kane and Shogren 2000; Adger 2001; Dang et al. 2003; Jones 2003). Adaptation increases the ability to cope measured from a baseline or reference which can be described as the current coping range (Jones and Boer 2005). Adaptation may increase the ability to cope incrementally or produce one or more step changes. Therefore, adaptation is path dependent, beginning with the ability to cope with current climate risks, aiming to manage changing climate risks under progressively warmer conditions over time. Larger climate change will require more and faster adaptations, which will be more expensive and less likely to be successful.

**Figure 15: Coping Range, Zones of Adaptive and Mitigation Capacity and Residual Risk**



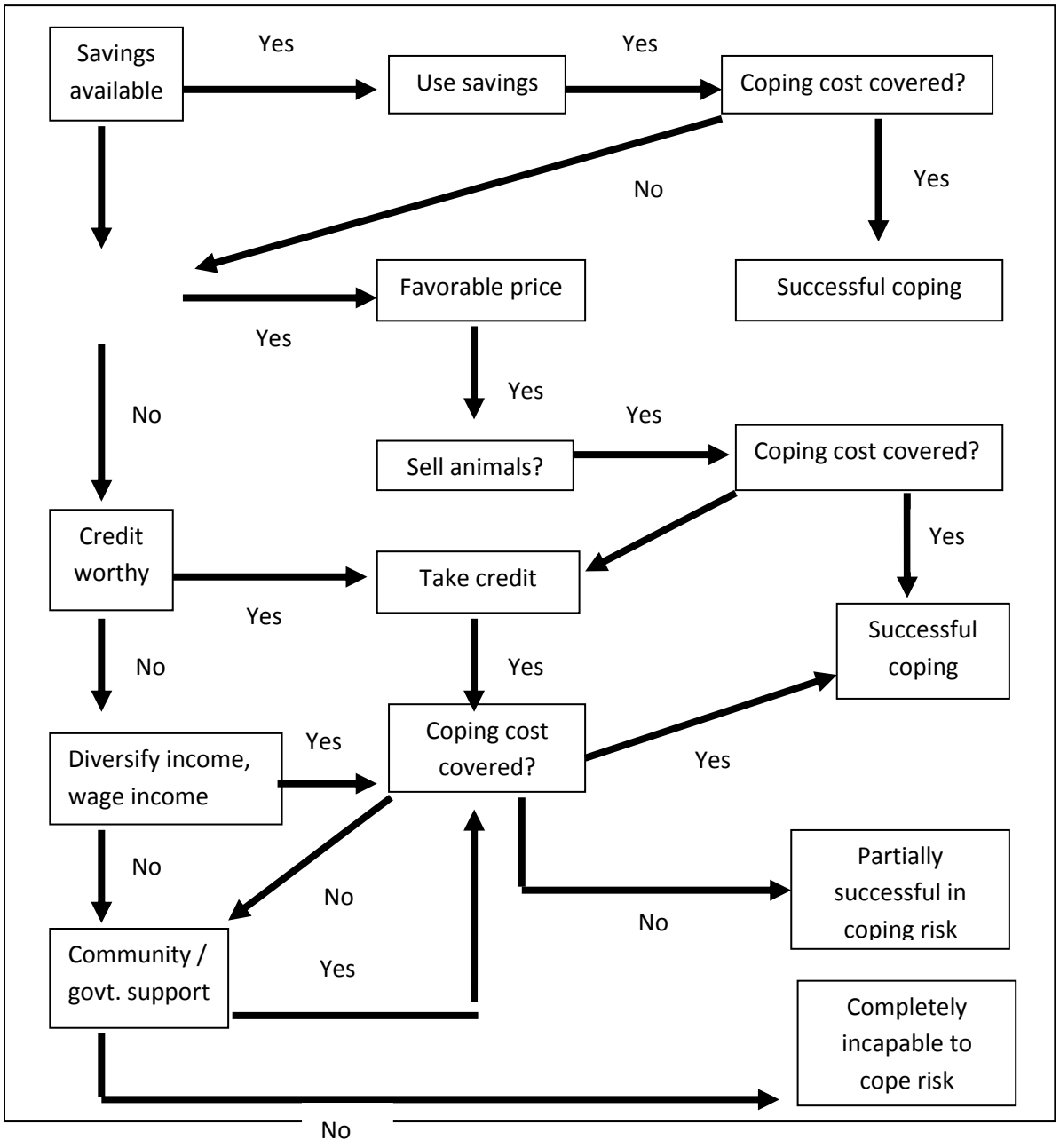

Source: Adopted from Jones etal. (2007)

This complementary relationship between adaptation and mitigation can be seen in Figure 15. Climate change is a major cause of disaster. Increases in temperature can be reduced through reducing carbon emissions. This requires actions on the part of the government and industrial firms. Through the actions of institutions, risk can be significantly mitigated. This is represented in the extreme right side box on mitigating risk through institutional capacity. But, climate change risk emanates from the behaviour of many countries. Therefore, climate change cannot be fully addressed by the action of any one country. In Bangladesh, whatever efforts are made there will always be some residual risk, shown in the second box from the right that requires global actions. Households and consumers thus need to live with climate change through adaptive measures. Given existing knowledge, households may cope with some of the consequences of climate change. This is represented by the box on risk analysis and coping strategy on the extreme left. Households can further manage risk through building their adaptive capacity. Coping ability and adaptive capacity together improve household risk management. Better risk management by households with improved knowledge on capacity and resilience is the key strategy to deal with climate change.

### 2.5.2 Risk management and coping strategies

In dealing with exposure to various kinds of risks, different kinds of arrangements have evolved. Holzman (2003) distinguishes three main categories: (i) informal; (ii) market based; and (iii) public arrangements. With perfectly symmetrical information and complete and well-functioning markets, it is presumed that all risk management arrangements can be market based. In the real world, the various risk management arrangements will all play important roles.

**Figure 16: Sequence of Strategies Associated with Coping Costs**




Source: Sauerborn et al. (1996)

Prevention strategies that are implemented before a risk event occurs are more effective than coping or rehabilitation strategies during or after the event, especially for idiosyncratic shocks. Preventive interventions can take many forms, such as reducing the risk of unemployment in labour markets, providing preventive health care services such as vaccination, use of mosquito nets, information campaigns and setting standards such as building standards in areas prone to earthquakes.

Mitigation strategies may help individuals or households reduce expected future loss especially when no preventive strategies are available. Households may prepare through formal and informal insurance

mechanisms to manage risks. Figure 16 indicates the sequence of strategies that households may adopt and their relationship with coping costs.

Table 10 provides examples of social risk management strategies and arrangements.Informal arrangements are omnipresent and still constitute the main source of risk management. Even with the presence of market institutions and public support, individual households respond to various risks by protecting themselves through informal and personal arrangements such as borrowing or saving money.

**Table 10: Examples of Social Risk Management Strategies and Arrangements**

| Arrangements/ strategies | Informal | Market-based | Public |
|---|---|---|---|
| Risk Reduction | • Less risky production<br>• Migration<br>• Proper feeding and weaning practices<br>• Engaging in hygiene and other disease preventing activities | • In-service training<br>• Financial market literacy<br>• Company-based and market-driven labour standards | • Labour standards<br>• Pre-service training<br>• Labour market policies<br>• Child labour reduction interventions<br>• Disability policies<br>• Good macroeconomic policies<br>• AIDS and other disease prevention |
| Risk Mitigation | | | |
| Portfolio | • Multiple jobs<br>• Investment in human, physical and real assets<br>• Investment in social capital (rituals, reciprocal gift-giving) | • Investment in multiple financial assets<br>• Microfinance | • Multi-pillar pension systems<br>• Asset transfers<br>• Protection of poverty rights (especially for women)<br>• Support for extending financial markets to the poor |
| Insurance | • Marriage/family<br>• Community arrangements<br>• Share tenancy<br>• Tied labour | • Old-age annuities<br>• Disability, accident and other personal insurance<br>• Crop, fire and other damage insurance | • Mandated/provided insurance for unemployment, old aged, disability, survivorship, sickness, etc. |
| Risk Coping | • Selling of real assets<br>• Borrowing from neighbours<br>• Intra-community transfers/charity<br>• Sending children to work<br>• Dissaving in human capital | • Selling of financial assets<br>• Borrowing from banks/MFIs | • Transfer/ social assistance subsidies<br>• Public works |

Source: Holzman (2003)

Market-based arrangements have great potential to assist households with their risk management. In places where the formal market has failed to provide financial services, the development of savings, loans and insurance services by microfinance institutions has potentially increased the formal options for coping.

Government services can be especially important when households are not capable of managing risks through informal and market based mechanisms. During covariate shocks, the government can provide some essential services to avoid massive losses. However, in managing risks, the role of government is quite limited and findings suggest that government support is inadequate and in some cases ineffective.

A table produced by the World Bank based on Gill and Ilahi (2000) identified several adaptation policies for various risks in a succinct way (Table 11). Many of the policies are pertinent to Bangladesh. Public and private, formal and informal schemes, etc., have been advocated for managing risks. Crop production risks, for example, can be managed by crop insurance, changing cropping intensity, and farm operation size.

**Table 11: Adaptation Policies for Various Risks**

| Measure | Individuals/household | Community | Government and international organisation |
|---|---|---|---|
| Prevention | • Owning multiple assets and with many sources of income;<br>• Investments to protect and maintain assets (timely repairs);<br>• Permanent migration | • Relocating to safer areas as a group;<br>• Community-training programmes;<br>• Local public goods and services (community-based information systems, small-scale irrigation and infrastructure projects) | • Good analysis and a system to convey information about risk (disaster risk profiles, raising public awareness, early warning systems); |
| Self-insurance | • Owning both financial and non-financial assets (livestock, stored grain, durables) | • Local borrowing and savings schemes;<br>• Rotating access to common property resources | • Facilitating markets for different assets including household goods;<br>• Ready access to prevailing market prices |
| Market insurance | • Property and catastrophe insurance;<br>• Agricultural insurance | • Microfinance;<br>• Savings and credit associations;<br>• Cereal and grain banks | • Sovereign budget insurance and catastrophe bonds |
| Coping | • Temporal migration;<br>• Intensification or expansion of household labour;<br>• Draw on stocks of social capital (credit, food, charity/begging);<br>• Running down stocks of human and physical capital;<br>• Reducing or minimising household expenditure | • Rotating savings and credit association (ROSCAs);<br>• Inter-household transfer and private remittances;<br>• Public employment guarantee schemes | • Safety nets (cash transfer and public works);<br>• Social investment projects (social funds);<br>• Disaster aid funds or food donor assistance (contingent loans) |

Source: World Bank based on Gill and Ilahi 2000

### 2.5.3 Empirical evidences: Loss and damages

InM conducted two studies in the south-western (SW) region of Bangladesh. The first evaluated the impacts of PKSF's PRIME and the second revisited the households affected by cyclones Sidr and *Aila* after almost eight years. As a part of the JICA Basic Study, another survey round was conducted. The analysis presented here is based on the current data set, supplemented by material from references. The PRIME study provides information on post-disaster impacts of financial and non-financial interventions considering the characteristics of programme participants and non-participants. The current data set provides cross-sectional information on loss and damages, extent of recovery, interventions adopted, and future strategies to cope with future disasters. Households in the SW region are expected to have better understanding of the consequences of climate change, and may have adopted strategies and measures for coping in the future. Since Sidr in 2007, both the government institutions and non-governmental organisations have been playing a critical role in supporting recovery. We presented the review of their policies and programmes in an earlier section. This section provides empirical evidences of the extent of loss and the recovery process. Such analysis will provide information on what is missing and what ought to be done for minimising risk and protecting assets.

### 2.5.4 Extent of loss and damages

Due to the geographical location of the coastal districts of Bangladesh, they are very vulnerable to cyclones and tidal surge. More than 80 percent of the households in the affected areas were affected by cyclones Sidr and *Aila*. Similar results were reported in InM (2014) and InM-BUP (2015). The high incidence of affected households is due to the highspeed of the cyclones and the high tidal bore, particularly for Sidr.

Sidr and *Aila* swept in two different directions – Sidr more towards the South-eastern region and *Aila* more towards the South-western region.Sidr was more intensive than *Aila*, which is reflected in the higherextent of collateral damage in the Sidr affected areas. Our data shows that the average amount of loss was around Tk.30,000 with a range of Tk.26,000 to Tk.31,000 (Table 12). Damages to physical assets were around 49 percent of the amount of total loss in the case of Sidr, while it was around 28 percent in the*Aila* affected areas (Table-12). For Sidr, because of the high incidence of property damage, the share of loss to income-generating assets is low. It is the inverse in the case of *Aila*. Because of the lower wind-speed of *Aila*, damage to physical assets was lower.

From the perspective of policy decisions, there are two critical findings: (i) average amount of loss is around Tk.30,000; and (ii) the share of damage to houses is around 48 percent (around Tk.15,000). Similar findings were also reported in InM-PKSF (2014) and InM-BUP (2015). These two findings will be quite useful in setting the future agenda for minimising risksto exposed households.

The intensity of households affected varies by district. Our survey was limited to nine districts. All these districts were largely affected by either of the two cyclones. For example, Satkhira and Khulna were relatively less affected bySidr, but were thedistricts most affected by *Aila*. On the other hand, Bagerhat, Barisal, Madaripur, Pirozpur and Patuakhali were badly affected bySidr, but not by*Aila*. Similarly, Bhola and Barguna were highly affected by Sidr but only very moderately by *Aila*. The findings suggest that allnine districts are exposed to high disaster intensity. The level of exposure may depend on how close the upazilas or districts are to the seashore. As cyclones originated from the sea, areas that are closer to the sea or sea-connecting rivers are more likely to be affected by cyclones.

We measured the distance of upazila headquarters from the nearest sea or sea-connecting river[4]. Table 13 shows the distance of upazila headquarter from the nearest major water-body.

**Table 12: Amount of Loss by Types of Assets**

| Types of Damages | Sidr (Average loss amount) | | | *Aila* (Average loss amount) | | |
|---|---|---|---|---|---|---|
| | All affected households | *Ex ante* MF | Non-member HHs | All affected households | *Ex ante* MF | Non-member HHs |
| Land | 567 | 384 | 630 | 795 | 1,597 | 239 |
| | (2.08) | (1.29) | (2.39) | (2.80) | (6.07) | (0.80) |
| Houses | 13,301 | 13,193 | 13,338 | 8,067 | 7,321 | 8,584 |
| | (48.90) | (44.31) | (50.67) | (28.37) | (27.84) | (28.70) |
| Livestock | 1,455 | 1000 | 1,611 | 4,465 | 4,487 | 4,449 |
| | (5.35) | (3.36) | (6.12) | (15.70) | (17.06) | (14.87) |
| Fish/Pawn/Crabs | 1,147 | 794 | 1,269 | 8,318 | 5,890 | 10,000 |
| | (4.22) | (2.67) | (4.82) | (29.25) | (22.40) | (33.43) |
| Forestry/Trees | 7,805 | 9,874 | 7,096 | 2,718 | 2,649 | 2,766 |
| | (28.69) | (33.17) | (26.96) | (9.56) | (10.07) | (9.25) |
| Business Assets | 603 | 1,917 | 153 | 419 | 922 | 70 |
| | (2.22) | (6.44) | (0.58) | (1.47) | (3.51) | (0.23) |
| Others | 2,324 | 2,609 | 2,226 | 3,651 | 3,431 | 3,803 |
| | (8.54) | (8.76) | (8.46) | (12.84) | (13.05) | (12.71) |
| TOTAL | 27293 | 29862 | 26415 | 28520 | 26384 | 29998 |
| | (100.00) | (100.00) | (100.00) | (100.00) | (100.00) | (100.00) |
| N | 1,950 | 498 | 1452 | 721 | 295 | 426 |

Source: InM Survey 2017

Based on the distance from the river/sea, we can categorise the study area into three major clusters: (i) Very close to sea (0~10 km), (ii) Moderately close to sea (20~35 km), and (iii) Distant from sea (50~60 km). Fifty percent of the study area is located very close to sea (Table 13).

Table 14 shows loss and damages by households by upazila and distance from the seashore. As expected, the amount of loss is directly correlated with distance from the sea. The shorter the distance, the higher is the amount of loss; it was equally true for the percentage of households affected by disasters. One of the nearest upazila to the seashore was Patharghata in Barguna, where the average amount of loss per household was over Tk.55,000, almost twice the sample mean of loss. In contrast, Rajoir was the furthest of the sample upazilas from the seashore.It experienced an average loss of Tk.16,000,almost50 percent less than the global sample mean.

[4] During the GIS survey, we collected the GIS location information of all upazila headquarters in the study area. Using the GIS information and the Google map service we measured the distance of the upazila headquarters from the nearest major water-body.

**Table 13: Distribution of Sample Upazilas by Distance from Sea**

| District | Upazila | Distance from closest sea or sea-connecting river | Cluster based on distance |
|---|---|---|---|
| Satkhira | Shayamnagar | 25 | Moderately close to sea (20~35 km) |
| | Kaliganj | 7 | Very close to sea (0~10 km) |
| Khulna | Koyra | 10 | Very close to sea (0~10 km) |
| | Paikgacha | 8 | Very close to sea (0~10 km) |
| Bagerhat | Sarankhola | 7 | Very close to sea (0~10 km) |
| | Mongla | 10 | Very close to sea (0~10 km) |
| | Fakirhat | 50 | Distant from sea (50~60 km) |
| Barguna | Amtoli | 20 | Moderately close to sea (20~35 km) |
| | Patharghata | 7 | Very close to sea (0~10 km) |
| Pirojpur | Mathbaria | 20 | Moderately close to sea (20~35 km) |
| | Nazirpur | 50 | Distant from sea (50~60 km) |
| Barisal | Mehendiganj | 10 | Very close to sea (0~10 km) |
| | Muladi | 30 | Moderately close to sea (20~35 km) |
| Patuakhali | Dashmina | 35 | Moderately close to sea (20~35 km) |
| | Golachipa | 30 | Moderately close to sea (20~35 km) |
| Bhola | Lalmohon | 6 | Very close to sea (0~10 km) |
| | Tazmuddin | 2 | Very close to sea (0~10 km) |
| Madaripur | Rajoir | 60 | Distant from sea (50~60 km) |

Source: InM Survey 2017

**Table 14: Percentage of Households Affected by Cyclone by Distance from Sea**

| District | Upazila | Distance from sea (km) | Household affected by Sidr (%) | Household affected by *Aila* (%) | Average loss from Sidr | Average loss from *Aila* | % of affected households have pre-Sidr membership (%) | % of affected households have pre-*Aila* membership (%) |
|---|---|---|---|---|---|---|---|---|
| Bhola | Tazumuddhin | 2 | 100 | 59 | 22,763 | 8,920 | 28 | 39 |
| Bhola | Lalmohan | 6 | 98 | 38 | 36,314 | 3,376 | 25 | 42 |
| Barguna | Patharghata | 7 | 100 | 28 | 57,867 | 8,410 | 17 | 31 |
| Bagerhat | Sarankhola | 7 | 100 | 0 | 37,416 | - | 6 | |
| Satkhira | Kaliganj | 7 | 28 | 77 | 1,352 | 4,218 | 57 | 56 |
| Khulna | Paikgacha | 8 | 87 | 97 | 16,375 | 29,796 | 20 | 32 |
| Bagerhat | Mongla | 10 | 99 | 54 | 30,517 | 29,265 | 17 | 27 |
| Khulna | Koyra | 10 | 57 | 100 | 6,274 | 53,093 | 24 | 22 |
| Barisal | Mehendiganj | 10 | 82 | 0 | 9,266 | - | 29 | |
| Barguna | Amtoli | 20 | 100 | 24 | 37,030 | 5,790 | 23 | 43 |
| Pirojpur | Mathbaria | 20 | 100 | 0 | 49,002 | - | 42 | |
| Satkhira | Shayamnagar | 25 | 23 | 100 | 2,262 | 22,777 | 66 | 67 |
| Patuakhali | Galachipa | 30 | 100 | 0 | 22,219 | - | 26 | |
| Barisal | Muladi | 30 | 92 | 0 | 17,727 | - | 25 | |
| Patuakhali | Dashmina | 35 | 100 | 0 | 14,546 | - | 15 | |
| Bagerhat | Fakirhat | 50 | 100 | 0 | 16,757 | - | 24 | |
| Pirojpur | Nazirpur | 50 | 100 | 0 | 30,987 | - | 38 | |
| Madaripur | Rajoir | 60 | 93 | 0 | 16,095 | - | 30 | |

Note: 0-10 km=very close to sea; 20-35 km=moderately close to sea; 50-60 km=distant from sea
Source: InM Survey 2017

The finding that the upazilas or villages near the sea experienced greater losses emerges more vividly when we classified distance into three categories – very close to the sea; moderately close to the sea and distant from the sea.There is an inverse relationship between distance and the collateral damage. In all cases, average amount of loss for any type of assets were higher in the upazilas or villages closer to the sea. For example, in the case of Sidr, about 90 percent of the households were damaged in the areas very close to the sea, in contrast to around 86 percent in other areas. In all cases, such inverse relationshipswere observed (Table 15). The most affected assets were houses and forestry/trees. The average amount of loss in houses in the upazilas or areas very close to the sea was higher than the amount of loss in other areas. A similar pattern was also observed in *Aila* affected upazilas or villages (Table 16).

**Table 15: Intensity of Damages by Households Affected by Sidr**

| Types of Damages | % of Sidr affected households | | | Average loss amount of Sidr affected households | | |
|---|---|---|---|---|---|---|
| | Very close to sea | Moderately close to sea | Distant from sea | Very close to sea | Moderately close to sea | Distant from sea |
| Land | 1.61 | 2.77 | 2.73 | 465 | 822 | 374 |
| House | 90.04 | 85.54 | 86.61 | 13,967 | 12,899 | 12,315 |
| Livestock | 18.20 | 5.08 | 1.09 | 2,525 | 642 | 169 |
| Buffalo | 7.17 | 0.15 | 0.82 | 2,272 | 8 | 301 |
| Fish/Pawn/Crab | 52.25 | 70.15 | 42.90 | 6,241 | 10,754 | 6,561 |
| Forestry/Trees | 1.39 | 0.62 | 0.82 | 896 | 112 | 730 |
| Asset Used for Business or Industry | 11.67 | 15.23 | 19.67 | 2,949 | 2,048 | 1,353 |
| Others | 1.61 | 2.77 | 2.73 | 465 | 822 | 374 |

Source: InM Survey 2017

**Table 16: Intensity of Damages by Households Affected by *Aila***

| Types of Damages | % of *Aila* affected households | | | Average loss amount of *Aila* affected households | | |
|---|---|---|---|---|---|---|
| | Very close to sea | Moderately close to sea | Distant from sea | Very close to sea | Moderately close to sea | Distant from sea |
| Land | 1.68 | 0.00 | | 963 | - | |
| House | 74.12 | 73.81 | | 9,159 | 2,913 | |
| Livestock | 30.25 | 9.52 | | 5,274 | 647 | |
| Fish/Pawn/Crab | 28.74 | 0.00 | | 10,080 | - | |
| Forestry/Trees | 42.86 | 25.40 | | 3,163 | 616 | |
| Asset Used for Business or Industry | 1.51 | 0.79 | | 491 | 79 | |
| Others | 25.21 | 29.37 | | 3,568 | 5,674 | |

Source: InM Survey 2017

Although the results are quite obvious and expected, it has implications. Note that very close to seashore was defined as the distance below or par 10 kilometer, and distant from the sea was defined with the distance over 50 kilometers. The villages or upazila located nearest to the sea are more risky. Therefore, the households in these areas are more vulnerable.

### 2.5.5 Long-run recovery from loss and damage

A fundamental question related to adaptation and resilience is- have the affected households fully recovered from the adverse impacts of Sidr and *Aila*? The answer to this question will shed light on the kind of risk management tools or strategies that need to beadopted for resilience. We defined full recovery as the amount invested to reinstate the assets damaged or destroyed by disaster. Tables 17 and 18 shows long run recovery of the affected households in Sidr and *Aila* affected areas.

Only around 28 percent of Sidr-affected households fully recovered the loss amount in ten years. Most importantly, 50 percent of the affected households could not either recover anything or less than

50percent of the loss. Sidr was more intensive than *Aila*, explaining why the percentage offull recovery-households islower for Sidr.

The impacts of MFI/bank membership are also revealed in Table 17 and Table 18. In the case of Sidr, compared to the 'never member' group, a higher percentage of the households with *ex ante* membership or new membership could fully recover the amount of loss (Table 17. In the case of *Aila*, a higher percentage of households with *ex ante* membership fully recovered compared to the groups of 'new member' and 'never member' (Table18).

**Table 17: Distribution of Recovery by Percentage of Affected Households in Sidr**

| | % of Sidr affected households | % of Sidr affected households by MFI/bank membership | | |
|---|---|---|---|---|
| | | *Ex ante* member (n=498) | New member (n=795) | Never member (n=657) |
| No recovery | 13.08 | 15.06 | 10.57 | 14.61 |
| Partial recovery (recovered less than 50% loss) | 36.92 | 36.14 | 35.35 | 39.42 |
| Partial recovery (recovered more than 50% loss) | 22.21 | 20.88 | 23.65 | 21.46 |
| Fully recovered | 27.79 | 27.91 | 30.44 | 24.51 |

Source: InM Survey 2017

**Table 18: Distribution of Recovery by Percentage of Affected Households in *Aila***

| | % of *Aila* affected households | % of *Aila* affected households by MFI membership | | |
|---|---|---|---|---|
| | | *Ex ante* member (n=295) | New member (n=274) | Never member (n=152) |
| No recovery | 22.19 | 18.31 | 15.69 | 41.45 |
| Partial recovery (<50% loss) | 26.07 | 25.76 | 33.21 | 13.82 |
| Partial recovery (recovered more than 50% loss) | 14.42 | 14.24 | 16.42 | 11.18 |
| Fully recovered | 37.31 | 41.69 | 34.67 | 33.55 |

Source: InM Survey 2017

Tables 17 and 18 show that access to finance matters in the recovery process, buthow significant is the relationship between access to finance and recovery of loss amount? We examined this relationship through the Tobit technique[5]. We defined the dependent variable as the amount of loss recovered. This is the long run impact of access to finance. As some households have zero recovery, we are interested only in the positive values of the outcome variable. Thus, the data for the outcome variable are censored or more specifically left as censored data. To identify the important determinants of the outcome variable, the Tobit regression model, which was first proposed by Tobin (1958), is employed. The Tobit regression model is applicable where the sample is censored, and that is why it is sometimes known as censored regression model or limited dependent regression model (Cameron and Trivedi, 2005; Gujarati, 2009; Greene, 2007; Wooldridge, 2010).

In our Tobit model, the variable of interest is *ex ante* access to microfinance that is defined as 1 for *ex ante* access and 0 for non-access to microfinance. The amount of loss recovered is determined by ex anteaccess to finance and other socio-economic characteristics of the households. We estimated the

[5] A note on the Tobit model is given in Appendix B.

parameters of the model separately for Sidr and *Aila*. In Table 19, we report marginal effect of *ex ante* access to microfinance on recovery of loss amount.

**Table 19: Effect of *Ex ante* Access to Microfinance on Loss Recovery**

| Dependent variable: Amount of loss recovered | (1) | (2) |
|---|---|---|
| | Total recovery: Sidr | Total recovery: *Aila* |
| VARIABLES | Marginal effect dy/dx | Marginal effect dy/dx |
| *Ex ante* access to finance | 2,689*** | 4,311** |

Note: *** significant at α=0.01, and ** significant at α=0.05 level.

We find that *ex ante* access to finance has a positive sign both in the case of Sidr and *Aila*. The marginal coefficient of Tk.2,689 in the case of Sidr suggests that compared to the non-member households, the households with *ex ante* access to microfinance had higher amount of recovery by Tk.2,689. Considering the total amount of loss, the effect is more than 10 percent of total loss. In the case of *Aila*, the marginal effect is even bigger. The marginal effect is Tk.4,311, which is over 15 percent of the total amount of loss in *Aila* areas. Does this recovery vary by proximity to sea? It is expected that the intensity of loss and damage will be greatest for the households located closer to the sea than the households further away from the seashore. One would expect that recovery amount will be less in areas with higher intensity of loss and damage. We estimated this in the context of *ex ante* access to microfinance, using the Endogenous Switching Regression technique[6]. The results are reported in Table 20.

**Table 20: Endogenous Switching Regression Analysis**

| | | Expected Gain (Tk.) under *ex ante* membership | | |
|---|---|---|---|---|
| | | All Households (Π) | *Ex ante* access to MF Households ($\Pi_1$) | *Ex ante* no access to MF ($\Pi_2$) |
| Column Number | | 2 | 3 | 4 |
| Sidr | **Total recovery amount** | 1,627*** | 2,717*** | -225 |
| | Closest to sea | 1,277*** | 4,178*** | -834*** |
| | Moderately close to sea | 3,345*** | 4,951*** | -435 |
| | Distant from sea | 4,489*** | 4,051*** | 3,896*** |
| *Aila* | **Total recovery amount** | 3,557*** | 5,024*** | 1,016*** |
| | Total recovery amount by | | | |
| | Closest to sea | 4,368*** | 6,193*** | 931** |
| | Moderately close to sea | 15,805*** | 7,033* | 22,469** |

Column 2 of the above table shows, the marginal gains of access to microfinance compared to non-member (no accesstomicrofinance). The results in this table show that marginal gains from participation in microfinance in recovery increases with increased distance from the seashore both in Sidr and *Aila* affected areas. However the results are clearer when we compare the expected gains in recovery of *ex ante* access to microfinance and the counter-factual of no *ex ante* access to microfinance. The larger effects of *ex ante* access to microfinance are derived from the results. Regardless of proximity to sea, the

[6] A Technical Note on Endogenous Switching Regression is given in Appendix C.

marginal gain in recovery is consistently above Tk. 4,000 compared to the counter-factual group. Similar results are also derived from column 4. This shows that non-members are worse-off in the relatively more affected areas than the counter-factual of participating in microfinance programmes.

In brief, the results provide several important findings about the long run recovery from the disasters. First, the amount of loss was higher in Sidr affected areas and the areas close to the sea than in *Aila*. Second, not all households could recover fully. In Sidr areas, some 13 percent of the affected households could not recover at all. The figure was even higher for*Aila* affected areas, despite the fact that Sidr was a much more severe cyclone. Third, the rate of full recovery was higher in *Aila* affected areas, at around 37 percent compared to around 28 percent in Sidr areas. Fourth, a higher percentage of recovery from loss and damages is significantly evident for the households with access to microfinance. Fifth, our econometric analysis shows that affected households with *ex ante* access to microfinance could recover consistently by over Tk.4,000more than if they had not participated in microfinance.

## 2.6 Does *Ex ante* Access to Microfinance Matter in Coping and Climate Change Adaptation?

In the previous section, we examined and evaluated recovery from loss and damages associated with cyclones Sidr and *Aila*. We showed that recovery is faster when affected households have access to microfinance. But we have not addressed the questions of how did the households cope with the post-disaster effects and who were better-off. We also did not answer the question of what roles microfinanceplays in the household coping mechanism. These questions are examined in this section at length. The focus here is on the relationship between microfinance and adaptation in response to disasters.

It is well documented and empirically established that access to microfinance improves adaptation capability of the households. Agrawala and Carraro (2010, p.9) argued that microfinance is highly relevant to adaptation as it is "consistent with the fundamental nature of a majority of adaptation actions that will ultimately consist of thousands of decentralised actions by individuals, households and communities, as they continuously seek to internalise climate risks in their activities." Fenton and Paavola (2015, p.263) elaborate this notion: "The historical experience of microfinance in channelling funds to low-income and otherwise disadvantaged groups indicates its potential to fund the many small actions that households may take to adapt to climate change." Despite such claims, little attention is given to the potential role of microfinance in adaptation in discussions on adaptation financing, which has mostly been channelled to governments, rather than to the household level (Fenton et al. 2014). Even raising the issue of microfinance in adaptation fora can result in "raised eyebrows," as it is often asserted that adaptation financing must take the form of grants, whereas microfinance is often associated with loans. In this context there is a need to set out the arguments on how microfinance could potentially contribute to adaptation and the evidence that supports this notion, which this section sets out to do through a review of recent literature.

### 2.6.1 Assertions that microfinance can contribute to adaptation

Hammill et al. (2008) provided the first serious discussion on how access to microfinance could contribute to climate change adaptation. They mapped out how microfinance could contribute to adaptation in terms of the five types of household assets used in the sustainable livelihoods approach, concluding that microfinance contributes to adaptation by enabling households to develop alternative livelihood opportunities, building assets and spreading risks. They argued that the potential for

microfinance to facilitate livelihood diversification and asset accumulation presents the most promising link between adaptation and microfinance, though provided no empirical evidence to substantiate this claim.

In their review of the literature on microfinance and climate change adaptation, Fenton and Paavola (Fenton & Paavola 2015) are concerned with presenting key concepts that can be used to develop an analytical framework that explains the links between adaptation and microfinance. They find that "attempts at examining the linkages between microfinance and adaptation have been largely exploratory, insufficiently comprehensive, and lacking robust assessments in light of empirical finding" (Fenton & Paavola 2015, p.263). From their review they conclude that while in theory microfinance can contribute to income and asset building as well as consumption smoothing, the scientific literature does not provide a consensus on these claims, with many impact assessments having weak methodologies or inadequate data to link empirical observations with their causes (Fenton & Paavola 2015). Their observation is correct in-so-far as the nature of most of the literature on this topic only goes as far as discussing possible linkages between adaptation and microfinance and how these might be enhanced, but there are careful empirical studies (Osmani 2014) that support the contention that access to microfinance contributes to adaptation (see below).

Fenton and Paavola (2015) differentiate between incremental and transformational adaptation, and autonomous and planned adaptation. As autonomous adaptation is a continual process of adjustment by households to changes in the circumstances, and as microfinance is the provision of financial services that can potentially assist households with their day-to-day financial management, they view microfinance as having its strongest links with autonomous adaptation. They contend that households acting autonomously may not have sufficient adaptation capacity; hence microfinance should be part of planned adaptation approaches.

Similar to Fenton and Paavola (2015), Scheyvens (2015) employs a literature review to conceptualise and analyse the relationships between microfinance and adaptation, though goes beyond this in attempting to map out what he considers good microfinance practice for adaptation, or "adaptation-oriented microfinance," and identifies the types of adaptation projects and activities that microfinance institutions (MFIs) could be involved in to take full advantage of their service delivery infrastructure. The study concludes that microfinance can contribute to adaptation by filling what is commonly referred to as the "adaptation deficit," i.e. the shortage of adaptive capacity that a household has because of its lack of capital in its various forms. The author finds that while it is not clear whether households are able to use microfinance to increase their income to the extent that they cross over the poverty line, there is sufficient empirical evidence to indicate that households can use microfinance to better cope with and recover from shocks and drawn-out periods of hardship, which makes microfinance particularly relevant to adaptation.

In common with a number of other studies, both Fenton and Paavola (2015) and Scheyvens (2015) emphasise that it is not only the clients of MFIs that are vulnerable to climate change, the MFIs are also vulnerable, because of the risks their clients face. If due to adverse climate change impacts borrowers begin to experience difficulties in repaying their loans, then MFIs will struggle with their cash flows. Climate change could also impact MFIs directly through extreme weather events that destroy their offices and other physical assets. The conclusion from these observations is that building climate-resilient livelihoods through microfinance is crucial to both the poor as well as the MFIs themselves. Partnerships will be critical to bring in the knowledge and other non-financial inputs to create such livelihoods. Fenton and Paavola (2015) sees here an "excellent opportunity for microfinance to be introduced into climate

projects, which typically involve diverse stakeholders and are likely to provide the supportive institutional environment required."

Ahmed (2016) discusses the role of microfinance institutions (MFIs) in adaptation at the community level in Bangladesh. He aims to provide an indicative assessment of the link between microfinance and adaptation and how MFIs can better integrate climate change issues into their activities. His discussion must be understood in the context of Bangladesh, where the MFIs are primarily non-governmental organisations (NGOs) with poverty alleviation missions, not formal banking institutions. His review is not just concerned with financial services but also covers the various types of non-financial services offered by NGO MFIs. He lists the following activities as ways in which MFIs are already promoting adaptation by taking a longer term perspective and helping reduce vulnerability to climate change risks: (i) disaster preparedness, (ii) loans for disaster-resilient houses, and (iii) promotion of hybrid crop varieties tolerant to salt and water-related stresses. In addition to these activities that build anticipatory capacities for adaptation, Ahmed observes that MFIs are supporting more reactive actions to current weather and climate risks that may be synergistic with adaptation. These include (i) disaster relief activities, (ii) building capacities for improved water management and increasing access to irrigation and groundwater, (iii) crop and income diversification to protect incomes and yields under variable weather and climate conditions, and (iv) support for aquaculture.

These observations support those of a similar study by Kabir et al. (2016), which employed a literature review, interviews of senior officials of government organisations and MFIs, and a field study of two MFIs working in the coastal areas of Bangladesh to shed light on the pre-emptive measures and response mechanisms of MFIs to climate-induced disasters. This study found that the MFIs have developed a range of financial and non-financial services to assist their members mitigate, cope with and recover from climate shocks. However, while many MFIs have designed their own programmes on adaptation and disaster risk reduction, the study concludes that many of these will only last for the period of donor funding, as the MFIs have insufficient financial and human resources to maintain them. Challenges to be met include developing an institutional framework that brings MFIs into national and local disaster risk reduction and climate change adaptation programmes, and securing the financial and technical resources for MFIs to mainstream adaptation into their activities (Kabir et al. 2016, p.31).

### 2.6.2 Empirical evidence of the links between adaptation and microfinance

Empirical studies on microfinance are wide ranging in the methodologies they employ. They include studies of secondary data collected or generated by the MFIs and others, intensive observation of MFI outreach activities and how clients/members respond to these by researchers "living with the community", as well as econometric studies employing panel data and random control trials that try to disentangle the causal effects of microfinance from other determinants of household wellbeing. From these numerous studies there is certainly no consensus on the impacts of microfinance on wellbeing; to the contrary microfinance is one the most debated instruments in the sustainable development literature over the past two and half decades. The causes of the disagreements amongst scholars are many and include fundamentally different theoretical standpoints, meaning researchers can make the same observations but draw entirely different conclusions; lack of robustness and quality data in some of the studies (Duvendack et al. 2011); and the difficult of linking effects with causes in complex social, cultural, and economic settings (Roodman & Morduch 2011).

Nevertheless, there are a number of empirical studies that support the contention that links exist between adaptation and microfinance. Agrawala and Carraro (2010), for example, attempted to uncover the extent of links between adaptation and microfinance by assessing the lending portfolios of 22 MFIs in Bangladesh and Nepal. Through a review of documents of the 226 lending programmes of the 22 MFIs in Bangladesh, the study concludes that 43% of these programmes are win-win from a climate change adaptation perspective, showing the "tremendous potential of microfinance for enhancing the climate resilience of some of the most vulnerable sections of the society which have been hard to target through international financing on adaptation as well as official development assistance" (Agrawala & Carraro 2010, pp.21–22). They found that "climate-proofing" was required for 13% of the portfolios in Bangladesh. However, a serious limitation of this study is that it focuses on the level of the MFI and does not look beyond portfolios at actual impacts on households.

Looking at empirical studies that investigate impacts at household level, we find a number of studies that support the contention that access to microfinance contributes to household adaptive capacity.

***Evidence for impact on consumption smoothing***

A poor household with high periodic temporal variation in consumption of basic food and other items because of climate influences can be considered highly vulnerable to climate change and to have low adaptive capacity. Therefore, if a household can use microfinance to smooth consumption and thus better cope with extreme climate events, while at the same time avoiding falling to a "debt trap" then it can be said to be contributing to adaptation capacity. Empirical studies support this contention. Khandker and Pitt (2002) found a disproportionate number of households that experience high seasonal variation in consumption patterns participating in microfinance, and that they were adding microfinance to their existing set of consumption smoothing strategies to lessen the impacts of seasonal hunger and other household stresses. Osmani (2012) reports that of the 6,300 households covered by the Institute for Inclusive Finance and Development (InM) 2010 benchmark survey, 63% of borrowers primarily used loans for consumption. There is reason for concern that relying of microfinance for consumption smoothing could lead clients into a "debt trap," but a study by Fraquee and Khalily (2011) suggest this is not happening, at least not to the extent envisioned by some.

***Evidence on diversifying income sources and self-employment***

There is also empirical evidence to support the claim that access to microfinance contributes to household adaptive capacity through livelihood diversification and self-employment. Pitt and Khandker (2002) found that households were using microfinance in ways that diversified their income sources and that most were using loans to finance nonfarm activities, thus reducing their vulnerability to seasonal fluctuation in agricultural income. Khandker and Samad (2014) also observe a positive relationship between microfinance and income diversity.

One of the largest impacts of microfinance appears to be on creating opportunities for self-employment (Islam 2009, p.13), which is particularly relevant to adaptation. More so than locally based wage-employment, self-employment could provide income during a flood or other drawn-out natural hazard, and enable households to begin generating income immediately after the flood waters recede. This hypothesis is supported by Rahman(1991), who found that his sample of Grameen Bank borrowers had greater capacity to cope with and recover from the 1987 and 1988 floods in Bangladesh than a control group, as, inter alia, they had been able to diversify their occupational pattern to include greater self-employment.

***Evidence on building human and social capital***

In addition to financial benefits, Fenton and Paavola (2015) note that participation in microfinance schemes can potentially contribute to adaptation by enabling households to create social capital, e.g. build relationships with others in their communities and act collectively to meet challenges. A number of empirical studies support this notion. Todd (1996), who spent one year observing a women's Grameen Bank centre, concluded that poor people gain confidence and a greater sense of self-worth from using microfinance. Hossain (1988) and Khandker (1998) find that poor households are interested in improving the health of their family members and educating their children, so use microfinance to support these objectives. Rahman (2002) found access to microfinance to be empowering for poor households as by using loans for self-employment poor people were able to extract themselves from exploitative patron-client relations and avoided coming under the control of village money lenders. Several studies that investigated the impacts of microfinance on gender concluded that access to and use of microfinance provides an alternative route to empowerment that can increase the social status of women, enable them to have greater influence in household decision making and in society in general, and release their entrepreneurial potential (Todd 1996; Hashemi et al. 1996; Kabeer 2001).

***Evidence on coping with shocks***

A number of empirical studies have investigated the impacts of *ex ante* access to microfinance on the capacity of households to cope with external shocks including extreme climate events, which is particularly relevant to adaptation. Zaman (1999) analysed the impacts of the 1998 floods in Bangladesh on 1,072 households, concluding that access to microfinance assisted with coping by contributing to crisis-coping mechanisms and enabling households to build assets. Islam and Maitra (2012) found that households with access to microfinance had lower tendency to sell livestock to cope with health shocks.

We now focus on two recent studies of quite different climate events in north-western and south-western Bangladesh.

#### 2.6.2.1 Coping with *monga* in north-western Bangladesh

Khan et al. (2015) investigated how *ex ante* access to microfinance impacts the strategies of poor households in north-western Bangladesh to cope with *monga*. *Monga* is a seasonal event that is associated with the low time in the agricultural seasons, i.e. between the planting and harvesting of crops such as paddy, when employment and income opportunities are very limited. During *monga*, due to less opportunity for gainful employment and thus income, poor households experience acute fluctuations in consumption, including a significant reduction in their daily intake of food. A census survey of poor households in Lalmonirhat district revealed that in 2006, outside *monga* 70% of the sampled households had three meals a day, while during *monga* only around one-third of households could afford three meals a day (Khan et al. 2015, p.5).

To cope with shocks, households adopt both *ex ante* and ex-post coping strategies. In the absence of formal financial services, these strategies include borrowing from informal markets, selling assets, food rationing, and advance sale of labour or crops. A concern that arises is that some coping strategies may contribute to coping in the short-term, but may prove to be erosive over the long-term, i.e. they result in a long-term reduction in the asset base of the household. The question this study took up is, does access to formal financial services reduce the dependence of *monga* affected households on erosive coping

strategies? The hypothesis was that households with access to microfinance prior to *monga* will have greater capacity to minimise the adverse impacts of *monga*.

This study used survey data of 480,918 poor households in the greater Rangpur, North-Western region of Bangladesh and focused on advance labour sale, asset sale, informal borrowing and internal migration as the main coping strategies. The study households included those with access to microfinance under the Programmed Initiatives for *Monga* Eradication (PRIME) programme of the Palli Karma-Sahayak Foundation (PKSF) and those without such access. To conduct the assessment on the impact of *ex ante*access to microfinance, an endogenous switching regression approach was used to control hidden potential self-selection biases of the households in choosing to be a member of a microfinance programme.

As hypothesised, *ex ante* access to microfinance was found to impact the coping strategies adopted by poor households. For the sampled households, the average number of days sold in advance by households with *ex ante* access to microfinance was 3.52 days lower than for households without such access (significant at the 1% level). The value of asset sales per household was also significantly lower for those household with *ex ante* access to microfinance. The switching regression analysis for the sample households reveals that the average gain per household from *ex ante* access to microfinance in the form of avoided assets sales was around Tk.1,663 (significant at the 1% level). *Ex ante* access to microfinance was also found to reduced informal borrowing by around Tk.3,401 per household for the sampled households (significant at the 1% level) and the probability of internal migration was found to be lower if households had access to microfinance.

A finding that is particularly relevant to the links between adaptation and microfinance is that poor households in *char* areas benefited more from access to microfinance in terms of avoided reliance on all erosive coping strategies (except informal borrowing) than households in non-*char* areas (Khan et al. 2015, p.15). *Chars* are river islands that are highly exposed to climate change impacts because of the powerful waters that surround them, their low lying topography and fragile sand foundations. Many people who live on *chars* are very poor. Their exposure and lack of livelihood capital means they are highly vulnerable to climate change. The findings of this study thus indicate that there are potentially significant gains for adaptation to be had by investing in the delivery of microfinance services on river *chars* and potentially other areas particularly vulnerable to climate change.

#### 2.6.2.2 Coping with super cyclones and tropical storms in south-western Bangladesh

The second study by the same authors and employing the same econometric techniques investigated the coping strategies of households with and without *ex ante* access to microfinance in south-western Bangladesh that were exposed to super cyclones Sidr (2007) and *Aila* (2009) and tropical storm Mahasen (2013). The coping strategies studied were use of current income or savings, sale of assets, use of informal loans and availing oneself of government support. As with the study in north-western Bangladesh on *monga*, this study asks whether participation in PRIME contributed to household coping ability, and it is also investigates whether various household characteristics, such as educational attainment, age and occupation of the household head as well as family size, income and landholdings, are determinants of the coping strategies used . A total of 3,687 households in three districts – Khulna, Patuakhali and Satkhira – were surveyed.

For Sidr, no significant difference in the use of current income or savings as a coping strategy by PRIME and non-PRIME households was found; however, sale of assets and use of informal loans was higher for non-PRIME households. In contrast to Sidr, in coping with *Aila* more PRIME households relied on current income and savings as a coping strategy than non-PRIME households. In contrast, PRIME households resorted less to informal loans (8%) than non-PRIME households (18%). In the case of Mahasen, twice as many PRIME households used current income and savings than non-PRIME households as a coping strategy. In contrast, and reflecting the experience of *Aila* and Sidr, non-PRIME households relied more on informal loans (24%) than PRIME households (12%).

Employing endogenous switching regression the study found that for Sidr the PRIME households had an expected coping gain from current income of savings of Tk.480 over that of non-PRIME households (significant at the 1% level). In terms of informal loans, PRIME households borrowed around Tk. 2,082 less than the non-PRIME households. Applying the methodology to *Aila* and Mahasen produced similar results with respect to PRIME households being able to rely more on current income and savings for their coping. A notable difference is that PRIME households borrowed more from the informal market to cope with Mahasen than non-PRIME households, with the reverse being true for Sidr and *Aila*.

The implications from this study are that PRIME and other microfinance interventions can assist households build adaptive capacity to cope with external shocks such as extreme weather events.

### 2.6.3 Economic Status of Households with *Ex ante* Membership

The review of relevant literature amply demonstrates that access to microfinance improves the ability of poor households in Bangladesh to adapt to climate change. Households with *ex ante* access to microfinance have a higher amount of own savings and networth to cope with disaster compared to those not having access tomicrofinance. The households with *ex ante* access to microfinance have more financial resources within the household that they can draw on. But, how significant is the impact of *ex ante* access to microfinanceon coping?The actual intensity of the impact will depend on the intensity of exposure to disaster and the additional resource base that households with *ex ante* access to microfinance haveover those without access. We aim to answer this questionising data from our survey in the SW region.

The extent of the positive impact of *ex ante* access to finance can be descriptively derived from the basic statisticsreported in Table 21. Table 21 shows that for all economic indicators, householdswith *ex ante* access to microfinance have greater economic assets, income, consumption expenditure and investment than households who joined microfinance schemes after the disaster and those who have never joined microfinance schemes. Also, the households with joinedmicrofinance schemes after the disaster have higher economic outcomes (income, expenditure, investment) than “never member” group. But, dothese observations hold econometrically, andhow did the households cope with the adverse impacts of disaster?

**Table 21: Current Economic Outcomes of the Households by Membership Status**

| | *Ex ante* member (n=847) | New member after disaster (n=699) | Never member (n=704) |
|---|---|---|---|
| Physical asset value (Tk.) | 668,498 | 527,412 | 552,584 |
| Financial asset value (Tk.) | 37,992 | 19,964 | 15,013 |
| Land (decimal) | 42 | 35 | 38 |
| House (number) | 1.5 | 1.4 | 1.3 |
| Cow (number) | 0.83 | 0.61 | 0.70 |
| Goat/sheep (number) | 0.37 | 0.42 | 0.28 |
| Poultry (number) | 6.01 | 5.71 | 4.59 |
| Income (Tk.) | 130,033 | 114,489 | 106,133 |
| Food expenditure (Tk.) | 56,254 | 55,467 | 49,647 |
| Non-food expenditure (Tk.) | 38,952 | 29,089 | 25,321 |
| Investment (Tk.) | 18,986 | 14,020 | 5,730 |

Source: InM Survey 2017

### 2.6.4 Coping with Loss and Damage

Households adopt several coping strategiesdepending on their economic conditions and the extent of damages. The discussion of loss and damages suggests that Sidr had the greatest impact on households in terms of severity of damages to houses and economic assets. The average amount of loss in both *Aila* and Sidr was around Tk.30,000, with damages to houses constituting almost 50 percent of the loss. Although the average amount of loss per household was not high, impacts can be long lasting. One reason why coping and recovery may take a long time is that disastersfrom extreme weather events such as cyclones affect the whole community, includingtheir economic resources. Coping and adaptation need to be understood in this context.

Since Sidr, ten years have elapsed, and since *Aila*, eight years have elapsed. Given this duration, the coping and adaptationmeasures observed inour survey in 2017 can be said to reflect the long-run capacities of the households and communities. We found that almost ninety percent of the households could adopt at least one coping measure in the case of Sidr and almost eighty percent of the households in the case of *Aila*. Two questions are relevant: What coping strategies did the households adopt? Were the coping measures adequate for full recovery?

Our framework suggests that households adopt multiple coping strategies: formal borrowing, informal borrowing, sale of assets, use of household savings, and acceptance of grants. Amongst these, informal borrowing is a costly measure. Use of savings is less costly from the perspective of not assuming any financial burden. Sale of assets can be considered an erosive measure that has multiple impacts. Generally, sale of assets for coping is a last resort. Once the asset is sold, its replacement can only be made either through borrowing, which will be costly, or by surplus from income-generating economic activities. In either of these ways, the process of recovery will take a long time, and will have bearing upon the portfolio of the households. Generally, households receive grants from the government or NGOs as immediate relief in the post-disaster period. They may also receive some asset support, but only in rare cases.

Generally speaking, coping and adaptation with disasters are responsibilities of the households. Therefore, we need to understand the coping mechanism and the process of improving adaptive capacity of the households.

Given our ultimate objective of improving adaptive capacity and resilience building through financial inclusion, we attempt to discuss the coping and adaptation measures associated with *ex ante* access to microfinance. We found that around 30 percent of the households in the affected areas had membership with microfinance institutions. This is a lower than the microfinance membership found at the national level. Membership was lowest in the *Aila* affected areas. It could be that topographical conditions and vulnerability of the areas may have discouraged MFIs from extendingmicrofinance services in these areas. Regardless of the intensity of access to microfinance services, we expect households participating in microfinance schemes to have access to both micro savings and microcerdit services. We anticipate that when loss and damages are high, these services may not be sufficient and households may resort to informal borrowing.

Households adopt different coping strategies that are determined by their characteristics. As our focus is on financial inclusion through access to microfinance, our analysis of the coping strategies is always disaggregated by *ex ante* access to microfinance. Table 22 reports coping strategies adopted by the affected households at the aggregate level and also by nature of access to microfinance. We have argued that use of savings will be the best option for household coping and adaptation as this does not add financial liability to the household. All households always save; what differs is the amount of savings. As reported in Table 22, about 61 percent of the households in Sidr affected areas and 55 percent of the households in *Aila*-affected areas used savings for coping.

Depending on the intensity of loss and damage, not all households will have sufficient savings for coping and will some are likely to resort to borrowing. Those who do not have access to institutional source like MFIs are more likely to borrow from informal sources. We found that almost one-third of the households had borrowed from informal lenders. There is an inverse relationship between informal borrowing and borrowing from MFIs. This is evident from columns3 and 4 in Table 22 in the case of Sidr and columns 5 and 6 in the case of *Aila*. Households having no access to microfinance borrowed more from informal lenders. Probably because of the higher intensity of loss in Sidr affected areas, even those households with access to microfinance had borrowed from informal sources and around one-fifth of the households had sold assets to cope with the disaster.

Another important observation is that a higher percentage of non-participating households received grants and other support from the government and also from NGOs. Although not part of our study objective, obliquely, it can be said that grants were more targeted and well placed towards non-participating vulnerable households.

Some important findings are derived from Table 23. First, households with *ex ante* access to microfinance could spend more on coping than the non-participants by around Tk.3, 000 in Sidr and around Tk.3, 200 in *Aila* affected areas. Thisshows that access to microfinance improves ability to cope. Second, these households also use more savings. Third, because of the credit ceiling and higher intensity of loss (20 percent higher in loss and damages), households with *ex ante* access to microfinance also resort to borrowing from informal sources. Although the absolute amount of borrowing from informal sources is almost the same for both participating and non-participating households, the share of informal borrowing

in the total amount of coping is relatively lower for the participating households. These findings hold for Sidr and *Aila* affected households.

**Table 22: Household Coping Strategies by Cyclones (% of households)**

| | Sidr | *Aila* | Sidr | | *Aila* | |
|---|---|---|---|---|---|---|
| | Aggregate percent of HHs | Aggregate percent of HHs | % of *Ex ante* member HHs | % of non-member HHs | % of *Ex ante* member HHs | % of non-member HHs |
| Column number | 2 | 3 | 4 | 5 | 6 | 7 |
| Borrowing from MFIs | 10.1 | 5.4 | 25.1 | - | 9.8 | - |
| Informal borrowing | 31.1 | 35.2 | 26.3 | 37.7 | 31.2 | 40.3 |
| Savings | 61.0 | 55.2 | 61.0 | 61.0 | 59.0 | 52.6 |
| Sale of Assets | 20.2 | 11 | 20.9 | 19.9 | 14.6 | 8.5 |
| Grants from NGOs | 7.8 | 16.9 | 7.4 | 7.9 | 20.7 | 14.3 |
| Grants from | 24.4 | 11.2 | 19.3 | 26.1 | 8.8 | 12.9 |
| N | 1950 | 721 | 498 | 1452 | 295 | 426 |

Source: InM Survey 2017

**Table 23: Amount of coping (Taka) by Source and Microfinance Participation Status**

| Strategy | Sidr | | *Aila* | |
|---|---|---|---|---|
| | *Ex ante* member HHs | Non-member HHs | *Ex ante* member HHs | Non-member HHs |
| | **(In Taka)** | | | |
| Borrowing from MFIs | 3,191 | - | 1,146 | - |
| Informal Borrowing | 3,399 | 3,276 | 3,899 | 3,951 |
| Savings | 4,951 | 4,299 | 5,504 | 3,865 |
| Sale of Assets | 1,988 | 1,832 | 805 | 505 |
| Grants from NGOs | 842 | 1,534 | 5,651 | 5,131 |
| Grants from Government | 865 | 1,162 | 1,565 | 1,858 |
| Total amount of Coping | 15,236 | 12,103 | 18,570 | 15,310 |
| | **(In Percent)** | | | |
| Borrowing from MFIs | 20.94 | - | 6.17 | - |
| Informal Borrowing | 22.32 | 27.07 | 21.00 | 25.81 |
| Savings | 32.49 | 35.52 | 29.64 | 25.24 |
| Sale of Assets | 13.05 | 15.14 | 4.33 | 3.31 |
| Grants from NGOs | 5.52 | 12.67 | 30.43 | 33.51 |
| Grants from Government | 5.68 | 9.60 | 8.43 | 12.13 |
| Total amount of Coping | 100 | 100 | 100 | 100 |
| N | 498 | 1452 | 295 | 426 |

Source: InM Survey 2017

An important question is whether coping strategies differ with topographical condition, such as proximity to the sea? As expected, the intensity of loss and damage is higher in the areas closest to the sea. Coping strategies also vary with proximity to the sea. Table 24 reveals that households in close proximity to thesea spent more in absolute amount of savings for coping. Because of the higher amount of loss and

damages to physical assets, these households could not fetch much income fromselling assets. The proceeds from the sale of assets were relatively low. This is to be expected. However, an unexpected finding is that borrowing from MFIs was lowest in the severely affected areas. Why might this be?In these areas MFIs may have been engaged in the reconstruction process and may have been more conservative in their lending. (Because of the fewer observations in some cases, we have not reported the coping behaviour of the households in *Aila* affected areas.)

**Table 24: Household Coping Strategy by Cyclone and Distance from Sea**

| | Sidr | | | *Aila* | | |
|---|---|---|---|---|---|---|
| | Very close to sea/river | Moderately close to sea/river | Distant from sea/river | Very close to sea/river | Moderately close to sea/river | Distant from sea/river |
| Total Loss | 29,317 | 27,284 | 21,803 | 17,293 | 1,668 | - |
| Coping Strategies | | | | | | |
| Taking Loan from NGOs | 716 | 1,568 | 1,918 | 565 | 873 | |
| Taking Loan from person | 3,621 | 2,104 | 2,459 | 3,858 | 3,407 | |
| Using Savings | 4,797 | 4,275 | 3,959 | 4,831 | 3,140 | |
| Getting Money from Selling Asset | 809 | 3,299 | 2,050 | 634 | 601 | |
| Grants from NGOs | 2,466 | 338 | 337 | 6,380 | 452 | |
| Grants from Government | 1,338 | 895 | 784 | 2,102 | 24 | |

Source: InM Survey 2017

In brief, despite the higher amount of savings utilised and borrowing from MFIs, participating households borrowed a significantly higher amount and fetched more funds by selling assets. The question is why? As we explained above, theaverage amount of loss was significantly higher for the households with*ex ante* access to microfinance than the non-member households. Such higher amount of loss and subsequently higher amount of fund mobilised for coping suggests that the *ex ante* member households cannot recover solely using their own resources and access to microcerdit when they are exposed to large loss and damages. However, their overall higher coping ability could be complemented by access to better risk management tools like microinsurance and special savings schemes with higher incentivesfor savings. Both savings and insurance products will improve household adaptation capacity.

### 2.6.5 Outcomes of *Ex ante* Access to Microfinance: Results from Endogenous Switching Regression

The descriptive results as discussed above provide sufficient information to formulate a set of hypotheses associated with the assumption that*ex ante* access to microfinance improves adaptation capacity of the households. The critical issue is solving the problem of impact assessment by comparing participating households with their counter-factual. We can never observe participants or non-participants and the counterfactual behaviour of the same group of individuals or households. Moreover, participation in microfinance programmes is not exogenous; it is endogenous. We hypothesised that *ex ante* access to microfinance enables participating households in microfinance programmes to cope better than the non-participants because of their access to different financial and non-financial services. As such, there is a change in the behaviourof households participating in microfinance programmes. It may be noted here that microfinance schemes in Bangladesh are quite different from those in many other countries; MFIs in this country offer both finance and non-finance interventions for poverty alleviation. Consequently, MFIs

have always adapted to the changing needs of the households affected by natural disasters like floods and cyclones.

Given the objective of the study, an endogenous switching regression (Maddala, 1983) technique is employed to evaluate the role of microfinance in coping and resilience building. The decision to join and participate in a microfinance scheme is not an exogenous variable; rather it is a choice variable and thus endogenous. To isolate the impact of the programme-participation, the counterfactual of the status needs to be defined. In this context, the endogenous switching regression technique helps to observe the coping strategies not only for observed characteristics but also for unobserved characteristics, and thus enables selection bias to be removed. The model was suggested by Maddala and Nelson (1975). This model allows us to compare each outcome variable for the same households by defining them as coming from the programme area as well as the control area. For a group of households, if they have access to microfinance, then the counterfactual would be what will happen if they had not and vice versa.

Outcomes of *ex ante* access to microfinance have been derived from the results of Endogenous Switching Regression for both Sidr and *Aila*. The outcomes are reported in Table 25. The model was run for seven outcome variables – recovery of loss, loan from NGO-MFI, informal borrowing, savings, sale of assets, grant from MFI and grant from government. Results are the expected gains of participating households compared to the non-participants Column 2 compares outcomes between microfinance members and non-members. Column 3 depicts expected gains of *ex ante* access to microfinance compared to its counterfactual state. Column 4 provides information on the expected gains of the non-participants compared to its counterfactual state.

**Table 25: Outcomes of *Ex ante* Access to Microfinance: Results from Endogenous Switching Regression**

| Disaster Type | | Expected Gain (Tk.) under *ex ante* membership | | |
|---|---|---|---|---|
| | | All Households ($\Pi$) | *Ex ante* access to MF Households ($\Pi_1$) | *Ex ante* no access to MF ($\Pi_2$) |
| | Column Number | (2) | (3) | (4) |
| Sidr | Borrowing from MFIs | 27,331*** | 27,022*** | 28,248*** |
| | Informal Borrowing | -8,823*** | -7,058*** | -11,663*** |
| | Savings | -1,328*** | -1,153*** | -2,4516*** |
| | Sale of Assets | -4,966*** | -5,361*** | -6,878*** |
| | Grant from MFIs | 31,408*** | 42,073*** | 31,149*** |
| | Grant from Government | -4,885*** | -2,610*** | -6,944*** |
| *Aila* | Borrowing from MFIs | 43,891*** | 52,429*** | 40,316*** |
| | Informal Borrowing | -8,368*** | -4,952*** | -14,575*** |
| | Savings | 664** | 1386*** | -1300*** |
| | Sale of Assets | 16,350*** | 1,695 | 25,846*** |
| | Grant from MFI | 42,296*** | 14,391* | 36,582*** |
| | Grant from Government | -31,716*** | -21,614*** | -47,329*** |

Note: *** significant at α=0.01; ** Significant at α=0.05; * Significant at α=0.10.

As noted earlier, households could cope through different sources: borrowing from NGOs; informal borrowing; use of savings, sale of assets and grants. Results of the outcomes (coping mechanisms) as derived in Table 25for both Sidr and *Aila* areas are quite consistent. As noted in column 2, microfinance participants have higher expected gains in borrowing and grants from MFIs, and lesser gains in informal borrowing, savings and grant from government. Similar results are also derived for *ex ante* access to microfinance compared to its counterfactual state. *Ex ante* access to microfinance households have higher access to microcerdit by over Tk.27,000 in Sidr affected areas, and by over Tk.52,000 in *Aila* affected areas. Because of higher access to microcerdit, expectedly borrowing from informal sources will be less compared to its counter-factual. For the group of households with *ex ante* access to microfinance, compared to the counter-factual, borrowing from the informal credit market is expected to be lower by Tk.7,000 in Sidr and by around Tk.5,000 in *Aila* areas. Similar results were derived for the households with noaccess to microfinance compared to the counter-factual of *ex ante* access to microfinance. The benefits for the households with *ex ante* access to microfinance, compared to the counter-factual of no access, are even greater.

In Table 25, we have provided information on the coping strategies by participation status of households in microfinance. From the policy perspective on placement of microfinance services, we need to examine whether coping strategies vary by proximity to sea? Results are reported in Table 26. The results on coping outcomes are generally similar. There is little divergence in findings as revealed from Table 25. Both in Sidr and *Aila*affected areas, membership with microfinance are expected to increase borrowing from MFIs than the non-participants regardless of proximity to sea. However, amount of borrowing is more likely to increase in the areas further from the seashore. Similarly, informal borrowing will be less for the microfinance participants. The intensity of less borrowing from informal sources will increase in the remote areas, far from the seashore. The picture is clearer when we compare *ex ante* access to microfinance and its counterfactual. Findings are similar. Findings also hold for the non-participants compared to had they participated in microfinance. They could have mobilised more resources from themicrofinance sector than from the costly informal source.

All these findings do suggest a very strong role of microfinance in coping and adaptation. Adaptation capacity can be increased and resilience can be built through financial inclusion, specifically, with MFIs providing financial and non-financial services tailored to the needs of poor households.

**Table 26: Expected Gains from Different Coping Strategies by Proximity to Sea and Microfinance Participation Status**

| | Expected Gain (Tk.) under *ex ante* membership in Sidr | | | Expected Gain (Tk.) under *ex ante* membership in *Aila* | | |
|---|---|---|---|---|---|---|
| | All Households ($\Pi$) | *Ex ante* access to MF Households ($\Pi_1$) | *Ex ante* no access to MF ($\Pi_2$) | All Households ($\Pi$) | *Ex ante* access to MF Households | *Ex ante* no access to MF ($\Pi_2$) |
| **Column Number** | (2) | (3) | (4) | (5) | (6) | (7) |
| **Loan from NGOs** | 27,331*** | 27,022*** | 28,248*** | 43,891*** | 52,429*** | 40,316*** |
| Closest to sea | 34,626*** | 50,272*** | 29,016*** | 40,479*** | 48,329*** | 39,520*** |
| Moderately close to sea | 15,204*** | 15,257*** | 16,229*** | - | - | - |
| Distant from sea | 58,972*** | 55,091*** | 73,320*** | - | - | - |
| **Informal loan** | -8,823*** | -7,058*** | -11,663*** | -8,368*** | -4,952*** | -14,575*** |
| Closest to sea | -4385*** | -267 | -9456*** | -6,981*** | -1,852*** | -13,433*** |
| Moderately close to sea | -12,396*** | -10,368*** | -14,279*** | - | - | - |
| Distant from sea | -40,248*** | -4,354*** | -9,300*** | - | - | - |
| **Savings** | -1,328*** | -1,153*** | -2,4516*** | 664** | 1386*** | -1300*** |
| Closest to sea | -404*** | -164 | -1443*** | 1,145*** | 2,159*** | -1,338*** |
| Moderately close to | -1,316*** | -517** | -3,838*** | 2,810** | -1,920 | 10,200*** |
| Distant from sea | -990*** | -712*** | 623*** | - | - | - |
| **Sale of asset** | -4,966*** | -5,361*** | -6,878*** | 16,350*** | 1,695 | 25,846*** |
| Closest to sea | 17,764*** | 15,146*** | 18,763*** | 24,427*** | 4,526** | 34,989*** |
| Moderately close to sea | -12,348*** | -10,061*** | -16,224*** | - | - | - |
| Distant from sea | 632* | -1,585*** | 861* | - | - | - |
| **Grant from MFIs** | 31,408*** | 42,073*** | 31,149*** | 42,296*** | 14,391* | 36,582*** |
| Closest to sea | 7,348*** | 11,488*** | 19,906*** | 18256*** | 6476 | 5346 |
| Moderately close to sea | 359 | 5355*** | 1463 | - | - | - |
| Distant from sea | -137,259*** | -85,440*** | -189,998*** | - | - | - |
| **Grant from Govt.** | -4,885*** | -2,610*** | -6,944*** | -31,716*** | -21,614*** | -47,329*** |
| Closest to sea | -7998*** | -4048*** | -12423*** | -26464*** | -18345*** | -38658*** |
| Moderately close to sea | -748*** | 1019*** | -1536*** | - | - | - |
| Distant from sea | 59,378*** | 55,733*** | 75,174*** | - | - | - |

Note: '-' could not be estimated because of fewer observations. ***significant at $\alpha$=0.01; significant at $\alpha$=0.05; and significant at $\alpha$=0.10 level.

## 2.7 Climate Change Knowledge and Its Determinants

We have demonstrated that *ex ante* access to microfinance improves household adaptive capacity and resilience by studying coping strategies. As adaptation is a long-term process, a follow on question is, what adaptation actions were taken by households in the post-disaster period? In addition to gaining an understanding of the adaptation actions taken by the households in the post-disaster period, we also intend

to examine the role of knowledge on climate change and access to microfinance in post-disaster adaptation.

Households living in the south-western or south-eastern regions have frequentlyconfronted disasters. Their knowledge grows with each disaster, but still they may lack sufficient information for informed decisions. In recent years, various initiatives and services have provided households with information on how to cope and how to improve adaptive capacity.

Tripathi and Misra (2017) showed that knowledge has a positive impact on the behaviour of farmers in adaptation to climate change in India. Similar results were derived by Zulu (2017) in Malawi. Kates (2000) argues that financial and social assets including education are major determinants of adaptive capacity. Bryan et al. (2009) argue that educated farmers with greaterknowledge on climate change are better equipped to cope with disaster.

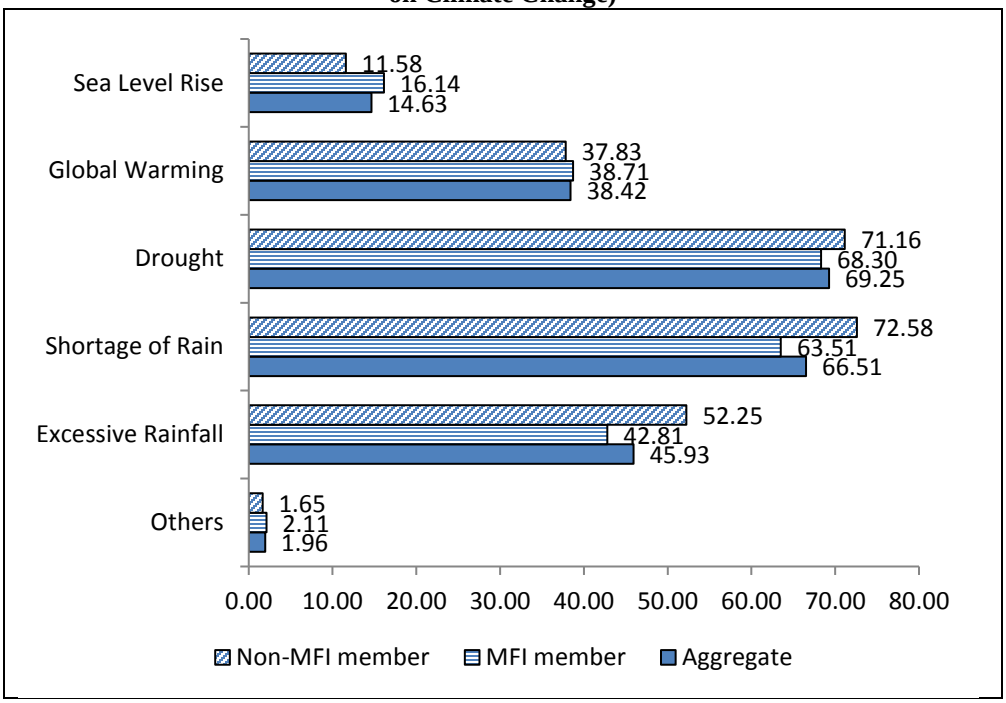
We have shown that access to microfinance contributes to coping strategies. Our conclusions are supported by Osmani et al. (2015), Khan et al. (2015a; 2015b) and Scheyvens (2014), amongst others. Based on the literature and close observations of the behaviour of households, we hypothesise that adaptation strategies will also be determined by access to microfinance as well as education or knowledge on climate change.Knowledge about climate change is not an exogenous variable; it is an endogenous variable that could be especially important for poor households. Specifically, we hypothesise that adaptation decisions of the affected households in Sidr and *Aila* affected areas are influenced by knowledge and socio-economic and financial assets. We employ econometric techniques to examine these hypotheses.

### 2.7.1 Knowledge on Climate Change

We defined climate change knowledge as awareness about the characteristics or outcomes of climate change. In an empirical sense, climate change knowledge was defined as a dummy variable (1 for yes and 0 otherwise). Five options related to knowledge on climate change impacts were provided for respondentswho stated that they are aware of climate change. The options were: (i) rise in sea level; (ii) global warming; (iii) drought; (iv) shortage of rain; and (v) excessive rainfall. The respondents were allowed to select a maximum of three options. Based on the responses we categorised into a binary variable. Figure 17shows the responses of the sample households.

Not many of the households are aware that sea-level rise is an outcome of climate change. However, close to 38 percent of the sample households are aware of global warming and more than two-thirds of the respondents were aware of that drought or shortage of rainfall could be a consequence of climate change. No significant differences could be observed in knowledge about climate change by participation status of the households in microfinance. However, such knowledge may differ by topographical condition or proximity to the sea. The role of MFIs may emerge from such analysis. Relevant information is provided in Table 27.

**Figure 17: What Climate Change Indicators Households are Aware of (% of household who have knowledge on Climate Change)**




Source: InM Survey 2017

**Table 27: Percent of Households having Knowledge on Climate Change by Topographical Condition and Salinity Type**

| | Aggregate N=2,249 | Having access to MFI N=1,545 | No access to MFI N=704 |
|---|---|---|---|
| **Aggregate** | [56.83] | [55.34] | [60.09] |
| ***Distance from river*** | | | |
| Closest to sea (N=1,125) | (64.05) | (62.53) | (67.32) |
| Moderately close to sea (N=750) | (55.73) | (55.98) | (55.17) |
| Distance from sea (N=375) | (37.33) | (32.95) | (47.37) |
| ***Salinity Type*** | | | |
| Low salinity (N=1,000) | (43.20) | (42.01) | (45.90) |
| Medium salinity (N=500) | (57.80) | (59.82) | (53.66) |
| High salinity (N=749) | (74.37) | (70.43) | (82.98) |

Source: InM Survey 2017

Note: percentage in first bracket () refers to percentage of the households with climate change knowledge estimated from cell total of row and column. Percentage in third bracket [] are the column percentage of households with climate change knowledge estimated from column total number of households.

At an aggregate level, around 57 percent of households have some knowledge about climate change. The percentage of households with awareness of climate change is greater in areas closer to the sea and with high salinity. This is quite expected. Similar results are derived when the sample is disaggregated by participation in microfinance. Of the households with access to microfinance living in close proximity to the sea, some 62 percent have knowledge about climate change. This holds also in high salinity areas. The same pattern is also evident for households with no access to microfinance. Perhaps greater exposure to climate change and disasters and increasing role of different institutions including MFIs may have contributed to higher degree of climate change related knowledge.

What are the sources of climate change related knowledge? We classified sources into two: media sources and community level sources (Table 28). Considering different media-related sources, we found that of the households with knowledge on climate change, 48.38 percent derived their knowledge from media, with television being the dominating source. People do not acquire knowledge from one source; they acquire knowledge from different sources including neighbours and others in their community. A little over 85 percent of the households with knowledge on climate change derived their knowledge from individuals in their communities (50 percent from neighbours) and organisations (23 percent from NGOs/MFIs). Interestingly, imams of different mosques also acted as a source of knowledge; some 10 percent of the households derived knowledge from the imams.

**Table 28: Source of Climate Change Knowledge**

| | Number of household who have knowledge on Climate Change | % of household who have knowledge on Climate Change (N=1,278) |
|---|---|---|
| **Training** | 128 | **10.02** |
| **Attend meeting/seminar on climate change** | 396 | **30.99** |
| ***Media*** | | |
| Radio | 216 | 16.92 |
| Television | 530 | 41.44 |
| Newspaper | 126 | 9.85 |
| Bill-board | 167 | 13.09 |
| **Access to at least one media source** | 618 | **48.38** |
| ***Community Individual*** | | |
| Teacher | 111 | 8.72 |
| Imam | 125 | 9.78 |
| Friends | 210 | 16.46 |
| NGOs | 296 | 23.13 |
| Relatives | 417 | 32.65 |
| Neighbours | 638 | 49.90 |
| **Access to at least one community individual source** | 1091 | **85.39** |

Source: InM Survey 2017

There are other sources of knowledge – training and focused seminars and meetings. Households living nearest to the sea received more training than the households living in other areas. Households living in the saline-prone area also received more training. Households who have membership with MFIs received more training than those who do not have membership. Those who received training mostly received the training from various development organisations, NGOs or MFIs (91.41%). Some training was provided by government organisations, particularly by local government (13.28%). Seminars, though infrequent, were concentrated more in high salinity areas and areas in close proximity to the sea.

### 2.7.2 Determinants of Climate Change Related Knowledge

Based on our short review of literature and empirical evidences in Bangladesh, we attempted to identify the determinants of climate change (CC) related knowledge. We specified the following equation to estimate determinants of the CC related knowledge:

$$CCK = \beta_0 + \sum_{i=1}^{5} \beta_{1i} HHC + \sum_{i=1}^{6} \beta_{2i} TGPC + \beta_{31} MFI + \sum_{i=1}^{4} \beta_{4i} CCKS + \varepsilon \qquad (1)$$

where, CCK refers to climate change related knowledge defined as a dummy variable. We have included five household level characteristics (HHC) as explanatory variables – education of HH head (also proxy for environmental literacy), HH age, female-headed households, primary occupation of the HH head and family size. Access to microfinance is denoted by MFI. TGPC refers to topographical conditions represented by three salinity-related variables and three proximity to sea related variables. Lastly, CCKS relates to sources of climate change knowledge. We incorporated four variables to reflect on sources of climate change knowledge – training, meeting, media and community level interaction.

In order to test for consistency of the results, we estimated five different models. In model 1, sources of knowledge related variables are dropped. In model 2, in addition to sources of knowledge, three salinity-related variables are excluded. In model3, instead of three salinity related variables, three proximate related variables are dropped. In model4, all salinity and proximate related variables along with sources of knowledge are dropped. In model 5, all variables related to salinity and proximity to sea are dropped but knowledge sources are included.

Results are reported in Table 29. Considering the parameter estimates in all models, we find that education of HH head, female headed households and family size have higher probability of having CC-related knowledge. Households living in high salinity areas are also expected to have higher probability of having CC-related knowledge. The coefficient of the MFI variable was not significant as expected. CCK could be explained through other variables in the model.This issue will be further investigated in the adaptation decisions of the households.

What is important in acquiring knowledge? Model5 estimates show that training, exposure to media and community level interactions are the major drivers of CC-related knowledge. We find that exposure to media and training arethe most important sources of knowledge.

In brief, we find that CC-related knowledge is not exogenous. It is explained by pure exogenous variables like salinity and proximity to sea. However, education of the household head matters. This is also captured in the strong significance of the training variable. Among others, community level interactions play a crucial role in CC knowledge. This has implications for policy-related decision on how to improve climate change related knowledge. Such knowledge will lead better preparation for adaptation and resilience building. This will be tested in the adaptation decisions of the households in post-disaster period.

**Table 29: Determinant of Climate Change Knowledge**

| Variables | CC Knowledge | CC Knowledge | CC Knowledge | CC Knowledge | CC Knowledge |
|---|---|---|---|---|---|
| Model Number | (1) | (2) | (3) | (4) | (5) |
| | | | | | |
| Household Head education | 0.0840*** | 0.0790*** | 0.0845*** | 0.0742*** | 0.0977*** |
| | (0.0124) | (0.0121) | (0.0124) | (0.0118) | (0.0145) |
| Household Head age | -0.00324 | -0.00437 | -0.00291 | -0.00321 | 0.000919 |
| | (0.00395) | (0.00386) | (0.00394) | (0.00378) | (0.00462) |
| Female headed household | 0.448*** | 0.468*** | 0.415** | 0.417** | 0.183 |
| | (0.174) | (0.169) | (0.174) | (0.166) | (0.200) |
| Primary occupation of household head agriculture | 0.169 | 0.0574 | 0.192* | 0.0920 | 0.151 |
| | (0.103) | (0.100) | (0.103) | (0.0980) | (0.120) |
| Family size | 0.0838*** | 0.0408 | 0.0882*** | 0.0379 | 0.130*** |
| | (0.0298) | (0.0287) | (0.0296) | (0.0281) | (0.0343) |
| MFI member | -0.292*** | -0.274*** | -0.291*** | -0.270*** | -0.300*** |
| | (0.0993) | (0.0968) | (0.0991) | (0.0949) | (0.115) |
| Low salinity | base | | base | | |
| Moderate salinity | 0.556*** | | 0.689*** | | |
| | (0.126) | | (0.115) | | |
| High salinity | 1.334*** | | 1.447*** | | |
| | (0.130) | | (0.109) | | |
| Moderately Close to sea | 0.0717 | -0.349*** | | | |
| | (0.109) | (0.0981) | | | |
| Distant from sea | -0.332** | -1.157*** | | | |
| | (0.152) | (0.126) | | | |
| CC training | | | | | 2.099*** |
| | | | | | (0.423) |
| CC meeting | | | | | 0.307* |
| | | | | | (0.157) |
| CC knowledge from media | | | | | 2.836*** (0.153) |
| CC knowledge from community | | | | | 1.133*** (0.116) |
| Constant | -0.989*** | 0.0995 | -1.099*** | -0.207 | -2.115*** |
| | (0.299) | (0.271) | (0.282) | (0.262) | (0.334) |
| Pseudo R2 | 0.0861 | 0.0498 | 0.0835 | 0.0212 | 0.2899 |
| Observations | 2,244 | 2,244 | 2,244 | 2,244 | 2,244 |

## 2.8 What Adaptation Strategies were adopted in the Post-Disaster Period?

So far we have reported that around 90 percent of the affected households had their houses partially or fully damaged by the cyclones. Reconstruction is clearly one major challenge. Another is to " build back better", i.e. not just to repair or rebuild a damaged house, but to do so in a way that it is better able to withstand future cyclones. Another challenge is meeting consumption needs.Because of the damage to their economic activities; households may not be able to meet their household needs throughout the year. They may have high and low periods of consumption, reflecting seasonal fluctuations in employment opportunities. Affected householdsmay lack the ability to smooth consumption.

There are several measures that affected households can adopt in the post-disaster period as a part of a broad adaptation strategy. Affected households can adopt strategies that minimisethe risk of future loss and damages as well as strategies that smooth consumption. We found that the use of savings is important in the adaptation process and for consumption smoothing as well as recovering from losses and damages.

In this context, we have investigated adaptation strategies in terms of minimising damages to physical assets, particularly housing, and improving adaptive capacity through savings and access to financial resources for investment purposes. Given the ultimate objective of improving adaptive capacity and resilience building through financial inclusion, we continue to discuss the issues in light of access to microfinance.

### 2.8.1 Adaptation through investment in physical assets

Damages to physical assets can be minimised through (i) raising the plinths of houses to reduce their exposure to tidal surge, and (ii) constructing a *pucca* house (i.e. a sturdy house with at least brick walls). Another important investment in physical asses as part of an adaptation strategy at household level isconstructing a rainwater harvesting system to meet demand for water.

#### 2.8.1.1 Plinth raising

Plinth raising reduces risk during disasters when there is flooding or tidal surge. Following Sidr, plinth raising dominated the agenda of reconstruction. We examined thisadaptation strategy in the context of access to microfinance, soil salinity and proximity to sea. Our data, as reported in Table 30, shows that 47.69 percent of the households raised their plinth during thepost-disaster period.The percentage of households that undertook plinth raisingwas higher among the microfinance participants. A little over 52 percent of the microfinance participants raised their plinths compared to 37.50 percent for the non-participants. A higher percentage of the households with access to microfinance raised their plinths when they were located in high salinity areas and close proximity to sea. Certainly, in these cases, risk of losses and damages to houses will be reasonably high, so these findings are not surprising. Theaverage expense for plinth-raising was between Tk.6,000 and Tk.12,000. A higher amount was spent for plinth raising in low salinity areas and areas far from the seashore, which may reflect the higher relative wealth of these households.

Several issues emerge that are relevant to policy decisions. First, less than 50 percent of the affected households raised their plinths. Some households may have lackedthe necessary funds, which is an issue of concern. It should be noted that most of the households in our sample were poor. Second, housing finance is not common in themicrofinance sector, especially in the southern part of Bangladesh where risk is quite high. This means that even if the plinth is raised, the dwellings themselves, which are mostly constructed with mud walls, may still be exposed to risk of damage in the event of a severe tidal surge or flood.

**Table 30: Plinth Raising as an Adaptation Strategy**

| | Percent of the HHs raised plinth | | | Expense For Plinth Raising | | |
|---|---|---|---|---|---|---|
| | Aggregate (N=2,249) | Access to MFI and bank (N=1,545) | No access to MFI and bank (N=704) | Aggregate | Having access to MFI and bank | No access to MFI and bank |
| **Aggregate** | **47.69** | 52.33 | 37.50 | 8,464 | 8,602 | 8,038 |
| Closest to sea (N=1,125) | 61.60 | 68.18 | 47.48 | 8433 | 8,465 | 8,336 |
| Moderately close to sea (N=750) | 46.93 | 51.35 | 37.06 | 8338 | 8,719 | 7,162 |
| Distance from sea (N=375) | 7.47 | 7.66 | 7.01 | 10785 | 10,650 | 11,125 |
| Low salinity (N=1,000) | 26.70 | 31.07 | 16.72 | 11662 | 12,497 | 8,127 |
| Medium salinity (N=500) | 59.20 | 60.71 | 56.09 | 9297 | 9,334 | 9,217 |
| High salinity (N=749) | 68.0 | 75.53 | 51.48 | 6304 | 6,057 | 7,103 |

Source: InM Study Survey 2017

#### 2.8.1.2 Construction of Pucca /Durable House

As noted above, one of the major consequences of cyclones Sidr and *Aila* was damages to houses. The high intensity of damage is partly because most dwellings are *katcha* or mud houses. Damages can be easily reduced if houses are constructed of bricks or durable materials resistant to disasters. It appears that following the two disasters, quite a significant percentage of households constructed *pucca* or other types of durable houses. When we refer to *pucca* houses in the southern regions, this generally refers to houses with brick walls; ceilings may be of different materials, but not concrete.

Some 44 percent of the HHs constructed *pucca* house following the disasters (Table 31). There is no difference in households adopting this strategy by microfinance status. However, a higher concentration of the construction of *pucca* houses is found in the areas closest to the sea, and also in high salinity areas. About 57 percent of the households in close proximity to the sea constructed *pucca* houses, while the concentration was even higher in the high salinity areas at around 75 percent. The concentration in these areas is a reflection of the high intensity of damages to houses in these areas.

The average expenditure for constructing *pucca* houses is around Tk.50,000 in the areas close to the sea, though proximity to the sea does not seem to have much influence of the amount of expenditure. In contrast, extent of salinity does seem to have a significant impact on expenditure, with the households in the high salinity areas spending on average much less (Tk.26,154) on constructing *pucca* houses than the households in other areas (Tk.76,130). This suggests that households in the high salinity areas have much less disposable income or access to finance.

These findings have implications for housing financing by MFIs. Our study suggests that there is demand for such loans. However, taking a loan for housing would add to financial liability. Such financial liability in the event of disaster can be minimised through some insurance mechanism, like micro property insurance. Provision for microinsurance could also create additional demand for housing loans. A "package" of services including a long-term loan with a reasonable rate of interest, insurance and some form of guidance on robust housing design delivered by the MFIs can be considered.

**Table 31: Construction of *Pucca*/Durable House**

| | Aggregate (N=2,249) | Access to MFI and banks (N=1,545) | No access to MFI and banks (N=704) | Aggregate | Access to MFI and bank | No access to MFI and bank |
|---|---|---|---|---|---|---|
| | Percentage of households built *pucca* or durable houses | | | Expense for building *pucca* or durable houses | | |
| **Aggregate** | **44.22** | 43.08 | 46.73 | 49,571 | 53,507 | 41604 |
| Closest to sea (N=1,125) | 56.71 | 54.23 | 62.01 | 49,857 | 53,497 | 43,036 |
| Moderately close to sea (N=750) | 36.26 | 35.71 | 37.5 | 48,924 | 55,614 | 34,700 |
| Distance from sea (N=375) | 22.66 | 24.9 | 17.54 | 49,506 | 47,585 | 55,750 |
| Low salinity (N=1,000) | 24.3 | 24.31 | 24.26 | 80,992 | 93,074 | 53,399 |
| Medium salinity (N=500) | 38.2 | 36.9 | 40.85 | 78,220 | 84,504 | 66,590 |
| High salinity (N=749) | 74.8 | 72.42 | 80 | 26,209 | 25,277 | 28,057 |

Source: InM Study Survey 2017

### 2.8.1.3 Preservation of rainwater

In the southern areas, whenever a cyclone causes a disasterone of the most serious problems households are confronted with is water security. In many cases, existing tube wells are either damaged or water is not drinkable because of raised salinity levels.

Of the sampled households, some 44 percent preserve rainwater (Table 32). The rate is higher (more than 60 percent) in the areas closest to the sea and more than 75 percent in the areas with high salinity. These findings are not unexpected.

In all areas, the percentage of householdswho are microfinance participants preserving rainwater is higher than non-participating households. In all areas, microfinance programme participants spend more on average on rainwater harvesting than non-participants. It can be noted that through its POs, PKSF has encouraged households to adopt rainwater harvesting technologies.

The average amount spent by households on rainwater harvesting is quite low. The main containersthey use to preserve rainwater are barrel, tank, bucket, pots and pans. Over 27 percent of the households use barrels, followed by some 23 percent who use buckets (Table 33). In terms of policy implications, in some cases water security interventions at the community level employing more scientific approaches may be more effective than household-based rainwater harvesting.

**Table 32: Preservation of Rainwater**

| | Aggregate (N=2,249) | Access to MFI and bank (N=1,545) | No access to MFI and bank (N=704) | Aggregate | Access to MFI and bank | No access to MFI and bank |
|---|---|---|---|---|---|---|
| | Number of household who preserve rainwater | | | Expense for preserving rainwater | | |
| **Aggregate** | 40.44 | 42.94 | 34.94 | 1468 | 1560 | 1223 |
| Closest to sea (N=1,125) | 61.68 | 65.71 | 53.07 | 1,792 | 1,894 | 1,519 |
| Moderately close to sea (N=750) | 18.53 | 20.27 | 14.65 | 522 | 617 | 228 |
| Distance from sea (N=375) | 20.53 | 21.07 | 19.29 | 269 | 294 | 209 |
| Low salinity (N=1,000) | 24.9 | 27.91 | 18.03 | 415 | 469 | 224 |
| Medium salinity (N=500) | 22.6 | 24.1 | 19.51 | 619 | 772 | 231 |
| High salinity (N=749) | 73.06 | 75.53 | 67.65 | 2,123 | 2,268 | 1,769 |

Source: InM Study Survey 2017

**Table 33: Methods of Preserving Rainwater**

| Method | % of HH using method for preserving rainwater (n=910) |
|---|---|
| Barrel/Drum | 26.26 |
| Water Tank | 20.88 |
| Bucket | 22.97 |
| Pots and Pans/Pitcher | 19.78 |
| Big clay pot | 6.37 |
| Others | 0.77 |

Source: InM Study Survey 2017

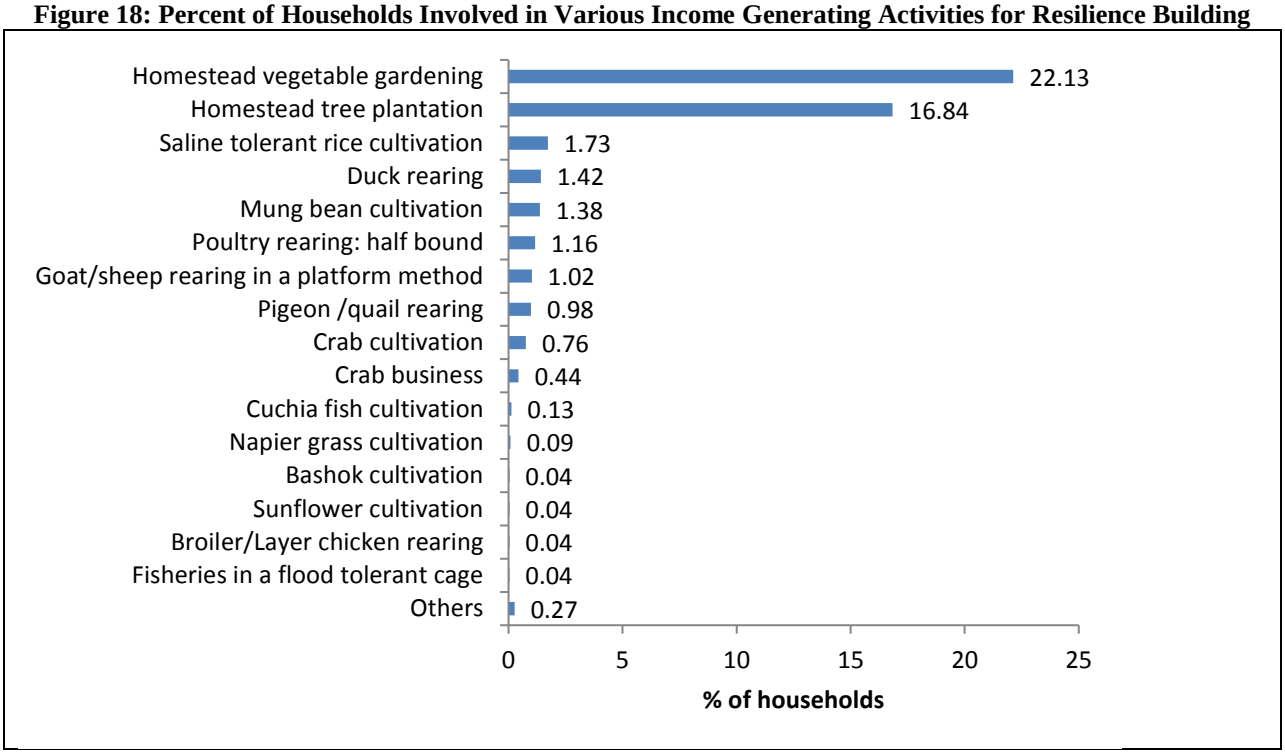
#### 2.8.1.4 Resilience and adaptation through climate-resilient income generating activities

Households in SW Bangladesh are confronted with the challenge of diversifying their economic activities to match the environmental conditions associated with climate change impacts. Following Sidr and *Aila*, the affected households derived their own lessons from their experiences associated with loss and damages from the two disasters. The MFIs, other NGOsand government organisations have also observed that there is a critical need for households to diverse their livelihood activities, and have implemented various training and other programmes to support this process. We prepared a list of agriculture-based economic activities associated with adaptationand resilience building based on the information provided by the respondents. Homestead vegetable gardening and homestead tree plantation dominate the list. These two activities are both livelihood and risk-minimising activities. Other important activities are saline-tolerant crop cultivation, rearing of different types of livestock, mung bean cultivation,aquaculture and related business, etc., as shown in Figure 18.

Training, technical assistance and grants played an important role in initiating and diversifying income generating activities. About 94 percent of the households who are involved with at least one type of climate-resilient income generating activity have received training on the relevant activity. Both MFIs and government institutions play important roles in providing training for income generation (58 percent and

42 per cent, respectively). Technical assistance is mostly from the MFIs. They are also major providers of grants for climate-resilient income generating activities.

**Figure 18: Percent of Households Involved in Various Income Generating Activities for Resilience Building**




Source: InM Study Survey 2017

### 2.8.1.5 Community level adaptation activities

It is widely understood that effective adaptation requires interventions and initiatives at community level, not just household level. Some required adaptation is beyond the capacities of individual households and it is only by working together at community level that they can implement the necessary actions. In Bangladesh,the interventions generally take the form of physical infrastructure and related systems and services. These activities are mostly supported by the government, thoughin many cases, NGO-MFIs also extend support for community level initiatives (Table 36). The activities do not always take place at village level; some of the activities might take place at the union level. Table 36 provides data on the frequency distribution of the community level activities and who initiated them.

The role of government is quite apparent in the community-level activities. Its main roles are found in setting-up deep tubewells, establishing satellite health clinics, construction of cyclone shelters, construction of sluice gates/dams, plinth-raising of community level infrastructure, road-construction and repair, and afforestation. The major role of MFIs is found in re-excavation of ponds, solar panel installment, plinth-raising, construction of desalination plants, and preservation of rainwater. Most of the activities noted above are placed at the village level and most of the villages have these community level interventions. However, some activities like solar panel installation, setting up of satellite health care systems, and desalination plants are found in only a limited number of villages. The community-level activitiespromoted by government and MFIs contribute to resilience at community and household levels, and will have implications for household level adaptation decisions.

**Table 34: Community Level Initiatives Taken in Post-Disaster Period**

| Community level initiatives | Number of village (n=72) | Initiated by government | Initiated by MFI |
|---|---|---|---|
| Set deep tube-well | 48 (66.7) | 43 [89.6] | 33 [68.8] |
| Preserve rainwater | 16 (22.2) | 9 [56.3] | 16 [100] |
| Construction of desalination plant | 6 (8.3) | 1 [16.7] | 5 [83.3] |
| Re-excavation of ponds and pond sand filters | 22 (30.6) | 8 [36.4] | 22 [100] |
| Placed toilet on high place, educational institutions and other community institutions | 24 (33.3) | 17 [70.8] | 22 [91.7] |
| Satellite health care | 17 (23.6) | 16 [94.1] | 9 [52.9] |
| Construction/repair of cyclone shelter | 38 (52.8) | 37 [97.4] | 21 [55.3] |
| Dam construction/repair, sluice gate construction | 35 (48.6) | 35 [100] | 16 [45.7] |
| Plinth raising of shelter, school and other community physical structures | 26 (36.1) | 25 [96.2] | 12 [46.2] |
| Road construction/repair | 53 (73.6) | 53 [100] | 12 [22.6] |
| Afforestation | 28 (38.9) | 27 [96.4] | 11 [39.3] |
| Installment of solar panels | 7 (9.7) | 4 [57.1] | 6 [85.7] |
| Others | 2 (2.8) | 0 [0] | 2 [100] |

Source: InM Study Survey 2017

Note: Numbers in first bracket () shows percentage of total village. Numbers in third bracket [] shows percentage of aggregate initiatives. In some villages both government and MFIs may supportthe same interventions, meaning that the summation of the percentage may exceed 100.

### 2.8.1.6 Determinants of adaptation decisions at household level

We have shown that households affected by Sidr and *Aila*adapted to minimise the risk of damageto physical assets like houses either through plinthraising or by constructing *pucca*/durable houses. They also adapted to minimise the risk of non-availability of drinking water through preserving rainwater. What led to such decisions? What role have MFIs played in these decisions? Is there any effect of climate change knowledge on adaptation decisions? In our analysis we consider three critical policy parameters as the determinants of adaptation decisions at the household level. They are climate change knowledge, access to microfinance and community interventions. We have considered four adaptation decisions as dependent variables. They are plinth raising, construction of *pucca* or durable houses, provision for drinking water, and construction of hygienic toilets. All these adaptation interventions improve quality of life andthe living environment, and reduce the consequences of disasters.

We specified the following equation for estimating the determinants of each of the above specified adaptation decisions:

$$ADPT_k = \beta_0 + \sum_{i=1}^{4} \beta_{1i} HHC + \beta_{21} CCK + \beta_{31} MFI + \beta_{41} COMACT + \varepsilon \qquad (2)$$

where, ADP Tk refers to adaptation of k type of interventions, and HHC represents four different characteristics of households (family size, primary occupation, age of HH head, female headed household). Access to microfinance is represented by MFI, and community level actions are represented by number of community level actions. ADPTk is a dummy variable. The MFI variable is also defined as a dummy variable. The COMACT variable is a continuous count variable. We did not include 'land' as a variable in the model as it is related toeligibility for participation inmicrofinanceschemes. After some statistical testing, we decided not to include land in the model because of the causality between microfinance membership and land size. From the policy perspective, we included access to microfinance as a variable.

We have specified six models for estimating determinants of the dependent variable. The first model excludes community variable (COMACT). Access to microfinance has a single variable as MFI. In the second model, we disaggregated the MFI variable into *ex ante* access to microfinance and ex-post access to microfinance but COMACT remains excluded. In the third model, COMACT is introduced along with single microfinance variable. In the fourth model, microfinance is disaggregated into two as in the second model. In the fifth model, COMACT is disaggregated into community level actions *ex ante* to disaster and community level ex-post to disasters along with the single variable on access to microfinance as in model 1. The six modelstakes all variables, including the two disaggregated variables on access to microfinance and community actions. Model six should be perceived as a complete model. In estimating the parameters, we had to tackle one problem of endogeneity of climate change knowledge. Therefore, we had to look for an instrumental variable. We used 'soil salinity type' as the instrumental variable. Parameters were estimated using IV Probit.

Results of the determinants of 'plinth raising' are reported in Table 35. Climate change knowledge positively influenced decision for plinth raising. Coefficients of CC knowledge in all models are statistically significant and have the expected signs. This suggests that CC knowledge induces adaptation decisions. Similarly, we find that access to microfinance positively contributes to the decision of plinth raising. This could be because households with access to financial services have more resources to support plinth raising and because MFIsare active in high salinity areas and areas in close proximity to the sea, where plinth raising is more critical. However, *ex ante* access to microfinance has more influence on the decision of plinth raising than the non-participants, as evident from model-2, model-4 and model-6. Community level interventions as a single variable were not significant, but the ex-post actions are significant and likely to influence adaptation decision of plinth raising. Among the HH level variables, we found that, ages of the HHs with older head and HHs in primary occupation of agriculture are more likely to undertake plinth raising. This is quite expected.

We estimated the coefficients of the same set of variables as the explanatory variables for the decision to undertake the construction of *pucca* or durable houses. Theresults are reported in Table 36. The findings are similar to that of plinth raising. CC knowledge, access to microfinance, more particularly ex

anteaccess to microfinance, community level actions and ex-post community level actions increase the likelihood of households taking the decision to construct *pucca* or durable houses. As with plinth raising, ex-post access to microfinance does not have any implication on the decisionto construct *pucca* or durable houses. Interestingly, HH level characteristics were found not to be significant, with the exception of one model in which the variable 'agriculture as primary occupation' was found to be significant.

We evaluated the determinants of the adaptation decisions to preserve water and construct hygienic latrines with the same set of variables. The results for the determinants of 'preservation of rainwater' and 'preservation of rainwater through tank' are reported in Table 37 and Table 38, respectively. The findings are robust and similar. CC knowledge has a strong influence on the decisions. Similarly accesses to microfinance and *ex ante* access to microfinance also have positive impacts of the decision to preserve rainwater, as doesthe age of the HH head. Ex-post community level interventions, as we discussed earlier, have positive impacts. We have reported the estimates of the determinants of the adaptation decision to construct a hygienic latrine in Table 39. CC knowledge; *ex ante* access to microfinance, and ex-post community level interventions have positive influences on the decision to construct hygienic latrines.

In brief, the results suggest that microfinance and climate change knowledge can play critical roles in improving the adaptive capacity of the households. Community level actions are also important, but their significance is greater when they induce household level outcomes.

**Table 35: Regression with InstrumentalV (climate change knowledge = soil salinity type)**

| VARIABLES | Plinth raising | Plinth raising | Plinth raising | Plinth raising | Plinth raising | Plinth raising |
|---|---|---|---|---|---|---|
| Model Number | 1 | 2 | 3 | 4 | 5 | 6 |
| Climate change knowledge | 1.853*** | 1.829*** | 1.580*** | 1.548*** | 1.618*** | 1.582*** |
| | (0.336) | (0.344) | (0.485) | (0.493) | (0.465) | (0.475) |
| MFI member | 0.156** | | 0.143* | | 0.147** | |
| | (0.0659) | | (0.0732) | | (0.0720) | |
| *Ex ante* member | | 0.244*** | | 0.224** | | 0.233*** |
| | | (0.0767) | | (0.0875) | | (0.0858) |
| Ex-post member | | 0.0469 | | 0.0424 | | 0.0405 |
| | | (0.0734) | | (0.0781) | | (0.0776) |
| hhh_age | 0.00570** | 0.00509** | 0.00521** | 0.00463* | 0.00526** | 0.00464* |
| | (0.00236) | (0.00238) | (0.00258) | (0.00259) | (0.00255) | (0.00256) |
| female | -0.00246 | -0.00494 | 0.0420 | 0.0405 | 0.0333 | 0.0316 |
| | (0.119) | (0.120) | (0.131) | (0.133) | (0.130) | (0.132) |
| agriculture | 0.152** | 0.151** | 0.173** | 0.172** | 0.169** | 0.168** |
| | (0.0688) | (0.0692) | (0.0722) | (0.0725) | (0.0719) | (0.0721) |
| family_size | 0.0313 | 0.0315 | 0.0389* | 0.0391* | 0.0380 | 0.0384* |
| | (0.0220) | (0.0221) | (0.0234) | (0.0235) | (0.0232) | (0.0233) |
| Community intervention count | | | 0.0401 | 0.0405 | | |
| | | | (0.0247) | (0.0249) | | |
| *Ex ante* community intervention count | | | | | 0.0146 | 0.0135 |
| | | | | | (0.0291) | (0.0294) |
| Ex-post community intervention count | | | | | 0.0546** | 0.0575** |
| | | | | | (0.0246) | (0.0247) |
| dom_soil_sali_type | | | | | | |
| Constant | -2.119*** | -2.078*** | -2.217*** | -2.174*** | -2.273*** | -2.234*** |
| | (0.173) | (0.176) | (0.207) | (0.210) | (0.206) | (0.210) |
| Observations | 2,122 | 2,122 | 2,122 | 2,122 | 2,122 | 2,122 |

Note: District dummy added in the regression to capture area specific characteristics

**Table 36: Determinants of Adaptation Decision to Construct *Pucca* or Durable Houses**

| VARIABLES | (1) Building *pucca*/durable house | (2) Building *pucca*/durable house | (3) Building *pucca*/durable house | (4) Building *pucca*/durable house | (5) Building *pucca*/durable house | (6) Building *pucca*/durable house |
|---|---|---|---|---|---|---|
| Climate change knowledge | 2.282*** | 2.277*** | 1.992*** | 1.981*** | 2.136*** | 2.125*** |
| | (0.124) | (0.127) | (0.300) | (0.302) | (0.221) | (0.225) |
| MFI member | 0.117** | | 0.0837 | | 0.103 | |
| | (0.0586) | | (0.0699) | | (0.0646) | |
| *Ex ante* member | | 0.179*** | | 0.131 | | 0.166** |
| | | (0.0670) | | (0.0827) | | (0.0748) |
| Ex-post member | | 0.0386 | | 0.0233 | | 0.0233 |
| | | (0.0649) | | (0.0727) | | (0.0699) |
| hhh_age | 0.00372* | 0.00323 | 0.00237 | 0.00197 | 0.00289 | 0.00235 |
| | (0.00210) | (0.00211) | (0.00247) | (0.00245) | (0.00232) | (0.00232) |
| female | -0.0411 | -0.0442 | 0.0424 | 0.0404 | 0.00205 | -0.000284 |
| | (0.102) | (0.102) | (0.122) | (0.123) | (0.114) | (0.115) |
| agriculture | 0.0872 | 0.0842 | 0.101* | 0.0985 | 0.0911 | 0.0879 |
| | (0.0556) | (0.0558) | (0.0609) | (0.0612) | (0.0587) | (0.0590) |
| family_size | -0.00335 | -0.00412 | 0.00548 | 0.00494 | 0.00196 | 0.00133 |
| | (0.0167) | (0.0168) | (0.0192) | (0.0193) | (0.0182) | (0.0183) |
| Community intervention count | | | 0.0962*** | 0.0968*** | | |
| | | | (0.0303) | (0.0301) | | |
| *Ex ante* community intervention count | | | | | 0.00904 | 0.00813 |
| | | | | | (0.0271) | (0.0273) |
| Ex-post community intervention count | | | | | 0.101*** | 0.104*** |
| | | | | | (0.0284) | (0.0281) |
| dom_soil_sali_type | | | | | | |
| Constant | -1.237*** | -1.193*** | -1.263*** | -1.226*** | -1.391*** | -1.347*** |
| | (0.194) | (0.193) | (0.247) | (0.244) | (0.211) | (0.211) |
| Observations | 2,247 | 2,247 | 2,247 | 2,247 | 2,247 | 2,247 |

Note: District dummy added in the regression to capture area specific characteristics

**Table 37: Determinants of Preservation of Rainwater**

| VARIABLES | (1) Preservation of rainwater | (2) Preservation of rainwater | (3) Preservation of rainwater | (4) Preservation of rainwater | (5) Preservation of rainwater | (6) Preservation of rainwater |
|---|---|---|---|---|---|---|
| Climate change knowledge | 2.091*** | 2.090*** | 1.881*** | 1.874*** | 1.953*** | 1.945*** |
| | (0.0910) | (0.0921) | (0.167) | (0.170) | (0.142) | (0.145) |
| MFI member | 0.323*** | | 0.365*** | | 0.351*** | |
| | (0.0609) | | (0.0649) | | (0.0637) | |
| *Ex ante* member | | 0.423*** | | 0.465*** | | 0.458*** |
| | | (0.0684) | | (0.0727) | | (0.0717) |
| Ex-post member | | 0.217*** | | 0.258*** | | 0.237*** |
| | | (0.0695) | | (0.0740) | | (0.0726) |
| hhh_age | 0.00742*** | 0.00683*** | 0.00779*** | 0.00720*** | 0.00769*** | 0.00706*** |
| | (0.00225) | (0.00226) | (0.00237) | (0.00238) | (0.00233) | (0.00235) |
| female | -0.251** | -0.254*** | -0.268*** | -0.272*** | -0.290*** | -0.296*** |
| | (0.0976) | (0.0978) | (0.102) | (0.103) | (0.102) | (0.102) |
| agriculture | 0.00937 | 0.00900 | 0.0324 | 0.0323 | 0.0254 | 0.0257 |
| | (0.0627) | (0.0628) | (0.0674) | (0.0677) | (0.0661) | (0.0664) |
| family_size | -0.0246 | -0.0260 | -0.0322* | -0.0338* | -0.0275 | -0.0291 |
| | (0.0177) | (0.0178) | (0.0187) | (0.0188) | (0.0184) | (0.0185) |
| Community intervention count | | | 0.107*** | 0.109*** | | |
| | | | (0.0324) | (0.0325) | | |
| *Ex ante* community intervention count | | | | | 0.0240 | 0.0235 |
| | | | | | (0.0266) | (0.0267) |
| Ex-post community intervention count | | | | | 0.112*** | 0.116*** |
| | | | | | (0.0323) | (0.0325) |
| dom_soil_sali_type | | | | | | |
| Constant | -1.431*** | -1.389*** | -1.648*** | -1.607*** | -1.695*** | -1.658*** |
| | (0.168) | (0.169) | (0.180) | (0.181) | (0.182) | (0.183) |
| Observations | 1,622 | 1,622 | 1,622 | 1,622 | 1,622 | 1,622 |

Note: District dummy added in the regression to capture area specific characteristics

**Table 38: Determinants of Preservation of Rainwater through Tank**

| VARIABLES | (1) Preservation of rainwater through tank | (2) Preservation of rainwater through tank | (3) Preservation of rainwater through tank | (4) Preservation of rainwater through tank | (5) Preservation of rainwater through tank | (6) Preservation of rainwater through tank |
|---|---|---|---|---|---|---|
| Climate change knowledge | 1.863*** | 1.866*** | 1.691*** | 1.702*** | 1.795*** | 1.817*** |
| | (0.241) | (0.245) | (0.304) | (0.305) | (0.264) | (0.261) |
| MFI member | 0.302*** | | 0.302*** | | 0.308*** | |
| | (0.0771) | | (0.0830) | | (0.0797) | |
| *Ex ante* member | | 0.469*** | | 0.476*** | | 0.487*** |
| | | (0.0859) | | (0.0915) | | (0.0885) |
| Ex-post member | | 0.118 | | 0.109 | | 0.110 |
| | | (0.0939) | | (0.100) | | (0.0965) |
| hhh_age | 0.00372 | 0.00283 | 0.00331 | 0.00240 | 0.00358 | 0.00268 |
| | (0.00296) | (0.00301) | (0.00317) | (0.00322) | (0.00306) | (0.00310) |
| female | -0.151 | -0.156 | -0.135 | -0.140 | -0.165 | -0.174 |
| | (0.129) | (0.131) | (0.139) | (0.140) | (0.133) | (0.134) |
| agriculture | 0.222** | 0.230** | 0.260*** | 0.267*** | 0.232** | 0.235** |
| | (0.0952) | (0.0967) | (0.100) | (0.101) | (0.0964) | (0.0973) |
| family_size | -0.0221 | -0.0208 | -0.0165 | -0.0153 | -0.0201 | -0.0192 |
| | (0.0253) | (0.0257) | (0.0272) | (0.0275) | (0.0261) | (0.0263) |
| Community intervention count | | | 0.0352 | 0.0333 | | |
| | | | (0.0214) | (0.0215) | | |
| *Ex ante* community intervention count | | | | | -0.0165 | -0.0242 |
| | | | | | (0.0294) | (0.0296) |
| Ex-post community intervention count | | | | | 0.0574** | 0.0593** |
| | | | | | (0.0232) | (0.0234) |
| dom_soil_sali_type | | | | | | |
| Constant | -1.915*** | -1.886*** | -2.072*** | -2.034*** | -2.073*** | -2.032*** |
| | (0.219) | (0.220) | (0.241) | (0.242) | (0.248) | (0.249) |
| Observations | 1,372 | 1,372 | 1,372 | 1,372 | 1,372 | 1,372 |

Note: District dummy added in the regression to capture area specific characteristics

**Table 39: Determinants of Hygiene Latrine as an Adaptation Strategy**

| VARIABLES | (1) Hygienic latrine | (2) Hygienic latrine | (3) Hygienic latrine | (4) Hygienic latrine | (5) Hygienic latrine | (6) Hygienic latrine |
|---|---|---|---|---|---|---|
| Climate change knowledge | 1.817*** | 1.796*** | 1.394*** | 1.363*** | 1.513*** | 2.125*** |
| | (0.317) | (0.325) | (0.518) | (0.525) | (0.469) | (0.225) |
| MFI member | 0.145** | | 0.128* | | 0.136* | |
| | (0.0628) | | (0.0728) | | (0.0699) | |
| *Ex ante* member | | 0.252*** | | 0.231*** | | 0.166** |
| | | (0.0697) | | (0.0829) | | (0.0748) |
| Ex-post member | | 0.0158 | | 0.00159 | | 0.0233 |
| | | (0.0727) | | (0.0798) | | (0.0699) |
| hhh_age | 0.00663*** | 0.00585*** | 0.00627** | 0.00548** | 0.00637*** | 0.00235 |
| | (0.00221) | (0.00224) | (0.00244) | (0.00247) | (0.00237) | (0.00232) |
| female | 0.0560 | 0.0537 | 0.139 | 0.137 | 0.113 | -0.000284 |
| | (0.125) | (0.126) | (0.143) | (0.144) | (0.140) | (0.115) |
| agriculture | 0.140** | 0.136** | 0.158** | 0.154** | 0.153** | 0.0879 |
| | (0.0623) | (0.0626) | (0.0657) | (0.0660) | (0.0651) | (0.0590) |
| family_size | 0.0241 | 0.0237 | 0.0364 | 0.0360 | 0.0339 | 0.00133 |
| | (0.0213) | (0.0215) | (0.0234) | (0.0235) | (0.0230) | (0.0183) |
| Community intervention count | | | 0.0639*** | 0.0642*** | | |
| | | | (0.0235) | (0.0234) | | |
| *Ex ante* community intervention count | | | | | 0.0250 | 0.00813 |
| | | | | | (0.0292) | (0.0273) |
| Ex-post community intervention count | | | | | 0.0669*** | 0.104*** |
| | | | | | (0.0216) | (0.0281) |
| dom_soil_sali_type | | | | | | |
| Constant | -2.073*** | -2.021*** | -2.242*** | -2.183*** | -2.287*** | -1.347*** |
| | (0.167) | (0.169) | (0.205) | (0.210) | (0.196) | (0.211) |
| Observations | 2,247 | 2,247 | 2,247 | 2,247 | 2,247 | 2,247 |

Note: District dummy added in the regression to capture area specific characteristics

## 2.9 Future Adaptation Planning

We have examined outcomes of *ex ante* access to microfinance and the ex-post adaptation decisions of the households and community. The findings are robust. *Ex ante* access to microfinance has strong impacts on coping and adaptation decisions of the households. Ex-post community level activities induce households to adopt some adaptation actions or decisions. Climate change knowledge has a strong impact on the decisions at the household level. In the post-disaster period, households have focused on construction or reconstruction of physical assets that will minimise risk of damage from severe natural disasters like floods and cyclones. Minimising risk through disaster-resilient physical assets is an essential element of resilience building. So too is minimising income risk through diversifying economic activities. Given the fact that off-farm economic activities are limited, poor households maintain their livelihoods mainly based on agricultural activities. We have shown that in a limited way, they have focused their adaptation and disaster risk reduction strategies on tree plantation and vegetable gardening as well as livestock rearing. We found thatvarious institutions played important roles in the post-disaster period, withMFIs being especially important. Based on what has been done, what has been experienced and existing constraints, households have responded through their adaptation planning. In this section, we focus on this issue of adaptation planning.

Adaptation is different from coping. Coping is a quick or immediate response to a disaster event. Households cope using their existing resources and external assistance from institutions within the social system. In contrast, adaptation is a long-term process; it seeks to address the consequences of disasters and minimise future risks. Adaptation can be both incremental and transformational. Incremental adaptation involves actions that maintain levels of wellbeing through small adjustments in response to changes in external factors, whereas transformational adaptation changes fundamental attributes of a system, often based on altered paradigms, goals, or values. Both are important.

Adaptation is incremental when actions are based on the existing systems but incrementally add to existing resources or strategies in response to external events. With this definition,plinth raising can be viewed as an example of incremental adaptation. On the other hand, transformational adaptation requires major action on the part of households, often supported by systemic changes at higher levels. Based on the actions of their communities, households may transform their economic behaviour in response to disasters. The adaptations can be within the social system households are living in or may go beyond the local social or economic system. Transformation of economic activities, such as from agriculture to aquaculture, may be an example of transformational adaptation within the local social system. Short or long-term migration may also be an example of transformational adaptation. We have distinguished these two terms – incremental and transformational adaptation – from the perspective of adaptation planning. Household adaptation can be a combination of both incremental and transformational adaptation. Our focus in this section will on both of these types of adaptations.Household level resources, community level actions and the role of external institutions or system may determine the intensity or combination of adaptations. These adaptations may address short, medium and long-term needs of the households and community.

The Ministry of Environment and Forestry of Bangladesh has been working on a National Adaptation Plan (NAP) to respond to the medium and long-term needs arising out of the impacts of climate change.The NAP is critical for preserving livelihoods, social capital and the environment. The NAP should be informed by an accurate set of information on vulnerabilities, available resources and

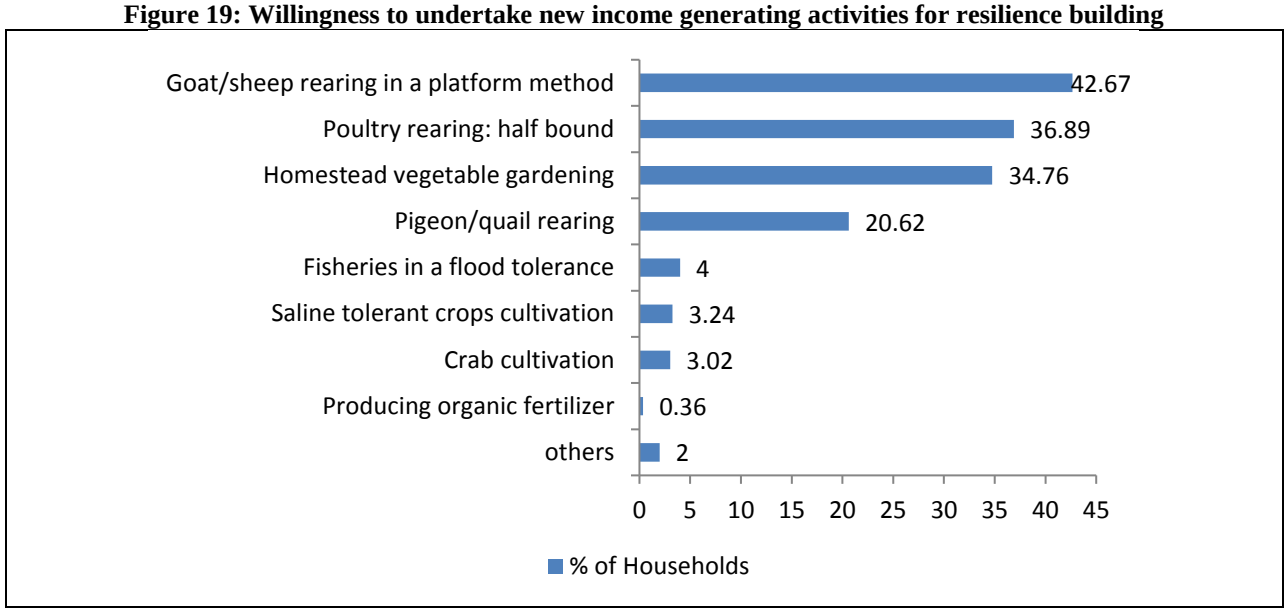
adaptation options and pathways. The mapping of vulnerabilities is crucial to the effectiveness of the NAP. The NAP must address the issue of minimising community risk from disasters, including through influencing the behaviour of households living in the community.

In this section, we focus on incremental and transformational adaptation. As such, we will be addressing different aspects of household level behaviour. Our discussion on adaptation planning is based on the responses of the households.

### 2.9.1 Income Generating Activities

We have shown that households are engaged in different economic activities and have already taken some adaptation actions in terms of moving towards more climate-resilient income generating activities. But, what are their intentions for the future? In order to minimise risk, the surveyed households intend to adopt different agriculture-based activities. These are (i) goat/sheep rearing using platform method; (ii) poultry rearing; (iii) homestead vegetable gardening; (iv) pigeon/quail rearing; (v) fisheries; (vi) crab cultivation; (vii) saline tolerant crop cultivation; and (viii) production of organic fertiliser. Of these, 42.67 percent of the households plan to engage in goat/sheep rearing (Figure-19). This is followed by poultry rearing (36.89 percent), homestead vegetable gardening (34.76 percent) and pigeon/quail rearing (20.62 percent). The intended activities that households are willing to adopt are combinations of both incremental and transformational adaptation strategies; what ought to be considered is the contextual situation of the concerned households.

**Figure 19: Willingness to undertake new income generating activities for resilience building**




Source: InM Study Survey 2017

The surveyed households reported that they will need on an average Tk.24,746 to initiate and/or operate the income generating activities. They also reported that they would like to borrow on average Tk.15,124 to finance the activities. The households perceived that both NGO/MFIs and various government institutions have important roles to play in their resilience building. More than fourth-fifths of the households recognise MFIs as having important roles in the future adaptation process, and many perceived a complimentary role for the government institutions in the adaptation process. These

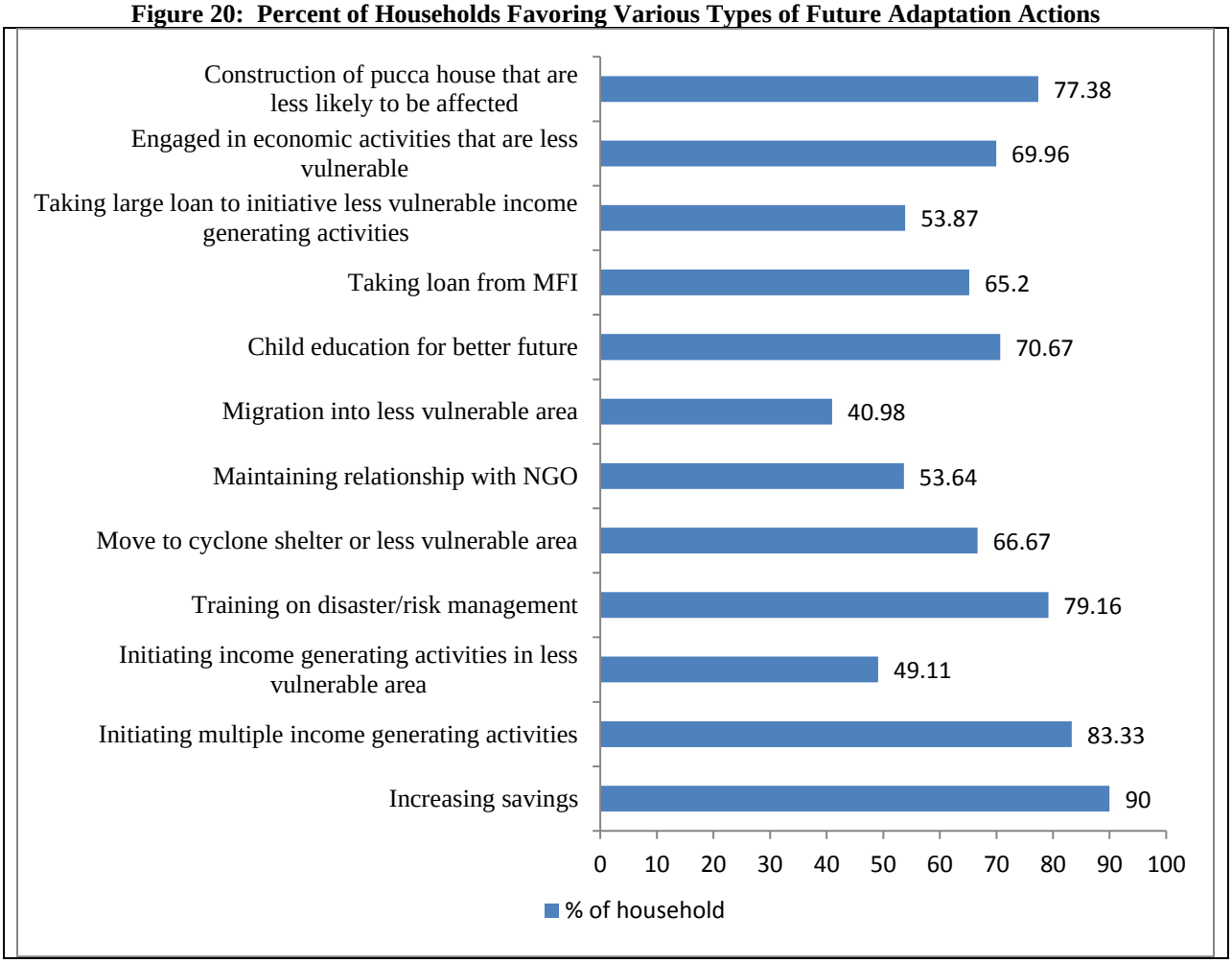
expectations can be considered reasonable as we found that *ex ante* access to microfinance through MFIs and community level actions have profoundly influenced household level adaptation actions.

### 2.9.2 Transformational adaptation strategies

Households have identified quite a number of activities that can be considered transformational in nature as a part of future adaptation planning. They are:

- Construction of *pucca* or durable house expected to be affected less by disaster
- Engaged in less vulnerable economic activities
- Migration to less vulnerable areas
- Child education for better future.

**Figure 20: Percent of Households Favoring Various Types of Future Adaptation Actions**




Source: InM Study Survey 2017

Of the major transformational strategies, some 40 percent of the sample households perceived migration to less vulnerable areas as an adaptation strategy. This desire is perhaps a reflection of their inadequate physical assets. This same reason may explain why we found that more than 75 percent of the households perceived that the construction of a semi-*pucca* or *pucca* house will significantly reduce damages to houses exposed to extreme weather events (Figure-20). The surveyed households also considered

economic diversification a key future adaptation strategy. Over 80 percent of the HHs considered that multiple income generating activities would reduce their exposure to risk and some 50 percent of the HHs considered that conducting economic activities in less vulnerable areas to reduce the intensity of damage to economic assets an adaptation strategy. Diversification of economic activities will enhance income, ensure long run financial stability, and equip them better to cope with any crisis. When reflecting on these findings, it should be noted that the perceptions are based on the current state of household knowledge.

### 2.9.3 Incremental adaptation strategies: Access to credit and savings

Incremental adaptation strategies are built on the existing facilities and opportunities within the existing system. Households do want to survive in their known environment building on the available opportunities through using resources efficiently. Poor households remain poor because of their limited resources and capital. That is why access to finance is a major determinant of coping and adaptation. We showed empirically that access to microfinance has a strong influence on coping and adaptation activities following Sidr and *Aila*. It is also well documented in the literature that microfinance helps with coping and adaptation, as we have reported. Different impact studies show that the impacts of microfinance are larger when borrowers have access to larger volumes of loans and members have higher amounts of savings. Training and outreach provided by MFIs enhance the impacts of these financial services.

**Perceptions of households on access to savings and credit**

More than sixty percent of the households perceived access to credit an adaptation strategy, and more than 50 percent of the households considered access to large loans an adaptation strategy. In order to increase their own financial resources, 90 percent of the households expect to save at a higher rate.

Access to credit and savings are complimentary goods. Both products can impact investment, increase income, support diversification of economic activities and the creation of multiple income opportunities. What is clear from the perceptions is that to support their adaptation households are interested in loans of a large size and types of saving products for increased savings.

### 2.9.4 Incremental adaptation strategy: Access to microinsurance

Although microinsurance has quite some presence in the microfinance sector, it has not really emerged as a distinct product with legal entity. Nevertheless, microinsurance is offered by MFIs to minimise different risks. In this section, we discuss separately the state of microinsurance in Bangladesh, based on an extensive literature review, and the extent of knowledge thatmicrofinancescheme members have about microinsurance, based on our HH survey. We also discuss willingness of the households to subscribe to microinsurance. We review all types of cover, but focus on asset insurance and to a lesser extent on health insurance because of the severe implications that property damage and morbidity associated with climate-related shocks can have for households.

#### 2.9.4.1 State of microinsurance in Bangladesh

The number of studies on microinsurance in Bangladesh is steadily growing. Several of these describe the existing microinsurance schemes. The ILO produced a short (and now dated) inventory of microinsurance activities in the country, describing features of products, eligibility criteria and premium structure (ILO/STEP 2003). The International Network of Alternative Financial Institutions (INAFI) also described some of the available microinsurance products (Hasan 2007), as did Werner (2009) in her report on micro health insurance schemes. The Palli Karma-Sahayak Foundation (PKSF) undertook a market survey

(unpublished) as part of its Developing Inclusive Insurance Sector Project (DIISP) that also reported on the existing microinsurance schemes. Drawing on the same material, a study published in *Bangladesh Development Studies* provided an analytical overview of the state of the microinsurance market (Ahsan et.al. 2013).

Market surveys on the prospects for microinsurance have also been conducted. INAFI conducted its own market study with the notion of developing insurance services for the poor (Hasan 2007). The PKSF DIISP market study had a similar aim, surveying household interest in three prototype micro health insurance products (Ali 2012).

Micro health insurance in particular has generated a lot of interest and was one of the focuses of the PKSF market survey. Several papers on challenges facing micro health insurance and design issues were published by the Institute for Inclusive Finance and Development (InM) (Ahsan & Hakim, 2011; Ahsan & Tax, 2011). Another InM working paper reported on shocks and coping capacities from a survey of 3,941 households, including impacts of participation in Grameen Kaylan's micro health insurance scheme (Ahsan et.al. 2014).

Bangladesh does not have a national programme on microinsurance, nor a regulatory regime specifically for microinsurance, though the need to control the management of microinsurance is mentioned in the National Insurance Policy 2014 (Titu n.d.). The Insurance Development and Regulatory Authority (IDRA) requires by regulation the insurers to undertake a minimum percentage of insurance business in the rural and social sectors (Gazette Notification dated 04-11-2012). Ali (2012) feels that this can help the IDRA to issue further regulations for orderly development and growth of microinsurance.

Under the Microcredit Regulatory Authority (MRA) Rules 2010, MFIs may offer insurance services to their members. For any insurance services, MFIs must provide to the MRA a complete description of the service, the applicable fees or premium to be realised from the client and the settlement of claims and the financial solvency of the MFI. However, while MFIs have been authorised by MRA to offer suitable products to their members, no guidance is provided on the role of a third party risk carrier.

As there is an absence of regulations and guidelines for MFIs on the process and nature of insurance services, under the DIISP PKSF recruited a legal specialist to draft a set of regulatory guidelines. These include definition and types of microinsurance products, policyholders' rights and duties, financial management, confidentiality and restrictions, and governance, etc. Ashan et al. (2010) also called for a set of microinsurance regulatory and supervisory directives, as outlined in their paper.

Several surveys have identified risks facing poor rural households that they believe can be mitigated at least to some extent with formal insurance. INAFI's market survey covered 3,000 households, 70 per cent of whom were poor and the remainder ultra-poor. Households were asked about their income, expenditure, their perceived need for various types of insurance coverage, and the preparedness to pay for such services. The survey team concluded that the highest demand was for life insurance products followed by health insurance (Ahsan et al., 2013). This was the rationale for INAFI to develop several life and health products (described below).

The PKSF DIISP market demand assessment survey covered approximately 3,500 households participating in microfinance programmes. It consisted of a household survey, a 'willingness to pay'

(WTP) survey for prototype micro health insurance products and a village survey. The survey covered households from urban, char, coastal and hoar areas. Of the surveyed households, 41% experienced non-accidental health shocks, 18% crop shocks, 8.7% livestock shocks, 7.3% property shocks and 6.5% death-related shocks. The economic burden of these shocks was severe, with households having to bear on average about BDT 10,000 due to crop, livestock, death, accidental health shocks or non-accidental health shocks over the previous two years. Lumpy expenditure and property shocks were especially burdensome, averaging about BDT 45,000. Health shocks followed by property shocks were found to impose the greatest burdens. The surveyed households were introduced to three prototype micro health insurance packages and over half of them expressed interest in joining a micro health insurance scheme.

Ashan et al. (2014) surveyed 3,941 rural households across 120 villages on shocks experienced over the previous two years and coping strategies. The major shocks identified were death and health related shocks, crop failure or damage, loss of livestock, loss or damage of household fixed assets, and wedding and dowry expenses. Of these, they felt that the largest insurable risks were associated with health shocks followed by property shocks.

Although commercial insurance companies in Bangladesh offer all types of insurance products including micro life insurance, they have not been able to penetrate the microinsurance markets due to high transaction cost, lack of trust of low-income households in insurance companies and delay in claims settlement. Ahsan et al. (2013) concluded that the products of the commercial life insurers are characterised by inadequate risk coverage, excessively high premium rates unrelated to any plausible model of mortality of the insured, lengthy process of claim settlement and high costs of intermediation. Commercial insurers were mostly interested in the "life" market, which is likely to generate profits quickly, and unlike health or crop insurance, is less troubled by moral hazard and adverse selection problems. Therefore, alternate institutional arrangements are more critical to offering microinsurance. MFIs in Bangladesh, although legally not permissible, have been offering microinsurance for over two decades, but it is more limited to credit life insurance.

The primary delivery mechanism for microinsurance in Bangladesh is development of the insurance product and their provision by MFIs to their members. The MFIs act as the insurer and distributor. No effective framework for collaborative implementation between insurance companies and MFIs has emerged.

**Grameen Bima and Gono Bima**

One rare example of collaboration between the commercial insurance companies and MFIs is "micro life insurance" which was initiated by Delta Life in 1988 in collaboration with the Grameen Bank. Grameen Bima was offered in the rural areas and Gono Bima in the urban slums in the late 1980s and throughout the 1990s, but the collaboration ended shortly thereafter (Ahsan et al. 2013).

Ahsan et al. (2013) argue that MFIs in Bangladesh have several "natural advantages" in insurance delivery. As most MFIs operate at the rural level, they can make use of their existing network of contacts for the implementation and enforcement of insurance policies and thereby reduce administrative costs. It is also easier for MFIs to assess the worthiness of a potential client because they can monitor the client's

situation closely without incurring high costs. There are also several other natural advantages not recognised in their review. First, MFIs are well established in the communities and have trust-relationships with their members. Second, MFIs in Bangladesh are mostly developmental NGOs and many provide both financial and non-financial services to their members. They are thus in a position to integrate insurance with various risk mitigation interventions associated with livelihoods, health and assets, which can bring down the costs of premiums. Third, as they have a presence in the communities, they can readily assess the validity of claims and organise quick benefit disbursement. Fourth, MFIs provide other financial services that insurance can be integrated with to make it more attractive. On the other hand, MFIs do not have in-house actuarial expertise, their staff are not trained on insurance and their management and information systems may need further development.

The survey by Hasan (2007) reported that 92 NGO/MFIs offer insurance services either in the name of "microinsurance" or in the form of a variety of saving products. Out of approximately 30 million microfinance clients, it was estimated that about 69% were covered by some form of microinsurance products. MFIs were found to mostly offer loan insurance thus minimising lenders' risks and to have a quick claim settlement process. Some MFIs were found to offer a variety of other covers, particularly term life, health and livestock insurance. Features of these schemes are that they have been designed specifically for poor households (mostly MFI members), that they are often bundled with other financial and non-financial services aimed at generating livelihoods and/or mitigating risks, and that limits are set on claim pay outs, leaving a large part of the risk with the insured. Drawing on descriptions in the literature and material available on MFI websites, some of the MFI insurance schemes are briefly described and illustrated with examples below

***i) Loan insurance***

"Term loan insurance" is a common practice of MFIs in Bangladesh. Usually a premium is charged at the time of loan disbursement and any outstanding loan amount is written off if the borrower dies. Most MFIs offer this type of cover, though some provide additional cash compensation or a "death benefit".

As an example of term loan insurance, in the scheme developed under the DIISP 0.7% of the loan is taken as a premium and the outstanding amount of the loan is written off if the borrower or their spouse dies for any reason. Borrowers are also given the option of paying BDT 40 per loan for a cash benefit of BDT 5,000, which goes to the family of the deceased. From September 2013 to December 2014, premiums collected totalled BDT 914,046,393 and pay outs amounted to BDT 355,506,915 (39% ratio) (PKSF., n.d.).

In contrast, BRAC provides credit insurance with the loans as a condition of the loan (along with a modest death benefit) without any explicit premium; in other words, the costs of the insurance elements are already incorporated in the interest rate structure.

Some MFIs also offer insurance to protect their larger micro enterprise loans in the form of a term policy. The Integrated Development Foundation (IDF) offers this insurance for loans above BDT 30,000. The premium structure varies from BDT 30 to BDT 250 (for loans from BDT 30,000 to BDT 200,000). Above BDT 200,000 the premium is a flat rate of BDT 250. The borrowers are also required to pay 4% of the income from loan utilisation to the insurance fund, which serves as a kind of second-tier premium (Ahsan et al., 2013).

"Endowment loan insurance" is also offered by a small number of MFIs. This product offers an additional lump sum payment even if the insured does not encounter death within the term of the insurance contract. Upon death of the borrower, the family receives the principal loan amount, after deduction of any unpaid portion of the loan. If death does not occur during the contract period, the borrower is refunded the premium paid and receives some additional cash benefits. Some MFIs also offer pay outs when a client dies, regardless of her/his loan or savings status.

In some cases the loan insurance is part of a bundled package, as can be seen in the examples of SAJIDA Foundation and Society for Social Service (SSS) given below in the section on "bundled cover".

***ii) Livestock insurance***

Livestock insurance is also offered by a few MFIs. PKSF has piloted an integrated approach which marries insurance coverage with veterinary services and good beef fattening practices.

**Insurance as Part of Integrated Approach to Beef Fattening**

Under the DIISP PKSF developed a pilot on livestock insurance in which 18 of its MFI partner organisations participated. It is mandatory for the borrowers under PKSF's beef fattening programme to obtain the policy for their cattle. 0.7% of the loan amount is deducted as a premium to insure each cattle-head for the period of the loan cycle (either 6 or 10 months). An additional BDT 20 is deducted for a para-vet service. If the cattle-head dies during the insured period due to conventional mortality or natural catastrophe or an epidemic, the full loan amount is waived. The borrower's life can also be covered by the policy for an additional payment of 0.3% of the loan as premium. The same benefit is applicable if the borrower dies during the insured period.

This integrated programme aimed to minimise risk by reducing mortality through good beef fattening practices and veterinary services. A half day training is given to clients for them to be able to identify healthy young bulls suitable for fattening and to build their knowledge on good practices for beef fattening (clean farming, housing, deworming, fodder management, monitoring growth etc.). Each cattle has a health card and its health is checked on a weekly basis. This service is provided by para-veterinarians engaged by the MFIs.

419,757 cattle were covered by this scheme in 2014. For Jan. – Dec. 2014, the claims to premiums ratio was 35% and for Jan 2014 – August 2015 it was 25.9% (PKSF, n.d.).

With support from the Swiss Agency for Development and Cooperation (SDC), PKSF is aiming to expand its support for livestock insurance as well as pilot new actuarial-based livestock products, such as insurance for dairy cows, goats, lambs and poultry.

***iii) Health insurance***

Micro health insurance appears to be exclusively offered in Bangladesh by a small number of MFIs (Ahsan et al., 2010). Their basic strategy is to focus on providing essential health services through low pricing and affordable premiums. Most MFI health schemes are linked in some way to loans, e.g. SSS requires every borrower to hold a health card at a small cost (which used to be BDT 20), which enrols them in the microinsurance health scheme. Some MFIs offering health insurance have community-based clinics and staff these with medical professionals and paramedics. Coverage varies between the schemes,

but many include discounts on medicines and pathology tests, and payment up to a specified limit for hospitalisation. Some include free health check-ups, immunisations, family planning advice, pre- and post-natal care, and house visits. Most schemes use referrals for secondary and tertiary care, though two schemes have their own large hospitals. Only SSS covers surgery, but requires BDT 3,000 co-payment. Overall, the NGO-MFI micro health insurance schemes are characterised by a high rate of co-payment with some of the risk remaining with the insured (Ahsan et al., 2010).

**Health Insurance as Part of an Integrated Approach to Community Health Care under DIISP**

Under the DIISP, PKSF developed an integrated approach to community health care and provided support to interested MFIs to implement this approach. Under this approach each of the participating branches appoints one qualified paramedic whose duty is to raise health awareness among the branch members and their families, provide basic healthcare to the patients and refer patients to qualified doctors and hospitals if needed. The paramedic also organises a static/satellite clinic once a week and a qualified doctor is hired by the branch to provide primary healthcare to the patients at the clinic. Health cards with information of members and their families are provided to the members in all participating branches.

Health insurance in the form of a hospital cash benefit (HCB) insurance policy is an important component of the approach. The HCB policy is optional for the members and is yearly renewable. The paramedics are responsible for creating awareness among member households about the necessity of health insurance and promote the HCB insurance policy. The policyholders pay BDT 250 to BDT 500 as a premium for one year for the policy. In return, the policyholder and his/her insured family members are entitled to receive a hospital cash benefit if any insured person under the policy is hospitalised for more than 24 hours. BDT 200 to BDT 400 per day is given as a cash benefit for a maximum of 30 days, excluding the first day.

DIISP provided financial grants to participating MFIs to cover management and administration costs. In 2014, premiums collected amounted to BDT 9,793,298 and pay outs to BDT 2,740,590 (ratio of 28%) (PKSF., n.d.).

A major problem faced by this scheme is the scarcity and high rate of drop-outs of paramedics, who are mostly women. Ahsan (2010) amongst others has observed that a shortage of qualified personnel is a constraint to micro health insurance in Bangladesh. Nevertheless, after the completion of the DIISP a small number of PKSF partner MFIs have continued to provide health insurance. For example, SSS continues to provide the cover at three of its branches, charging the upper limit of the premium of BDT 500 per five-member family (SSS, n.d.).

**iv) Bundled cover**

Some MFIs are also bundling risks under a single insurance policy. Examples are SAJIDA Foundation's Nirapotta and the "life insurance" policy of SSS.

**SAJIDA Foundation's *Nirapotta* (Safety net)**

In addition to providing micro-financial services to as many as a quarter of a million households, SAJIDA Foundation operates two secondary care hospitals with 100 and 70 beds in Keraniganj and Narayanganj, and implements various community health programmes in five districts: Dhaka, Gazipur, Narayanganj, Chittagong, and Jamalpur.

SAJIDA Foundation designed a comprehensive microinsurance product titled Nirapotta (Safety net), initially known as HELP, to provide social protection and security to its microfinance programme members and their families. The insurance provides coverage for health, death, education, fire, and legal aid. SAJIDA claims to be the first organisation in Bangladesh to provide preventive and curative healthcare to the poor through its microinsurance system. SAJIDA also has microinsurance products for its microenterprise borrowers' employees and cattle loan borrowers.

The premium charged for Nirapotta ranges from BDT 250 to BDT 1,050, depending on the amount and tenure of loan. An additional premium of BDT 20 to BDT 100 is charged for each supplementary loan borrowed by Nirapotta members (SAJIDA Foundation, n.d.).

**Health insurance:** Health insurance is a major component of the microinsurance programme. The insurance holder can receive monetary support of up to BDT 4,000 for most major hospital services as outlined in the policy. Insured members receive discounted rates if they go to one of the two SAJIDA hospitals. Members are also entitled to consultations with general physicians, natural child births, and cataract surgeries, free of cost at SAJIDA hospitals. SAJIDA Foundation also organises satellite health clinics three times a year in the areas where the microenterprises are located to provide basic healthcare to the employees.

**Life and Loan Insurance:** The life insurance component provides financial support to the families of members in the event of the death of an adult family member and waives SAJIDA Foundation issued loans, if any. The loan balance waiver is provided up to a maximum of BDT 39,000 and a BDT 5,000 cash benefit is provided in the event of death of the member or his/her spouse.

**Education / Scholarship:** Under the programme, one child from each family is eligible for up to BDT 500 per month given that the child meets the eligibility criterion and maintains satisfactory progress. For higher studies, all academic expenses are covered for scholarship holders.

**Fire/Man-made Disaster Insurance:** This component entitles the policy holder to BDT 10,000 to cover damages to a home or work place in the event of a fire or man-made disaster.

**Legal Programme:** The legal component under Nirapotta makes a lawyer available at least once a month at every microcredit branch to provide consultation and guidance on legal issues. No financial support is provided under this component.

**Microinsurance for microenterprise borrowers' employees:** SAJIDA Foundation, in coalition with Milliman, an international actuarial and consulting firm, has designed a microinsurance product for employees of its microenterprise borrowers. This product offers fixed cash benefits under life and health insurance. It also covers a part of the employee's wage in case of an accident encountered at the workplace resulting in time off from work. The product is not mandatory. An annual premium of BDT

260 is shared between the employer (50%) and the employee (50%). The components under this insurance package are:

**Life Insurance:** In the event of the death of the employee or his/her spouse, the family is entitled to a fixed cash benefit of BDT 5,000 under this coverage. This benefit has been incorporated keeping in mind funeral expenses.

**Accident and Disability Benefits:** If an employee suffers from an accident and/or disability caused by or at the workplace that leads to an inability to work, then, the employee can take partially paid leave of a maximum of 2 weeks during which 50% of his/her wage will be paid for.

**Cattle Insurance:** Cattle loan borrowers are covered under cattle insurance. Upon death of a cattle, 85% of the loan amount or cattle purchase price, whichever is lower will be waived. The premium is 0.70% of the loan amount, plus BDT 100 for veterinary services.

Source: SAJIDA Foundation (n.d.)

**SSS Bundled Cover**

Society for Social Service (SSS) is a non-government development organisation formed in 1986 with the goal of improving the socio-economic condition of the destitute and underprivileged people and establishing justice and peace. By June 2016, SSS had expanded its working area to 10,224 villages. It launched its microfinance programme in 1991, which provides loan, savings, insurance and remittance transfer services to its members. SSS participated in the DIISP project and also provides "life insurance" to its group members. Its life insurance covers not just life but several other risks.

All the members organised under the credit programme of SSS, except those of the Housing and Disaster Management Scheme, automatically become beneficiaries of the insurance scheme. Members of its Ultra Poor Programmes deposit an insurance premium of 0.50 % and members of other programmes 1.0 %. For an individual borrower there is a provision of two nominees of his/her insurance (after death), the debtor her/himself and the spouse or a selected person of his/her choice. If any one of these two dies, the outstanding amount of the current loan is exempted. In addition, if any borrower under the SSS credit programme dies, his/her family receives BDT 4,000 to perform the funeral rites. Simultaneously the borrower also receives healthcare support of BDT 4,000 for various types of health care such as caesarean deliveries, operations on gallbladder stones and for appendicitis, and hysterectomies. If the borrower has other expenses associated with natural disasters, weddings, medical expenses, education, sudden death of family member etc., up to BDT 50,000 can be given to them from the insurance fund (SSS, n.d.).

This programme has grown steadily over the past few years. From 2009 to 2013, the number of participants increased from 267,680 to 461,278. Its claims ratio averaged 40% between 2009 and 2013 (SSS, n.d.).

**Provision of microinsurance through mutual**

One example of microinsurance through a mutual can be found under the "Microinsurance for Mutual Enabling (MIME)" project launched by INAFI in May 2007 in collaboration with Oxfam Novib and Rabobank, and in its second phase financed by The Rockefeller Foundation. Under the mutuality approach, the policyholders become owners of the company when they buy an insurance policy. As a mutual, the profits are shared with the policyholders by reducing premiums and/or having a built-in refund or bonus system. The policyholders also have voting rights and the board is elected by them.

There is provision for establishing a Mutual Insurance Company in the Insurance Act as amended in 2010. "MIME Limited" was registered as a joint-stock company and in pursuant to the new provision in the Bangladesh Insurance Act amendment 2010 applied for a license as a registered insurer under the "mutual" category.

MIME works in building partnership with NGOs/MFIs to use their networks to serve microfinance borrowers primarily to build up the trust and ensure prompt service delivery. The partner NGOs/MFIs are all PKSF partner organisations.

As of 2012, MIME offered three types of life microinsurance products and one outpatient micro health insurance product as a rider with the life product and is also in the process of developing two separate inpatient micro health insurance products. Its life insurance products had reached 140,404 policyholders as of August 2012. As of the same date, premiums collected totalled BDT 228,466,044 and claims settled BDT 2,580,054 (INAFI, n.d.).

**MIME Life Insurance Products**

**Simple Term Life Insurance (STLI) – (Two Policies – Dual and Single)**

- Both male and female members eligible to apply
- Age should be within 18 to 47 years
- Policy covers 2 lives in a family (Dual); Policy covers 1 life (Single)
- Policy ends at 60 years of age
- Premium is BDT 5, 10, 15 and 20
- Monthly premium payment
- 5% bonus in cash on premium at every 5 years

**Term Life Insurance with Endowment (TLIE)**

- Both male and female members eligible to apply
- Age should be within 18 to 47 years
- Policy covers 1 life
- Duration of the policy is 5 years, 7 years, 10 years and 12 years
- Premium is BDT 50, 100, 150, 200, 300, 500
- Monthly premium payment
- Mutual benefit to clients e.g. the policyholders will get the insured amount at the end of different terms
- In case of surrender, clients will not get anything if it occurs before one year and will get calculated amount when applicable

Partial payment to the nominee of the policyholders is made as soon as MIME is informed about a policyholder's death and MIME settles the rest of the claim amount within 15 days of the claim application submission.

MIME finalised one of the three micro health insurance products it was developing – the outpatient product. This is being piloted in 10 branches of 9 NGOs since January 2012. MIME was working on two more micro health insurance products – clinical/hospital inpatient product and surgical/non-surgical inpatient product – with the intention of launching these in 2013.

**MIME Outpatient Micro Health Insurance Product**

***Product Features:***

- Both male and female beneficiaries of implementing NGOs eligible to apply
- Principal card holder's age should be within 18 to 47 years
- Each card covers service for 5 members of the household
- Duration of the cards is 6 months and 1 year
- Premium/ Health card fee is BDT 60 for 6 months and BDT 100 for 1 year duration for the MIME policyholders and BDT 75 for 6 months and BDT 120 for 1 year for members of other NGOs

***Services Offered:***

- Free medical consultation and checks by MBBS Doctor and Paramedics
- Free prescription for medicines by MBBS Doctor and Paramedics
- Medical consultation through telemedicine service
- Information to the cardholders about the medical service providers such as hospital, clinic and diagnostic centre
- Some necessary common medicines at 20% less price from outside Pharmacy
- Referral service to the cardholders for pathological test at 50% less price from outside pathology labs

**MIME clinical/hospital inpatient product**

***Product features:***

- Premium/ Health card fee is BDT 1,620 for 1 year duration
- 30 days waiting period between the policy purchase date and first day of services.

***Services that will be offered:***

- Non-surgical treatment of 22 common diseases
- Free medicine, lab test and imaging to the insured household for treatment on 22 diseases
- Free medical consultation by MBBS, specialised doctor and paramedics
- Referral service to the cardholder for treatment for non-listed diseases
- Telemedicine service
- If the condition of the cardholder is serious enough, he/she can admit in the selected hospital/clinic, with reimbursement to hospital at maximum of BDT 4,000 or actual bill, whichever is lower

***Surgical/non-surgical inpatient product***

***Product features:***

- Premium/ Health card fee is BDT 648 for 1 year duration
- 30 days waiting period between the policy purchase date and first day of services

***Services that will be offered:***

- Aimed not to cover all the cost but to give the cardholders some financial relief. Provides maximum BDT 10,000 on all hospital stays whether surgical, non-surgical, medication, lab test, imaging etc.

We have reviewed the types of microinsurance that are in place in microfinance sector in Bangladesh. Loan life insurance is mandatory. Other types of microinsurance like health insurance and livestock insurance have limited coverage. Similarly, institutionally, microinsurance through mutual associations is legal but its operations are quite limited.

Our analysis of loss and damages showed that housing is the major asset that is largely damaged in cyclone or disaster. Property insurance can emerge as a tool in preserving assets and quick pace of recovery. This is more justified when we found that even ten years of Sidr, not many households could recover total loss. Provision for microinsurance can facilitate the process of recovery. The issue is, are the households willing to accept microinsurance? To what extent are they aware of microinsurance?

### 2.9.5 Knowledge about and interest in microinsurance

We evaluated knowledge on microinsurance with respect to the structure of microinsurance and the nature of the insurance contract. Knowledge on microinsurance is evaluated in terms of credit life insurance.

Table 40 provides responses of the households on microcerdit life insurance. Two-thirds of the households were aware that credit life insurance is tied with micro loans. Of them, 85 percent of the households have access to microfinance. Interestingly enough, even though non-members do not receive microfinance services, some 15 percent also have understanding about the credit-linked microinsurance of the MFIs. The same pattern follows when we inquired about details of the insurance contract. Most of the households with access to microfinance are aware of the fact that the life of the borrower and her spouse is insured under credit life insurance and that the loan outstanding will be waived in the event of the death of the borrower or spouse.

**Table 40: Knowledge on Microcredit Life Insurance**

| Knowledge indicators | Number of household (n=2250) | Do not have access to MFI or Bank | Have access to MFI |
|---|---|---|---|
| Credit insurance is inbuilt with microcredit | 1487 (66.12) | 224 (15.06) | 1263 (84.94) |
| Borrower will give the premium which is non-refundable | 1404 (62.43) | 198 (14.1) | 1206 (85.9) |
| Death of borrower or spouse is insured | 1375 (61.14) | 183 (13.31) | 1192 (86.69) |
| If borrower or her spouse die then MFI writes off the loan | 1594 (70.88) | 244 (15.31) | 1350 (84.69) |
| MFI take the responsibility of burial cost | 1190 (52.91) | 174 (14.62) | 1016 (85.38) |
| Insurance is valid till the loan is fully paid | 1267 (56.34) | 167 (13.18) | 1100 (86.82) |

Source: InM Study Survey 2017

#### 2.9.5.1 Willingness to purchase asset insurance

Probably because of limited coverage of livestock insurance and health insurance, households did not demonstrate much knowledge about these two insurance products. Conversely, they understood credit life insurance because of their exposure to it. Therefore, one can perhaps argue that access to information improves knowledge about microinsurance products and willingness to subscribe to insurance policies. After providing basic information on what asset insurance is, we asked the respondents to express their willingness to purchase asset insurance. We wanted to test the sensitivity to their responses, so we also asked them to express their willingness to subscribe to asset insurance if the insurance premium is increased.

The results are reported in Table 41. More than 80 percent of the households expressed their willingness to purchase asset insurance. Of them, about 70 percent have access to microfinance. However, the rate reduces to 41 percent when we suggested an increase in premium. Although our statements on the design and increase in premium are indicative, it seems that most households are willing to purchase asset insurance. The rate is higher among the microfinance scheme participants, which may be due to the fact that they have greater exposure to microinsurance. There is not much divergence in their willingness to purchase asset insurance by proximity to sea or salinity type. All these results strongly support the notion that there will be high demand for asset insurance. But the question is, what are the determinants of such willingness to buy asset insurance?

**Table 41: Willingness to Purchase Asset Insurance**

| | Number of household (n=2250) | Do not have access to MFI or Bank | Have access to MFI |
|---|---|---|---|
| Willing to buy asset insurance | | | |
| Yes | 1811<br>(80.52) | 549<br>(30.31) | 1262<br>(69.69) |
| No | 150<br>(6.67) | 73<br>(48.67) | 77<br>(51.33) |
| Not sure | 288<br>(12.81) | 82<br>(28.47) | 206<br>(71.53) |
| Willing to buy high premium insurance | | | |
| Yes | 924<br>(41.08) | 276<br>(29.87) | 648<br>(70.13) |
| No | 1047<br>(46.55) | 343<br>(32.76) | 704<br>(67.24) |
| Not sure | 278<br>(12.36) | 85<br>(30.58) | 193<br>(69.42) |
| Will buy the insurance at once | | | |
| Yes | 696<br>(30.95) | 223<br>(32.04) | 473<br>(67.96) |
| No | 1147<br>(51) | 358<br>(31.21) | 789<br>(68.79) |
| Not sure | 406<br>(18.05) | 123<br>(30.3) | 283<br>(69.7) |

Source: InM Study Survey 2017

**Table 42: Willingness to Purchase Asset Insurance by Proximity to Sea**

| Household willing to purchase asset insurance | Closest to sea | Moderately close to sea | Distant from sea |
|---|---|---|---|
| Yes | 955<br>(84.96) | 567<br>(75.6) | 289<br>(77.07) |
| No | 97<br>(8.63) | 40<br>(5.33) | 13<br>(3.47) |
| Not sure | 72<br>(6.41) | 143<br>(19.07) | 73<br>(19.47) |

Note: Numbers in parenthesis are the column percentage.

Source: InM Study Survey 2017

**Table 43: Willingness to purchase Asset Insurance by Exposure to Salinity**

| Household willing to purchase asset insurance | Low salinity | Medium salinity | High salinity |
|---|---|---|---|
| Yes | 748<br>(74.8) | 460<br>(92.18) | 603<br>(80.4) |
| No | 55<br>(5.5) | 34<br>(6.81) | 61<br>(8.13) |
| Not sure | 197<br>(19.7) | 5<br>(1) | 86<br>(11.47) |

Note: Numbers in parenthesis are the column percentage
Source: InM Study Survey 2017

We estimated four different models to assess determinants of willingness to purchase asset insurance. Household characteristics, access to microfinance, and community level actions were included in the model, along with district dummy variables to capture district level heterogeneity. We did not include land and income as variables in the model because of their strong correlation with access to microfinance services. We introduced an aggregate variable on access to microfinance in models 1 and 3, and disaggregate microfinance (*ex ante* access to finance and ex-post access to microfinance) in models 2 and 4. Similarly, we included disaggregated community level actions (*ex ante* community level action and ex-post community level action) in models 3 and 4, but not in models 1 and 2. We have also included intensity of exposure to Sidr and *Aila* with four different variables in all the models. With the dependent variable asa dummy (1 for willingness to purchase and 0 otherwise), we used logistic regression to estimate the parameters. Table 44 reports the odd-ratio of the parameter estimates.

**Table 44: Determinants of Willingness to Purchase Asset Insurance (Logistic Regression (Odds ratio reported))**

| Variables | Willingness to purchase asset insurance | Willingness to purchase asset insurance | Willingness to purchase asset insurance | Willingness to purchase asset insurance |
|---|---|---|---|---|
| Model Number | 1 | 2 | 3 | 4 |
| *Ex ante* member | | 1.514** | | 1.544** |
| | | (0.259) | | (0.266) |
| Ex-post member | | 1.473** | | 1.490** |
| | | (0.264) | | (0.269) |
| hhh age | 1.001 | 1.001 | 1.001 | 1.000 |
| | (0.00581) | (0.00585) | (0.00584) | (0.00587) |
| female | 2.971*** | 2.970*** | 2.910*** | 2.908*** |
| | (0.683) | (0.683) | (0.673) | (0.673) |
| agriculture | 1.000 | 0.999 | 0.978 | 0.976 |
| | (0.161) | (0.161) | (0.158) | (0.158) |
| Family size | 1.058 | 1.057 | 1.057 | 1.057 |
| | (0.0473) | (0.0473) | (0.0472) | (0.0473) |
| 2.sidr_intensity_cat | 1.086 | 1.086 | 1.033 | 1.033 |
| | (0.660) | (0.660) | (0.627) | (0.627) |

| | | | | |
|---|---|---|---|---|
| 3.sidr_intensity_cat | 0.591 | 0.592 | 0.729 | 0.729 |
| | (0.412) | (0.412) | (0.512) | (0.513) |
| 2.*Aila*_intensity_cat | 0.164*** | 0.164*** | 0.250*** | 0.249*** |
| | (0.0458) | (0.0457) | (0.0754) | (0.0753) |
| 3.*Aila*_intensity_cat | 0.134*** | 0.134*** | 0.193*** | 0.193*** |
| | (0.0717) | (0.0717) | (0.105) | (0.105) |
| MFI member | 1.495*** | | 1.520*** | |
| | (0.229) | | (0.234) | |
| *Ex ante* intervention count | | | 0.932 | 0.932 |
| | | | (0.0655) | (0.0656) |
| Ex-post intervention count | | | 1.135*** | 1.135*** |
| | | | (0.0521) | (0.0521) |
| Constant | 20.23*** | 20.39*** | 10.99*** | 11.11*** |
| | (12.08) | (12.21) | (7.120) | (7.221) |
| Observations | 2,248 | 2,248 | 2,248 | 2,248 |

Note: District dummy added in the regression to capture area specific characteristics.

Our results clearly and strongly show that access to microfinance has a strong influence on the willingness to purchase asset insurance. This is equally true for both *ex ante* and ex-post access to microfinance services. Female headed households are more likely to purchaseasset insurance. The odd-ratio is similar in all the models. Severity of exposure to disasters matters in the decision. All coefficients have the expected positive signs, but are only significant in *Aila* affected areas. Community level actions (ex post)are an important determinant of willingness to purchase asset insurance. One may conclude from the findings that the presence of MFIs and community level initiatives may influence the decision of the households on asset insurance. Although household willingness to purchase asset insurance appears strong, their actual decisions will depend on the scientific design and premium determination of the insurance product.

Our study showed that 80 percent of the households are willing to purchase asset insurance. In the other sub-component of the JICA Basic Study on microinsurance, they found this rate to be higher; 90 percent of the households have strong preference for asset insurance.

#### 2.9.5.2 Willingness to purchase health insurance

As health insurance was an important segment in another study on microinsurance under this project, we did not focus to the same extent on health insurance. As we noted earlier, health microinsurance is only offered on a limited scale in selected areas in the country because implementation requires institutional support. Health insurance requires agreement amongsthousamd households; hospitals and the insurance underwriters (could be commercial insurance companies or MFIs). However, because of the limited scale of current operations, most households do not have any perception on health insurance. We use the findings of the other study (sub-component of the JICA Basic Study on microinsurance) to make the argument that with adequate coverage, appropriate design and better availability of information, households will be able to make prudent decisions on micro health insurance.

**Table 45: Micro Health Insurance - Willingness to Join Hospital Cash Benefit Package**

| District | Geographic characteristics | Package A %(n) | Package B %(n) | Overall WTJ (Package A and Package B) % | Not WTJ any package %(n) |
|---|---|---|---|---|---|
| Patuakhali | Coastal | 71.43 (120) | 27.38 (46) | 98.81 | 1.19 (2) |
| Satkhira | Coastal | 88.1 (148) | 10.71 (18) | 98.81 | 1.19 (2) |
| Sunamganj | *Haor* | 58.93 (99) | 41.07 (69) | 100 | 0 (0) |
| Jamalpur | Remote | 67.26 (113) | 31.55 (53) | 98.81 | 1.19 (2) |
| Kurigram | *Char* | 50.6 (85) | 47.62 (80) | 98.22 | 1.79 (3) |
| Cox's Bazar | Coastal | 90.48 (152) | 7.14 (12) | 97.62 | 2.38 (4) |
| Total | | 71.13 (717) | 27.58 (278) | 98.71 | 1.29 (13) |

Source: InM Microinsurance Study Survey 2017

This study sought the responses of the households on specific designs of health insurance. The basic design was a direct cash benefit. Both a lower premium for lower cash benefit and higher premium for higher cash benefit were presented (Package A). We report here the result in Table 45. As evident from column 5, around 98 percent of the surveyed households are willing to join a health insurance programme. The households are more interested in the health policy with higher cash benefit. Given the overwhelming response of the households to join a health insurance programme, it can be inferred that households, regardless of whether they have access to microfinance and the role of community level institutions, are willing to purchase health insurance.

## 2.10 Role of Community Level Actions in Adaptation

We have in the earlier sections explained the role of community level actions in adaptation. Community level actions are complimentary to institutional programme implementation and household level decisions on adaptation. Our results, as discussed earlier, clearly show that community level actions positively induce incremental and transformational adaptations. We have shown that they play a role in coping, transformational adaptation like the establishment of support systems that promote more climate-resilient livelihoods, and in incremental adaptations like microinsurance decisions, demand for higher loan amount and higher amount of savings, as well as in small household infrastructure investments such as raising plinths.Community level actions create confidence in the mind of the households and reduces risks emanating from different disasters. Ability to cope and adaptation increases with community level actions. Therefore, future adaptation planning should support the critical role that community level institutions play. Furthermore, their role will also be required for providing information on activities that will be central to the national adaptation plan of the government of Bangladesh.

## 2.11 Analysis and Implications

There are enduring effects of Sidr and *Aila* in the affected areas. The disasters have caused huge collateral damage that has multiplier effects on the economic lives of the affected households. On average, loss and

damages per household amounted to around Tk.30,000. Even 10 years after Sidr and eight years after *Aila*, only one-third of the affected households could fully recover the amount of loss. Around one-sixth of the households could not recover at all andthe remaining households could only partly recover. This dismal picture continues because of the static behaviour of different institutions. Who could really recover or which community could recover? What did the households do?

The affected households took three types of actions: coping with shocks, adaptation action in the post-disaster period, and future adaptation planning. In the coping process, households had to depend on informal borrowing; almost one-third of the households borrowed from informal sources. The amount of informal borrowing was lower for the households with *ex ante* access to microfinance, though they also had to borrow informally because of the credit ceilings of the MFIs. Households with access to microfinance were also able to rely more on their savings. These results clearly show that economic outcomes of participating in microfinance are positive for coping and adaptation.

In the ex-post scenario, households regardless of membership in microfinance schemes had to make decisions on adaptation. Adaptation can be both transformational and incremental. Most of the affected households adopted strategies to minimise risk of damages to physical assets. These strategies included plinth raising, construction and/or reconstruction of semi-pucca or pucca houses, preservation of rainwater and installation of hygienic latrines, all of which also contributed to improved living environments. Economic opportunities are limited in the affected areas mostly to agricultural activities and fishing. Following the disasters, households have attempted to engage in economic activities that are less vulnerable to climate-related hazards and reduce the vulnerability of the household to extreme weather events. Some of these activities are homestead gardening, homestead tree plantation, cultivation of salinity-tolerant crops, and crab cultivation. They have also attempted to increase their number of income generating activities.

Who adapted most? There are multiple drivers of adaptation. Employing Endogenous Switching Regression we found these to include climate change knowledge, *ex ante* access to microfinance, and ex-post community level actions. Climate change knowledge and community level actions have induced the households to adopt risk minimising strategies. Access to microfinance has facilitated the process of adaptation through credit and savings services.

How do the households plan to face future similar disasters? What do they need? Our findings are straightforward. Many of the households have expressed their desire to migrate, though this is not simple. Short-term or seasonal migration is less difficult and might certainly be beneficial. But if community level actions and access to financial resources can minimise risk and create economic opportunities, migration will perhaps become less of a priority for vulnerable households. We found that more than two-thirds of households wanted access to appropriate financial resources, but their needs are beyond traditional small loans provided by MFIs. Many are interested in accessing larger loans and they also want to expedite the pace of savings. New or revised microfinance products to meet these expectations will enable households to make more significant investments and thus enhance their income, and this in turn will ultimately improve their future adaptive capacity. What would households do with larger loans and more savings? They plan to create multiple income opportunities to diversify risk and improve their physical assets. With respect to physical assets, with more income their main plans are to raise the plinths of their existing houses or construct durable houses. Investing in more climate-resilient livelihoods and in physical infrastructure will reduce but not eliminate vulnerability to climate change and natural disasters. Another severe disaster like Sidr would still cause significant damage to physical assets. That is why households

recognise the importance of microinsurance. Our analysis shows that health insurance and asset insurance will help minimise this residual risk. Households expressed strong interest in these two microinsurance covers.

Based on the findings and analysis, we recommend the following actions for further building the adaptive capacity and resilience of households exposed to the impacts of climate change:

- Expand access tomicrofinance services through a wider network of MFIs;
- Increase loan size and formulate special savings scheme;
- Support community level interventions and community level organisations;
- Provide climate change related knowledge for better planning of adaptation;
- In addition to credit life insurance, introduce health insurance and asset insurance;
- Formulate special programmes for the most vulnerable poor households like female-headed households and/or beggars.

But the question is, who should undertake these actions? There are many actors that have important roles to play in supporting effective adaptation at community and household levels. They include national and local governments, research institutes and other knowledge providers, non-governmental organisations and others.Amongst these, our analysis clearly demonstrated that access to microfinance institutions has contributed to both better coping and adaptation. Given their comparative advantages, including their extensive service delivery infrastructure, MFIs must play a key role in delivering the recommended actions. Household adaptive capacity and resilience can be built through financial inclusion. MFIs are the key actors for financial inclusion in Bangladesh.

A critical issue is, do the MFIs locate their programmes in more vulnerable areas. We have shown that the amount of loss and damages due to cyclones is higher for the households very close to the sea. Therefore, locating branch networks in the most vulnerable areas might be costly for the MFIs. On the other hand, locating branches in these areas may not be an issue because MFIs operate through their field assistants at the village level, meaning the physical site of the branch can be in a less vulnerable location.

How should the recommended services be delivered? What will be there effects? It is not easy to ensure delivering the services as outlined. This requires an integrated approach. The actual planning and implementation should be based on experimental research.

# Chapter 3

# Balance Sheet and ContingencyStocktaking

## 3.1 Objectives of Balance Sheet Analysis

A stocktaking analysis of the financial "health of MFIs," reflecting on (i) how climate disasters such as Sidr and*Aila* affected their balance sheets, and (ii) their contingency plans for future climate shocks, will be undertaken. It is important that MFIs are able to sustainably provide a wide range of financial and non-financial services, and continue to evolve these services, as climate change progresses. Climate change adaptation is a continual process; hence, MFIs have to be engaged continuously with households and communities to support adaptation at these levels. Continuity in the provision of services is only possible when NGOs have a sound financial base, which requires sufficient provisioning for bad loans, access to disaster funds and contingency plans.

Climate change poses a serious threat to this continuity. Climate change could increase the frequency and severity of extreme weather events, reduce the predictability of seasonal weather patterns and through long-term changes in rainfall, temperature and other regimes, reduce agricultural productivity. All of these impacts would make it difficult for the borrowers investing in agriculture to repay their loans. MFIs could also incur direct damages from climate change, such as when a storm or cyclone destroys some of their physical assets, such as buildings. Information on how MFIs can best prepare for future climate change scenarios is required. A study of MFI financial preparedness for climate change will be undertaken.

The objectives of this component will be to (i) assess impact of past extreme weather events on financial health of MFIs, and (ii) assess and present options for MFI preparedness for future climate risks

## 3.2 Methodology

To understand how extreme weather events, such as *Aila*, Sidr and Mohasen, have impacted the financial health of MFIs, the study will collect information of various financial indicators of branches of MFIs operating in the climate hazards areas. Information on selected financial indicators will be collected for current period as well as for pre and post disaster period.

Other than the financial indicators, the study will also collect information on number of borrowers affected, length of time they cannot repay loans, amount of loan write-off required, amount of savings released, access of MFIs to soft finance, etc.

A two-part methodology has been adopted. Part 1 considers how extreme weather events,such as *Aila,* Sidr and Mohasen, have impacted the financial health of MFIs. Analysis willinclude operating cash flow before and after disasters (increased operating costs and decreased operating revenues would be expected). The analysis would consider whether Internationally Accepted Accounting Standards for cash flow reporting are being applied. Another useful indicator would be "times interest cover" ratio (e.g. a ratio of X times interest cover to net profit before interest expense). Other ratios will be considered for

any costs that might have been impacted by the disaster, e.g. net profit to wages. The indicators would be able to uncover whether a worsening financial position is occurring.

Part 2 considers how well MFIs are resourced to withstand future extreme weather events. Scenario analysis will be conducted with plausible scenarios developed as a Stress Test forMFI cash flows. The scenarios will present assumptions on number of borrowers affected, length of time they cannot replay loans, amount of loan write-off required, amount of savings released, access of MFIs to soft finance, etc. Scenarios will also consider multiple disasters at various time intervals, with reference to IPCC climate scenarios.

A sample of NGO-MFIs will be selected for the analysis. A number of meetings will be arranged in the study area with the MFIs where officials from both main office and branch offices will participate.

The study will conduct a branch level survey to gather information on the necessary indicators. The MFIs operating in the selected districts constitute the population. SampleMFIs will be selected from this population. MFI selection criteria are as follows:

1. Select both local and national MFIs.

2. Select MFIs of various sizes. Small MFIs, however, should be avoided since they havelimited scope and capacity currently to implement climate adaptation programme in the nearfuture.

Branch selection criteria are as follows:

1. Select 250 branches from the selected MFIs

2. Branch should be selected based on the size of the branch and vulnerability of the location.

## Questionnaire preparation

A questionnaire has been prepared to collect the required information from the selectedbranches. The questionnaire has covered the following:

1. Information on the branch staff
2. Information on the borrower/member
3. Information on loan disbursement and savings
4. Income and expenditure of branch
5. Asset and liabilities of branch
6. Source of fund
7. Geographic and economic information of the operating areas of the branch

Financial information has been sought for different time period.

## Selection of MFIs and branches

Based on the selection criteria mentioned above, we have selected total of 22 MFIs. Fromeach of the MFIs, we have collected the location of all branches operating in the selected. Total number of branches operating in this area from the selected MFI is 1,094.

While selecting sample branches to be surveyed, we have considered that the action research will be designed based on the findings of all three components. So it is important to ensure that the study areas of

all three components are common so that the component level information can be easily matched. In the intervention stocktaking component, we mentioned that the study will be conducted in 18 upazilas of 9 districts. So, for the balance sheet analysis, we choose those branches of 22 MFIs which are operating in these 18 upazilas. Accordingly, the total number of branches is found to be 275 in number.

From the MFIs, we collected the names/addresses of the branches operating in the selected 18 upazilas. After receiving the list of branches, we communicated with the MFIs with the request to fill-in the branch questionnaire. We finalised the branch questionnaire during the first quarter. We also prepared a guideline for the questionnaire and shared it with the MFIs.

From these 275 branches we finally received data from 250 branches. So the balance sheet analysis will be conducted on these 250 branches. Table 46shows the sample branches by location and name of the MFIs

**Table 46: Number of Branches by MFIs and Upazila**

| Name of the MFIs | Number of Branches |
|---|---|
| Addin | 2 |
| ASA | 91 |
| Bangladesh Development Society | 1 |
| CARSA Foundation | 6 |
| Coast Trust | - |
| Codec | 16 |
| DakDiye Jai | 8 |
| DAM Foundation For Economic Development | - |
| GonoUnnayanProchesta | 5 |
| GrameenJanoUnnayanSangstha (GJUS) | 7 |
| HEED | 6 |
| Jagorani Chakra Foundation | 16 |
| NabolokParishad | 3 |
| NowabenkiGonomukhi Foundation | 22 |
| Padakkhep | 10 |
| Rural Reconstruction Foundation | 5 |
| Sangkalpa Trust | 8 |
| Sangram | 17 |
| SUS | 10 |
| Uddipan | 15 |
| Unnayan | 2 |
| UnnayanProchesta | - |
| Total | 250 |

| District | Upazila | Number of Branches |
|---|---|---|
| Satkhira | Kaliganj | 14 |
| | Shayamnagar | 20 |
| | Ashasuni | 1 |
| | Satkhira | 1 |
| Khulna | Paikgacha | 14 |
| | Koyra | 12 |
| Bagerhat | Bagerhat sadar | 2 |
| | Fakirhat | 19 |
| | Mongla | 7 |
| | Sharankhola | 3 |
| Barguna | Amtoli | 20 |
| | Patharghata | 17 |
| | Taltoly | 2 |
| Pirojpur | Nazirpur | 12 |
| | Mathbaria | 17 |
| Barisal | Mehendiganj | 14 |
| | Muladi | 7 |
| Madaripur | Rajoir | 13 |
| Patuakhali | Golachipa | 23 |
| | Dashmina | 13 |
| Bhola | Char fashion | 1 |
| | Tazmuddin | 3 |
| | Lalmohon | 15 |
| Total | | 250 |

Source: Study Survey 2017

### Meeting with MFIs

The purpose of the meeting with MFIs is to understand the practice and preparedness of the MFIs operating in the climate distressed areas. InM Research Team has organised several meetings in different study location. Some of these meetings were held with the CEOs of the organisations while some others were with the branch level staffs. The list of the meetings is provided in Table 47.

**Table 47:List of meetings with MFIs**

| Serial Number | Date | Institution/Place | Participants |
|---|---|---|---|
| 1 | January 30, 2017 | NowabenkiGonomukhi Foundation (NGF), Head office, Shayamnagar | CEO, NGF;<br>Director, NGF |
| 2 | February 01, 2017 | SUS, Koyra branch | Area manager, Branch manager and other branch level staffs |
| 3 | February 13, 2017 | Sangram, Pathorghata Branch | CEO, Sangram<br>Representatives from the following institutions working in Pathorghata:<br>Sangram<br>Sankalpa Trust<br>Brac<br>Muslim Aid<br>RIC |
| 4 | February 13, 2017 | Sankalpa Trust, Head office, Pathorghata | CEO, Sankalpa Trust; Director (Programme), Sankalpa Trust |
| 5 | February 14, 2017 | DakDiye Jai, Mathbaria Branch | Representatives from the following institutions working in Mathbaria<br>DakDiye Jai<br>Steps Towards Development<br>Legal Aid Association<br>RIC<br>Sangram<br>Buro Bangladesh<br>Sankalpa Trust<br>Proshika<br>Brac |
| 6 | March 13, 2017 | GonoUnnayanProchesta (GUP), Regional office, Rajoir | CEO, GUP<br>Representatives from the following institutions working in Rajoir:<br>GUP<br>RDF<br>Carsa Foundation<br>Brac<br>Bangladesh Development Society<br>BURO Bangladesh<br>Jagorani Chakra Foundation |
| 7 | March 20, 2017 | Codec, Golachipa Branch | Area manager, branch manager, programme organiser, accountant and field officers of Codec Uddipan, 8<br>SAP Bangladesh 7 area manager |
| 8 | March 20, 2017 | Community Development And Health Care Centre (CDHC), Golachipa Branch | Programme Coordinator, Branch Manager, Project Manager, Accountant, and Field officers of CDHC |
| 9 | March 22, 2017 | Uddipan, Golachipa Branch | Branch manager and other branch staffs |
| 10 | March 22, 2017 | SAP Bangladesh, Golachipa Branch | Area manager, branch manager and other staffs of area office and branch office. |

Source: Study Survey 2017

## 3.3 Findings from discussion meetings with MFIs

### 3.3.1 How disasters affect livelihoods of locality

Various types of disaster such as cyclones and floods affect the livelihood of the local people adversely. The study areas were highly affected by two major cyclones; Sidr and *Aila*. It is observed that some people did not go to cyclone shelter because of their ignorance. Cyclone has destroyed the houses of many people. Crops are damaged and normal economic activities interrupted due to various natural disasters. As a result, people get unemployed after disasters. It becomes difficult for them to maintain the normal lifestyle in the case of such disasters, particularly for the people who do not have sufficient savings. There are not much employment opportunities for the people living in the disaster prone areas. Many people migrate to other areas for availingwork opportunities.

### 3.3.2 Role of MFIs in disaster prone areas

**Relief and rehabilitation activities after disasters**

Various type of activities include providing food items for the disaster affected people, establishing water sources (such as deep tube well, PSF, desalination plant, water treatment plant etc.) for drinking water. However, the amount of relief in most cases is not adequate in many areas.

**Financial services**

***Insurance:*** Credit insurance is the mostly practiced insurance by MFIs. If the economic activities or livelihood of the borrowers (such as livestock rearing or business) get damaged due to disasters or earning member of the borrowing family dies, then the outstanding loan amount is waived which is covered by the insurance.

***Credit:***After super cyclone Sidr and *Aila*, many MFIs waived loans or withhold loan installment collection. Currently some MFIs provide loan for housing.

**Non-financial services**

***Training on income generating activities:*** MFIs provide training for various agricultural and non-agricultural income generating activities.

***Climate change literacy:*** MFIs used to discuss climate change related knowledge in their weekly meetings with the borrowers. Discussion topics include required pre- and post- disastr activities needed for survival. However, no such training is provided for improving climate change knowledge or resilience building. Also there is no specific discussion/training modules for discussion on climate change issues. MFI field staffs directly interact with the community people, so this is important that the MFI staffs who work at the field level should have adequate knowledge on climate change issues and they could have been provided with appropriate training when necessary.

### 3.3.3 MFIs suggestions regarding future adaptation of climate vulnerable people

***Health facility:***People living in disaster prone areas are at risk of various health hazards. MFIs may organise training on basic health issues which will increase their health awareness. Also MFIs may provide some basic health facilities for the climate vulnerable people.

***Employment generation:***Government needs to take initiatives for establishing appropriate manufacturing industries. This will create employment for many people.

***Infrastructural improvement:***Government, community organisations and MFIs need to work for improving roads, cyclone shelters, dams and other important infrastructures at the community level. At the household level, people need to construct durable houses.

***Forestation:***Forestation is necessary to minimise the adverse effect of climate change. MFIs and other community organisations may participate in the forestation process along with the government.

***Supply of drinking water:***All unions should have at least one water treatment plant/desalination plant as a source of safe drinking water.

***Coordinating activities of MFIs and government institutions:***Government institutions provide various support for the people in the form of social safety net programmes. Such programmes can be operated in collaboration with the MFIs working in the area. This will help to avoid duplication and target the right people to be incorporated in the programmes.

***Security of females during disasters:***Government institutions and MFIs have to provide financial and social security for the females, as females are most vulnerable during any type of natural disasters. This includes providing safe places for them in the cyclone shelters. Discussion meetings can be organised to build awareness for security issues of females during natural disasters.

**Financial services**

***Credit:***MFIs and the government (e.g.through '*ekti bari ekti khamar*' programme) could provide loan with minimal interest rates (or interest free loan) for the disaster affected vulnerable poor. Such disaster loan could be short-term loan (repayable within 3 months), and this can be tagged with other regular loan. Main purpose of this loan would be to provide disaster affected people the supply of liquid money which they may use for restoration of assets and consumption smoothening. Amount of loan could be varied; however, the loan amount should not exceed Tk. 100,000. MFIs need to stop realising loan installment until the adversity of the disaster is minimised. Instalment period should be flexible.

Housing loan can be provided for the disaster affected people. However,borrowers need to have certain amount of his/her own capital to avail such loan for housing. However, it has to be noted that, interest free loans (or subsidised interest rates) may have adverse effect on the financial health of the MFIs.

***Savings:***People who depend on the agricultural activities are most often financially constrained. Special savings scheme can be arranged for these people; which can be used during disasters like cyclones to restore economic activities.

***Disaster insurance:***Considering the intensity of disaster and its consequences on the physical asset of the people living in the disaster-prone areas, the MFIs suggest to initiate 'disaster insurance' in these areas. Such insurance may be used to address the risk of damage in housing or business activities. Such insurance products will be more effective if these are tagged with other financial services like credit. For example, if the borrower takes loan for the construction of house, then they will also be considered for housing insurance and certain premium amount will be charged during loan disbursement.

This is suggested since people need some minimum economic capacity to be able to pay for the premium of the insurance. So, improving economic abilities of the people should be prioritised to initiate any type of insurance in such disaster prone areas.

***Training on income generating activities:*** Considering the geographical characteristics and available economic opportunities, appropriate training for income generating activities need to be organised for the climate vulnerable people. Various types of training may include agricultural cultivation, livestock rearing, fisheries, vocational training etc. It is important to provide training by qualified trainers and the training duration should be long enough to cover all details.Other than training on income generating activities, training on disaster management is also mportant.

## 3.4 Financial Statement Analysis and Performance Evaluation of MFIs

Interestingly, empirical evidence on the impact of natural disasters on microfinance is rather scanty. Excepting a handful of studies that investigate either macroeconomic or firm-level (non-financial) implications of natural disasters, no such study is found that investigates the impact of natural disasters on microfinance industry in any country. The present study thus contributes to an important research question as to how cyclone disasters affect financial performance and stability of MFI branches in Bangladesh. In doing so, the study utilises survey data of 250 MFI branches located across 23 upazilas in nine Southern districts. A longitudinal dataset is compiled incorporating branch-specific financial and non-financial attributes over the 2006-2016 period. A particular focus has been on capturing MFI branch-level exposure to disaster risks arising from cyclones *Sidr* (2007), *Aila* (2009), and *Mohasen* (2013). Impact of cyclone disasters is estimated using a pasimonious distributed lag specification including standard covariates as suggested by the literature on banking and finance, in addition to the proxies for disasters. For valid public policy implications, the present study thus investigates various MFI characteristics representing profitability and its drivers, business orientation, efficiency, asset quality, and stability within a framework of panel data econometrics.

In microeconomic perspective, natural disasters may disrupt supply chains, thereby causing not only financial losses but also reduction in product quality, damage to productive capacity and reputation loss (e.g., Hendricks and Singhal 2005). In other words, natural disasters will reduce profitability via decreases in net interest margin, non-interest income, and increase in loan-loss provisions.

In the macroeconomic context, several studies find a positive correlation between the frequency of natural disasters and long-run economic growth. This indicates that disasters provide opportunities for reconstructing the capital stock to make it more productive (Skidmore and Toya 2002). Noy and Vu (2010) call it 'Investment-producing destruction' hypothesis. This implies that financial leverage of firms will increase shortly after the disasters. Albala-Bertrand (1993) shows that following natural disasters, GDP increases, capital accumulation accelerates, agricultural and construction outputs rise, the twin-deficits increase, and reserve accumulation accelerates.

Disaster effects on net borrowing costs are likely to be decreasing because of political pressure for cheaper credit. Business orientation after natural disaster will undergo rapid change and so the share of fee income and the extent of non-deposit funding will increase.

On efficiency effects of disasters, Skidmore and Toya (2002) observe: "higher frequencies of climatic disasters are correlated with higher rates of human capital accumulation, increases in total factor productivity (TFP), and economic growth." Horwich (2000) posits that the "destruction of physical assets is a form of accelerated depreciation that accelerates the adoption of new technologies and varieties of investment." This implies that natural disasters will enhance operational efficiencies, and operating cash flows (OCF). But its effect on free cash flows meaning operating cash flows net of cash investments in periods following disasters will be negative as the demand for new investments (flows) will outweigh increase in operating cash flows via efficiency gains. Furthermore, efficiency gains are likely to be gradual and over long-term. Asset quality and financial stability following disasters will deteriorate. Disaster risks and their effects on firm performances are likely to be heterogeneous across regions and their vulnerability to disaster risks.

**Econometric specification**

Distributed lag specification and key variables**:** The general form of the specification:

$$y_{it} = \acute{\alpha} C_{it} + \acute{\beta} X_{it} + \acute{\gamma} Z_i + \mu_j + \acute{\sigma}_t d_t + U_{it}$$

The vector $C_{it}$includes first and second lags of cyclone dummies taking 1 for SIDR, AILA and MOHASEN and 0 otherwise. $\alpha$is the corresponding vector of the coefficients.

The vector $X_{it}$ represents cross-section and time-varying variables. They include size (measured by the natural logarithm of total assets), business risk (measured by the standard deviation of return on operating assets), share of non-interest earning assets, short-term liquidity, share of fixed assets, loans/total assets, age (log of age), ln(Employees), proportion of female employees, product diversity (number of loan, saving, and insurance products), ln(schooling of Branch Manager), and ln(population) is the natural logarithm of population.

The vector $Z_i$ represents time-invariant cross-sectional variables (e.g., gender dummy taking 1 if the branch manager is a male person and 0 otherwise). $\mu_j$is the unobserved upazila fixed effect, $d_t$is the vector of deterministics, $U_{it}$represents i.i.d. error. Upazila and year fixed effects control for spatial and time-dependent heterogeneity. The estimated regression model is thus a distributed lag model capturing long-term disaster effects on key financial measures.

The dependent variable $y_{it}$ represents a diverse set of financial attributes of an MFI branch. Firstly, from an MFI perspective, before-tax profit divided by total assets satisfies the following accounting identity: $\frac{\text{Profit}}{\text{TA}} \equiv NIM + \frac{NII}{TA} - \frac{\text{OV}}{TA} - \frac{LLP}{TA}$. The identity suggests that realized return (before tax) follows a useful decomposition into its constituent parts including net interest margin (NIM), noninterest income (NII), overhead, and loan loss provisions (LLP).

Secondly, return on equity is a measure of profitability and determined by return on net operating assets (RNOA), financial leverage (FLEV), and spread between return on net operating assets and net borrowing costs. The identity is

$ROE \equiv RNOA + FLEV \times (RNOA - NBC)$ The definition of RNOA and NBC required a restatement of the balance sheet identity $A \equiv L + E$ into a modified form that $NOA \equiv NFO + E$. Here $NOA = (OA - OL)$ meaning that net operating assets are the operating assets net of operating liabilities. Operating assets is the total assets minus financial assets. NFO is the financial obligations net of financial (short term liquid) assets. This reformulation is useful for long-term profitability analysis.

We estimate ROE and its drivers separately in order to examine how cyclone disasters affect return on equity and its specific drivers.

Thirdly, we investigate business model of MFI and it is measured by fee income, non-deposit funding, and loan deposit ratio of MFI branches. FI1 (Fee income-1) is the non-interest income scaled by the lagged total assets. FI2 (Fee income-2) is the share of non-interest income in total operating income. NDF (nondeposit funding) is the share of nondeposit short-term funding in total deposits and short-term funding. LDR (loan deposit ratio) is the ratio of loans to total financial obligations including funds from head office, deposits (if any), members' savings and other borrowings.

Efficiencies are proxied by overhead costs, cost-income ratio, and capacity to generate free cash flows (FCF). Overhead costs represent operating costs scaled by lagged total assets. Cost-income ratio is the ratio of total operating cost and total income. Free cash flow (FCF) is operating cash flows net of cash investment and estimated as accrual operating income minus change in net operating assets following Yehuda and Penman (2009).

Three measures of asset quality include ratio of loan loss provision to gross loans, ratio of loan-loss reserves to gross loans, and ratio of non-performing loans to gross loans.

We use several indicators of bank stability. The ratio of liquid assets to short-term funding is indicative of maturity mismatching. We use z-score as a measure of stability and defined as **((ROA+CAR)/SROA)**, where **ROA** represents return on assets, **CAR** represents capital asset ratio, and **SROA** is standard deviation of return on assets. Z-score measures distance from insolvency, combining accounting measure of profitability, leverage, and volatility (Levine and Levine, 2008; Beck et al, 2013)).

Following table shows the descriptive statistics of branches for the above mentioned indicators.

**Table 48: Descriptive Statistics of Key Variables**

| Key Financial Measures | N | Mean | SD | Min | p25 | p50 | Max |
|---|---|---|---|---|---|---|---|
| Return on assets | 1279 | 0.019 | 0.287 | -6.363 | -0.030 | 0.020 | 2.328 |
| Net interest margin/ $TA_{(t-1)}$ | 1146 | 0.144 | 0.228 | -0.897 | 0.070 | 0.116 | 3.021 |
| Non-interest income/ $TA_{(t-1)}$ | 1220 | 0.017 | 0.072 | 0.000 | 0.000 | 0.002 | 1.034 |
| Overhead costs | 1220 | 0.131 | 0.153 | 0.000 | 0.058 | 0.089 | 1.535 |
| Loan-loss provisions/ $TA_{(t-1)}$ | 1272 | 0.030 | 0.102 | -0.559 | 0.000 | 0.008 | 1.788 |
| Return on equity | 1252 | 0.08 | 16.25 | -461.90 | -0.41 | 0.17 | 210.83 |
| Return on net operating assets | 1167 | 0.100 | 0.533 | -3.433 | 0.018 | 0.085 | 10.294 |
| Financial leverage | 1200 | 19.06 | 57.04 | -383.74 | 2.16 | 7.96 | 426.16 |
| Net borrowing costs | 1172 | 0.170 | 1.720 | -0.811 | 0.030 | 0.065 | 54.457 |
| Spread | 1167 | -0.068 | 1.702 | -51.724 | -0.053 | 0.011 | 10.362 |
| Fee-based income /$TA_{(t-1)}$ | 1220 | 0.017 | 0.072 | 0.000 | 0.000 | 0.002 | 1.034 |
| Fee-based income/Total Income | 1479 | 0.063 | 0.150 | 0.000 | 0.004 | 0.013 | 1.000 |
| Ratio of non-deposit funding | 1296 | 0.223 | 0.460 | -6.728 | 0.039 | 0.109 | 8.466 |
| Loan-deposit ratio | 1416 | 2.70 | 13.12 | -201.67 | 0.88 | 1.17 | 192.72 |
| Overhead costs//$TA_{(t-1)}$ | 1209 | 0.124 | 0.124 | 0.002 | 0.058 | 0.089 | 0.995 |
| Overhead costs/Total income | 1227 | 0.482 | 0.201 | 0.002 | 0.355 | 0.462 | 1.000 |
| Loan-loss provisions/Gross loans | 1318 | 0.038 | 0.128 | -0.171 | 0.000 | 0.010 | 1.966 |
| Loan loss reserves/Gross loans | 1295 | 0.061 | 0.128 | -0.168 | 0.007 | 0.025 | 2.234 |
| Non-performing loans/G. loans | 1592 | 0.116 | 0.565 | 0.000 | 0.011 | 0.034 | 20.241 |
| Free cash flows/ $TA_{(t-1)}$ | 1124 | -0.55 | 5.30 | -130.84 | -0.29 | -0.06 | 2.63 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Liquid assets /Short term funding | 1336 | 0.282 | 1.452 | -0.069 | 0.005 | 0.049 | 38.574 |
| Return on assets | 1279 | 0.019 | 0.287 | -6.363 | -0.030 | 0.020 | 2.328 |
| Return on operating assets | 1147 | 0.109 | 0.293 | -1.637 | 0.021 | 0.085 | 2.798 |
| Capital asset ratio | 1446 | 0.117 | 0.242 | -2.585 | 0.020 | 0.067 | 1.856 |
| Z-score | 1134 | 3.41 | 7.20 | -6.75 | 0.43 | 2.00 | 132.38 |

**Findings:**

Following tables shows the impact of cyclone disasters on drivers of MFI profitability, business model of branches, efficiency, asset quality and finally sustainability of MFI branches.

**Table 49:The Impact of Cyclone Disasters on Drivers of MFI Profitability**

| COEFFICIENT | ROE | RNOA | FLEV | NBC | SPREAD |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | |
| Constant | 7.848 | -0.090 | 34.027 | -0.127 | 0.037 |
| | (19.911) | (0.551) | (102.703) | (0.386) | (0.504) |
| L.SIDR | -3.525 | -0.194*** | 12.572 | -0.080** | -0.114** |
| | (2.685) | (0.055) | (13.964) | (0.036) | (0.047) |
| L2.SIDR | -0.949 | -0.110*** | 2.394 | -0.032 | -0.078* |
| | (1.033) | (0.032) | (5.736) | (0.028) | (0.044) |
| L.AILA | -0.387 | -0.032 | 5.072 | 0.115 | -0.147 |
| | (0.889) | (0.030) | (4.783) | (0.104) | (0.089) |
| L2.AILA | -0.295 | -0.056* | 9.638* | -0.060*** | 0.004 |
| | (1.007) | (0.027) | (5.059) | (0.021) | (0.020) |
| L.MOHASEN | 0.269 | -0.057** | -2.735 | -0.050*** | -0.007 |
| | (0.999) | (0.027) | (4.485) | (0.017) | (0.025) |
| L2.MOHASEN | 0.009 | 0.008 | 8.002 | -0.017 | 0.025 |
| | (0.984) | (0.023) | (7.186) | (0.013) | (0.023) |
| Size [=Ln(Assets)] | 2.247** | -0.002 | 17.982** | -0.014 | 0.012 |
| | (0.911) | (0.022) | (6.835) | (0.025) | (0.035) |
| Business Risk | 9.506* | 0.502*** | -9.125 | 0.089 | 0.412 |
| [=SD(ROOA)] | (5.180) | (0.151) | (9.655) | (0.130) | (0.247) |
| Share of Non-interest | -8.858 | -0.267 | -20.303 | -0.135 | -0.132 |
| Earnings Assets | (8.640) | (0.263) | (15.449) | (0.104) | (0.249) |
| Short-Term Liquidity | 18.251** | 0.585* | -13.772 | 0.271 | 0.313 |
| | (6.770) | (0.298) | (37.816) | (0.260) | (0.257) |
| Loans/Total Assets | -0.549 | -0.031 | 4.602** | -0.007 | -0.024 |
| | (0.687) | (0.023) | (1.815) | (0.012) | (0.022) |
| Ln(Age) | -4.193*** | -0.010 | -2.575 | 0.111** | -0.121** |
| | (1.457) | (0.034) | (8.261) | (0.045) | (0.043) |
| Proportion of | -1.987 | 0.014 | -25.866* | -0.048 | 0.061 |
| Female Employees | (3.617) | (0.091) | (13.164) | (0.076) | (0.087) |
| Gender dummy taking | 0.987 | 0.042 | -0.508 | -0.032 | 0.074** |
| 1 if BM is a Male P | (0.921) | (0.034) | (7.546) | (0.038) | (0.031) |
| Observations | 721 | 730 | 721 | 730 | 730 |
| R-squared | 0.099 | 0.207 | 0.175 | 0.081 | 0.120 |

**Table 50:The Impact of Cyclone Disasters on Drivers of MFI Profitability**

| COEFFICIENT | FI1 | FI2 | NDF | LDR |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Constant | -0.310* | -0.332 | 0.211 | -13.439 |
| | (0.156) | (0.282) | (0.706) | (11.387) |
| L.SIDR | 0.000 | -0.009 | 0.182*** | -1.103 |
| | (0.009) | (0.018) | (0.051) | (2.999) |

| | | | | |
|---|---|---|---|---|
| L2.SIDR | -0.003 | -0.001 | 0.073 | -0.154 |
| | (0.005) | (0.014) | (0.086) | (4.390) |
| L.AILA | -0.004 | -0.006 | -0.022 | -0.077 |
| | (0.006) | (0.015) | (0.025) | (0.950) |
| L2.AILA | 0.004 | 0.007 | -0.006 | -1.266 |
| | (0.003) | (0.009) | (0.021) | (1.176) |
| L.MOHASEN | 0.016** | 0.032** | 0.014 | 1.125 |
| | (0.007) | (0.012) | (0.027) | (1.782) |
| L2.MOHASEN | 0.005* | 0.011* | 0.016 | -0.607 |
| | (0.002) | (0.006) | (0.031) | (0.473) |
| Size [=Ln(Assets)] | -0.009 | -0.020 | -0.031* | 1.437 |
| | (0.006) | (0.012) | (0.017) | (0.972) |
| Business Risk | -0.007 | -0.035*** | 0.026 | -1.822 |
| [=SD(ROOA)] | (0.009) | (0.012) | (0.176) | (1.753) |
| Share of Non-interest | 0.087 | 0.097 | 0.458** | -0.499 |
| Earnings Assets | (0.143) | (0.209) | (0.196) | (4.982) |
| Share of Fixed Assets | -0.151 | -0.216 | 0.093 | 2.158 |
| | (0.164) | (0.243) | (0.266) | (5.963) |
| Loans/Total Assets | -0.002 | -0.007* | -0.029** | 0.621 |
| | (0.002) | (0.004) | (0.013) | (0.513) |
| Ln(Age) | -0.028** | -0.056* | 0.007 | 1.334 |
| | (0.013) | (0.028) | (0.073) | (1.744) |
| Ln(No. of Employees) | 0.058** | 0.097** | -0.042 | -1.602 |
| | (0.020) | (0.042) | (0.063) | (1.808) |
| Ln(Schooling) | 0.110** | 0.181* | 0.167 | 0.184 |
| | (0.052) | (0.095) | (0.183) | (3.603) |
| Gender dummy taking | 0.035** | -0.027 | -0.291*** | 1.249 |
| 1 if BM is a Male P | (0.014) | (0.021) | (0.070) | (1.022) |
| Observations | 730 | 714 | 660 | 730 |
| R-squared | 0.253 | 0.262 | 0.228 | 0.224 |

**Table 51: The Impact of Cyclone Disasters on Business Model of MFI Branches**

| COEFFICIENT | FI1 | FI2 | NDF | LDR |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Constant | -0.310* | -0.332 | 0.211 | -13.439 |
| | (0.156) | (0.282) | (0.706) | (11.387) |
| L.SIDR | 0.000 | -0.009 | 0.182*** | -1.103 |
| | (0.009) | (0.018) | (0.051) | (2.999) |
| L2.SIDR | -0.003 | -0.001 | 0.073 | -0.154 |
| | (0.005) | (0.014) | (0.086) | (4.390) |
| L.AILA | -0.004 | -0.006 | -0.022 | -0.077 |
| | (0.006) | (0.015) | (0.025) | (0.950) |
| L2.AILA | 0.004 | 0.007 | -0.006 | -1.266 |
| | (0.003) | (0.009) | (0.021) | (1.176) |
| L.MOHASEN | 0.016** | 0.032** | 0.014 | 1.125 |
| | (0.007) | (0.012) | (0.027) | (1.782) |
| L2.MOHASEN | 0.005* | 0.011* | 0.016 | -0.607 |
| | (0.002) | (0.006) | (0.031) | (0.473) |
| Size [=Ln(Assets)] | -0.009 | -0.020 | -0.031* | 1.437 |
| | (0.006) | (0.012) | (0.017) | (0.972) |
| Business Risk | -0.007 | -0.035*** | 0.026 | -1.822 |
| [=SD(ROOA)] | (0.009) | (0.012) | (0.176) | (1.753) |
| Share of Non-interest | 0.087 | 0.097 | 0.458** | -0.499 |
| Earnings Assets | (0.143) | (0.209) | (0.196) | (4.982) |

| | | | | |
|---|---|---|---|---|
| Share of Fixed Assets | -0.151 | -0.216 | 0.093 | 2.158 |
| | (0.164) | (0.243) | (0.266) | (5.963) |
| Loans/Total Assets | -0.002 | -0.007* | -0.029** | 0.621 |
| | (0.002) | (0.004) | (0.013) | (0.513) |
| Ln(Age) | -0.028** | -0.056* | 0.007 | 1.334 |
| | (0.013) | (0.028) | (0.073) | (1.744) |
| Ln(No. of Employees) | 0.058** | 0.097** | -0.042 | -1.602 |
| | (0.020) | (0.042) | (0.063) | (1.808) |
| Ln(Schooling) | 0.110** | 0.181* | 0.167 | 0.184 |
| | (0.052) | (0.095) | (0.183) | (3.603) |
| Gender dummy taking | 0.035** | -0.027 | -0.291*** | 1.249 |
| 1 if BM is a Male P | (0.014) | (0.021) | (0.070) | (1.022) |
| Observations | 730 | 714 | 660 | 730 |
| R-squared | 0.253 | 0.262 | 0.228 | 0.224 |

**Table 52: Impact of Cyclone Disasters on Efficiencies of MFI Branches**

| COEFFICIENT | OHC | OHCR | FCF |
|---|---|---|---|
| | (1) | (2) | (3) |
| Constant | -0.066 | 10.054 | 1.684 |
| | (0.256) | (7.173) | (1.163) |
| L.SIDR | -0.035*** | -0.032 | -0.511** |
| | (0.010) | (0.136) | (0.231) |
| L2.SIDR | -0.011 | 0.326* | -0.663* |
| | (0.016) | (0.184) | (0.322) |
| L.AILA | -0.033*** | 0.029 | -0.059 |
| | (0.009) | (0.143) | (0.089) |
| L2.AILA | -0.015** | 0.229 | -0.036 |
| | (0.007) | (0.218) | (0.126) |
| L.MOHASEN | 0.004 | 0.069 | 0.045 |
| | (0.005) | (0.061) | (0.098) |
| L2.MOHASEN | 0.011 | 0.006 | -0.099 |
| | (0.006) | (0.080) | (0.120) |
| Size [=Ln(Assets)] | -0.059*** | -0.172 | -0.529*** |
| | (0.013) | (0.151) | (0.149) |
| Business Risk | 0.069** | -0.676 | -1.253** |
| [=SD(ROOA)] | (0.033) | (0.546) | (0.512) |
| Share of Fixed Assets | -0.089 | -3.231** | -1.027 |
| | (0.118) | (1.318) | (0.863) |
| Ln(No. of Employees) | 0.102*** | -0.213 | 0.509** |
| | (0.028) | (0.324) | (0.193) |
| Ln(Schooling) | 0.116 | -1.529 | -0.670* |
| | (0.095) | (2.270) | (0.369) |
| Gender dummy taking | -0.041 | -3.173*** | 0.020 |
| 1 if BM is a Male P | (0.033) | (0.264) | (0.154) |
| Observations | 730 | 714 | 730 |
| R-squared | 0.297 | 0.226 | 0.267 |

**Table 53: Impact of Cyclone Disasters on Asset Quality of MFI Branches**

| COEFFICIENT | Loan-loss provisions | Loan-loss reserves | Non-performing Loans |
|---|---|---|---|
| | (1) | (2) | (3) |
| Constant | 0.111 | 0.130 | 0.357 |
| | (0.109) | (0.188) | (0.689) |
| L.SIDR | 0.118*** | 0.061*** | 0.101** |

| | | | |
|---|---|---|---|
| | (0.024) | (0.017) | (0.044) |
| L2.SIDR | 0.048 | 0.001 | 0.395 |
| | (0.032) | (0.012) | (0.330) |
| L.AILA | 0.019*** | 0.003 | 0.023 |
| | (0.006) | (0.008) | (0.034) |
| L2.AILA | 0.009 | -0.004 | -0.005 |
| | (0.006) | (0.008) | (0.051) |
| L.MOHASEN | 0.001 | 0.013 | -0.030* |
| | (0.003) | (0.012) | (0.016) |
| L2.MOHASEN | -0.002 | 0.016 | -0.023 |
| | (0.005) | (0.010) | (0.020) |
| Size [=Ln(Assets)] | 0.013* | -0.014** | -0.069* |
| | (0.007) | (0.006) | (0.035) |
| Loans/Total Assets | 0.005 | -0.007 | -0.037*** |
| | (0.003) | (0.004) | (0.012) |
| Ln(Age) | -0.025** | 0.011 | 0.010 |
| | (0.011) | (0.015) | (0.037) |
| Proportion of | -0.007 | 0.028 | 0.754* |
| Female Employees | (0.031) | (0.065) | (0.401) |
| Product Diversity | -0.000 | 0.003* | -0.021 |
| | (0.002) | (0.001) | (0.020) |
| Ln(Schooling) | 0.000 | -0.008 | 0.250 |
| | (0.033) | (0.050) | (0.250) |
| Gender dummy taking | -0.000 | -0.015 | 0.292*** |
| 1 if BM is a Male P | (0.005) | (0.016) | (0.077) |
| Observations | 730 | 730 | 730 |

**Table 54: Impact of Cyclone Disasters on MFI Stability**

| COEFFICIENT | Liquid Asset Ratio | ROA | CAR | Z-Score |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Constant | 1.862*** | -0.129 | 0.146 | 1.995 |
| | (0.314) | (0.373) | (0.362) | (8.518) |
| L.SIDR | 0.154 | -0.145*** | -0.046** | -1.254* |
| | (0.101) | (0.050) | (0.019) | (0.715) |
| L2.SIDR | -0.091 | -0.076** | 0.035 | -0.122 |
| | (0.100) | (0.031) | (0.027) | (0.613) |
| L.AILA | -0.051 | -0.039 | 0.002 | 0.949 |
| | (0.061) | (0.024) | (0.032) | (1.974) |
| L2.AILA | -0.023 | -0.017 | -0.016 | -0.597 |
| | (0.066) | (0.017) | (0.014) | (0.416) |
| L.MOHASEN | -0.065 | -0.021 | -0.002 | -0.360 |
| | (0.044) | (0.019) | (0.009) | (0.442) |
| L2.MOHASEN | -0.060 | 0.007 | 0.008 | 0.150 |
| | (0.043) | (0.016) | (0.012) | (0.418) |
| Business Risk | -0.267 | 0.336** | 0.025 | -9.406*** |
| [=SD(ROOA)] | (0.254) | (0.125) | (0.065) | (2.020) |
| Share of Non-interest | 0.129 | -0.113 | 0.396*** | 0.674 |
| Earnings Assets | (0.439) | (0.197) | (0.071) | (2.773) |
| Short-Term Liquidity | 5.586*** | 0.402** | -0.068 | 0.168 |
| | (1.006) | (0.192) | (0.380) | (6.124) |
| Share of Fixed Assets | -0.327 | 0.013 | -0.344*** | -0.147 |
| | (0.530) | (0.234) | (0.109) | (4.078) |
| Loans/Total Assets | -0.096 | -0.027 | 0.031** | 0.080 |
| | (0.059) | (0.017) | (0.014) | (0.263) |

| | | | | |
|---|---|---|---|---|
| Ln(Age) | 0.087 | -0.042 | 0.092*** | 1.217 |
| | (0.067) | (0.026) | (0.026) | (1.126) |
| Proportion of | -0.139 | 0.040 | 0.102** | 0.672 |
| Female Employees | (0.233) | (0.065) | (0.040) | (1.924) |
| Product Diversity | -0.002 | 0.000 | 0.000 | -0.098 |
| | (0.003) | (0.004) | (0.003) | (0.158) |
| Gender dummy taking | -1.934*** | 0.079*** | -0.085* | -6.607*** |
| 1 if BM is a Male P | (0.135) | (0.018) | (0.048) | (0.973) |
| Observations | 660 | 730 | 730 | 730 |
| R-squared | 0.374 | 0.227 | 0.334 | 0.205 |

**Findings and Concluding Remarks**

MFI branches are hugely undercapitalised under the prevailing organisational model. Note that funds from the head office comprise the major source of funding and a fixed-cost financial obligation. Financial leverage is thus prohibitive. Any natural disasters that cause asset return to decrease will cause return on equity to turn negative. Key financial ratios of median MFI branch often indicate technical insolvency of MFI branches. Non-interest income and operating efficiencies (thus falling overheads) though increase following cyclone disasters; decrease in NIM and asset quality is so dominant that disaster effects on return on assets (ROA) is negative. Financial leverage rises, and net borrowing costs subside after disaster. But return on operating assets decreases faster and thus spread b/w RNOA and NBC deteriorates. We find evidence of diversification in business orientation after cyclone disasters. Operating efficiencies improve; but free cash flows (FCFs) decrease following disasters. Asset quality declines after disasters. Financial stability deteriorates. Female leadership is observed to enhance both asset quality and financial stability but not profitability. This is expected as lower appetite for risk will depress asset return.

From the balance sheet analysis this is evident that natural disaster adversely affects the financial performance of the MFI branches. This is because their clients are affected and they cannot repay loan after the disaster. Financial performance of the branches worsens because of the increasing bad loans.

Now the question is: how such vulnerability of branches can be reduced? If the risk of the clients can be reduced this will also reduce the operational vulnerability of the branches. Various types of microinsurance could be an effective risk minimising financial instrument for the people living in disaster prone area. If their loss due to disaster is covered through insurance, then their transaction with MFIs will not be affected. This in turn will ensure less vulnerability in the operation of branches.

Further, factors such as simultaneous causality relationship between financial sustainability and breadth of outreach, trade-off between financial sustainability and breadth of outreach with regards to the minimum loan size in group lending (e.g. larger loan size improves profitability but reduces the breadth of outreach), term to maturity and number of instalments in lending terms and other issues are also important in determining profitability and financial sustainability of specific MFI branches.

# Chapter 4

# Spatial Analysis

## 4.1 Objectives of Spatial Analysis

Accessibility to goods and services often varies across space due to differences in population, demographics, transportation infrastructure, etc., at different geographic locations. Geographic variations in the spatial accessibility (SA) to a particular service – i.e. the number of service providers available at a location and the spatial connectivity (distance or travel time) between the location and the potential service providers (A. A. Khan and Bhardwaj, 1994) – have been studied in relation to various services including: health care (Gautam, Li, & Johnson, 2014; Guagliardo, 2004; A. A. Khan and Bhardwaj, 1994; Schuurman, Bérubé, and Crooks, 2010), day care(Fransen, Neutens, De Maeyer, and Deruyter, 2015), urban parks (Abercrombie et al., 2008; Maroko, Maantay, Sohler, Grady, and Arno, 2009), public transportation (Du and Mulley, 2006; Jang, An, Yi, and Lee, 2017), supermarkets (Larsen and Gilliland, 2008; Zenk et al., 2005), and financial services (Beck, Demirguc-Kunt, and Peria, 2007; A. Khan & Rabbani, 2015). Several studies have analysed the relationships between SA and demographics, to identify whether certain segments of the population (e.g. low-income households or minority groups) were particularly lacking in services (Abercrombie et al., 2008; Zenk et al., 2005). In contrast, little research has focused on the relationships between adverse environmental conditions (e.g. flood vulnerability or poor soil quality) and SA. As one clear example, Khan and Rabbani(2015) examined the relationship between households' distance to the nearest major river and their SA to microfinance services in two districts of northern Bangladesh (a flood-prone region) using ordinary least squares (OLS) regression, and found that households located nearer to rivers had lower SA to microfinance. These results were mainly significant because microfinance institutions (MFI's) have poverty alleviation as their main objective (Salim, 2013), and the households in the highly flood-prone areas were among the poorest and most vulnerable.

Building on the work of Khan and Rabbani(2015), in this study we further investigate the relationships between climate vulnerability and SA to microfinance services, with a focus on the southwestern region of Bangladesh. Unlike the previous work, in addition to flood vulnerability we also consider the relationship between high soil salinity and SA to microfinance because high soil salinity is another major environmental problem in southwest Bangladesh. Salinity levels in this region have been rising over the past few decades, particularly in the dry season, due to a combination of lower dry-season fresh water levels, land subsidence, and sea level rise (Alam, 1996; Faisal & Parveen, 2004; Mirza, 1998). In areas with high soil salinity, agricultural productivity is typically significantly reduced (and in severe cases all crops may be lost) (Haque, 2006).

Our hypothesis is that SA to microfinance is lower in areas with high flood vulnerability and high soil salinity because it is more difficult for MFIs to generate enough income to cover their working costs in these areas (e.g. due to risks of loan non-repayment after severe floods or crop losses). Other novel aspects of this study are: (1) we employ multiple SA measures (distance to nearest branch, a gravity model-based measure, and a kernel density estimation-based measure) to reduce uncertainties caused by adopting an overly narrow definition of SA, and (2) we compare global (OLS) and local (geographically-

weighted regression (GWR) modelling approaches to determine which better explains the relationships between SA and the spatial determinants.

In terms of prior SA studies related to microfinance, we are aware of only one (A. Khan & Rabbani, 2015).

In short, the stock taking analysis will employ GIS to examine:

- How vulnerability to climate change is affecting the financial performance of MFI branches. It is hypothesised that an inverse relationship exists between MFI branch vulnerability to climate change and financial performance.
- How vulnerability to climate change and natural hazards is influencing the spatial distribution of NGO-MFI services and how this spatial distribution has changed over time. It is hypothesised that MFIs will be less active in areas most vulnerable to climate change, unless they have climate change adaptation as one of their programmed objectives.
- How vulnerability to climate change and natural hazards impacts microfinance products and how they are used. It is hypothesised that both slow and rapid onset climate changes will impact the size of loans and how they are invested/used by households, with average loan sizes and per member savings being lower in climate vulnerable locations than other areas.

### 4.1.1 Spatial accessibility (SA) measures

Several measures of SA have been developed and applied in past studies. One commonly-used measure is the number of service providers within a specific geographic zone (e.g. a census block, neighbourhood, or city) divided by the population of the zone. While this ratio measure has the benefit of being easy to interpret, it does not take into account peoples' ability to cross borders to access services in other nearby zones (Guagliardo, 2004). Another relatively simple measure of SA is the distance from a location to the nearest service provider, but this measure has often been criticised for the opposite reason of the ratio method, because it fails to account for the number of service providers available to consumers. One SA measure that takes into account both the number of service providers available and the distance to the service providers is based on the gravity model (GM) (Reilly, 1931). GMs estimate the potential interactions between a population at a specific point (e.g. a census block or city/town centroid) and the service providers located within a reasonable distance of the point, with service providers located farther from the point having less weight in the calculation (Guagliardo, 2004) The simplest version of the GM, which only accounts for the potential supply of a service (not demand), is calculated as:

$$SA_i = \sum_j \frac{P_j}{d_{ij}^{\beta}} \quad (1)$$

Where $SA_i$ is the spatial accessibility at point $i$, $P_j$is the number of providers at point $j$, and $d_{ij}$is the distance (or travel time) from point $I$ to $j$, and $\beta$ is a distance weighting function.Although more sophisticated versions of the gravity model also take into account demand for a service (Fransen et al., 2015; Schuurman et al., 2010), we limit our focus to the simpler version because factors determining demand for microfinance are still not well understood (A. Khan & Rabbani, 2015). In addition to the GM, another SA measure that takes into account both the number of and distance to service providers is based on kernel density estimation (KDE) (Silverman, 1986). KDE for measuring SA is done by passing a kernel (i.e. a fixed-size moving window) over a map of service provider points and counting the number of service providers within the kernel. Similarly to the GMs, for KDE a distance weighting function is

typically applied to reduce the weight of providers located farther from the centre of the kernel; e.g. a Gaussian kernel function (Guagliardo, Ronzio, Cheung, Chacko, & Joseph, 2004). Although we only briefly explained the basics of KDE here, in-depth descriptions of its mechanics are provided in Silverman (1986) and more recently in Scott (2015)

## 4.2 Methodology

### Study area

The study area consisted of 18 sub-districts (upazilas), randomly selected from ninedistricts, in southwest Bangladesh (Figure 1).

### Data

Several geospatial data sets related to MFI branch locations and spatial determinants of SA to microfinance were collected for this study. First, a field survey was conducted to obtain the GPS locations of all MFI branches in the 18 selected upazilas, and these branch locations were mapped using Geographic Information Systems (GIS) software. Next, data sets related to the potential spatial determinants of SA were gathered from various online sources. Gridded population data for the year 2015 ("population per 100m x 100m grid cell") was obtained from WorldPop: http://www.worldpop.org.uk/ (last accessed 28 April 2017). The population counts in this data set are downscaled from upazila level census population counts using several geospatial data sets and a random forest regression modelling approach, as detailed in Stevens et al. (2015). A data set with the locations of paved (*pucca)* roads, created by the Bangladesh Local Government Engineering Department (LGED), was downloaded from: https://data.humdata.org/search?q=bangladesh&ext_search_source=main-nav&page=1 (last accessed 28 April 2017). A polygon data set with the boundaries of major rivers and the Bay of Bengal, created by the U.S. National Renewable Energy Laboratory (NREL), was downloaded from: http://geonode.wfp.org/layers/geonode:bgd_hyd_major_rivers_py#category-more (last accessed 28 April 2017). Finally, a polygon data set with soil salinity information, created by the Bangladesh Agricultural Research Council (BARC), was obtained from: http://maps.barcapps.gov.bd/index.php (last accessed 28 April 2017). All of these maps were projected into a common coordinate system (Universal Transverse Mercator) and overlaid onto one another, as shown in Figure21.

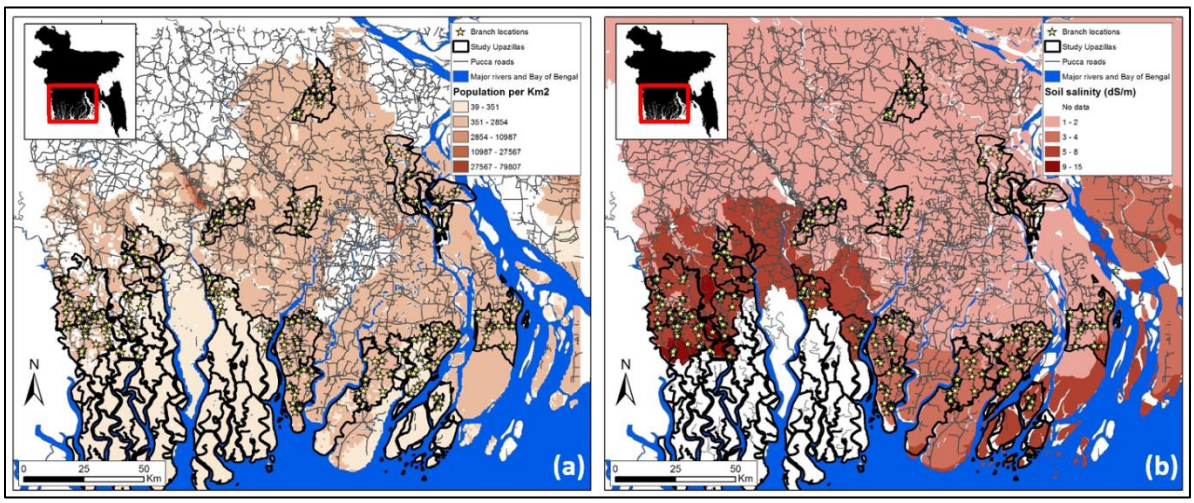



**Figure 21: Geo-spatial data sets used in the study**

Finally it was required to generate locational data in the form of geographical coordinates for each branch. A field survey was conducted to collect branch location information of all MFI branches located in the selected 18 upazilas of 9 districts. Following table shows the number of MFI branches in each upzila.

**Table 55: Number of Branch GIS Data Collected from the Study Area**

| District | District total | Upazila | Upazila total |
|---|---|---|---|
| Bagerhat | 107 | Sharankhola | 14 |
| | | Mongla | 36 |
| | | Fakirhat | 57 |
| Khulna | 84 | Koyra | 42 |
| | | Paikgacha | 42 |
| Satkhira | 142 | Shayamnagar | 67 |
| | | Kaliganj | 75 |
| Barisal | 45 | Mehendiganj | 26 |
| | | Muladi | 19 |
| Barguna | 79 | Amtoli | 41 |
| | | Patharghata | 38 |
| Madaripur | 50 | Rajoir | 50 |
| Pirojpur | 116 | Mathbaria | 55 |
| | | Nazirpur | 61 |
| Patuakhali | 88 | Dashmina | 29 |
| | | Galachipa | 59 |
| Bhola | 52 | Lalmohon | 40 |
| | | Tazumuddin | 12 |
| Total | 763 | | 763 |

Source: Study Survey 2017

## 4.3 Exploring the Relationships between Climate Vulnerability and Spatial Accessibility to Microfinance

### 4.3.1 Generating maps of SA and its potential spatial determinants

For analysis of the spatial determinants of SA to microfinance, we first generated a map of potential microfinance consumer locations (points) using the WorldPop gridded population data set. This population data was resampled from 100m to 1km spatial resolution to reduce errors from the population downscaling methodology, and the centroid of each 1km x 1km grid cell was used as a potential consumer point. Because areas that contain no population (no potential consumers) should be excluded from the regression modelling of SA, we removed any point centroids located in forested areas (likely to have no, or very little, population) by overlaying a forest map of Bangladesh, obtained from OpenStreetMap (http://download.geofabrik.de/asia/, last accessed 28 April 2017)), onto the consumer points and discarding points located within forest polygons.

Next, information related to each potential spatial determinant of SA was assigned to the consumer points. The population per $km^2$ at each consumer point was calculated from the resampled WorldPop data

set (Fig. 22(a)). The Euclidean distance from each consumer point to the nearest road, in m, was calculated from the LGED roads data set (Fig. 22(b)). The Euclidean distance from each consumer point to the nearest major river, in m, was calculated from the NREL major rivers data set (Fig. 22(c)). The percent of the land area (per $km^2$) with high soil salinity levels (> 4 deci Siemens per meter (dS/m)) was calculated from the BARC soil salinity data set (Fig. 22(d)).

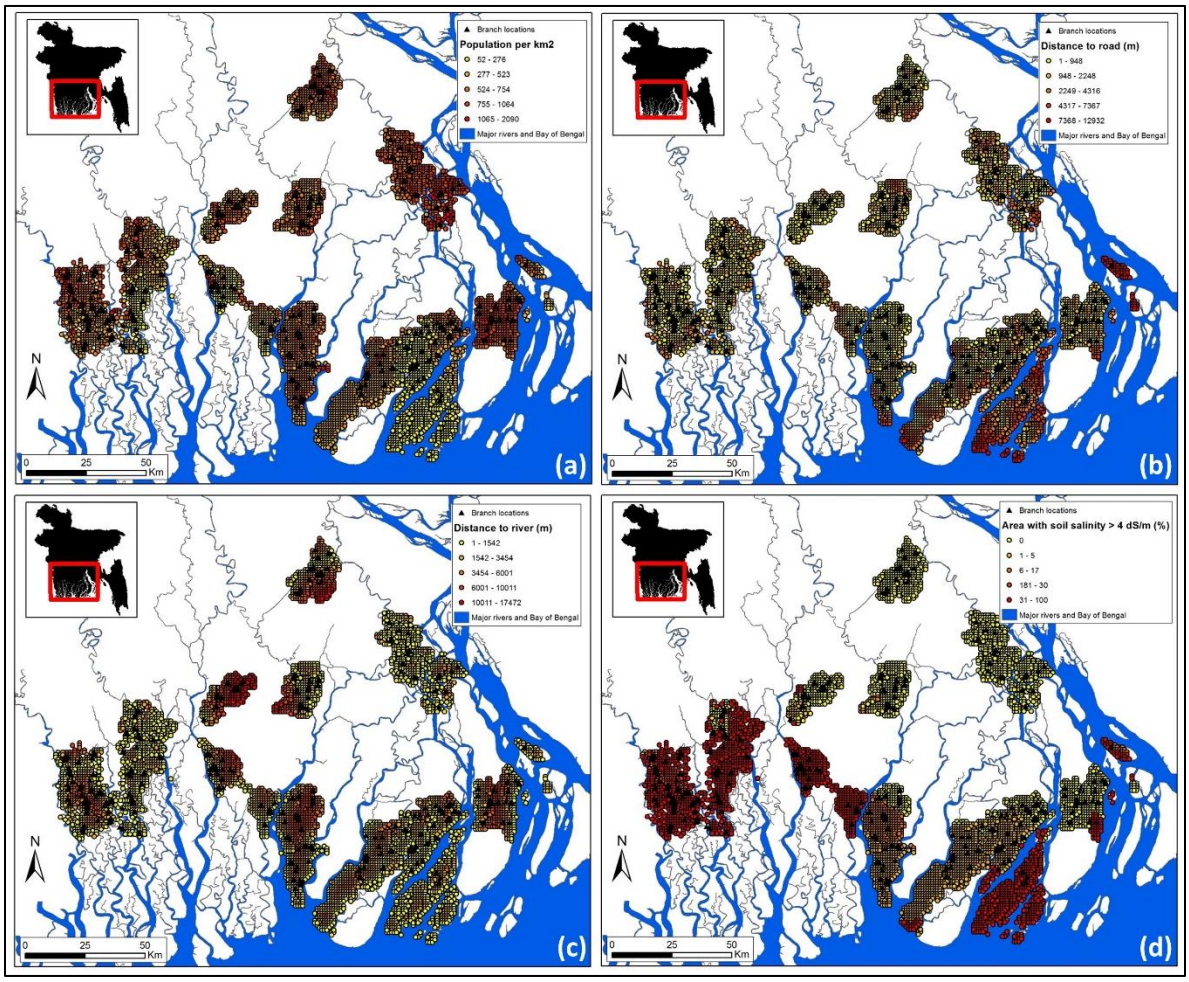



**Figure 22: Values of the potential spatial determinants of spatial accessibility (SA) to microfinance at the consumer point locations.**

Finally, maps of SA to microfinance were generated using the MFI branch points as the service provider locations. The first SA measure calculated was the Euclidean distance to the nearest branch, in Km, measured from each consumer point. The second SA measure calculated was a GM-based measure. For this GM-based SA measure, we applied Equation 1 with a $\beta$ value of 1 (i.e. inverse distance weighting) and a search range of 10km (because MFI branches typically restrict their operations to within 10km) (A. Khan and Rabbani, 2015). The resultant GM-based SA values were multiplied by 100,000 for easier interpretability. The third SA measure calculated was a KDE-based measure, and for this we applied the same kernel function (Epanechnikov function) and kernel radius (10km) as the previous study on microfinance by Khan and Rabbani(2015).

### 4.3.2 Regression modeling

OLS and GWR regression modelling approaches were used to analyse the spatial determinants of SA to microfinance. Both are linear regression models, with the main difference being that OLS is a global regression model and GWR is a local regression model (Fotheringham, Brunsdon, and Charlton, 2003). A GWR model is calculated for each location of interest (i.e. each consumer point location in our study) using either: (a) a fixed distance approach (i.e. including all data points within a specific distance), or (b) an adaptive distance approach (i.e. including a specific number of nearest data points). GWR typically employs a kernel weighting function, e.g. a Gaussian or bi-square kernel function (Tomoki, 2016), to allow data points located nearer to the location of interest to have more influence in the regression calculations. For GWR calculations in this study, we used the adaptive distance approach. GWR models with several different numbers of nearest neighbours were tested, and the model with the lowest Akaike's Information Criterion (AIC) value (Akaike, 1974) was selected as the most appropriate one. All GWR modelling was done using the GWR4 software package version 4.09, which is freely available at: http://gwr.maynoothuniversity.ie/gwr4-software/ (last accessed 05 June 2017).

### 4.3.3 Results

**Maps of Spatial accessibility (SA)**

Maps of SA to microfinance for each of the three SA measures, generated using the branch location data (number of branches = 763), are shown in Fig. 23. In all three maps, it is clear that areas located near rivers typically had lower SA to microfinance. The southeastern part of the study area in particular had quite low SA values. This area, in addition to being located near rivers and the Bay of Bengal, also has quite high soil salinity, as shown in Fig. 23 (d). Comparing the three maps, there are some slight differences in terms of the patterns of SA. In the KDE map (Fig. 23(c)), SA values are very high in areas with a dense concentration of MFI branches, but decrease rapidly outside of these densely concentrated areas, leading to a larger number of consumer points with SA values of 0 (no SA to microfinance). The GM map has a similar pattern, but the decrease in SA values with distance from branches is more gradual, leading to fewer consumer points with SA = 0. As KDE and GM are quite similar in terms of how they are calculated, the differences in our study may be due to the parameters we selected (e.g. selecting a higher $\beta$ value for the GM measure would lead to a map similar to the KDE map). The distance to nearest branch map (Fig. 23(a)) has the most gradual changes in SA values across space, and because it is a simple distance-based measure, no consumer points have SA values of 0. It should be noted that higher values indicate higher SA in the GM and KDE maps, while lower values indicate higher SA in the distance to nearest branch map.

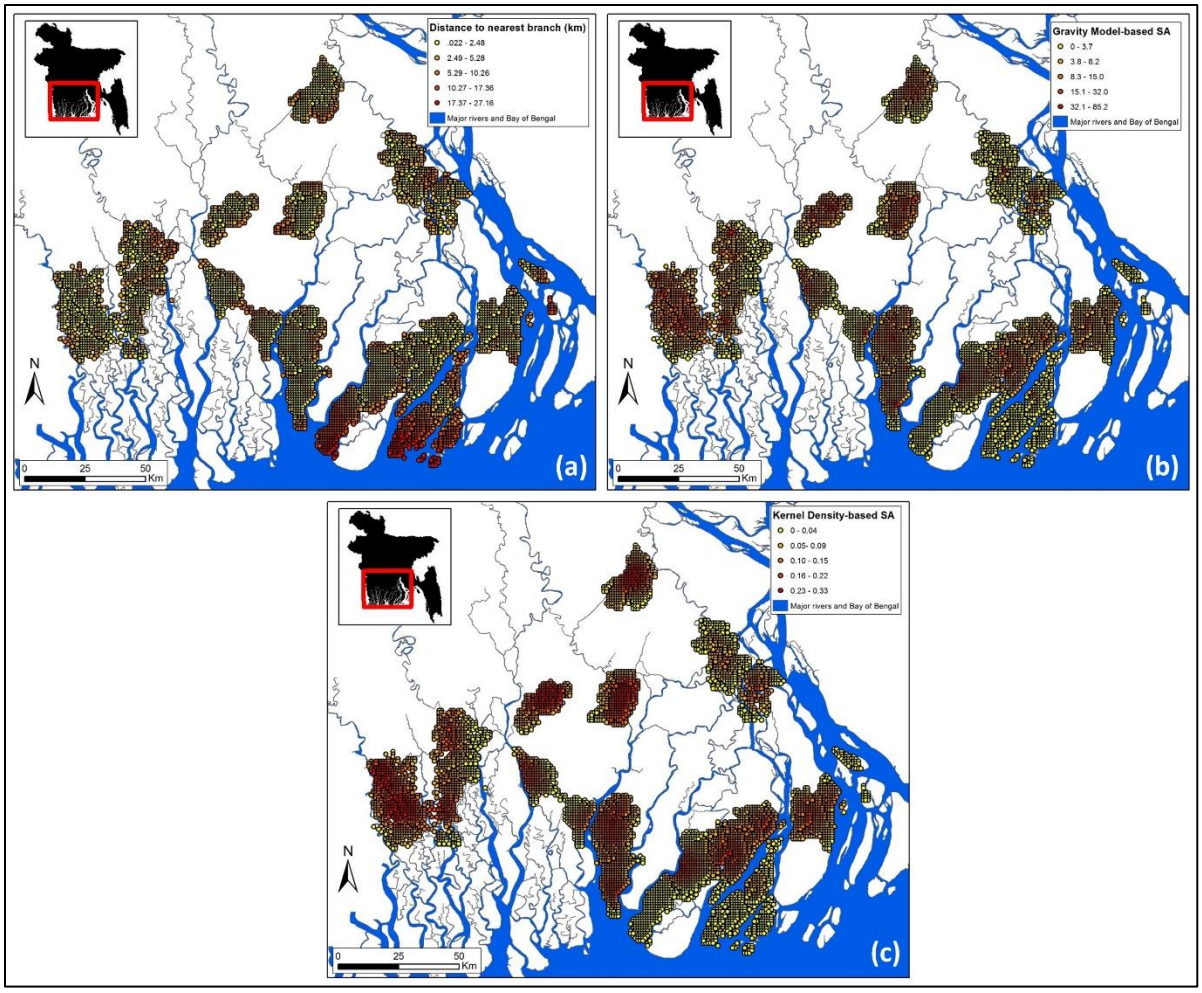



**Figure 23: Maps of spatial accessibility (SA) to microfinance at each consumer point, as measured by: Euclidean distance to nearest branch (a), gravity model (b), and kernel density estimation (c).**

## Regression modelling results

### OLS results

The adjusted $R^2$ values of the OLS regression models ranged from 0.221 to 0.259, indicating meaningful (although somewhat weak) global relationships between SA and the spatial determinants we considered. In general, the directions of the relationships (i.e. positive or negative) between SA and the spatial determinants were as expected. Population density and distance to rivers had positive relationships with SA in all three OLS models, and distance to roads had a negative relationship with SA in all three models. These relationships were in line with the results of the previous study on SA to microfinance (A. Khan and Rabbani, 2015). The global relationship between high soil salinity and SA to microfinance was less clear, as there was a negative relationship for two regression models (distance to nearest branch and KDE), as expected, but a positive relationship for the GM model. All of the OLS results are shown in Table 55.

**Table 56: OLS Regression ModellingResults for Each SA Measure.**

| **(a) "Distance to nearest branch"** Adjusted $R^2 = 0.259$ | | |
|---|---|---|
| Variable | Coefficient | t-Stat |
| Intercept | -1263.523 | -4.042** |
| Population per km2 | -342.734 | -18.533** |
| Distance to River (m) | -0.033 | -1.806* |
| Distance to Road (m), natural log. | 1025.212 | 27.313** |
| % area with soil salinity > 4 dS/m | 7.519 | 6.686** |
| | | |
| **(b) GM** Adjusted $R^2 = 0.221$ | | |
| Variable | Coefficient | t-Stat |
| Intercept | 1233.162 | 28.756** |
| Population per km2 | 36.352 | 14.329** |
| Distance to River (m) | 0.023 | 9.447** |
| Distance to Road (m), natural log. | -138.808 | -26.956** |
| % area with soil salinity > 4 dS/m | 0.346 | 2.244** |
| | | |
| **(c) KDE** Adjusted $R^2 = 0.244$ | | |
| Variable | Coefficient | t-Stat |
| Intercept | 0.169 | 29.882** |
| Population per km2 | 0.00438 | 13.09** |
| Distance to River (m) | 0.000006 | 17.755** |
| Distance to Road (m), natural log. | -0.0168 | -24.807** |
| % area with soil salinity > 4 dS/m | -0.000015 | -0.735* |

*t-Stat significant at $p < 0.10$; **t-Stat significant at $p < 0.05$,

Source: Study Survey 2017

### GWR results

The adjusted $R^2$ values of the GWR models ranged from 0.437 to 0.717, indicating much stronger relationships between SA and the spatial determinants than the OLS models. The higher lower $R^2$ values for the GM and KDE SA measures may have been due to fact that their values are truncated at 0, while the distance to branch SA measure is a true continuous variable. The better prediction capabilities of GWR over OLS in our study is in line with the findings of other studies that have compared the two approaches (Maroko et al., 2009; Xie, Zhang, and Berry, 2013). Variable coefficients for GWR vary locally (as do the t- and p-values of the coefficients), but global values of each variable coefficient can be calculated as the mean of the local coefficient values. The relationships between SA and the mean variable coefficients for the GWR models were also in line with our expectations, even more-so than for the OLS models. In all three GWR models, population density and distance to rivers were positively related to SA, while distance to roads and high soil salinity were negatively related to SA. All of the GWR modelling results are shown in Table 56.

**Table 57: GWR ModellingResults for Each SA Measure.**

| | |
|---|---|
| **(a) "Distance to nearest branch"**<br>Adjusted $R^2$ = 0.717 | |
| Variable | Coefficient |
| Intercept | -21.781 |
| Population per km2 | -109.731 |
| Distance to River (m) | -0.085 |
| Distance to Road (m), natural log. | 533.608 |
| % area with soil salinity > 4 dS/m | 29.519 |
| | |
| **(b) "Gravity model" measure**<br>Adjusted $R^2$ = 0.437 | |
| Variable | Coefficient |
| Intercept | 1006.83 |
| Population per km2 | 42.672 |
| Distance to River (m) | 0.022 |
| Distance to Road (m), natural log. | -96.421 |
| % area with soil salinity > 4 dS/m | -2.201 |
| | |
| **(c) "Kernel density estimation" measure**<br>Adjusted $R^2$ = 0.571 | |
| Variable | Coefficient |
| Intercept | 0.1372 |
| Population per km2 | 0.00366 |
| Distance to River | 0.000006 |
| Distance to Road (Ln) | -0.00918 |
| % area with soil salinity > 4 dS/m | -0.00046 |

Source: Study Survey 2017

### 4.3.4 Conclusions

In this study, we have analysed the relationships between climate vulnerability (vulnerability to flooding and high soil salinity) and spatial accessibility (SA) to microfinance in southwest Bangladesh. This region suffers from extreme flooding in the monsoon season and high soil salinity in the dry season, and while microfinance products can help households deal with these extreme conditions, they are not available in areas located far from any microfinance branches. To first understand variations in SA to microfinance in the region, we calculated and mapped three different commonly-used SA measures: “distance to nearest branch”, “gravity model-based SA”, and “kernel density estimation-based SA”. Next, values of four potential spatial determinants of SA were calculated: “population density”, “distance to nearest paved road”, “distance to nearest river”, and “percent of land with soil salinity > 4 dS/m”. The relationships between SA and these explanatory variables were investigated using ordinary least squares (OLS) regression and geographically-weighted regression (GWR) modelling approaches. The GWR models were better able to predict SA based using these explanatory variables, and the GWR model predicting “distance to nearest branch” had the highest prediction accuracy (adjusted $R^2$ = 0.717). In all of the GWR models (and two of the three OLS models), high flood vulnerability (measured by “distance to nearest

river") and high soil salinity (measured by "percent of land with soil salinity > 4 dS/m") negatively affected SA to microfinance, indicating that access to microfinance is lacking in these climate-vulnerable areas.

Given the significance of microfinance to building households' resilience and adaptive capacities, and the relatively lower access to microfinance in the climate-vulnerable areas currently, there is clearly a need for additional support to increase SA in these areas. This support could come through various means. For example, larger MFIs with branches in less vulnerable areas (which may have better financial performance) could help subsidise the establishment of branches in climate-vulnerable areas. A purely business-oriented approach to microfinance would not be appropriate as such cross-subsidisation only makes sense for MFIs with a poverty alleviation agenda. Another option might be to offer external financial support to MFI branches located in vulnerable areas, either from donors or from the state's adaptation funds.

# Chapter 5

# Action Research

## 5.1 Purpose and Methodology of Action Research

The experimental design of the action research will provide effective institutional and operational arrangements and intervention packages to build adaptive capacities at household and community levels. The action research will be elaborated to reflect the impacts of climate change on different parts of Bangladesh, e.g. draught in the North-West vs. sea level rise and greater weather extremes in the South-West. An experimental testing of different sets of interventions for different locations will generate scientific knowledge with generalisable conclusions for applications in other countries with similar environmental conditions.

The interventions selected for the action research will be based on the results of the stock-staking and other background studies and the exposure visits to selected countries to identify progressive practices. The following activities will be considered in designing the experimental action research.

### 5.1.1 Activities for designing action research

#### Network and institutional development

For the microfinance sector to contribute effectively to disaster risk reduction and climate change adaptation requires that its activities are well coordinated with other actors and that microfinance and nonfinancial services are delivered through appropriate institutional structures with effective and efficient operating arrangements. The networking and institutional component consists of the following interventions:

- **Local adaptation networks**

Local adaptation networks consisting of local organisations involved in climate change adaptation and disaster risk reduction, including MFIs, local government, line agencies, other NGOs, etc. will be established in the study areas as part of the action research. It is anticipated that such networks have an important role to play as effective adaptation requires that there is clear understanding of roles and responsibilities of different actors and that their efforts are properly coordinated to avoid overlaps and realise synergies.

- **Alternative institutional and operational arrangements**

The component will test alternative institutional and operational arrangements for providing financial and non-financial services under different environmental settings – flood-prone areas and cyclone-prone areas. Adaptation requires MFIs to be continually learning, not just to implement a pre-determined set of agreed interventions. Operational arrangements that encourage a learning approach by having field workers identify, discuss and propose solutions to problems as part of the institutional mode of working will be tested through the participating MFIs. In addition, arrangements for building community-based organisations (CBOs) and linking them constructively with MFIs will be tested. While MFIs are the main

conduits of financial services to poor households in Bangladesh, it can also be anticipated that CBOs will have an important role to play in disaster risk reduction and climate change adaptation in climate change vulnerable and disaster-prone areas because being home-grown they can quickly organise the people and mobilise local and community level resources as well as respond to post-disaster needs.

- **Customised and flexible savings and loan products**

A set of customised and flexible savings and loan products that reflect household capacities and needs under different environmental contexts will be tested. Whether customisation and flexibility place additional administrative burden on MFIs will be monitored.

- **Appropriate and effective microinsurance**

The activities aiming to develop effective insurance products that cover the real risks faced by households will be included as part of the action research. The insurance products tested could include insurance of household dwellings and income generating assets (catastrophic losses).

- **Financial services packaged with training and outreach**

In areas experiencing the impacts of climate change, microfinance needs to be matched with new livelihood activities, both on-farm and off-farm. Financial services will have to be packaged with training and outreach to build household capacity and provide ongoing support to enable households to implement new livelihood activities. The action research will test alternative packages of financial and non-financial inputs to build climate-change resilient livelihoods in different environmental contexts.

- **Community-based environmental literacy**

Environmental literacy is a necessary condition for sustainable development with implications for disaster risk reduction and climate change adaptation. A community-based literacy programme will be designed and tested, potentially through CBOs.

The design of the experimental action research will be finalised through a series of interaction with JICA and participants in several workshops. In possible cases, the core research team members will interact with small groups of experts.

This component will deliver a complete action research proposal along with implementation modalities as the deliverable product.

## 5.2 International Exposure Trips

Southern region of Bangladesh is exposed to various natural disasters like cyclone, flood, salinity and water logging. These events mostly affect their properties (particularly the housing), health and agriculture adversely. As mentioned earlier, the action research will design certain insurance product – particularly the housing property, agriculture and health insurance. These insurance products do not exist in Bangladesh for the poor and vulnerable people. However, similar type of microinsurance products has already been implemented in some other countries.

Some countries in Africa, Latin America and Asia are currently implementing micro-insurance through MFIs for the climate vulnerable people. Exposure visit to relevant countries will help to design the appropriate microinsurance products for the vulnerable poor in Bangladesh.

Considering the objective of the action research and relevancy in the context of Bangladesh, the research team, in consultation with JICA, decided to visit Philippines and India[7].

### 5.2.1 Lessons and observations from Philippines and India exposure visits

- **Microinsurance needs an appropriate regulatory and institutional framework to flourish**

India introduced microinsurance regulations in 2005 and Philippines in 2006. The regulations define microinsurance, establish product parameters, regulate the disaggregation of premiums, identify the entities with the right to underwrite and deliver microinsurance, relax some requirements in order to make microinsurance more attractive to the insurers, and provide some protection to the policy holders.

The situation in the Philippines used to be similar to that of Bangladesh in that the MFIs were informally providing microinsurance to their members. Revisions to the regulations in 2010 required all MFI insurance services to be formalised. It was felt that if microinsurance remained an entirely informal practice of MFIs, there were potential risks to consumer protection, risks to the financial stability of the MFIs, and reputational risks to the MFI sector. Lack of scaling up of partner-agency relationships between insurers and MFIs and lack of coordination between and among financial regulators were other reasons for developing the microinsurance regulations.

- **Regulations on microinsurance are best developed through a multistakeholder approach**

The experience in the Philippines and India shows that it is important to develop microinsurance regulations through dialogues and consultations that bring out stakeholder interests, and technical groups involving the financial regulators, the insurance industry, MFIs, the financial intermediaries, etc. The Philippines has been particularly successful in creating constructive processes in which stakeholders have worked together on developing the framework for microinsurance. Several inter-agency committees and technical working groups composed of government agencies and industry/providers were created to establish the regulations on microinsurance. Joint circulars between the regulators (Insurance Commission, Cooperative Development Authority, and Securities and Exchange Commission) were issued.Multistakeholder dialogues built trust, contributed to evidence-based and proportionate regulations, and created strong ownership to ensure implementation and compliance.

- **Regulations can be introduced after some experience is accumulated and should not be too rigid**

Stakeholders in both countries emphasised the importance of developing regulations based on lessons from early initiatives as well as keeping the initial regulations flexible to encourage experimentation. It may be best to begin with a set of basic regulations that allow microinsurance to get off the ground, with

[7]Detailed notes on the exposure visit is attached in Appendixes. Appendix D contains detailed meeting minutes on discussions held in Philippines. Appendix E summarises the lessons learnt from the Philippines tour. Appendix F contains detailed meeting minutes on discussions held in India. Appendix G contains some case studies on mutual benefit association, regulations in Philipinnes, and microfinance banks, insurance practices and insurance literacy in India.

preparedness to elaborate the regulations at a later point in time. The Philippines revised its regulations twice and India once on the basis of lessons learnt and the changing insurance context

- **Regulations should permit the provision of microinsurance by various types of entities and a through a variety of distribution channels**

The microinsurance regulations in India are restrictive in that they focus solely on the partner-agent model. Cooperative societies are providing insurance but are not under regulatory supervision. The Philippines may provide a better reference for Bangladesh. In the Philippines, the first regulatory regime for microinsurance created Microinsurance Mutual Benefit Associations as a special tier of regulated insurance entities. The regulatory framework was then broadened in 2010 to open up the market beyond the MI-MBAs. All entities practicing informal insurance activities were required to formalise their schemes, but were given three options: 1) partner with commercial insurance companies to provide group or individual coverage to members, 2) have its members join a cooperative insurance society or MI-MBA, and 3) organise themselves into an insurance entity such as commercial company, cooperative insurance society or MI-MBA.

- **Mandating a body at national level to promote microinsurance may accelerate the development of the sector.**

In the Philippines, a Microinsurance Division was established in the Insurance Commission as the focal group in charge of microinsurance-related issues. Recently, the Microinsurance Division has engaged stakeholders in developing three new frameworks: Micro Pre-Need Regulatory Framework, Agriculture Microinsurance Regulatory Framework, and Health Microinsurance Framework.

- **A national microinsurance strategy and literacy programme can also contribute significantly to the development of the sector.**

The Philippines issued its National Strategy for Microinsurance in January 2010, which defines the objective of microinsurance, the roles of the various stakeholders and the key strategies to be pursued in enhancing access to insurance of the poor. The response of the Insurance Commission to Typhoon Haiyan which struck the Philippines in 2014 demonstrates the importance of having a national microinsurance strategy. Recognising that there was a need to ensure timely pay-outs on microinsurance policies in the wake of the typhoon, the Insurance Commission institutionalised an internal disaster response mechanism, set up a Claims Action Centre, generated a master list of all policy and plan holders, and relaxed some documentary requirements. As a result of these efforts, microinsurance claims of more than USD 12 million were paid out to 111,000 beneficiaries.

Stakeholders in the Philippines and India argued strongly that without a large investment in literacy at all levels, microinsurance for the low income sector will not succeed. In the Philippines, the Microinsurance Literacy Roadmap consists of: 1) the formulation of key messages on the role of stakeholder groups in the development of the microinsurance market; 2) the development of training and communication materials to be used by various stakeholders, 3) training of microinsurance advocates, and 4) roadshows and public seminars in key cities across the country. In India, the Centre for Financial Education owned by all the regulators provides financial literacy for bank account holders, while the Reserve Bank of India supports financial literacy in schools. There are now more than 1,300 financial literacy centres across the country.

- **While the partner-agent model is widely promoted, MFI-MBAs, self-help groups (SHGs) and co-operatives have been more successful than commercial companies in developing and delivering microinsurance.**

The dominant microinsurance distribution model in the Philippines is still through MFIs (rural banks, NGOs and coops), though the regulatory reforms were successful in encouraging more commercial insurance companies to enter the microinsurance sector, with the number growing from 3 in 2006 to 42 in 2014. In India, the SHGs and co-operatives have been more successful than the companies in developing and delivering microinsurance.

- **Numbers can be achieved when insurance rides on other financial services.**

India has achieved large numbers of participants in the Prime Minister's crop insurance scheme because the banks are required to insure their loan portfolios. This means that every loanee farmer has to have crop insurance. Microinsurance is also riding on bank accounts. In India, life cover was made available to anyone who opened an account under the Prime Ministers financial inclusion programme known as PMJDY. MFIs have essentially made microinsurance a rider on their credit services. When MFIs form mutuals, as they have done in the Philippines, all their members are automatically enrolled in the insurance schemes. In India, Annapurna Mahila State Coop Credit Society explains that the motive for its members to join the Society is to obtain credit; they do not join to have access to the insurance. However, it has generated numbers in its insurance scheme, which has been financially self-sustaining over the past 12 years, by making life, health and family insurance compulsory for all borrowers.

- **Some promising examples of micro health insurance can now be observed, but micro health insurance and improvements in primary health care services need to go hand-in-hand.**

Several different micro health insurance models were observed in the Philippines and India. The most basic model offers a simple daily hospitalisation benefit as a form of financial assistance. More complex models pay according to the types of treatments and have agreements with hospitals on services and prices. Regardless of the type of model, in both countries the need to improve health care services in many localities is recognised. In India, under the Prime Ministers RSBY scheme, it is hoped that hospitals will improve their health care services and extend these to remote locations using the insurance payments they receive from the scheme. A more direct approach is where micro health insurance is part of a community health care programme. An example in India is Annapurna's Community Social Protection Programme, which in addition to health insurance provides a 24/7 help line with a doctor stationed at each of its offices and has a medical officer visit each branch once a month to provide a check-up service and guidance to members.

- **Some weather-based index insurance products exist but the concept is yet to prove itself.**

MicroEnsure is testing innovative weather-based index insurance covers in the Philippines, but after several years still describes these as pilots. In India, the Weather-Based Crop Insurance (WBCI) developed in parallel with yield-based crop insurance. Weather triggers are set for each agro-climate zone and for various time periods in the cropping cycle. However, farmers had trouble understanding the scheme and it also became somewhat political.

- **There are a few examples of calamity cover that provide a pay-out to support recovery. They do not indemnify for total losses.**

In the Philippines, CARD Pioneer offers calamity insurance as part of its SAGIP plan. The cover is a simple 10,000 PHP pay-out to assist with recovery after a natural calamity. Annapurna's family insurance provides financial assistance at the time of accidental loss of assets. Financial assistance of Rs. 1,500 in the form of food, clothes and utensils is provided at the time of accidental loss of assets.

- **Product bundling is becoming more common.**

Bundling of different types of cover is becoming more common. In the Philippines, CARD Pioneer's Camia Paid plan provided a funeral benefit, personal accident cover, and 10,000 PHP coverage for calamities – typhoon, floods, earthquakes and volcanoes. In India, Annapurna bundles life, health and family insurance.

- **Microinsurance can be incorporated into a package of inputs to support livelihood development.**

In the Philippines, CARD is supporting local families set up and run *sari sari* (general goods) stores. The *sari sari* programme includes support on business development, start-up capital and a savings programme. Participants are then encouraged to save while undertaking the training programme and with their savings to purchase store insurance, which covers damage from typhoons, floods and fire.

# Chapter 6

# Experimental Research on Improving Adaptive Capacity and Building Resilience through Financial Inclusion in Bangladesh- A Proposal

## 6.1 Introduction

Natural disasters are quite frequent in a country like Bangladesh. Their consequences are severe. In the north-western region, the problem of seasonal food insecurity exists. During the period of food insecurity (July-October), households resort to reducing their number of meals each day due to floods and the high degree of damage they cause to agriculture-based economic activities. In the southern part of Bangladesh, households are faced with frequent cyclones and also occasional droughts. The consequences are severe; the houses are damaged, economic opportunities are greatly diminished, and as a result, household-level poverty increases. The situations in both the northern and southern parts of the country are projected to worsen because of climate change. The adverse impacts of climate change are a global problem (IPCC, 2007). In Bangladesh, where exposure and poverty are high, the impacts of climate changed induced catastrophes (cyclones, floods and droughts) may be intense and long lasting. The intensity and longevity of the impacts will depend on the resilience of households and communities, i.e., their capacity to recover from a shock in a given socio-ecological environment (Folke et al. 2004).

In recent years, there has been growing interest in the relationship between vulnerability, poverty and resilience to covariate shocks (Diagne 2015). Ahsan et. al. (2013) showed vulnerable households in Bangladesh are more likely to be poor and less likely to possess adaptive capacity to idiosyncratic and covariate shocks. Even wealthy households are affected. Berg (2009) showed that natural catastrophe in Nicaragua has put many better-off households into worse-off situations. Similarly, Carter et. al. (2007) argue that covariate shocks of natural disaster can push households into a poverty trap that they cannot exit from.

How does covariate shock affect the households and aggravate poverty? There can be number of impacts, including (i) immediate loss of labour income due to damage to economic assets of the community, and (ii) damages to goods and assets (Jakobsen 2012; Carter et al. 2007). Effects of covariate shocks such as natural disasters are enduring because of limited access to the labour, insurance and credit markets.

**Evidence from Bangladesh**

The southern part of Bangladesh has experienced a number of severe natural disasters over the past decade, such as those associated with cyclones Sidr and *Aila*. The immediate consequences are severe and the impacts are long-lasting. Even after ten years of Sidr, most of the households have not been able to recover their total amount of loss. The scenario is no different in the areas affected by the relatively weaker cyclone *Aila*. A series of studies were conducted on the impacts of Sidr and *Aila* and the state of recovery in the affected areas (Khalily et. al. 2015; BUP-InM 2015; Khan et. al. 2015; InM 2017). All these studies consistently concluded that the state of recovery is slow. The InM household survey (2017) conducted as part of this JICA Basic Study provides the latest information on loss and damages and on the recovery state and mechanisms. The basic findings are reported below:

***Coping Mechanism***

- Average amount of loss and damages was estimated to be around Tk.30,000. Similar estimates were also reported in Khalily 2015; Khan et. al. 2015; BUP-InM 2015.
- About 90 percent of the houses were damaged.
- Average amount of damage to house was around Tk.15,000; Modal group was between Tk.20,000 and Tk.30,000.
- Generally, households adopted different coping mechanisms: sale of assets, informal borrowing, use of savings, borrowing from MFIs, and grants from government and NGOs. Almost all the households used a mix of different coping mechanisms.
- Use of savings was the dominating coping mechanism in terms of percentage of households.
- Around one-third of the households borrowed from informal sources.
- Microfinance participants had higher ability to cope with the impacts of Sidr and *Aila*. They used more savings and microcerdit in coping than non-participants in microfinance schemes.
- Even some households participating in microfinance schemes could not recover fully. Some 13 percent of the affected households could not even take any step for recovery.

***Ex-post Adaptation***

Households not only cope; they also adapt to minimise risks of a similar nature in the future. The affected households focused on developing their physical assets like plinth raising, construction and reconstruction of semi-*pucca* or *pucca* houses and preservation of rainwater. Over 50 percent of the households raised their plinths, at an average cost of Tk.12,000. Around 40 percent of the households constructed/reconstructed semi-*pucca* houses, at an average cost of around Tk.50,000. More households in close proximity to the sea and in high salinity areas took these adaptive measures.

In addition to improving physical assets to reduce risks, households also attempted to diversify and increase income-generating activities. They have attempted to make their livelihoods more climate-resilient by investing their efforts in homestead vegetable gardening and homestead tree plantations, disaster-resistant crops, multiple economic activities in less vulnerable areas, and livestock. About one-fifth of the households adopted homestead-based economic activities. They considered tree plantations as both income generating and risk minimising. A higher percentage of microfinance participants living in high salinity areas and close proximity to the sea employed these adaptation actions. Why were they more able to adopt these? Households with *ex ante* and ex-post access to microfinance were better-off than the non-participants, and our econometric analysis indicates that this greater net wealth supported their adaptive measures. Our analysis found that apart from access to finance, climate change knowledge and ex-post community level actions also induced households to undertake adaptive measures. A concern our analysis raised is that the network of MFIs is yet to bring financial services to all households, particularly poor households, because of their limited resources and limited risk-taking ability.

***Adaptation Planning***

The survey also assessed the adaptation planning of the households. The households expressed their willingness to adopt a number of activities as part of their adaptation planning and strategies. They are:

- Plinth raising;
- Reconstruction of houses;

- Preservation of rainwater;
- Diversified and multiple economic activities;
- Both short and long-run migration, and
- Training on diversified economic activities

But how would they finance these? They perceived the following actions from institutions as necessary:

- Provision of larger loans;
- Provision of products that would increase their savings;
- Provision of affordable microinsurance.

More than 75 percent of the households perceived larger loans and increased savings as useful in their future planning strategies. Eighty percent of the surveyed households expressed willingness to purchase asset insurance. Expressed willingness to purchase micro health insurance was also high. In the study on microinsurance, around 98 percent of the households viewed micro health insurance positively and responded that they would consider purchasing health insurance. The most important element in their perception is payment of premium; they do not perceive microinsurance products as free goods.

Households expect a greater role of the MFIs in ensuring access to different financial instruments. This includes the provision of microinsurance. As established in the empirical study, climate change related knowledge and community level actions, training and awareness building have positive impact to ex-post adaptation activities.

***Implications of the findings***

Based on the survey findings and literature review, the following policy implications can be drawn:

**First,** climate change related literacy along with financial literacy should be promoted. PKSF can establish a Centre for climate change and financial literacy to promote literacy in a structured manner. This Centre will implement literacy programmes both for MFIs and participants and non-participants at the field level through InM and PKSF-POs.

**Second,** participating POs should design specialised credit policies with provision for large loans, and also design special savings scheme to expedite the pace of savings.

**Third,** microinsurance products particularly health insurance and asset insurance should be designed and offered to the microfinance members and borrowers through POs.

**Fourth,** participating POs should work closely with the community and local government to support community level adaptation planning and interventions.

**Fifth,** special schemes should be developed for the most vulnerable poor households, such as those who could not recover at all even ten years after Sidr and eight years after *Aila*. The vulnerable poor households are likely to include beggars, female-headed households and wage-labour dependent families. In all these efforts, InM can play supportive roles especially through sharing technical and knowledge products.

## 6.2 ENRICH: An Effective Approach for Building Adaptive Capacity and Resilience

The recommendations that we have drawn from the findings of the household survey will improve adaptive capacity and resilience of the households. But, this requires a well-structured approach that can ensure coordination of households, MFIs, community level institutions and local government. The most convenient approach would be through a single entity that can deliver and implement all the components in coordination with or participation of the local governments and community level organisations. PKSF has been implementing a programme called ENRICH (Enhancing Resources and Increasing Capacities of Poor Households towards Elimination of their Poverty) that is being implemented through PKSF POs in coordination with local government and community level institutions. ENRICH is an appropriate vehicle for our recommendations as it not only promotes participation of local government and community level leaders, its programme components include larger loan size, special savings, primary health care, special programmes for the ultra-poor, such as beggars, education, and a community Centre - the ENRICH Centre.

The ENRICH programme marks a significant departure from PKSF's existing mode of operation. The traditional role of PKSF has been to act as a wholesale lender of funds to the MFIs (partner organisations – POs), who then channel these funds towards the weaker segments of society. ENRICH seeks to change this role. PKSF's role as a wholesale lender still remains, and the focus of POs on the weaker segment of the society also remains unchanged, but there are to be radical changes in the purpose for which the fund is to be lent and in the manner in which the fund is to be utilised by the POs.

The objectives of ENRICH are:

- To empower the participating households so that they may reduce and eventually remove their poverty in a sustainable manner;
- To ensure the access of poor people to health, nutrition and education, with special attention to women and children;
- To work together with local community and institutions to face the challenges of natural calamities and to enable participating households to contribute towards subsequent rehabilitation;
- To promote structures of cooperation between private/NGO sector and the government, especially local-level government, so as to implement a process of sustainable poverty eradication and development.

In ENRICH, credit plays a pivotal role, but with several major differences from typical microcredit programmes. First, credit, combined with other necessary support, is provided on the basis of a comprehensive assessment of a household's needs and capacities. Second, the scale of credit made available to households is ramped up significantly. Third, in recognition of the fact that poor people need credit for a variety of reasons, of which use in directly productive activities is only one, ENRICH explicitly allows for credit to be offered for non-income-generating purposes such as asset creation or purchase of household durables and other expenditures that could lead to higher living standards. Fourth, the intervention would be of a multi-faceted nature, with credit being only one component of an integrated package. In addition to credit, the programme also has (a) an education component, which currently focuses mainly on the problem of dropouts of very young children, (b) a health component, which focuses mainly on child and maternal nutrition and maternal health in general, (c) a youth training

and job creation component, (d) an environment programme, (e) special savings component to expedite the process of savings towards sustainability; (f) special programmes for vulnerable segments of the poor like beggars and female headed households; and (g) a community development component, which aims at enabling the socially weak households to better access community resources.

***Health***

Among all the components of ENRICH, the Health Scheme has expanded the most. This is partly because of the design of the scheme. The provision of universal home visits by Health Volunteers has necessarily meant that the scheme would cover almost the entire population in programme villages. However, even the services that depend on the health-seeking decision of prospective recipients - such as visit to static clinics, satellite clinics and health camps - have achieved a commendable reach. Households are now required to have health cards.

***Education***

On the educational front, ENRICH has put in place a set of pre-primary and primary-level interventions by setting up tutorial centres (*Shikkah Kendra* or SK). The stated objectives of these interventions are to: (a) enhance the quality of primary education, (b) eliminate dropout from schools, and (c) eliminate fear/apprehension (if any) about school among young learners.Rural households, especially the poor households, view the role of ENRICH-sponsored education positively. As the teacher of SK is selected from the same community as the students', the closeness between the parents and the teacher helps overcome any difficulty in running the education centre. The intimate care and follow-up by the SK tutor sends a strong positive message to the child's family, which then becomes motivated to respond to the tutor. As a consequence, the attendance rate in SKs remains high. The focus on pre-primary education also pays an additional dividend. It is well-known that children from poorer backgrounds systematically perform worse (on average) than their better off peers in terms of educational outcomes.

***Environment***

There are four major interventions under the Environment Programme: (1) improved cooking stove (*bandhuchula*), (2) renewable energy source: solar lantern/solar home system (SHS), (3) biogas plants, and (4) cultivation of medicinal plants (*basak* leaf). None of these interventions have spread on a large scale so far, but their benefits are acknowledged by participating households.

***Community development and participation of local government***

The Community Development component of ENRICH aims to promote a set of objectives that may be divided into two distinct parts for analytical convenience - a tangible and an intangible part. The tangible part consists of a number of interventions that aim at providing valuable services at the community level as distinct from the household level. These include creation of small-scale physical infrastructure, sinking of tubewells and construction of sanitary latrines for community use. The community is, however, encouraged not just to be a passive beneficiary of these facilities but to be an active agent for ensuring that the benefit can be enjoyed in a sustainable way by being entrusted with the responsibility of managing and maintaining them. Community development is thus supposed to take place simultaneously on two fronts - well-being and agency - the two components of human capability as recognised by the capability approach to development.

The intangible component seeks to build upon the agency goal further. This aspect of community development tries to encourage and enable a wide spectrum of ENRICH members to become actively involved in the institutions for community-level decision-making.

As a part of better integration of the community, local government and the ENRICH programme, in each village an ENRICH Centre has been established. Generally, the Centre committee is chaired by the community leader or elected local government member. The Centre is also a place for providing health services, meeting of the coordination committee and village level gathering of social and economic agents. Generally, the Chairman of local government (Union Parishad) is the Chairman of the Coordination Committee of ENRICH. The MFI in each union implements programme components in collaboration with the local government.

***Credit and savings***

ENRICH has special savings and credit schemes. Both components contain a number of innovative features. Under the Special Savings Scheme, the ultra-poor are encouraged to save in small amounts over a period of two years, with the incentive that PKSF will double the amount of their savings at the end of the period. In order to ensure that the accumulated funds are not frittered away, the scheme requires that the funds can only be used to buy some valuable asset that can help the saver to generate income in the future.

Among the various innovative features of the ENRICH loan, the one that captures the interest of most borrowers is the large size of the loan. For the vast majority of the borrowers, large loans meet a felt need.

***Integrated approach***

The methodology of the integrated approach of ENRICH is based on the understanding that the poor remain poor because of multiple capability failures. Lack of income is both an important dimension and cause of this multi-dimensional capability failure, but it is not the only one. Poor health, unhygienic environment, lack of education and basic skills, lack of knowledge about available opportunities for livelihood improvement, inadequate involvement in community development are all at the same time dimensions of poverty as well as causes of poverty. Once poverty is viewed in this multi-dimensional manifestation, it becomes obvious that no single intervention can possibly be enough to deal with this complex phenomenon. Provision of credit may help redress some of these failures, provided the amount of credit is large enough, but not all. A multi-pronged strategy is needed – addressing health, education, environmental deprivation, lack of voice in the community, etc., in addition to removing the credit constraint. Furthermore, this multi-pronged strategy is to be implemented in an integrated manner so as to maximise the synergies among the various components.

ENRICH is now being implemented in more than 220 unions in Bangladesh. The programme is partly financed by PKSF and partly by the government. Only very recently, the programme has been extended to the southern part of Bangladesh.

Osmani et. al. (2014) and Khalily et. al. (2015) have evaluated the impacts of ENRICH and find that the programme has made substantial socioeconomic impacts, encouraged households to save, integrated local government in the programme, reduced child dropout from school, reduced poverty and increased human dignity of the participating households.

## 6.3 Relevance of ENRICH to Present Recommendations

We have recommended that households can build their adaptive capacity and resilience through: (i) access to larger loans and special savings schemes; (ii) climate change and financial literacy; (iii) community level actions; and (iv) microinsurance, especially health insurance and asset insurance. Of the four major recommendations, the ENRICH comprises recommendations (i) and (iii). Given the existing network of ENRICH and PKSF POs, ENRICH components can be extended to include climate change and financial literacy and microinsurance. This will also facilitate PKSF to implement the next phase of the project with the existing network and following the guidelines of ENRICH. Although ENRICH is an on-going programme, the extended programme could be experimented using randomised controlled trials (RCT) in the southern part of Bangladesh for effective implementation at a large scale in future.

## 6.4 Design of Proposed Experiment

The interventions proposed for the testing are: (1) financial and non-financial services targeting ultra-poor and poor households, (2) financial and environmental literacy, (3) community level institutions and interventions, and (4) networking with local governments and other service/knowledge providers

It is anticipated that access to formal financial services (savings accounts, loans and microinsurance) will assist households with their day-to-day financial management, accumulate sums for important investments, build their assets, potentially diversify and increase their income sources, and better prepare for, and cope with and recover from shocks. The impacts of different features of the financial products as well as different combinations of products on resilience can be tested. It is assumed that the impacts of financial services on resilience will be enhanced when they are packaged with training and extension, e.g. on alternative and climate-resilient livelihoods. It can also be assumed that financial and environmental literacy, support to communities and networking with local governments and other service/knowledge providers will contribute to resilience building as well. All these assumptions can be tested. As argued earlier, this will be an extension of the ENRICH model to ensure achieving the core objectives of present research. We spell out the products separately.

***Credit***

Under the programme, credit of different sizes will be offered. The problem of credit constraint as it is commonly argued against microcredit in Bangladesh will be solved. Households will be able to borrow based on their needs. Large loan size will meet the higher demand for loans that many households now have and they can contribute to developing micro enterprises. As of now, micro enterprise borrowers can borrow as high as Taka one million. Higher investment in micro enterprises and subsequent higher income will build adaptive capacity and resilience, and also create local employment opportunities.

There is high demand for informal loans for recovery after a disaster, indicating that disaster affected people do not have sufficient volume or the right type of credit from MFIs, forcing them to rely a lot on informal borrowing. The following assumptions can be tested:

(i) Greater diversity in loan product type, including purpose, terms and amounts, as well as flexibility for renegotiation of installment schedules, will reduce the reliance of households on informal lenders, enable them to increase their net worth, and better assist them in mitigating the impacts of shocks.

(ii) Small loans with zero interest can assist ultra-poor households move on to a pathway of asset building.
(iii) Emergency/disaster loans effectively expand the coping strategies available to affected households.
(iv) Longer term loans with higher ceilings can increase household net worth and contribute to resilience through investment in microenterprises, construction of disaster-resilient houses, excavation of ponds, etc.

***Savings***

Regular compulsory savings and incentive-based special savings to accelerate the pace of savings are part of the proposed programme. Under the incentive-based special savings arrangement, poor households will be required to save a maximum of Tk.20,000 in two years, and at the end of year two, the expanded ENRICH programme will add an equivalent amount. This will help poor households to be financially independent and make their living with their own investment. This scheme does not exclude them from borrowing from the MFIs. Both voluntary special savings and compulsory savings can be tested to find out whether marginal propensity to save changes under different savings schemes.

***Primary health care and micro health insurance***

Two key elements of the health care scheme would be (i) integrating insurance into a health care programme for MFI members and their households, and (ii) networking with the health care providers. The health insurance product to be tested would be incorporated into an integrated health care programme for MFI members to mitigate risks, increase acceptability of the product, as well as maximise the contribution to household resilience. As in ENRICH, primary health care will be provided to all households regardless of their economic status. The existing practice of ENRICH will be followed. Primary health services will be given at the household level – regular health check-up, addressing basic problems, health services at the satellite clinics and other facilities.

Voluntary health insurance schemes are not practicable; hence, a compulsory insurance mechanism will be implemented for all members of a specific social group. Different delivery mechanisms for the micro health insurance will be considered. If PKSF creates a Mutual Benefit Insurance Company, it could implement a community-based health insurance scheme. The community would participate in implementing the scheme. Claims committees could be formed with representatives elected by MFI members and their positions rotated.

A large investment in insurance literacy will be required. Product development has to be a continuous cycle and should comprise, among others, understanding demand and supply, inferring the willingness to join and to pay, initiating prototype product and testing, selecting partners, product finalisation and process design, pilot testing and analysis, and product rollout.

The insurance benefits may include: referrals to specialists; lab tests at concessional rates; medicines at concessional rates; capped monetary support for common hospital expenses. All family members could be covered as part of the basic policy or optionally. A hospital cash benefit (HCB) which kicks in after a specified number of days and with a maximum stay could also be optional.

Lack of reliable health service providers is a major problem that needs to be considered in product design. A network of health care providers with agreements on service pricing, including at discounted rates where possible, could be established.

***Asset insurance***

It is anticipated that the benefits of financial services will be enhanced when they are offered in an integrated manner and packaged with non-financial services for generating alternative and climate-resilient livelihoods. 'Packaged' products and services relevant to climate vulnerable areas would be developed and tested. ENRICH and PKSF's livestock fattening programme provides a good reference on how different financial services (loans and microinsurance) can be packaged with non-financial services (training, extension and veterinary services) for alternative livelihood generation. It is especially important that packaged products and services are designed and tested for saline prone areas where crop cultivation may no longer be possible outside the wet season.

Asset insurance will largely focus on housing, as loss and damages to houses is the main reason why recovery is so difficult after extreme weather events, as the survey of Sidr and *Aila* affected households has shown. Long-term credit facilities for constructing semi-*pucca* or *pucca* houses (disaster-resilient housing) in the disaster-prone southern region would be provided and housing insurance would be built into the product. In this case, asset insurance will be limited to the borrowers of housing loans. In other words, asset insurance will be a combination of credit-life and credit-asset insurance. Other ways to offer asset insurance will also be considered. Since asset insurance will be for a long period or over the period of a long-term housing loan, the premium will be kept low, but would be determined actuarially based on available data.

***Climate change knowledge***

The empirical analysis clearly shows that climate change related knowledge has strong impacts on both incremental and transformational adaptation. Therefore, increasing local knowledge on climate will be an important element of the proposed action research. Climate change knowledge includes knowledge about future climate trends and knowledge on mitigation and adaptation strategies. As we have shown, financial services facilitate adaptation; therefore, financial literacy will be considered a part of climate change knowledge. How can climate change knowledge be imparted? Our empirical analysis shows that training, media and interaction at the community level helps the community to acquire climate change knowledge. The experimental research design will implement and test a component to build climate change knowledge through the media and community-level awareness activities. The focus of climate change literacy will be on understanding climate change and its consequences, potential coping and adaptation strategies, investment decisions and other relevant issues.

***Community level action and integration with local government***

Community level action and integration with local government will take place at two levels. The Chairman of the Union Parishad will be the Chairman of the Steering /Advisory Committee. The Ward Commissioner or elected member will be Chairman of the operational committee at the ENRICH Centre. The ENRICH Centre will be the place for training, social interaction with elites and local government officials, and providing health services, and even education services for the children. Regular meeting

with the advisory committee members and elites at the ENRICH Centre will integrate all segments of the society to the whole process of expanded ENRICH. Community level actions that require actions of the local government (e.g. Union Council) will also be promoted at the ENRICH Centre.

***Education***

Children's education will be promoted through reducing drop-outs of the children from school. In ENRICH, this is being promoted through afternoon tutoring at the village level by local girls. With closer interaction and preparation for school, the phobia for school can be removed and education can be enjoyable. Basically, the proposed research will focus on ENRICH with additional components of climate change knowledge and microinsurance. All other elements as spelled-out above are elements of the existing ENRICH model.

To summarise, the elements are put in a tabular form:

**Table 58: Design of the Proposed Research in Southern Region of Bangladesh**

| Components | Design | Implementation |
|---|---|---|
| The basic design is testing existing ENRICHmodel with additional components of climate change knowledge and microinsurance in improving adaptive capacity and resilience building of the households in southern region of Bangladesh. | | |
| **Expanded ENRICH *Components*** | | |
| Scaling Up of Loan | Both traditional and higher loan size will be offered | One MFI (PKSF-PO) in each union council will be responsible for implementation |
| Special Savings | Existing practice of ENRICH will continue: incentive based savings scheme. Both regular and special savings would be tested. | The responsible PO |
| Education | Local level after-school tutoring will take place. The existing practice of ENRICH will be used. | Tutor will be appointed by selected MFI (PKSF-PO). Optimum size will be set. |
| Primary Health Care | ENRICH practice of primary health care provided by health assistant and community level hospitals or satellite clinics. | Selected MFI (PKSF-PO) |
| ENRICH Centre | UnderENRICH, ENRICH Centre is constructed. This practice will be followed. It increases social interaction and helps coordinate with local government. | Selected MFI (PKSF-PO), Advisory Committee/ Coordination Committee |
| Community Level Actions | Coordination Committee | ENRICH Centre and committees |
| Credit Life Microinsurance | Waiver of loan outstanding in case of death of borrower or spouse. | Selected MFI (PKSF-PO) |
| Credit-Asset Insurance | Waiver of loan outstanding in case of death of borrower or spouse.<br>Payment for damage to asset subject to insurance ceiling. Co-insurance would be in place. | MFI (PKSF-PO) alone in case of informal insurance. MFI in collaboration with insurance company in case of formal insurance. |
| Health Microinsurance | This would be linked with primary health care. Cash payment based insurance. Co-insurance would be in place. | MFI (PKSF-PO) alone in case of informal insurance. MFI in collaboration with insurance company in case of formal insurance. |

**Major hypotheses**

Based on the design of 'Expanded ENRICH' and our proposed dimensions of research, we formulate the following hypotheses:

(i) 'ENRICH plus' with components of microinsurance and climate change and financial literacy will make a greater contribution to economic wellbeing, adaptive capacity and resilience compared with households with access to ENRICH.

(ii) Incentive-based special savings scheme will encourage a higher marginal propensity to save than regular savings scheme.

(iii) Packaged financial and non-financial interventions will have greater impact on poverty alleviation, adaptive capacity development and resilience building than financial interventions alone, or under no invention cases.

(iv) Climate change and financial literacy improves household investment and adaptation decisions over households with no such literacy.

(v) Large loans contribute to micro enterprise development, sustainable poverty reduction, employment creation, adaptive capacity and resilience building more than regular microcredit.

**Methodology**

1. **The set of interventions would be tested through an experimental design employing randomised controlled trials.**

The interventions proposed above are based on ENRICH experiences, accumulated knowledge of best practices, leanings from Bangladesh and other countries, and an understanding of needs and opportunities within local contexts of Bangladesh. However, their effectiveness should not be assumed; rather, they should be objectively studied employing a robust research framework that enables lessons to be drawn on the effectiveness of the interventions. The knowledge that is generated can then be used for the selection of packages of interventions as well as for further fine-tuning of the individual interventions and their combinations. This knowledge can also inform the development of similar approaches in other countries. Randomised controlled trials are recommended, as they allow the impacts of an intervention to be isolated from other causal factors through comparison of comparable participants and non-participants.

2. **Randomly selected unions in southern districts are proposed for the study**

Spatial access to the services of MFIs tends to be lowest in areas most exposed to climate change impacts, yet it is in these areas where financial services are expected to be especially important for resilience building. The project sites would be selected from those unions that are highly exposed to the projected impacts of climate change, especially those exposed to cyclonic storms, flooding and salinisation of ground and surface water.

One of the requirements of RCT is application of randomness in all phases of the study so that selection bias is removed. All 12 districts in Southern areas will be the population for the purpose of the study.

Multi-stage sampling will be conducted to select unions. Four upazilas will be randomly selected from the list of upazilas. From each upazila, one union will be selected.

In the original ENRICH model, all villages are brought under the programme. However, variation in components of 'ENRICH Plus' will be made based on topographical conditions and proximity to the sea. Control areas will be limited to three villages in the control unions. The villages will be randomly selected.

### 3. Sample size and data collection

Since the experiment will be conducted over a relatively long period, it is quite likely that there will be attrition. In order to solve the consequences of attrition, sample size would be sufficiently large. As this is a common practice, all targeted households in the selected programme union will be taken into consideration. Similarly, targeted households in control villages will be included in the proposed experiment. Considering the dimensions and hypotheses, a minimum of 4,000 households including control households will be brought under the longitudinal RCT.

Data will be collected at three levels – benchmark, mid-term and final. In order to ensure quality impact of the interventions, a benchmark survey will be conducted over the targeted households in both programme and control areas covering all aspects that will be required for impact assessments. While the final design is underway, the benchmark survey will be conducted. After one year of implementation, mid-term survey will be conducted over the same households. In the last year of programme implementation, a final survey will be conducted.

### 4. Institutions to be engaged in implementation

PKSF partner NGO-MFIs (PKSF-POs) would be engaged to implementthe proposed sets of interventions, whichaim to build the resilience of ultra-poor and poor households in climate vulnerable areas by reducing poverty and enhancing capacities for climate change adaptation in an integrated manner.

In the local contexts in Bangladesh, ultra-poor and poor rural households face the dual challenges of lifting themselves out of poverty and adapting to climate change. For households these are inseparable issues. At the same time as they have to meet their day-to-day survival needs, they also have to cope with weather-related shocks and slow onset changes associated with climate change. Support services for ultra-poor and poor rural households also must tackle poverty reduction and climate change adaptation in an integrated manner. Focusing just on poverty could result in maladaptation, while focusing on adaptation could result in missed opportunities for sustainable poverty reduction.

The PKSF POs will be engaged to test the sets of interventions as,through their service delivery infrastructure, these organisations have a strong presence in villages across the study region and have established good trust relationships with local communities. Moreover, they have rich knowledge and experience in the field of poverty reduction and are now also working on climate change adaptation issues. Their infrastructure, social credentials, culture of experimentation and learning, and expertise place them in a strong position to support resilience building through an integrated approach to poverty reduction and climate change adaptation.

InM will provide technical and knowledge support in the entire implementation process.

## 5. Period of study and phases of implementation

The study will be conducted over a period of four years in the following phases:

First year: The study team/InM will finalise designing the products in consultation with PKSF and its partner organisations working in the Southern region of Bangladesh, select MFIs in different unions, prepare necessary training materials on climate change and its consequences, financial literacy, investment decisions, risk minimisation through diversification of economic activities and microinsuranceknowledge. In the first year, sample unions will be selected. Benchmark questionnaires will be designed and data collection will be completed.

Second year: Different villages will be selected for implementation of different interventions. The components will be implemented through selected PKSF POs. Close monitoring by the study team/InM will be conducted.

Third Year:In the beginning of the third year, a mid-term survey will be conducted for mid-term evaluation by InM. Implementation of the interventions will continue throughout the year. At the end of third year, mid-term results will be disseminated through seminar/workshop.

Fourth year: Project implementation will continue. In the second half of the fourth year, data will be collected by InM from the households for final evaluation and analysis of the project impacts. A final set of results will be disseminated at seminar/workshop.

## *6. Management and implementation*

The project will be managed and supervised by a Consultative Committee headed by the Chairman, PKSF and InM. The members of the Committee will be drawn from Ministries of Finance (External Relations Division), Disaster Management and Relief; Bangladesh Bank; Microcredit Regulatory Authority; Insurance Development and Regulatory Authority; Palli Karma-Sahayak Foundation; Institute for Inclusive Finance and Development; and JICA.

The basic responsibilities of the Consultative Committee will be to review the design of the research experiment, review progress, provide necessary guidelines for effective implementation of the intervention, provide policy directions, and review progress of implementation.

The implementation will be carried out under the supervision of the PKSF-IIUwith support from a Project Committee which may include services ofexternal experts, if needed. The Committee will formalise the proposal and finalise interventions and implementation mechanism in consultation with selected PKSF POs within the first year. The Committee will closely monitor the experiment at every phase, while InM will conduct the benchmark, mid-term and final (end-term) surveys, analyse the data and disseminate findings at seminars/workshops in cooperation with PKSF.

**Role of PKSF**

The experimental research project will be conducted towards a common objective of finding out appropriate set of interventions for improving adaptive capacity and building resilience of the poor households. The products that are highlighted include credit, savings, micro health and asset insurance along with credit life insurance and financial literacy. Although PKSF has implemented health

insurancein the past, it is notinstitutionalised at the PKSF level. Similarly, asset insurance will be a new product to implement in future. The actual success of'Expanded ENRICH' will thus depend critically on institutionalisation of these interventions at the PKSF level.

In view of the above, PKSF needs to consider the following:

(i) Strengthen and developPKSF Inclusive Insurance Unit (PKSF-IIU) including deploying appropriate technically trained staff especially on health and asset microinsurance;
(ii) Develop infrastructure for implementation of health and asset microinsurance within needed institutional framework such as Mutual Benefit Association or a separate entity on microinsurance promoted by PKSF;
(iii) Adopt an organised approach to climate change and financial literacy in collaboration with InM for enriching knowledge of households on adaptive capacity and investment decisions;
(iv) Initiate a process of dialogue with MRA and the Ministry of Finance to bring microinsurance through MFIs within a regulatory framework;
(v) Collaborate with national and international organisations in promoting 'ENRICH Plus', based on evidences of experimental research; and
(vi) Undertake any other activities as needed in support of the experimental project.

Furthermore, PKSF will have to take the lead role in implementing the findings and recommendations of the present study.

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# APPENDIX A

**Demographic information of population in the sample survey**

| | Population characteristics | Household head characteristics |
|---|---|---|
| Total number of population | **10,132** | **2,250** |
| ***Female population (%)*** | 48.18 | 7.87 |
| ***Marital status (%)*** | | |
| Unmarried | 42.73 | 0.44 |
| Currently married | 51.23 | 90.71 |
| Divorced | 0.42 | 0.58 |
| Separate | 0.64 | 1.02 |
| Widow/widower | 4.97 | 7.25 |
| ***Age range (%)*** | | |
| 0-17 years | 34.4 | - |
| 18-64 | 59.35 | 87.81 |
| >=65 | 6.25 | 12.19 |
| ***Education (%)*** | | |
| Illiterate | 7.48 | 13.8 |
| Able to sign only | 16.03 | 30.97 |
| Informal education | 0.45 | - |
| Adult Education | 0.06 | 0.13 |
| Not enough age for schooling | 7.6 | - |
| Class 1 to class 5 | 36.46 | 29.05 |
| Class 6 to class 12 | 29.72 | 24.75 |
| Above class 12 | 2.22 | 1.3 |
| ***Primary occupation (%)*** | | |
| Wage labour | 11.24 | 28.79 |
| Farm activities | 8.95 | 28.84 |
| Cottage industry | 0.85 | 1.64 |
| Transport | 2.74 | 7.81 |
| Business | 2.52 | 7.92 |
| Service, job, various professionals | 8.08 | 15.84 |
| Non-income generating | | |
| Domestic work | 25.18 | 4.13 |
| Student | 27.23 | - |
| Children | 7.69 | - |
| Aged people | 3.93 | 3.78 |
| others | 1.67 | 1.14 |

**Household income, expenditure and investment**

| | Amount | % of total |
|---|---|---|
| ***Source of income*** | | |
| Agriculture (Crop production, Tree plantation, Vegetable gardening) | 14,825 | 13% |
| Livestock and Fisheries | 13,793 | 12% |
| Wage employment | 33,016 | 28% |
| Business and Transport | 21,483 | 18% |
| Service, Pension | 13,325 | 11% |
| Remittance | 16,586 | 14% |
| Social Safety Net Programme | 1,388 | 1% |
| Grant from Relatives | 2,037 | 2% |
| Others | 1,273 | 1% |
| **Total Income** | **117,727** | |
| ***Expenditure*** | | |
| Food expenditure | 53,943 | 63% |
| Non-food expenditure | 31,637 | 37% |
| **Total expenditure** | **85,580** | |
| I***nvestment*** | | |
| Buying Land | 1,139 | 9% |
| House repairing/rebuild | 3,162 | 24% |
| Investment in agriculture/cultivation | 1,533 | 12% |
| Buying livestock | 665 | 5% |
| Buying vehicle | 2,429 | 18% |
| Investment in business | 3,600 | 27% |
| Others investment | 768 | 6% |
| **Total Investment** | **13,296** | |

**Physical and financial asset of the sample household**

| | Amount | % of total |
|---|---|---|
| ***Physical Asset*** | | |
| Land | 493,881 | 86.1% |
| House | 43,597 | 7.6% |
| Livestock and Fisheries | 20,247 | 3.5% |
| Business/industry/agricultural equipment | 2,298 | 0.4% |
| Vehicles | 4,051 | 0.7% |
| Furniture | 9,171 | 1.6% |
| Others | 617 | 0.1% |
| **Total Physical Asset** | **573,863** | **100%** |
| ***Financial Asset*** | | |
| Savings in MFI | 3,144 | 12.5% |
| Savings in Bank | 7,672 | 30.4% |
| Savings in Co-operative | 68 | 0.3% |
| Life Insurance | 985 | 3.9% |
| Savings in Post Office | 473 | 1.9% |
| Deposit to Other individuals | 1,151 | 4.6% |
| Prize Bond | 85 | 0.3% |
| Cash in Hand | 2,788 | 11.1% |
| Ornaments (Gold/Silver) | 8,667 | 34.4% |
| Others | 169 | 0.7% |
| **Total Financial Asset** | **25,201** | **100%** |

# APPENDIX B

We used Tobit because of some zero values of the amount of loss recovered. Let us define $y^*$ as a variable that is observed incompletely and sometimes known as latent variable. In case of left truncation, the variable $y^*$ is observed on the basis of a certain threshold. For the outcome variables considered in this study the threshold is zero. That is, $y^*$ is observable if $y^* > 0$. Generally, the latent variable has a linear relationship with the regressors including additive error term which is normally distributed with constant variance. That is, $y^* = X^{/}\beta + \varepsilon$ where, the error term $\varepsilon$ is normally distributed with mean 0 and variance $\sigma^2$. Thus, the latent variable $y^*$ has a normal distribution with mean $X^{/}\beta$ and constant variance $\sigma^2$. Finally, the observed value of the outcome variable $y$ is defined as $y=y^*$ if $y^*>0$ and y is missing if $y^*$ is either zero or negative.

That is, amount of loss recovered is observed in the model when $y^* \leq 0$. The maximum likelihood estimation method is used to estimate the parameters of the models. The original estimated coefficients which are in fact the marginal effect on the mean of the latent variable $y^*$ are not presented here since we are more interested on the marginal effect of the explanatory variable on the mean value of the actual *y*. The marginal effect is sometimes known as partial effect (Wooldridge, 2002).

The marginal effect on the latent variable $y^*$ is

$$\frac{\partial E(y^* \mid x)}{x_i} = \beta_i$$, where $\beta_i$ overestimates the marginal impact.

Whereas, the marginal or partial effect on the actual variable is

$$\frac{\partial E(y \mid x)}{x_i} = \beta_i \Phi\left(\frac{x\beta}{\sigma}\right)$$, where $\Phi\left(\frac{x\beta}{\sigma}\right) = \Pr(y > 0)$

This marginal effect considers both the effect on the mean value of the observed outcome variable and the effect of the probability that the latent variable $y^*$ is actually observed.

## APPENDIXC

The criterion function or latent variable $I_i$ that determines the $i^{th}$ household decision on access to microfinance is defined by the following selection equation.

$I_i = 1$ if $\gamma' Z_i \geq u_i$ i.e. the $i^{th}$ household has *ex ante* access to microfinance

$I_i = 0$ otherwise i.e. the $i^{th}$ household does not have *ex ante* access

Where, $Z_i$ is a vector of individual and household level characteristics that determines the household choice of access to microfinance, $\gamma$ is the parameter to be estimated and $u_i$ is the error term.

Consider the following two models:

Regime 1: $y_{1i} = \beta_1' X_{1i} + u_{1i}$ if $\gamma' Z_i \geq u_i$ (2)

Regime 2: $y_{2i} = \beta_2' X_{2i} + u_{2i}$ if $\gamma' Z_i < u_i$ (3)

where, $y_{ji}$ are the values of the outcome variables and $X_{ji}$ are the vector of characteristics including age, educational and occupational qualifications of the household head, family size, total land holdings in decimals, total income, total loss caused by cyclone, and districts, and $\beta_1$ and $\beta_2$ are vectors of parameters. The two regimes are the households with *ex ante* access to microfinance and without *ex ante* access, respectively. The criterion function determines whether a household joins in the microfinance scheme or not and two equations indicate each of the outcome variables,such as current income or savings, sale of assets, loan from informal markets and government support for two groups of households. In the selection and outcome models, it assumes that $u_i$ are correlated with $u_{1i}$ and $u_{2i}$ and have a trivariate normal distribution with zero mean vector and covariance matrix:

$$\Omega = \begin{bmatrix} \sigma_u^2 & . & . \\ \sigma_{1u} & \sigma_1^2 & . \\ \sigma_{2u} & . & \sigma_2^2 \end{bmatrix}$$

where, $\sigma_u^2$ = the error variance of the selection equation

$\sigma_1^2$ = the error variances of the outcome equations 1

$\sigma_2^2$ = the error variances of the outcome equations 2

$\sigma_{1u}$ = covariance of $u_i$ and $u_{1i}$ and

$\sigma_{2u}$ = covariance of $u_i$ and $u_{2i}$

The maximum likelihood estimation of parameters of the model (Lokshin and Sajaia, 2004) would help us to evaluate the following conditional and unconditional expectations:

Unconditional expectations:

$$E(y_{1i} \mid X_{1i}) = \beta_1^{/} X_{1i} \quad (4)$$

= Unconditional expected value of the outcome variable for programme households

$$E(y_{2i} \mid X_{2i}) = \beta_2^{/} X_{2i} \quad (5)$$

= Unconditional expected value of the outcome variable for control households

Conditional expectations:

$$yc_{1\_1i} = E\left(y_{1i} \mid I_i = 1, x_{1i}\right) = x_{1i}\beta_1 + \sigma_1\rho_1 f(\gamma Z_i) / F(\gamma Z_i) \quad (6)$$

= Conditional expected value of the outcome variable for programme households if they are assigned to programme group

$$yc_{0\_1i} = E\left(y_{2i} \mid I_i = 1, x_{1i}\right) = x_{1i}\beta_2 + \sigma_2\rho_2 f(\gamma Z_i) / F(\gamma Z_i) \quad (7)$$

= Conditional expected value of the outcome variable for programme households if they are assigned to control group

$$yc_{0\_0i} = E\left(y_{2i} \mid I_i = 0, x_{2i}\right) = x_{2i}\beta_2 + \sigma_2\rho_2 f(\gamma Z_i) / \left[1 - F(\gamma Z_i)\right] \quad (8)$$

= Conditional expected value of the outcome variable for control households if they are assigned to control group

$$yc_{1\_0i} = E\left(y_{1i} \mid I_i = 0, x_{2i}\right) = x_{2i}\beta_1 + \sigma_1\rho_1 f(\gamma Z_i) / \left[1 - F(\gamma Z_i)\right] \quad (9)$$

= Conditional expected value of the outcome variable for control households if they are assigned to programme group

where, $\rho_1 = \frac{\sigma_{1u}^2}{\sigma_u \sigma_1}$ is the correlation coefficient between $u_1$ and $u$ and $\rho_2 = \frac{\sigma_{2u}^2}{\sigma_u \sigma_2}$ is the correlation coefficient between $u_2$ and $u$.

The following impact evaluation indicators can be calculated from the conditional and unconditional expectations which help us to evaluate the impact of *ex ante* access on the outcome variable under study:

$$\Pi = \beta_1^{/} X_{1i} - \beta_2^{/} X_{2i} \quad (10)$$

= (Expected amount of the outcome variable of i$^{th}$ household with *ex ante* access)

- (Expected amount of the outcome variable of the same household without *ex ante* access)

= Expected gain of *ex ante* access to microfinance (calculated by using all households)

$$\Pi_1 = yc_{1\_1i} - yc_{0\_1i} \quad (11)$$

= (Expected amount of the outcome variable of i$^{th}$ sample programme household with ex- ante access to microfinance)

- (Expected amount of the outcome variable of the same household without any *ex ante* access to microfinance)

= Expected gain of *ex ante* access to microfinance (calculated by using sample households having PRIME)

$$\Pi_2 = yc_{1\_0i} - yc_{0\_0i} \quad (12)$$

= (Expected amount of the outcome variable of i$^{th}$ sample control household if they had PRIME)

- (Expected amount of the outcome variable of the same household)

= Expected gain of PRIME (calculated by using sample households without PRIME)

To evaluate the above expected values, the regression models were run in two phases. In the first phase, the access to *ex ante* access to microfinance is predicted by a probit model. This model finally provides us the inverse Mills ratio. In the second phase, the tobit regression model is run for the outcome variable.

## Appendix D

*Meeting notes: Philippines microinsurance exposure trip under JICA Basic Study, May 2-12, 2017.*

*InM-IGES team: Professor Baqui Khalily, Henry Scheyvens*

**Participants, Philippines side: Mr. Panfilo dela Paz, Chairperson**
**Organisation: Asian Actuaries Inc.**
**Date and time: Tuesday May 9, 9:00-11:00**
**Place: Asian Actuaries, Makati**

**Topic 1: Basic facts on insurance and actuarial services in the Philippines**

- There are ~ 30 life insurance companies and ~70 non-life (general insurance) companies in the country. The Association now has ~ 100 actuaries.
- Nearly all actuaries in the Philippines are life insurance actuaries. There may be only 1 or 2 casualty actuaries, as the general insurance companies don't think it is important for them to have an actuary on board. There is a belief here that the rates should be aligned with tariff rates that have been set by the association of general insurance companies. So there is little opportunity for casualty actuaries to do product development and pricing.
- In contrast, for life insurance different pricing is required for different products and there are no tariff rates for these products.
- Most of the general insurance companies are family owned and are not listed on the stock exchange. Not one life insurance company is listed on the stock exchange. The only listed insurance company is the Philippine National Reinsurance Company.
- The Philippine National Reinsurance Company is a private insurance company that is (or used to be) 1/3 owned by the government service insurance system, which insures government services and property, and the rest owned by 2 groups of companies. 10% of the stock holdings are listed, so are owned by the public at large.
- Over the past 10 years, most insurance products developed by the insurance companies are variable unit-linked products. With these products part of the premium is set aside for expenses, part for provision to pay for death benefit, part for managing the investment fund, and the rest is converted into a number of units, which has a given unit price. The number of units times the given unit price is the equity of the policy holder. Units can be invested in equities or fixed income or a combination of both. About 90% of new life insurance premiums is for unit-linked products. But, unit-linked insurance has not penetrated the microinsurance market.

**Topic 2: Microinsurance products and the Insurance Code**

- The most common microinsurance product in the Philippines is life insurance put out in the market by mutual benefit associations (MBAs) to cover their members.
- The product design must be aligned with the provisions in the Insurance Code covering MBAs. In brief, life microinsurance must have an annual premium that does not exceed the annual equivalent of 7.5% of the minimum daily wage for non-agricultural workers in Metro Manila. This wage is currently 491 PHP. The coverage must not exceed 1,000 times this minimum daily wage (i.e. 480,000 PHP).
- The section in the Insurance Code covering MBAs only contemplated the governance of microinsurance organisations pertaining to life insurance. They are silent on general insurance. So, if an MBA puts out a general insurance product, it must currently follow the regulations for life insurance regarding annual premium and amount of coverage.

- Some microinsurance is provided by the life insurance companies.

**Topic 3: Data for developing and pricing microinsurance products, and product design**

- The Actuarial Society of the Philippines conducts an intercompany mortality experience study, the results of which provide the basis for the Insurance Commission to develop regulations on what will be the acceptable mortality table for evaluation for reserve purposes. The Insurance Company does not regulate mortality pricing. The mortality table is updated about every 20 years. Data from the national census that takes place about every 5 years is not used for updating the mortality table. The data for updating the table may be from accumulated mortality experience.
- His involvement with microinsurance began with the biggest MBA in the country, Centre for Agricultural and Rural Development (CARD) MBA. When CARD registered their MBA formally with the Insurance Commission it was after several years of experience providing informal insurance. So, they already had accumulated mortality data over several years. CARD brought in a Canadian actuary to design and price their product using the accumulated mortality experience of CARD and the national population mortality data. Dela Paz then took over this work and continued the product pricing using the mortality data that CARD accumulated every year.
- The product design of CARD life insurance is very simple. Out of a premium of 100 PHP, 50% is set aside as member's equity, which is required by law. The investments of members' equity must be aligned with the investment provisions in the Insurance Code. The other components that the premium is disaggregated into are the components for expenses and the component for claims. The Insurance Commission says that the admin expenses should preferably not exceed 20% of the contribution. For a microinsurance company, 5% of the contribution should be set aside as a guaranty fund (this is required by law). This leaves 25% to buy coverage. So, with a premium income of 100 million, there is 25 million for provision for death claims (benefits). This is compared with the actual death claims for a year and over a couple of years whether provision for claims is sufficient or inadequate will be known. The weighted average mortality rate of the operations can also be determined. When setting up another MBA, the actuary can use the data accumulate by CARD, but must keep in mind that CARD has the advantage of a large population of clients, giving it a good spread of risk. So for life insurance under MBAs, pricing is not difficult because the data now exists.
- CARD's life insurance product is just a life product; it has no health component. CARD did venture into a micro-health insurance product, but the benefits under the product were not attractive. The product design was very basic. If hospitalised, the holder receives a fixed payment for each day of confinement in the hospital. Many holders felt that the product was too expensive and found that their claims were not accepted as one provision of the product was the exclusion of pre-existing conditions. This provision was included because the product was optional, raising the risk of adverse selection. This contrasts with the life insurance product, for which a borrower or saver is required to be covered (unless disqualified by age).
- CARD is now very interested in reviving health insurance and in providing protection against property damage caused by natural calamities. But, CARD's licence to operate is confined to providing coverage for life and accident. To provide insurance against property, CARD must either put up a separate MBA involved in general insurance or partner with an existing general insurance company.
- In order to provide property insurance, CARD entered into a joint venture with an existing commercial general insurance company to form CARD Pioneer. CARD Pioneer is classified as a regular commercial company subject to the regulation and taxes applicable to commercial companies. In the case of MBAs, they are tax free. Regardless, the limit of coverage is restricted by the provisions on microinsurance as they pertain to life insurance.

- Recently, RIMANSI requested Asian Actuaries to develop a product with coverage for property damage caused by natural calamities. We had little data, so started with the premiums charged by general insurance companies for insurance against typhoons, floods and earthquakes – natural perils. The target market for this proposed product was CARD membership. CARD Pioneer rejected this stating they felt the product pricing was too aggressive. They felt the price was too low and the risk of claims from natural calamities was too high. They had their own idea for product pricing. Nevertheless, RIMANSI is planning to test the product with their other partner clients. The actual coverage provided is very low. Property damage coverage is limited to a maximum of 10,000 PHP. (The 1,000 times the average min daily wage approach is not used). The current rate of general insurance companies for protection against typhoons is 0.05% of the amount of coverage; 0.1% for earthquake. So if coverage is 10,000 PHP, the premium would be 10 PHP. This is the general guideline issued by the Insurance Commission and pertains to structures with materials commonly found in the neighbourhood. For the light materials found in the marginalised sector, the base premium of 0.05% and 0.1% can be loaded (maybe by 3 or 4 times).

- This product will only be feasible with mandatory participation to spread risks; some parts of the country and very vulnerable, and others less so. However, CARD Pioneer rejected the idea of mandatory enrolment. The product offered by CARD is not mandatory and carries a much higher premium as a result. Asian Actuaries referred to historical data pertaining to typhoons and floods over a period of 10 years considering the worst case scenario for the pricing. A stop-loss arrangement with the Philippines Reinsurance Corporation was recommended, but negotiations with them have not yet taken place. The pricing of the product was 500 PHP per year (10 PHP/week) so Asian Actuaries felt that mandatory participation would not be too difficult to implement.

**Topic 4: Conflict with insurance companies**

- There was no real conflict between the MFIs setting up MBAs to offer insurance to their clients and the insurance companies. Insurance companies may not have opposed to the MBA provisions in the Insurance Code as the MBAs can only provide insurance to their members.
- Large insurance companies were traditionally not interested in microinsurance because of the high transaction costs and they had been doing well without it. Most of them have tie ups with commercial banks and use the branch networks to sell insurance. For the marginalised sector of society, many do not have access to banks, so premium collection, administration and claims collection may be difficult for the companies.
- The CARD type operations makes use of cell groups. The groups are closely knit and this makes collection of premiums very efficient. The MBAs have an advantage in that they can allow their members to pay premiums on a weekly basis. The collection efficiency of premium payments is about 95% for CARD. Claim settlements are fast. CARD adopts a 1:3:5 system (*explained later in these notes at the meeting with CARD MBA*)

**Topic 5: More about CARD**

- The insurance product of CARD is only available to the members of CARD. About 95% of the members of CARD are borrowers of the CARD microfinance institutions and the rest are savers with the rural/savings bank. CARD has a sister company that is a savings bank. The borrowers of the MFIs and the savers in the CARD savings bank are qualified to become a member of the MBA. The MFIs are thus the “partners” of the MBAs.
- Within the CARD group of companies there is an insurance company (CARD MBA), a microfinance company, a savings bank, and others.

**Topic 6: Reinsurance**

- For reinsurance, we start by understanding that the coverage provided by the MBAs is limited to 1,000 times the minimum non-agricultural daily wage in Metro Manila. CARD does not need reinsurance (*we find out at the meeting with CARD MBA that they do use reinsurance to cover a small amount of risk*) as the maximum benefit per person in the case of life insurance is only 100,000 PHP.
- A rule of thumb in commercial insurance for retention limit exists. When this limit is exceeded, reinsurance is necessary. As a rule of thumb the Insurance Commission guideline for retention limit is that if risk is within 0.5% of net worth, the provider can retain the risk. If the risk exceeds 0.5%, there is no legal requirement for reinsurance, but to be conservative the guideline should be followed.
- RIMANSI and its partner MBAs have asked the Philippines National Reinsurance Company to provide protection for the partner clients in the case of excessive debts arising from national calamities. To describe the reinsurance coverage in simple terms, if as a result of a national calamity the number of lost lives exceeds a specified threshold number and the amount of claims exceeds a specified amount, then the coverage provided by the reinsurance company kicks in. This is a type of excess of loss coverage. The MBAs themselves have the option of directly approaching any life insurance company for reinsurance.

**Topic 7: MBAs**

- RIMANSI has 18 MBA partners, but there are other large MBAs that are not part of RIMANSI, such as the MBAs of the armed forces of the Philippines, the public school teachers, the Philippines national police, and there are several teacher groups that have their own MBAs. Some conglomerates with a large number of employees have also established their own cooperatives that have organised themselves into MBAs. So there may be about 40 large MBAs nationwide. Some of the MBAs, e.g. of the armed forces, have mostly traditional life insurance products, but they are all required as MBAs to have a basic plan where all the members are covered (mandatory coverage). In addition to the basic plan, some MBAs develop additional products, such as endowment. The characteristics of the basic plan are constrained by law in terms of use of premiums, 50% as members' equity etc., but for the optional plans, there is no specified disaggregation of the premium. The product is governed by how the actuary designs and prices it, though it must be approved by the Insurance Commission.

**Topic 8: National health insurance**

- Health insurance is provided by the government as part of the social security system. The government has a separate organisation to provide this. Payment is a certain percentage of salary.
- There are separate social security systems for private sector and government employees. For the private sector, all companies are required to participate in the social security system for private employees. The participation is about 60%. Self-employed are also encouraged to enrol in this system. (*More information can be found in the voice recording of the meeting but is not particularly relevant to microinsurance.*

**Participants, Philippines side: Mr. Jun Jay Perez, Executive Director; Raceal, programme officer**
**Organisation: RIMANSI Organisation for Asia & the Pacific**
**Date and time: Tuesday 09 May 16:00**
**Place: RIMANSI, Ortigas**

**Topic 1: Features of RIMANSI**

- People began discussing expanding insurance to the low income sector from about 2004. Until 2006 there was no official definition of microinsurance. At that time the only MBA was CARD, which had about 260,000 members. Dr. Alip, the founder of CARD MRI, gathered a group of social entrepreneurs (basically heads of MFIs) and offered to share the CARD model with other MFIs that wanted to put up microinsurance programmes. About 8 of the MFIs agreed with the idea, but to replicate the model some organisation was required so RIMANSI was set up with this purpose. RIMANSI has retained this initial role to developing new MBAs, but its functions have expanded to policy work (working with the regulators). It is also now involved in product development, so effectively it has 3 roles.
- RIMANSI has 17 MBAs with 4.55 million members. CARD alone has 3.7 million members.
- The first product of an MBA under RIMANSI is life insurance (basic life) covering the death of the member, spouse and children, at 20 PHP/week (50 weeks collection for the year) with a maximum benefit of 100,000 PHP. The maximum age is 65. For those between 65 and 100 years of age, CARD developed a new product (*Golden Life, discussed at meeting with CARD MBA*) that is now being replicated across other RIMANSI MBAs.
- The second product is credit-life, covering the principle of the loan.

**Topic 2: Resistance from /collaboration with insurance companies**

- When microinsurance was being developed with the Insurance Commission, the low income sector was invisible to the insurance companies so there was no great opposition from them.
- As MBAs can only offer life insurance, the RIMANSI approach is to partner with non-life insurance companies to develop and sell non-life insurance products to MBAs.
- Insurance companies have more recently become interested in microinsurance as they can see the sector is robust. Some of the big commercial banks have already ventured into microfinance.

**Topic 3: Coverage in cyclone-prone areas and *sari sari* store insurance**

- CARD had a residential house insurance product. RIMANSI is now working on residential house and store insurance. Recently, with support from Canada RIMANSI developed a *sari sari* store insurance product that covers typhoon, flood and fire. The cover is only for the physical structure, not the inventory; regardless, the benefit is a simple 10,000 PHP pay-out.
- About 1 million of MBA clients have *sari sari* stores so these are the initial product target. The product is going on sale next week.
- There are several organisations involved in the product: the MBAs, CARD Pioneer, CARD Microinsurance Agency, Canada, which provided support for product development, and the sari sari stores.
- The insurance is just one part of a set of support interventions. The *sari sari* store owners also receive support on business development and if necessary they can get start-up capital from the CARD group. They are also required to save while undertaking the training programme and with their savings are encouraged to buy the insurance.
- The *sari sari* stores thus buy the product, but they will also sell it. In this relationship CARD is the principle and the stores are both clients and distributors. As distributors, the receive a commission for each product they sell. CARD Microinsurance Agency is the licensed agency that sells the insurance to the *sari sari* stores and supervisors them as distributors. (*We learn about CARD*

*Insurance Agency at the meeting with CARD MBA*)

- The annualised premium is 1,500 PHP for a 10,000 PHP benefit. The price was actuarially determined. A large study involving key informant interviews and a nationwide survey on willingness and ability to pay was undertaken that identified 10,000 PHP as the benefit that the store owners were willing to accept. The price was then determined from this. The respondents felt that about 500 PHP was an appropriate premium, but the insurer felt this needed to be higher. The 1,500 PHP is still lower than the 1,700-2,000 PHP premium for another product developed by the insurer for house structure.
- Whether the *sari sari* stores could also sell life insurance is under study.
- The whole programme is targeting assisting 1,600 *sari sari* stores, with 160 expected to become distributors.
- Where are the MFIs in this whole chain? Some of the *sari sari* store owners are members of MFIs, some are not. Insurance literacy is provided by the MFIs through the centre meetings. Loan officers can also encourage their members to buy insurance. The MFIs can be agents of microinsurance but they cannot be providers.
- As for RIMANSI, its roles have been in research and development, from which it has made recommendations on the product and pricing to the insurance company (CARD Pioneer). In the *sari sari* product, RIMANSI proposed to the commercial insurer (CARD Pioneer) to lower the price to 510 USD so that a lot of people would buy it, even from the non-calamity areas.
- Providing calamity insurance to vulnerable and less vulnerable areas requires a great deal of marketing in the less vulnerable areas. The higher the premium, the greater the marketing effort required in the less vulnerable areas.

**Topic 4: Definition and features of microinsurance**

- The definition of microinsurance was proposed to the Insurance Commission by the RIMANSI group and was adopted. This explains why the first definition in 2006 on microinsurance was skewed towards developing mutuals. Microinsurance was defined in terms of its maximum benefit (as explained to us by Asian Actuaries – initially it was 500 times the min. non-agricultural daily wage in Metro Manila, but was later raised to 1,000 times.) It is also defined in terms of the premium – 10% of the min. wage in 2006, but later in the Insurance Code change to 7.5%. This is now 491 PHP. Actual implementation of the premium is lower than the max. limit at 20 PHP/week (limit is 36.8 PHP according to above figures) as this reflects willingness and ability to pay of the poor.
- The grace period for microinsurance is 45 days, compared to 30 days for commercial insurance, to give the poor enough time to recover.
- The suicide clause is 3 years for commercial insurance and 1 year for microinsurance, i.e. a policy is payable 1 year after a suicide.
- The duration of microinsurance is defined by each product. There are life insurance products sold by pawn shops with 3 to 6 month terms, while MBA life insurance is yearly renewable with premiums paid weekly. The longest term of any microinsurance product is probably 1 year.

**Topic 5: MBAs. MFIs, co-operatives, etc.**

- MFIs had bad experiences as agents of insurance companies so came to RIMANSI to set up MBAs. The insurance companies did not honour claims or were slow to make pay outs.
- Regulation requires a mutual to have a minimum of 5,000 members with at least 5 million PHP in capital put up by the members. However, to be sustainable, RIMANSI has found that they should have a minimum of 20,000 members, and so only work with MFIs of this size and above.
- MBAs, as non-stock, non-profit corporations, are registered under the Securities and Exchange Commission, and licensed to operate as insurance providers by the Insurance Commission.

Regulation supervision is with the Insurance Commission.

- There are other players like co-op insurance societies registered by the co-op development authority and which have secured insurance licenses from the Insurance Commission.
- The 1974 Insurance Code (the original Code) provided an MBA provision, but no microinsurance provision. The microinsurance MBA was defined in the 2006 memorandum and the microinsurance provision was provided by the amendment in the 2013 Insurance Code.
- The MBAs are separate and distinct from the MFIs. The borrowers and the savers of the MFIs are micro-entrepreneurs so they are mostly not members of the "regular" MBAs (these are the large MBAs that represent specific professional interest groups). Perhaps micro-entrepreneurs are less than 10% of the regular MBA population. However, the MFI clients automatically become members of an MBA established by their MFI.
- There are about 2,500 MFIs in the country, about 50 of which are large and the remainder small local initiatives, serving 7 million members, 4.55 of which are under the RIMANSI network. MFIs can be NGOs, co-operatives and rural banks. CARD MBA is partnering with 1 CARD NGO and 3 CARD rural banks. Other MBAs are partnering with one MFI.
- As the smaller MFIs do not have MBA partners, to provide insurance some have partnered with insurance companies and co-operative insurance societies.
- MBAs have 61% of the microinsurance market share in the Philippines.
- The Microfinance Council has about 55 MFI members. They have a website.

**Topic 6: Health insurance**

- The employed pay 13,000 PHP/year for health cards provided by the health maintenance organisations (HMOs). For groups the premium is lower. Consultations are free and the benefit for hospitalisation is 150,000 PHP. There are other coverages that provide greater benefits.
- Providing micro-health insurance like that offered by the HMOs is challenging. RIMANSI starts with simple components like the daily hospital income benefit (DHIB), which is a rider of the basic life insurance plan. The idea is to give financial assistance to an MBA member who cannot do business because of hospitalisation. This product costs 450 PHP annually and provides 200 PHP per day for 15 days of hospitalisation. The product differs a little between the MBAs. When an MBA does not have the DHIB as a component of the basic life insurance plan, RIMANSI will provide the product. In order to do this, a new institution, RIMANSI Mutual Solutions, was established to facilitate non-life and health microinsurance products that MBAs cannot offer. This is the for-profit arm of RIMANSI. The idea of the DHIB is not to provide a benefit that is so high it encourages people to remain in hospital (compare 200 PHP with the daily min. wage rate of 491 PHP). The DHIB is a financial assistance, rather than an insurance.
- Social health insurance is provided by the government. The poor and employed have access to this but it covers only about 40% of hospitalisation expenses.

**Participants, Philippines side: Deputy Insurance Commissioner Dorothy M. Calimag, Atty. Juan Paolo P. Roxas, Shayne Rose R. Bulos, others from Microinsurance Division**
**Organisation: Philippines Insurance Commission**
**Date and time: Wednesday 10 May 15:00-17:00**
**Place: Insurance Commission, Manila**

**Topic 1: Industry structure**

- There are 67 Non-Life companies (18 are involved in microinsurance business) and 27 Life insurance companies (24 of them are with microinsurance). Out of the 34 MBAs, 22 are Microinsurance-MBAs.
- The dominant distribution model is through MFIs (rural banks, NGOs and coops), though there is increasing participation of insurance companies in the market. More recently, innovative distribution channels have emerged, such as through pawnshops and mobile phones.
- The microinsurance products are still largely term life, credit-life, personal accident, fire, hospital income benefit, among others, though product diversity including crop and health can be observed.
- Institutionalisation of microinsurance can be observed in the evolution of the regulatory framework and the establishment of a Microinsurance Division in the Insurance Commission in June 2015.

**Topic 2: Significance and growth of the sector**

- In 2012, the microinsurance coverage coming from regular insurance (53%) was higher than that of microinsurance (47%). In 2013, on the other hand, the coverage provided by microinsurance became higher at 55% than that of the regular insurance 45% and increase to 62% in 2014.
- In 2006, there were only 6 Microinsurance Mutual Benefit Associations (MI-MBAs) and 3 commercial companies in the market, mostly offering credit-life only. The participation grew in 2012 to 18 MI-MBAs and 18 commercial companies with a total of 199 approved microinsurance products. The number grew further in 2014 to 21 MI-MBAs and 42 commercial companies having 162 total approved microinsurance (MI) products. The total number of microinsurance coverage (lives and properties insured) was 187,000 in 2004, 19.9 Million in 2012 to 31.1 Million by end-2014.

**Topic 2: Evolution of the regulatory framework for microinsurance**

- The reasons for regulation included the growing scale of informal insurance by the MFIs; lack of scaling up of partner-agency relationships between insurers and MFIs; and lack of coordination between and among financial regulators. Prior to regulation there was little interest from companies in insurance because their business models do not fit the characteristics of the informal and low income sectors which demand affordable premiums, simple and flexible enrolment procedures, responsive products, efficient claims processes, and easy access. However, large insurance companies entered the microinsurance sector after the new regulation in 2010.
- 3 regimes of microinsurance policy and regulatory reforms have existed over a period of 9 years (2006-2015). The first regime refers to milestone regulations in 2006, the second regime to regulations issued starting in 2010, and the third regime to the most recent regulations in 2015.

**First regime**

- Insurance Memorandum Circular (IMC) 9-2006 Microinsurance Regulation and Declaration of Policy Objectives defined microinsurance as “the insurance business activity of providing specific insurance products that meet the needs of the disadvantaged for risk protection and relief against distress or misfortune.”
- IMC 9-2006 set the limit of daily premium of 10% of the daily minimum wage of a non-agricultural worker in Metro Manila. It set the maximum insurance cover of not more than 500 times of the daily wage of a non-agricultural worker in Metro Manila. It stated that microinsurance contract provisions should be easily understood by the insured, documentation requirements should be simple, and the manner and frequency of premium collections should coincide with the cash-flow or otherwise

should not be onerous for the insured.

- Responding directly to the growing informal insurance activities, IMC 9-2006 gave birth to Microinsurance Mutual Benefit Associations (MI-MBAs), a special tier of regulated insurance entities. The circular set the guaranty fund or capital requirements of MBAs that are exclusively engaged in microinsurance business to at least 5 million PHP and authorised MBAs to underwrite life products only and to offer these only to its members.

**Second regime**

- The second regime of policy reform came with four pillars: the National Strategy for Microinsurance, the Regulatory Framework for Microinsurance, the Roadmap to Financial Literacy on Microinsurance, and the Alternative Dispute Resolution for Microinsurance.
- The background to these reforms was that the government wanted to open up the market of microinsurance beyond MI-MBAs. The insurance companies were not interested in microinsurance beyond a CSR activity and many MFIs especially the coops and small NGOs did not see the MI-MBA as a feasible solution for their informal insurance activities. So, in 2009 the financial regulators, the insurance industry, the financial intermediaries and other stakeholders together formed Technical Working Groups (TWGs) that conducted series of meetings and consultations to formulate a broader regulatory framework on microinsurance and the national strategies to implement the framework.

***1. National Strategy for Microinsurance***

- The National Strategy for Microinsurance (issued in January 2010) defined the objective, the roles of the various stakeholders and the key strategies to be pursued in enhancing access to insurance of the poor. It provides directions towards mainstreaming informal insurance and insurance-like activities. It also provides strategies for the institutionalisation of financial literacy.

***2. Regulatory Framework for Microinsurance***

- In January 2010 the Insurance Commission issued IMC 01-2010 – Regulation for the Provision of Microinsurance Products and Services. The circular drew its provisions from the regulatory framework and the national strategy on microinsurance. The new regulation required claims to be paid in 10 days, set the qualifications of entities that can underwrite and sell microinsurance, etc.
- A joint IC-CDA-SEC Memorandum Circular (MC) 01-2010 Defining Government's Policies on Informal Insurance Activities, and joint IC-CDA-SEC Memorandum Circular (MC) 02-2010 Guidelines on Treatment of Funds Collected from Informal Insurance Activities were issued.MC 01-2010 defines activities on insurance that need (and need not) be formalised. It requires all entities practicing informal insurance activities to formalise their schemes by seeking authority from the Insurance Commission. It provides **several options to formalise informal schemes**. The 3 options to formalisation are 1) partner with commercial insurance companies that will provide group or individual coverage to its members, 2) have its members join a CIS or MI-MBA, and 3) organise themselves into an insurance entity such as commercial company, cooperative insurance society or MI-MBA. (One MI-MBA (CARE) was organised under option 2 to formalisation. CARE has over 37,000 members from smaller cooperatives. In 2015 an inter-agency committee was set up to systematically gather data on the extent of formalisation, which was unknown.)
- Several other circular to fill gaps on training, licensing, marketing etc. were also issued. To further provide incentives, the Department of Finance issued in 2012 Department Order 15-2012 which reduces the minimum paid-up capital requirement of commercial companies to 50% for those having at least 50% of their production in microinsurance.

***3. Microinsurance Literacy roadmap***

- The Microinsurance Literacy roadmap consisted of four key components: 1) the formulation of key messages on the role of stakeholder groups to the development of the microinsurance market; 2) the development of training and communication materials to be used by various stakeholders, 3) training of microinsurance advocates, and 4) roadshows and public seminars in key cities across the

country.Roadshows were conducted in 16 regions across the country and reached out to a variety of partners such as the local government units, insurers and intermediaries, local groups and clients. All in all, 660 staff members of authorities and the private sector were trained as "MI advocates".

***4. Alternative Dispute Resolution Framework***

- The Alternative Dispute Resolution Framework for Microinsurance (issued in October 2012) requires all insurance entities, agents and brokers who are engaged in microinsurance business to follow mediation-conciliation processes of claims dispute based on parameters of Least cost, Accessible, Practical, Effective and Timely, or LAPET.

**Third regime**

- In October 2015, the Enhanced Microinsurance Regulatory Framework through circular letter 2015-54 was published. This framework is considered an extension of the previous framework as circularised in 2010 with the purpose of filling the gaps that became more apparent as the industry matured. It establishes involvement in the business process/value chain of regular agents, general agents and brokers; provided guidelines on reinsurance of microinsurance risks; and extended the provisions of Product Bundling, highlighting accountability of lead insurer.

**New frameworks under development**

- To further improve the policy and regulatory environment, the stakeholders (government agencies, development partners and private insurers) continually create frameworks to fill the needs of the Filipino people. The three (3) new frameworks are the: Micro Pre-Need Regulatory Framework, Agriculture Microinsurance Regulatory Framework, and Health Microinsurance Framework.The Micro Pre-Need Regulatory Framework aims to prepare Filipinos on certain future events that will require financial outflow – death, old age and children's education. The Micro Agri Framework covers both standard indemnity-based and parametric-based microinsurance covering a wide range of risks. Issued through Circular Letter 2015-53 on October 15, 2015, it aims to be a disaster resiliency mechanism, creating a doorway to financial stability and business resiliency in the face of climate change.

**Topic 3: Players that entered the market and other developments**

- In 2010 the biggest non-life commercial company repositioned one of its allied companies for the microinsurance market.
- In 2012 the biggest composite company and second biggest non-life insurer have set up a new company (CARD Pioneer) for microinsurance in partnership with the largest MFI (CARD).
- MicroEnsure entered the market as a broker.
- PLEA and TREA each set up committees on microinsurance.
- Pioneer Insurance Company partnered with CARD MBA
- The Rural Bankers Association/Foundation began providing training to rural banks as agents for microinsurance. (Note that the partner-agency model in the Philippines takes the form of the insurance companies partnering with the rural banks.)

**Topic 4: The role of GIZ and ADB**

- External organisations have an important role in the development of the sector as they can facilitate processes to bring government and industry together.
- GIZ and ADB provided technical and financial assistance for development of the regulatory framework and other activities.
- GIZ established MEFIN to support the development of microinsurance regulations and the sector. MEFIN has one public dialogue to share information on regulations and another on business models and products. Its network members include Indonesia, Nepal, Pakistan, Mongolia, Vietnam and the Philippines. 13 Factsheets are available for download from the MEFIN website (www.mefin.org).

- Under APEC, GIZ has a mandate for developing a roadmap on microinsurance for Asia Pacific developing countries. The idea is to share experiences from different countries and put this into a strategy to be adopted at the APEC meeting either this year in Vietnam or next year in PNG.

**Topic 5: Experience of tropical cyclone Haiyan and how the importance of a national microinsurance programme was demonstrated**

- Typhoon Haiyan acted as a driver for microinsurance. People saw that pay-outs were being made. Microinsurance claims of more than 12 million USD were paid out to 111,000 beneficiaries. In 2014, microinsurance has contributed about 2% of the total premium production of the industry. The cost-loss ratio was high, reinsurance helped providers survive this event. The policy holders were more interested in receiving materials for rebuilding their houses than cash.
- The role of having a national microinsurance programme was evident in the way the Insurance Commission facilitated pay-outs after the cyclone. The Insurance Commission institutionalised an internal disaster response mechanism. It set up a Claims Action Centre, generated a master list of all policy and plan holders and relaxed certain requirements related to documents needed for pay-outs.
- The typhoon Haiyan experience raised some questions about capacities of insurance entities to respond after disaster, reinsurance capacity, co-insurance agreements, and intermediation. During the microinsurance month culmination event in Jan 2015, the government and various stakeholders launched the theme “microinsurance challenging the climate, responding to change” and a manifesto was signed expressing the commitments of various public and private stakeholders to advance microinsurance as a mechanism for climate change adaptation. This sets the impetus for further policy and regulatory reform.

**Topic 6: Stakeholder collaboration**

- Stakeholder collaboration, meaning collaboration horizontally and vertically across government agencies, and with MFIs, the insurance industry and other non-government stakeholders, was essential for moving the microinsurance sector forward.
- Several inter-agency committees and technical working groups composed of government agencies and industry/providers were created to establish the regulations on microinsurance. Joint circulars between the regulators (IC for insurance, CDA for coops, and SEC for NGOs) were issued.Effective dialogue between stakeholders was achieved and was essential to the progress that can be observed. The dialogue builds trust; it enabled evidence-based and proportionate regulations; and it created strong ownership to insure implementation and compliance.
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**Topic 7: Why MFIs cannot provide formal microinsurance**

- The fundamental reason why MFIs cannot provide formal microinsurance is that microfinance is governed by 1 law and microinsurance by another, and the 2 cannot be married.

**Topic 8: MBAs**

- The majority of MBAs partner with non-life companies. 21 MBAs are partnered with MFIs. MBAs still provide the largest outreach for microinsurance.

**Topic 9: Coops**

- Many primary coops have stopped and/or reduced doing in-house insurance, and instead enrolled their members to a coop-owned commercial insurance company (coop insurance society).

**Participants, Philippines side: Ms. May Dawat, Managing Director**
**Organisation: CARD MBA**
**Date and time: Thursday 11 May 10:00-12:00**
**Place: CARD MBA, San Pablo**

**Topic 1: CARD Group and outreach**

- CARD is a private sector group. CARD MRI (Mutually Reinforcing Institutions) group has 15 institutions, a number that will grow to 19 by the end of 2017. Most are involved with microfinance and rural banking. Activities of the Group also include information technology, education, property holding and pharmacy.
- Of its almost 4.2 million clients, 2.4 million are loan clients. CARD accounts for 57% of microfinance clients in the Philippines.

**Topic 2: CARD microfinance**

- CARD has 3 banks that provide microfinance amongst other services, as well as CARD Inc., an NGO that solely provides microfinance. The approach used is individual, rather than group (social collateral).
- The repayment rate is 99.57%. 86% of borrowers are women.

**Topic 3: Basic facts on CARD MBA**

- CARD MBA was the first microinsurance provide in the country. It was launched in Sept 1999 and acquired a license from the Insurance Commission in Oct. 2001. Prior to this it provided informal insurance.
- CARD MBA is 100% owned by its members. 13 of the 15 Board of Trustees are elected members of the Association. Voting takes place each year. CARD MBA is registered with the Insurance Commission and the SEC, as required under Philippines law.
- In 1994, CARD introduced insurance in its microfinance operations as its members had demanded this. Life insurance and a pension plan were provided. CARD Inc. later decided that microfinance and microinsurance should not be handled by the same organisation.
- 3.2 million of 4.2 million CARD members belong to CARD MBA.
- 12.9 million people are insured by CARD. 45% of life insurance holders in the country have their policies with CARD.
- CARD MBA is a provider of life insurance in the form of basic life, credit life, retirement savings fund and Golden Life Insurance.
- CARD MBA is a distributor of non-life insurance, namely the products provided by CARD Pioneer (Sagip plan, Kabuklod plan, CARD Care, Burial Assistance Plan and other traditional non-life insurance).

**Topic 4: Business model**

**Strategy 1**

- CARD MBA "partners" are 3 banks, 1 MFI and 21 co-operatives. These partner organisations are the agents of CARD MBA. They are responsible for marketing and promotions, selling, collection and claims settlement.
- Microfinance and microinsurance are integrated at various operation levels in a hierarchical arrangement. At the top level, there are head offices for microfinance and for microinsurance. They both have organisations at the regional (4 microinsurance offices), area and provincial levels (49 microinsurance offices). At the field level, microfinance has it centres (80,000) and microinsurance has its MBA coordinators, of which there are 1,576.
- The microinsurance coordinators receive a minimum monthly allowance and work on a commission

basis.

- CARD MBA provides a build-operate-transfer (BOAT) for its business model

**Strategy 2**

- CARD established an Insurance Agency to provide for the needs of its staff and property, etc. It seems that CARD Insurance Agency acts as an agent for insurance companies.

**Strategy 3**

- CARD has a joint venture with Pioneer Insurance Company. CARD Pioneer is the first non-life microinsurance company in the Philippines. It was established in 2013 and began operating in 2014. CARD MBA holds 47% of equity, CARD MRI 2% and the Pioneer Group 51%.
- CARD Pioneer offers calamity insurance (SAGIP plan), group insurance with fire cover (Kabuklod plan), and health insurance, as its 3 unique products. The first 2 are only for CARD MBA members. The health insurance product, CARD Care, provides a daily hospitalisation income benefit. Traditional insurance such as car insurance are also provided.
- As of 31 March 2017, the non-life policy holders totalled 927,085.

**Topic 5: Details of CARD MBA insurance products**

- The main products are basic life, retirement savings fund, loan redemption, and Golden Life. These products are designed for the members of CARD MRI financial institutions. Members must retire from CARD on reaching 70 years of age. Golden Life provides coverage for 70-100 years of age. CARD members also have access to mass weddings, student scholarships, and relief after disasters, and a regular clinic and health service.

**Topic 6: Disaggregation of premium**

- For the premium, CARD MBA is required to have a reserve of 50%. Administrative loading is 12%, claims are priced at 33% (about 27% of the insurance premium is used annually for claims) and 5% is an annual increase on the guaranty fund.
- The 12% for administration includes reinsurance (provided by the Philippines National Insurance Company), which is a very small percent of costs.
- CARD MBA funds can be a source of funding for the microfinance activities of partner organisations up to 10% of MBA admitted assets.
- A Loyalty, Reward and Experience Refund will be given to members (becomes possible after a revision to the insurance code in 2016).

**Topic 7: Relationship with other actors**

- She feels the Insurance Commission is giving its full support to microinsurance and greatly appreciates its efforts.
- She feels that RIMANSI played a key role in getting microinsurance into the insurance regulation in 2006.

**Topic 8: In-house database and data sharing**

- CARD MBA has an in-house database, which is supported by CARD's IT company. Using this, member details can easily be accessed from the Main Office, including claims history.
- CARD MBA's in-house actuary submits data on exposure of CARD members annually to the Insurance Commission.

**Topic 9: Claims systems**

- CARD MBA pioneered the 1-3-5 Day Target in claims settlement for efficient claim validation and settlement. If the dead body is not buried at the time of claim validation, settlement must be within 24 hours. If the body is buried and required documents are provided, claims must be settled within 3 days. Final action on all claims, regardless of documentation, is required within 5 days.

**Participants, Philippines side: Mr. Roger de Pedro Jr., Country Manager**
**Organisation: MicroEnsure**
**Date and time: Thursday 11 May, 15:00-17:00**
**Place: MicroEnsure, Ortigas office**

**Topic 1: Basic facts**

- MicroEnsure began its activities in Africa and has been in the Philippines for the past 10 years. It is licensed in the Philippines as an insurance broker.
- MicroEnsure does product development and backroom and customer support. It is not an underwriter, so requires underwriters to carry the risk.
- In the Philippines, MicroEnsure works with MFIs, credit co-operatives and banks.
- Its core business is under MFIs. Most are small in size with 5,000-10,000 members. The MFIs take service fees.
- 1.5 – 2 million lives are now covered on a year to year basis.

**Topic 2: Products**

- MicroEnsure provides loan risk cover and this is embedded in the core operations of MFIs. The underwriter is underwriting the risk of the MFI as a lender and the risk of the borrowers.
- It has moved from credit-risk cover to covering loss. The MFI client can now take a loan of 5,000-30,000 PHP and have a coverage of 100,000 PHP. This is a bundled credit-risk and life product. More recently, this has been linked with calamity insurance. In other cases it is bundled with weather-based index insurance and health insurance.
- These products comply with the maximum allowable benefit of 100,000 PHP in total coverage. Such bundled products may be underwritten by different insurers. MicroEnsure does the pricing and profiling for the bundled products.
- It has its own template (sheets) for constructing profiles of MFIs (we have a hard copy). This focuses on portfolio at risk (PAR).
- To be cost efficient and viable, the products offered are term (yearly) with the possibility of renewal.
- MicroEnsure is putting a lot of effort into health insurance, as the premiums of the HMOs are high.
- Because of typhoon Haiyan, the rates for flood and typhoon cover have increased by as much as 10 times.
- Weather-based index insurance is still at a pilot stage. A challenge is competing with the Philippines Crop Insurance Corporation (PCIC, attached to the Department of Agriculture) rates (public insurance) as these are subsidised by the government. Other than MicroEnsure, no one else is promoting weather-based index insurance in the Philippines.

**Topic 3: Recent developments and challenges**

- MicroEnsure is now looking at using more technology, such as cell phones. In other countries, MicroEnsure offices have partnered with telcom companies. It is now trying to do the same in the Philippines.

**Participants, Philippines side: Mr. Geric Laude, President**
**Organisation: CARD Pioneer**
**Date and time: Friday 12 May 10:00-12:00**
**Place: CARD Pioneer, Makati**

**Topic 1: Basic facts on Pioneer Insurance**

- Pioneer was established in 1954 as a private insurance company. It is 100% Filipino owned (it is not listed) and is now one of the largest insurance companies in the country. There are 4 companies under the Pioneer group.
- The aim of Pioneer is to reach all segments of the insurance market. Within Pioneer there was movement towards the microinsurance sector. Some smaller insurers had already entered the sector.
- Pioneer Insurance has 70 MFI partners and one pawnshop partner.

**Topic 2: Collaboration between Pioneer and CARD**

- In 2014, CARD Pioneer was established as a joint venture between CARD and Pioneer Insurance.
- Collaboration between Pioneer and CARD can be traced back to 2007. Through this collaboration, Pioneer was able to offer its first microinsurance product in the same year. This was the Camia Paid plan.
- The President believes this is a strong partnership because of the different yet complementary strengths of Pioneer and CARD.

**Topic 3: Products**

- The Camia Paid plan was a non-life product. This voluntary product provided a funeral benefit, personal accident cover, and 10,000 PHP coverage for calamities – typhoon, floods, earthquakes and volcanoes. For the calamity component, the focus was not on indemnity (covering the loss of property), but rather on providing assistance for recovery. The annual premium was 250 PHP. This was not costed actuarially; rather, the premium was based on an agreement between Pioneer and CARD on what they considered appropriate. The Camia Paid plan was considered ground-breaking and quite successful. 28,000 clients signed up in the first year.
- The Camia Paid plan was stopped after 3-4 years due to life claims kicking in and with the impact from typhoon Haiyan. This was replaced with the Saigip plan, a family product with "less difficult" cover. The premium is 2,000 PHP/year for family and individual cover. 2/3 of the premium is for calamity cover. The premium can be lowered by reducing calamity cover to fire only.
- CARD Pioneer provides the Kabuklod plan and CARD Care, *described above at the meeting with CARD MBA*. For CARD members, the minimum number for the Kabuklod group plan is 3, and for non-CARD members, 10.
- There are some challenges with Saigip. One moral hazard is people buying the product when they hear that a typhoon is approaching. To deal with this, CARD Pioneer initiated a stop-selling process at one point in time in 2014, though the CARD insurance sellers continued to sell the product. The stop-selling approach was thus replaced by a delayed liability approach, with liability kicking in after one month.
- For product development, the President emphasised the importance of experimentation, beginning with the needs of clients and then working backwards.

**Topic 4: Performance**

- Trends became apparent after 3-4 years of data had been collected. By 2009, CARD Pioneer had 7.2 million PHP in premiums. This had grown to 57 million PHP by 2011.
- 600,000 lives are now covered under the partnership between Pioneer and CARD.

- Though CARD Pioneer was established in 2014, we were told that it has 4 years of experience. In year 1, it incurred a 40 million PHP loss as it had no reserves and there were some typhoons. In year 2, business grew to 280 million PHP and it was able to earn a small profit. In year 3, business reached 3,581 million PHP, with 150 million PHP earned as profit. The President believes this demonstrates a business case, but he explains the going is not easy. He also foresees the possibility of returning some of the profits to the clients, if profits exceed 10% of gross premiums.

**Topic 5: Delivery**

- The microinsurance coordinators of CARD MBA are female members of CARD; they are not regular CARD officers. They receive 50 PHP per policy/plan they sell.

**Participants, Philippines side: Mr. Hiroyuki Aoki, Senior Financial Sector Specialist, SERD/SEPF**
**Organisation: ADB**
**Date and time: Thursday 11 May, 15:00-17:00**
**Place: ADB, Oritgas**

**Topic 1: Role of ADB**

- ADB tries to connect 2 fronts to promote microinsurance: the commercial insurers and the MFIs.
- The ADB invested 2 million into supporting the secretariat of the Steering Committee on microinsurance, which has wide cross-departmental participation. Under the Steering Committee, technical committees are established to address specific issues on a needs basis. ADB view this investment as a small investment for a lot of gain. Its involvement was well accepted by Congress, which was well aware of the risks households were facing.
- In working with government on microinsurance its basic principles are (i) the government creates the enabling environment, (ii) the government will not provide the services, and (iii) the government will not subsidise the products. This contrasts with agricultural insurance which is provided by the PCIC and is heavily subsidised. The services are very poor, with only 2% of the agricultural sector covered. The Department of Finance would like them to be much more efficient.
- The ADB is promoting the Philippines approach to microinsurance in other countries, though some respond that they require regulation first.

**Topic 2: Views on why microinsurance has made good progress in the Philippines**

- The formalisation of microinsurance by the government has been a great achievement. It basically formalised the informal insurance that MFIs were providing. This formalisation includes a logo for microinsurance that is issued for use product by product. The Insurance Commission is thus able to collect detailed data on microinsurance.
- A big strength of the Philippines in developing microinsurance is the close communications and working relationships that were established between relevant government departments, including BSP, SEC, CDA and DOF.

**Topic 3: Current issues and ADB plans**

- One pending issue is reinsurance for the smaller providers.
- ADB will launch a financial inclusion programme next year to support the inclusive finance national strategy. Based on a request from the Insurance Commission, this programme will focus on agricultural microinsurance.

**Topic 4: Others**

- ADB has a recent knowledge product on microinsurance in the Philippines that can be access through its website.

## Appendix E

**Philippines microinsurance exposure visit: Findings**

Insurance Structure:

- The insurance market in the Philippines comprises of multi-dimensional institutions – 27 commercial life insurance companies (24 of these companies are engaged in microinsurance); 67 commercial non-life insurance companies (18 are engaged in microinsurance business); 22 Microinsurance Mutual Benefit Associations (MI-MBAs), 12 pure Mutual Benefit Associations (MBAs) and one joint NGO-commercial insurance company (CARDPIONEER).
- Contribution of microinsurance both in outreach and premium is dominant. Of the total number of persons insured, contribution of MBAs was 29 persons. Multiple institutions offer microinsurance. But who has been playing a key role? The share of the MBAs in total MI business by the end of 2014 was 44 percent. But microinsurance is perhaps dominating in total insurance business in the Philippines. Of the total coverage, the contribution of MI was 62.47 percent.

Can Microfinance Institutions (MFIs) Offer Microinsurance?

- Some 1500 MFIs in the Philippines used to offer microinsurance to its members, as it is in Bangladesh. The journey of giving legal status to microinsurance practices started from 2006. *Under the regulatory framework, no MFIs can offer microinsurance directly.*

How Are Members of MFIs Offered Microinsurance?

- MFIs offer microinsurance services to its members through either mutual benefit associations (MBAs) or establish new insurance companies or through existing insurance companies. The issue of offering MI informally to the MFI-members was a reflection of insurance market failure. Therefore, MBAs became more effective approach.
- CARD, a leading NGO-MFI, in consultation with Insurance Commission and regulatory changes, formed CARD-MBA. The largest MBA is that of CARD; it is generally MI-MBA. Leading MFIs also followed through and adopted the model. But the MFIs with memberships of below 20,000 could not form MBAs. RIMANSI, a non-government organisation, was established to develop MI products for these MFIs. RIMANSI organised MBA in collaboration with these MFIs. Of the 34 MBAs, some 18 MBAs are under the network of RIMANSI.
- Both commercial life and non-life insurance companies also offer microinsurance generally following the principal-agency approach.
- In 2014, CARD entered into a partnership with Pioneer insurance company to establish CARD Pioneer Insurance Company to broad base microinsurance services. CARD hold 49 percent of the shares. This companies offer both life and non-life insurance products to the members and non-members. Under the non-life insurance product, the CARD-pioneer insurance offers specific amount of emergency assistance.
- The Card-Pioneer offered Camia Paid plan, a non-life product. This voluntary product provided a funeral benefit, personal accident cover, and 10,000 PHP coverage for calamities – typhoon, floods, earthquakes and volcanoes. For the calamity component, the focus was not on indemnity (covering the loss of property), but rather on providing assistance for recovery. The annual premium was 250 PHP.
- This was further expanded to bring family under the scheme.

Microinsurance products

- The microinsurance products are still largely term life, credit-life, personal accident, fire, hospital income benefit, among others, though product diversity including crop and health can be

observed.

- The most common microinsurance product in the Philippines is life insurance put out in the market by mutual benefit associations (MBAs) to cover their members. CARD MBA insurance products are basic life, retirement savings fund, loan redemption, and Golden Life. These products are designed for the members of CARD MRI financial institutions. CARD brought in a Canadian actuary and now uses a local actuary to design and price their product using the accumulated mortality experience of CARD and the national population mortality data. CARD MBA pioneered the 1-3-5 Day Target in claims settlement for efficient claim validation and settlement. If the dead body is not buried at the time of claim validation, settlement must be within 24 hours. If the body is buried and required documents are provided, claims must be settled within 3 days. Final action on all claims, regardless of documentation, is required within 5 days.
- CARD Pioneer had a non-life product known as the Camia Paid plan. This voluntary product provided a funeral benefit, personal accident cover, and 10,000 PHP coverage for calamities – typhoon, floods, earthquakes and volcanoes. For the calamity component, the focus was not on indemnity (covering the loss of property), but rather on providing assistance for recovery. The annual premium was 250 PHP. This was not costed actuarially; rather, the premium was based on an agreement between Pioneer and CARD on what they considered appropriate. The Camia Paid plan was considered ground-breaking and quite successful. 28,000 clients signed up in the first year.
- The Camia Paid plan was stopped after 3-4 years due to life claims kicking in and with the impact from typhoon Haiyan. It was replaced with the Saigip plan, a family product with "less difficult" cover. The premium is 2,000 PHP/year for family and individual cover. 2/3 of the premium is for calamity cover. The premium can be lowered by reducing calamity cover to fire only. For fire damage, the benefit cannot exceed 30,000 PHP, and for natural calamities, the ceiling is 10,000 PHP with 500 PHP deductible. The natural calamities covered include flood, earthquake, typhoon, and volcanic eruption. There were some challenges with Saigip. One moral hazard is people buying the product when they hear that a typhoon is approaching. To deal with this, CARD Pioneer initiated a stop-selling process at one point in time in 2014, though the CARD insurance sellers continued to sell the product. The stop-selling approach was thus replaced by a delayed liability approach, with liability kicking in after one month.
- Recently, with support from Canada RIMANSI developed a sari sari store insurance product that covers typhoon, flood and fire. The cover is only for the physical structure, not the inventory. The annualised premium is 1,500 PHP for a 10,000 PHP benefit. The price was actuarially determined. The sari sari store owners also receive support on business development and if necessary they can get start-up capital from the CARD group. They are also required to save while undertaking the training programme and with their savings are encouraged to buy the insurance.
- Providing micro health insurance like that offered by the HMOs is challenging. RIMANSI starts with simple components like the daily hospital income benefit (DHIB), which is a rider of the basic life insurance plan. The idea is to give financial assistance to an MBA member who cannot do business because of hospitalisation. This product costs 450 PHP annually and provides 200 PHP per day for 15 days of hospitalisation. The product differs a little between the MBAs.
- MicroEnsure provides loan risk cover and this is embedded in the core operations of MFIs. The MFI client can now take a loan of 5,000-30,000 PHP and have a coverage of 100,000 PHP. This is a bundled credit-risk and life product. More recently, this has been linked with calamity insurance. In other cases it is bundled with weather-based index insurance and health insurance. These products comply with the maximum allowable benefit of 100,000 PHP in total coverage. Such bundled products may be underwritten by different insurers. MicroEnsure does the pricing and profiling for the bundled products.

- MicroEnsure has innovated with agricultural insurance products. It has piloted index insurance with cover for flood, pests and diseases. It also piloted typhoon index insurance, which pays out according to the distance and intensity of the typhoon that passed the area. However, MicroEnsure described its weather-based index insurance as still at a pilot stage and provided no further information on its schemes. A challenge it faces is competing with the subsidised rates of the Philippines Crop Insurance Corporation.

National strategy and regulation of Microinsurance

- The Government of Philippines and the Insurance Commission realised that informal microinsurance of the MFIs is not managed based on sound insurance principles. Therefore, it might increase risk to the core business of MFIs, the credit and savings. It has inherent risk to consumer protection, risk to financial stability of the MFIs and reputation risk to the microfinance industry. Therefore, the need for regulation of informal microinsurance was recognised.
- Regulation was introduced at three different times.
- First, in October 2006, the Insurance Commission, through a series of dialogues and consultations of the stakeholders, Insurance Memorandum Circular (IMC) 9-2006 and amendement in Insurance Code to define microinsurance, declare policy objectives and allow formation of Microinsurance Mutual Benefit Associations (MI-MBAs) as a separate insurance entity to engage in microinsurance business.

- The IMC 9-2006 gave birth to, a special tier of regulated insurance entities. The circular has set the guaranty fund or capital requirements of MBAs that are exclusively engaged in microinsurance business to at least equivalent USD 235,000. It also set the limit of daily premium of 10% of the daily minimum wage of a non-agricultural worker in Metro Manila and ceiling on insurance cover of not more than 500 times the daily wage of a non-agricultural worker in Metro Manila.

- Second, the government wanted to open up the market of microinsurance beyond MI-MBAs. Technical Working Groups were constituted in 2009 with the financial regulators, the insurance industry, the financial intermediaries and other stakeholders that conducted series of meetings and consultations to formulate a broader regulatory framework on microinsurance and the national strategies to implement the framework.

- The policy reforms came with four pillars: the Regulatory Framework for Microinsurance, the National Strategy for Microinsurance, the Roadmap to Financial Literacy on Microinsurance, and the Alternative Dispute Resolution for Microinsurance.

- The Regulatory Framework for Microinsurance vide IMC 01-2010 was issued in January 2010) defined the objective, the roles of the various stakeholders and the key strategies to be pursued in enhancing access to insurance of the poor. It provides directions towards mainstreaming informal insurance and insurance-like activities. It also provides strategies for the institutionalisation of financial literacy. The new regulation required claims to be paid in 10 days, set the qualifications of entities that can underwrite and sell microinsurance, etc.

- The circular provided for thee options for formalising informal insurance. They are: (i) partner with commercial insurance companies to provide group or individual coverage to its members; (ii) organise CIS or MI-MBA with its members; and (iii) organise into an insurance entity such as commercial company, cooperative insurance society or MI-MBA.

- The Microinsurance Literacy roadmap was designed with (i) development of key messages on the

role of stakeholder groups in insurance business; (ii) the development of training and communication materials to be used by various stakeholders; (iii) training of microinsurance advocates, and (iv) roadshows and public seminars in key cities across the country.

- Third, in October 2015, a circular (2015-54) was issued to spell out the Enhanced Microinsurance Regulatory Framework. Over the period 2010—15, the microinsurance industry became more matured. The framework reflects such maturity. It establishes involvement in the business process/value chain of regular agents, general agents and brokers; provided guidelines on reinsurance of microinsurance risks; and extended the provisions of Product Bundling, highlighting accountability of lead insurer.

- Finally, to further improve the policy and regulatory environment, Insurance Commission with participation of the stakeholders (government agencies, development partners and private insurers) created the three new frameworks, respectively, Micro Pre-Need Regulatory Framework, Agriculture Microinsurance Regulatory Framework, and Health Microinsurance Framework.
- Underlying the regulatory reforms from 2010 onwards is the National Strategy for Microinsurance. It is also notable that the insurance Commission established a separate division on microinsurance.
- (Note: While a proposal to institute mandatory household and business insurance cover against natural disasters has been formulated with inputs from the Philippine Insurers and Reinsurers Association, no further information was provided on this at our meeting with the Deputy Insurance Commissioner.)

Participation of the Stakeholders

- In all phases of the development, all the stakeholders including Government, financial regulator, insurance companies, insurance regulators, MFIs, rural banks, cooperatives and policymakers were involved.

**Recommendations based on Lessons Learned**

- First, a pro-active role of the stakeholders, more particularly the lead role of the Ministry of Finance, GoB, is required to promote microinsurance, recognising several facts:

  (i) insurance companies have generally failed to provide microinsurance to low-income poor households;
  (ii) the MFIs have effectively extended informal microinsurance services to their millions of members using the insurance products (credit-life insurance, life insurance, funeral insurance, health insurance etc.);
  (iii) microinsurance should be formalised;
  (iv) alternate institutional framework should be developed to provide microinsurance formally;
  (v) Learning from international experiences will be useful in developing microinsurance framework.
- Second, a Consultative Committee on Microinsurance with representatives of Ministry of Finance, Bangladesh Bank, IDRA, insurance association, MFIs, PKSF, and professional should be constituted for dialogues and consensus on the process of creating alternate institutions for offering microinsurance.
- Third, since microfinance providers (with lending and savings) may have conflict of interest in insurance business, particularly in claims settlement, alternate institutions should be created by the MFIs within the legal framework.

- Multiple institutions should be created. The probable institutions may be as follows:
  (i) MFIs with members of not exceeding 50,000 can establish MBAs of their members;
  (ii) PKSF can create Mutual Benefit Insurance Company for microinsurance of the members of its partner organisations, particularly with the POs with memberships of less than 50,000 members;
  (iii) Microfinance members may also be organised into cooperative assurance societies;
  (iv) PKSF can take lead to partner with one major leading insurance company to establish a joint venture insurance company to offer microinsurance services to the MF members;
  (v) Insurance companies can apply principal-agent model to provide microinsurance through MFIs, mobile operators, cooperative societies, different stores and rural organisations.

- Different microinsurance products can be developed either as separate products or bundled insurance policy.

- Considering the severe outcomes of disaster like cyclone and flood, property insurance for houses or small business or income generating activities may not be feasible. Several lessons can be drawn from the experiences of the Philippines:
  (i) life insurance or credit-life insurance policy may bundle life, credit waiver, death, personal accident;
  (ii) Personal accident policy may be bundled with term life, health and emergency assistance after disaster;
  (iii) Credit-life insurance policy or personal accident policy may bundle with physical assets reconstruction;
  (iv) Family insurance, not individual insurance, policy may be developed addressing different needs of the family members;
  (v) There should be ceiling on the policy sum insured considering the average income of the low-income poor households and average amount of loss of different assets or average amount of expenditure for health and medical treatment.

- Microinsurance should be mandated for all members or borrowers of microfinance institutions.

- Government of Bangladesh (Ministry of Finance) should formulate a National Microinsurance Strategy with support from institutions like JICA and ADB. The strategy should identify regulatory framework, multiple institutions for offering microinsurance services, microinsurance literacy and participation of the stakeholders. The strategy should be aligned with national strategies on financial inclusion, disaster risk reduction and climate change adaptation.
- A Team comprising representatives of Ministry of Finance, IDRA, Bangladesh Bank, Insurance industry, PKSF, InM, MFIs, professional bodies and microinsurance experts.
- Finally, Ministry of Finance, GoB, should take the lead in initiating the process.

## Appendix F

*Meeting notes: India microinsurance exposure trip under JICA Basic Study, July17-27, 2017.*
*InM-IGES team: Professor Baqui Khalily, Henry Scheyvens*

**Participants, India side: Financial Inclusion and Development Department– 8 members including Chief General Manager-in-Charge**
**Organisation: Reserve Bank of India**
**Date and time: 11:00, 17 July**
**Place: RBI, Central Office Building Mumbai**

**Topic 1: Role of RBI and Department**

- RBI requires development through credit as well as undertakes studies on developmental economics etc. and provides related advice.
- The Financial Inclusion and Development Department is required to undertake supervisory and development activities. It is now in the process of making a national strategy on financial inclusion.

**Topic 2: Targets for banks**

- Under the priority sector guidelines developed from the 1970s all public and private banks must provide a certain proportion of financing for priority sectors. These have mostly been agriculture and small-scale and microenterprises, housing, education, etc. Small loans for those below an income threshold is also a priority sector.From the 1990s this is all competitive lending and no price gaps are placed on the banks.
- Government departments also have their own running programmes that put targets on banks, e.g. amount targeted to be lent to agriculture.

**Topic 3: Business correspondent model**

- The business correspondent model was developed as a type of partner agent model.The business correspondent bridges the gap between the branch and the village. The correspondents facilitate the access of SHGs to credit from the banks. The correspondents can receive applications for loans but cannot approve the applications.

**Topic 4: Financial inclusion**

- In 2010, RBI encouraged boards of various banks to formulate their financial inclusion plans. RBI felt that the banks should be nudged to align their business plans with financial inclusion plans.They should thus prepare both 3-year business and financial inclusion plans. For financial inclusion, RBI promoted the banks to develop credit products, savings products, remittance services (including in-country), and insurance and micro-pensions.
- Once the financial inclusion plans were prepared, RBI discussed with the individual banks. RBI required that 25% of bank branches must be opened in rural centres (tier 3, 4, 5 centre). From 2010-2015, over 15,000 branches were set up in rural centres.
- Various credit cards existed – farm credit cards. These began to grow. From 2016-2019, RBI has a set of plans to promote these.
- 230 million accounts were opened in a span of about 4 years from 2010; mostly opened by the business correspondents – mostly ICTs; others set up brick and mortar branches.
- From 2009, RBI started developing plans for covering villages with populations< 2,000. Services are now available in 500,000 of 650,000 such villages.

**Topic 5: Direct Benefit Transfers**

- There have been successful cases with DBTs (direct benefit transfers). In DBTs there is no physical contact between the bank and receiver.RBI is pushing DBTs for the LPG subsidy, food subsidy, fertiliser subsidy and employment assurance programme. Ithopes to use DBTs for subsidised loans to farmers for both investment and production credit.

**Topic 6: Self-help group bank linkage programme**

- India has 8.5 million SHGs with typically 10-15 members. Government has its own programmes promoting SHGs. Both government and NGOs are clustered in a way to aid the process of bank lending and loan repayment. About Rs. 360 billion lent through SHG bank linkage programmes this year.

**Topic 7: MFIs**

- For-profit MFIs have lent about Rs. 570 billion to peer groups. Some MFIs have converted to small financial banks; they are mandated to give small loans to people with small needs. There are differentiated licenses to support this. The small financial banks are required to provide 75% of loans to the priority sectors.
- MFI average borrowing cost is about 14-15%. The RBI 2010 policy restricts MFIs from lending out at more than 26%.50 MFIs account for 95% of the market and they are all registered as NB-MFIs.

**Topic 8: Financial literacy**

- The Centre for Financial Education, owned by all the regulators, has been established and currently has three focus areas: 1, financial literacy for people who have recently opened bank accounts (about 4.9 million accounts); 2, financial literacy for people who are involved in the financial landscape but could move onto other financial services and activities; 3, same as 2 but are encouraged to be involved in various types of investments.
- RBI financial literacy efforts also focus on schools – classes 6 to 9 mostly. There is a financial literacy exam. There are also plans for a huge media campaign on financial literacy. India has more than 1,300 financial literacy centres across the country. The target groups are SMEs, marginal farmers, etc. The Centres for Financial Literacy are being tested through links between banks and MFIs.

**Topic 9: Insurance and agricultural sector**

- India has a very large crop insurance scheme,but the agri-infrastructure that is available does not make it attractive to an insurance company to provide an affordable premium. So, the government has decided to subsidise the premium.
- The Government of India (GoI) is promoting investment in agri-infrastructure (irrigation schemes, roads, bridges, etc.) rather than supporting production credit. With this agri-infrastructure, financial services can then come into play.
- GoI has 2 large schemes on microinsurance – accident and general. RBI is working with closely the Insurance and Regulatory Authority (IRDA).
- RBI used to hold 50% ownership in NABARD. NABARD is now totally financially sustainable.

**Participants, India side: Mangesh Patankar, Underwriter, Gomathi V, Vice President, Puneet Malhotra, Underwriter**
**Organisation: Swiss-Re India**
**Date and time: 17:00, 17 July**
**Place: Swiss Re, BKC, Mumbai**

**Topic 1: Swiss Re India operations**

- Swiss Re is 154 years old. In India, Swiss Re wrote its first policy in the 1940s or 1950s. Major growth started in the 1990s when it set up a service office. It got its branch license in 2016 and now is regulated by IRDA. Before that it was writing products in its Singapore office.

**Topic 2: Agricultural insurance**

- Crop insurance was made mandatory by NABARD in terms of the banks having to insure their loan portfolios.Swiss Re reinsures PMFBY, the Prime Minister's new crop insurance scheme. Most of the income for Swiss Re in agriculture comes from this scheme. Feels that the allocation of portfoliosfor reinsurance by GoI under PMFBY is fair. Some reinsurers may not be interested in some states.

- Punjab state has not subscribed to any of the GoI crop insurance schemes, despite it being one of the largest grain producers.
- Swiss Re's approach is cat bonds and parametric cover to deal with covariate risks. Swiss Re pays out to the government or beneficiaries within 7 days. This is seen as less challenging that asking farmers to buy policies for their chickens and goats, etc.

**Topic 3: Reinsurance for MFIs**

- To reinsure MFIs (if they were allowed to provide formal insurance) Swiss Re would ask them to form a pool of their aggregate exposure. An apex body would need to be created. Swiss Re would cover some of the risk, and the MFIs would cover some based on the premium they collect.For MFIs, a tariff could be set for them to follow.
- Swiss Re reinsured one MFI portfolio in India for Basix.

**Topic 4: Activities in Bangladesh**

**Flood index insurance product in Bangladesh**

- In Bangladesh, Swiss Re designed a flood index insurance product with Oxfam. A threshold flood level was set for each village in the portfolio. The design partner was CIRM Advisory Services Pvt. Ltd. and the insurance is provided by Pragati Insurance Limited (PI). The project is implemented by Manab Mukti Sangstha, a local NGO, which holds the insurance policy. Funding was from Swiss Agency for Development and Cooperation (SDC).
- The product uses model generated flood data for payout calculation, instead of setting up new settlement water level gauges, which makes the product scalable and free from human error and tampering.The Institute of Water Modelling (IWM) developed a dedicated hydrodynamic model to generate historical water level data in the river channel and flood plains and is also used for pay outs. Different water trigger levels were set for different areas.
- Increasing pay outs are made after 11, 21 and 26 days of continuous floods.
- In 2013, households paid a premium of BDT 824 + VAT for a maximum pay out of BDT 8,000. The coverage period was Aug 16th - Sept 30th, 2013. 1,661 households were covered with a total sum insured of BDT 1,328,800.

**Discussions with PKSF on livestock insurance**

- Swiss Re discussed with PKSF the idea of it managing the fund PKSF collected from livestock insurance. However, it isdifficult for Swiss Re to get involved as the premium charged is low at 0.75%, compared to about 3% in India.

**Topic 5: Health insurance**

- Feels that Rashtriya Swasthya Bima Yojna (RSBY) (National Health Insurance Programme) is a good insurance scheme that Bangladesh can take lessons from. RSBY is a 500 dollar cover. It is suited to a context where primary health care is lacking.8 to 20 dollars was the cost for the insurance for the 500 dollar cover. Incidence rates varied from below 1% to above 15% in some states.
- Emphasised that health insurance must be structured according to the health services on the ground, i.e. whether there both primary and secondary health services.

**Participants, India side: G.R. Chintala, Chief General Manager, Kaushal Kishore, Deputy General Manager, Jaideep *Monga*, Deputy General Managerand several other offices – all from Microcerdit Innovations Department**
**Organisation: NABARD**
**Date and time: All day, 18 July**
**Place: NABARD HQ, Bandra East, Mumbai**

**Topic 1: NABARD general**

- NABARD is 100% owned by government. It receives share capital from the government. It has its own funds but also acquires about half its fund from the money market. NABARD provides wholesale lending to state governments, banks, etc. at 8-12% charge.
- NABARD provides refinance support to the banks and lends directly to the SHGs.NABARD provides support to the regional rural banks and co-operative banks.

**Topic 2: Microfinance channels in India**

- There are two main channels for microfinance in India: (1) A banking system through self-help groups under the self-help group bank linkage programme and the joint liability group lending programme, (2) Microfinance institutions. MFIs can be (1) NGO-MFIs registered under the Societies Registration Act 1860 or the India Trust Act 1880, (2) cooperative-MFIs registered under the State Cooperative Societies Act or Mutually Aided Cooperative Societies Act or Multi State Cooperative Societies Act, (3) MFIs incorporated under the Companies Act 1956/2013, and (4) non-banking financial companies (NBFC) and NBFC-MFIs incorporated under the Companies Act 1956 and registered with RBI.

**Topic 3: MFIs and MFI-Bank Linkage Programme**

- MFIs are allowed to mobilise financial resources through various means including obtaining bulk loans from banks or other financial institutions. The loans from banks to MFIs qualify for the priority sector category. NABARD previously provided financial assistance to MFIs in the form or capital/equity support to help them extend their outreach to the rural poor and leverage commercial borrowings from banks. NABARD has been extending 100% refinancing to banks towards their lending to SHGs and MFIs.
- India has a new policy of differentiated banking. Of the 50 MFIs, 10 have become small finance banks. The advantage is that they can raise deposits but cannot lend beyond 25 lakh. Their interest rates are coming down to about 19% on a declining balance.

**Topic 4: Financial literacy**

- NABARD has supported rural finance institutions improve financial literacy of various stakeholders. In one intervention it identified the most suitable product, channel and influencers for the rural poor, and planned financial literacy around these points.

**Topic 5: National Adaptation Fund for Climate Change**

- NABARD is the designated entity for implementing adaptation projects under the National Adaptation Fund for Climate Change. NABARD's role is to facilitate identification of project ideas and concepts from state action plans for climate change, project formulation and appraisal, sanctioning of fund disbursement, etc. 12 projects had been funded as of 2016.

**Topic 6: Self-Help Groups (SHGs), SHG-Bank Linkage Programme (SHGLP), and SHGs as bank agents**

- Self-Help Groups (SHGs) are community-based groups of mainly women who come together to save and lend each other small amounts of loans.The members of SHGs are mostly subscribers of the government's health and life insurance programmes.
- The SHG-Bank Linkage Programme was pioneered by NABARD over 2 decades ago. NABARD sets national targets for establishing new SHGs and how many must be credit-linked. SHGs have access to the banks and then lend to their members at a higher rate of interest. Through the SHGLP, about

74 million of these groups also have a bank account where they save and can receive larger bank loans. There are now 4.4 million SHGs with credit outstanding of more than Rs. 51,545 crore. Both total savings and outstanding credit are growing, indicating expansion of the SHGLP. Efforts are being made to revitalise the SHGLP. Emphasis has been placed on livelihood interventions for members, convergence of the SHGLP with other Government and RBI programmes, and financial inclusion and credit linkage. NABARD provides training to SHGs free of charge. The recovery rate of SHGs is about 95% and for MFIs above 99%.

- NABARD is also supporting digitalisation of SHGs. The major challenge faced by NABARD is getting the banks involved. Lack of credit history and bookkeeping may deter banks from working with SHGs. To overcome this, all SHGs will be part of a new platform that will provide real time data to bankers on SHG performance. Application forms for new loans and loan top ups will also be automated.
- NABARD has been working on microfinance for past 25 years through self-help groups. SHGs are informal and unregistered so have no legal standing, but cannot have more than 20 people. SHGs can be promoted by any legal entity. 85% of SHGs are women's groups.
- NABARD launched a pilot programme to promote SHG members as bank agents (Bank Sakhi) of rural financial institutions providing a range of financial services to their communities. A Bank Sakhi is someone who has been an SHG member involved in conducting banking and book-keeping activities of the group. As a Bank Sakhi, she provides a range of financial services on behalf of the bank to her community, with support from local SHG federation, which provides capacity development, training, and financial awareness in the community, andshe receives a commission for these services.
- Under the SHG-bank linkage programme, the NABARD district officer is a catalyst who encourages the development NGOs to form SHGs, then helps them get involved with the banks. NGOs organise the SHGs, and provides them with financial literacy and other training to function well as SHGs.NABARD gives each NGO a grant of Rs. 10,000 per SHG to support mobilisation, etc. NABARD also has a training and capacity building programme for the NGOs.Some state governments have taken on the role of the NGOs and set up SHGs.
- There are now 9-10 billion dollars of credit from banks to the SHGs. About 5 million SDGs have received credit from the banks without any collateral.

**Topic 7: Joint Liability Groups (JLG)**

- Joint liability groups are SHG members who became relatively well off after a few years and now want access to larger amounts. The JLG model has been implemented since 2004. NABARD's role is awareness creation and capacity building of stakeholders and JLG members. There are now 2.2 million JLGs now entirely anchored by NABARD.
- An informal group of 4-10 individuals avail a bank loan either as individuals or a group against a mutual guarantee. They can access larger credit than SHGs as the credit limit is not linked to savings. The interest are is about 14% and there is a ceiling on the loan amount; usually, Rs. 100,000 is allocated per member when deciding the loan amount.

**Topic 8: Loans to farmers**

- Because of NABARD, farmers get loans at 4%. Nearly every farmer in India has a credit card developed by NABARD.

**Topic 9: Various government schemes**

- Prime Minister's Housing Scheme: The Prime Minister's Housing Scheme aims to guarantee each citizen a permanent pucca house. The government gives a subsidy and then the banks will give a loan at about 10%. India has a national housing bank.
- Members of SHGs are mostly subscribers of thePrime Minister's Life Insurance Scheme and Health Insurance Scheme.There is also a Prime Minister's Accident Insurance scheme (Rs. 12 per year for Rs. 50,000 cover).These schemes are all developed by the government but delivered by the banks.

- APY is the Prime Minister's pension programme. Payment is made up to 60 years payouts received until death. This is managed by the Pension Fund Regulatory Authority.

**Topic 10: Hopes for the future**

- The number of SHGs should rise to 15 million and thecredit linkage of groups should grow from 50 to 80%. A seamless database should be in place providing real time data on SHGs to banks.

**Participants, India side: About 13 members of MAVIM Community Managed Resource CentreOrganisation: Community Managed Resource Centre supported byMahila Arthik Vikas Mahamandal (MAVIM)**
**Date and time: Afternoon, 18 July**
**Place: MAVIM office, Maharashtra**

**Topic 1: Background and overview**

- Mahila Arthik Vikas Mahamandal (MAVIM) is the State Women's Development Corporation of the Government of Maharashtra, established in 1975 on the occasion of International Women's year. MAVIM has been declared as a Nodal agency by the Government of Maharashtra in 2003 to implement various women empowerment programmes through SHGs.
- MAVIM's objectives are: To organise women through Self Help Group; To build the overall capacities of women; To enhance self confidence amongst women; Entrepreneurial development of women; To synchronise employment opportunities and market linkages; To promote women's initiative for equal opportunities, prosperity and participation in governance; To build grassroots institutions over SHGs as a way forward to sustainable development.
- MAVIM supports 8,851 VLCs, 310 Community Managed Resource Centres (CMRC), and 97,301 SHGs with 1,181,804 members across the state (figures may need to be updated). It accounts for 20% of SHGs in the state.
- MAVIM is implementing various state programmes through SHGs, including the Convergence of Agricultural Interventions in Maharashtra (CAIM), under which SHGs get access to village tool banks.

**Topic 2: CMRCs and SHGs**

- CMRCs are essential federations of SHGs within one block.
- Within 5 years 80% of the CMRCs have become sustainable. The CMRCs impose a service charge on their member SHGs ofRs. 1,000 to Rs. 2,000 per year. Other income sources for CMRCs are member fees, bank linkage/payout from banks, the Microlivelihood Plan (MLP) and other state programmes, and other sources (interest and training).
- Every year the CMRC makes a bank credit plans and organises the bank linkages for this. They monitor the loan status of all the members. The CMRCs develop a business plan as MAVIM has an exit strategy after 8 years.

**Topic 3: Features of the CMRC visited (descried by** CMRC "bharari" manager)

- This CMRC has 170 SHGs. Itshuman resources are a manager, accountant, area coordinators, 34 community resource persons, a bank mitra (laisse with the bank), amongst others. The CMRC covers 34 villages, 391 SHGs with 4,996 SHG members, and enjoys a repayment rate of 98%. The geographical coverage is one block –25 km radius.

**Participants, India side: Dr Medha Purao Samant, Founder Trustee, Sujata Bhat, Finance and Liaison officer, 3 field staff, and other officers**
**Organisation: Annapurna Mahila Co-op Credit Society Ltd.**
**Date and time: 11:00, 19 July**
**Place: Annapurna office and nearby slum, Pune**

**Topic 1: Background and overview**

- Annapurna Pariwar is a group of five organisations working in slums in Pune and Mumbai since 1993. Of these five organisations, Annapurna Mahila State Coop Credit Society provides small loans to poor groups of self-employed women and men, while Annapurna Pariwar Vikas Samvardhan (APVS), or the Community Social Protection Programme, is responsible for microinsurance and pension schemes.
- Why credit centric approach? Annapurna is a credit centric as the chair started from a banking background. The board members are mostly also from banking backgrounds. Also, people are interested in credit from the very beginning and later it becomes possible to promote savings and insurance. It is hard to sell insurance policies to the poor.
- Why mutual model? Annapurna is not regulated by IRDA but would like to be as it could increase recognition. It hasno interested in being registered as a small finance bank as it would not serve the poor, nor as a co-operative bank, as this would require payment of income tax, maintaining CCR, etc. as required by IRDA.SEWA, the first MFI bank in India, set up its own insurance company with IRDA which needed Rs. 100 crore. So for an NGO, it is better not to work as an insurance company. An NGO in India can be a business correspondent for an insurance company, but this is not attractive – the NGO collects the money from the premiums and passes some over to the insurance company.

**Topic 2: Financial sustainability**

- Several banks provide Annapurna with credit. The borrowing rate is usually 11-15.5% and Annapurna lends to members at about 25%; lesser rate for higher amounts (about 22%).Return on assets is 2%. Return on equity is about 20%. OSS is about 12%. FFS is maybe 10%; need to confirm. The CGAP model calculates these ratios. The last premium pay out to members was 20%.
- Insurance: There are about 40 claims from Pune and 40 from Mumbai for death of family members every month. So of Rs. 60,000 (230,000 household members) members there are 80 claims per month. Around Rs. 4 lakh is received every month as premium (claim payable was Rs. 77,000 in June 2017). The closing balance is Rs. 2,141,010. The policy renew ratio is 75%. The claim ratio is 45%.
- Positive trends in member growth and portfolio growth can be observed over the past 15 years.

**Topic 3: Microfinance Programme**

- 11 branches are located in Pune and 10 in Mumbai.All are located in the slum colonies.
- Women are formed into joint liability groups of 5 people. This joint liability approachcomes from the cooperative principle that everyone should have a share before they take a loan. They cannot enter a new loan cycle until all have paid off the loans. The advantage of taking a loan from a group is peer pressure and peer support.The group mentality is carried forward to the microinsurance. Meetings are monthly.
- There are SOPs for selecting groups. 90% of beneficiaries are women.
- 8% of each loan instalment amount goes into a savings account that earns 6% interest. This credit-linked savings is paid when the outstanding loan is paid off. The groups can withdraw from Annapurna after repaying their loans and then get access to their group savings. Unless they leave Annapurna, they cannot get access to the savings. About 500-600 groups withdraw a month. There has not been a situation where many people desperately want to withdraw their savings, so

Annapurna sees no need to change its compulsory savings system.

- There is also a voluntary savings programme with 10% interest. Any amount can be saved and withdrawn at any time. Total savings are 30% of loan outstanding (about Rs. 30 crore loan-linked savings and Rs. 4-5 crore voluntary savings). About 50-60% of members have voluntary savings. Share money is refunded at end of each loan.
- Starting loan is Rs. 20,000 with max.ofRs. 100,000, but can go beyond this for SMEs (up to about Rs. 1.5 lakhs).75% of loans are for microenterprises (the minimum requirement set by RBI); the rest may be for education, consumption, housing, etc. Loan utilisation checks are conducted.

**Topic 4: Community Social Protection Programme**

- In 2003, Annapurna Pariwar Vikas Samvardhan (APVS) was set up as a not for profit company owned by the borrowers of Annapurna Mahila State Coop Credit Society, whose representatives are on the management committee. APVS aims to empower poor self-employed women and their families by providing a comprehensive package of micro health, life and family insurance and pension services, along with health care services.
- Every year mortality is monitored and an actuary reviews this. He has prepared a mortality table with 13 years data for Annapurna.
- While the Credit Society provides credit to members, APVS enrols members from the families of the borrowers in the community-based health insurance scheme.
- APVS manages three insurance products and 1 pension product.
    1. Health microinsurance is compulsory and is exclusively for all loan borrowers of the Coop Credit Society.Membership of the immediate family is encouraged but is voluntary.
    2. Life microinsurance is also compulsory for all borrowers. For a contribution of Rs. 50-825 per loan (depending on loan size and repayment period) outstanding loan amount is waived and the nominee receives a payment of Rs. 15,000 on case of natural or accidental death. The borrower's savings is also paid to the nominee.
    3. Family insurance is also compulsory for all borrowers. The premium for family insurance is standardised at Rs. 90 regardless of loan size. The thinking is that everyone is equal and that mortality is similar regardless of loan cycle. Financial assistance of Rs. 1,500 in the form of food, clothes and utensils is provided at the time of accidental loss of assets.
- There are exclusions, e.g. suicide, and if a person starts a fight and is injured.

**Topic 5: Health insurance product details**

- The health insurance scheme was developed with actuarial guidance from MACIF and Inter Aide, France. Technical support including underwriting of claims was later provided by UPLIFT.
- Under the APVS, health cards are provided to each member on enrolment with a family photograph and family information. This is used at the time of hospital admissions to get appropriate concession.
- A Health Care Providers' Network is created by signing an MOU with hospitals and health care providers. This helps obtain quality health care at lower costs for members. The MOU includes health care quality, discounted rates and premium services to members. Medical officers verify the claims and if required they call the network hospitals to check whether concessions as per the MOU were given.
- Eligibility: Client who takes a loan, with spouse and children covered; in laws can be covered; parents of member can be covered when living with them.
- Premium: 1 or 2 people – Rs. 150/person; Rs. 120/person for 3 people and above. Is paid to the fund of the respective branch (each branch has own fund). Exists for duration of loan to a maximum of 12 months. Automatic renewal for loans more than 12 months (deducted from savings account) with new health card issued.
- Services offered besides claims: 24/7 help line, with a doctor each stationed at the Mumbai and

Pune offices (Note: There is no group meeting where training on health care is given. Annapurna tried this earlier using flash cards and other techniques but people do not have so much time to spend at meetings.); Referrals to specialists; Lab. tests at concessional rates; Medicines at concessional rates; Education. A Medical Officer visits each branch once a month and plans "guidance centres" where members can receive check-ups and medical guidance.

- Maximum coverage:
  - Rs. 2,500 for 1 day treatment; Rs. 5,000 for general ailments; Rs. 7,500 for major ailments; Rs. 10,000 for very major ailments; Rs. 15,000 for most serious ailments
  - Health Care Providers: Public network hospital – 100%; Network private hospital – 70%; Emergency in out of network hospital – lesser of Rs. 15,000 or 70%.
- Exclusions: Pre-existing conditions of new members are not covered.
- Claims processing:
  - Specially appointed Service Executives in each branch office collect the claim papers and send them to the Head Office for processing.
  - The claims are encoded using specialised software and claim decision sheets are prepared. The software provides an integrated system for MF, insurance, etc. 10 staff are assigned to the all-female software division. The software was designed in house with guidance from the actuary on what type of data was required.
  - Member representatives (CRs) are elected for terms of 2 years once a year at the Community Meetings. 161,600 members elect 70 CRs. CRs receive training on rules for settlement and on use of the software which shows how much collected premium there is. The CRs do not receive the names of the claimants. They meet once a month in Pune and Mumbai. The CRs assess and take decisions on loans and claims every month, referring to the claim decision sheets.
  - Once claims are approved, the payments are given out by the CRs at the community meetings held monthly in every branch office
- Settlement period: Claim settlement is within 60 days.
- Management Information System: Members' information is recorded and maintained in a MIS using specialised software developed in house an all-women software team.
- Claim Fund: The Claim fund is earmarked for payment of claims and is deduced based on actuarial calculations. Any left over money after paying claims goes into a Reserve Fund and the community can decided whether to appropriate the profit or keep it for future possible shocks.

**Topic 6: Analysis of the health scheme**

- One study surveyed 100 members to gauge the impacts of the health insurance product. This survey found most of the members to be women from minority religions and backward castes, a significant number of whom are illiterate. More than half live in rented houses. The study concluded that the scheme was effectively reaching vulnerable households in the urban slums.
- An ILO study found Annapurna's health products to cover more medical expenses, have stronger links with other interventions, and to have been in operation for a considerably longer period than comparable products of other providers.
- Two studies by MicroSave in 2012 and 2013 found the APVS programme to be a unique self-sustainable programme having potential for further scale up. MicroSave concluded that the level of product customisation and detail cannot be replicated without proper market interaction, but that the product details and their justification provide guidance on how such products should be. It found the APVS product to be designed by high actuarial standards and that fund management is done in a sound way to ensure long term continuance of the programme.
- A study by an Assistant Professor, Dept. of Economics, FLAME University, Pune found APVS to have self-sustained its operations for the last 12 years, with growth in reserves and surpluses and a good

number of dependents voluntarily enrolled in the scheme.

**Topic 7: Awareness and training**

- Why no skills training? Livelihood training is not provided as Annapurna feels it is not necessary for urban slums. Also, at one time training on beauty parlours and other livelihoods was provided under another organisation that they set up in about 2010 but this was found not to be sustainable.
- Awareness and training methods:
  - Training of field staff: All staff undergo 1.5 day training programmes conducted by the in-house managers
  - Training of clients: This is mainly done through the field staff. Financial literacy training is provided through a video produced in-house. Community monthly meetings are also a time for providing training, e.g. on loan portfolio, on insurance, on loan sanctioning and insurance claims. Training on health is provided through the disease-specific pamphlets.
  - Videos: Annapurna produces videos in-house that it uses for training the members. Group members are invited to the branch office every month, a video is shown, and then guidance is provided. It has produced videos on excessive borrowing, group importance, investing in business, etc. The videos have been found to be very effective and are always followed by Q&A.

**Topic 8: Importance of HR management**

- Field staff comes from a variety of academic disciplinary backgrounds; they are not just from banking.
- For everything there is a manual so everyone knows what needs to be done. Everyone has a clear job description and this is used for their performance evaluation. Can refer to "Report on Human Resource Practices in Microfinance Sector."

**Annapurna Head Office, Pune**

**Women's joint liability group attended by field staff, Pune**

**Participants, India side: Shri B.K. Datta, Deputy Secretary, Nishant Jain, GIZ**
**Organisation: Ministry of Health and Family Welfare**
**Date and time: 11:00, 20 July**
**Place: Ministry of Health and Family Welfare, CP, New Delhi**

**Topic 1: Health care in India and the birth of RSBY**

- Health in India is managed by the state governments. Since independence, the system has been supply side driven – setting up hospitals from village level upwards – with efforts to try and make it free. But, OOP payments remain high, so GoI looked for alternatives. This is when insurance came into the picture.

- In early 2000 there was some experimentation with micro health insurance but it was not successful. A product was designed and given to the insurance companies to implement but with no oversight they made lots of money and the scheme was not effective.
- In 2007, the PM announced a new national health insurance scheme, Rashtriya Swasthya Bima Yojana (RSBY), which was launched in 2008. RSBY is a health insurance scheme for families below the poverty line and specific groups of organised workers with the objectives to reduce OOP expenditure on health and increase access to health care.
- The scheme was given to the Ministry of Labour, despite the fact that they had no experience with insurance or health. It included organised labour to justify their role. On the positive side, as the Ministry of Labour had no experience with such insurance, it could start with a clean slate and carried no baggage. In April 2015, the Ministry of Health and Family Welfare took over management of the scheme.

**Topic 2: Objectives of RSBY**

- RSBY has two objectives:
  - To provide financial protection against catastrophic health costs by reducing OOP for hospitalisation
  - To improve access to quality health care for below poverty line households and other vulnerable groups in the unorganised sector
- RSBY aims to cover 70 million households by the end of the Twelfth Five Year Plan (2012-17).

**Topic 3: Main features**

- The main features of the RSBY service delivery model are demand financing, freedom of choice among accredited government and private hospitals, and cashless service reimbursable to the provider on pre-determined package rates on a family floater basis.
- The scheme is cashless, paperless and portable:
  - As the mandate for design was to focus on poor families,it was decided that the scheme had to be cashless; not a reimbursement scheme. This was not such a challenge as there are many cashless schemes.
  - Another idea was to have a paperless scheme as many people are illiterate.
  - The scheme also had to be portable, as people travel a lot across the country and they should not lose access to services if outside their home state.The solution was a biometric smartcard given to each family. Using this and an IT system, the scheme became paperless and portable.
- The IT scheme was found to be very useful. The participating hospitals are required to send real time data to the Ministry. Internet connectivity is not required as the smartcard has a finger print and this can be checked against the actual print when someone visits the hospital. The IT system can thus work in an offline environment.
- Fraud and other abuses happen more in outpatient as one cannot check whether the person actually sees the doctor, so it was decided that the scheme would focus oninpatient, where OOP are much higher.Benefits are only received when the insured becomes an inpatient, though free consultations are provided.
- The insured have the freedom to choose between public and private hospitals.
- This policy is generally for a year and enrolment needs to be repeated at the end of each term.
- The scheme includes a grievance mechanism for any of the stakeholders to raise a complaint against another stakeholder (described at http://www.rsby.gov.in/how_works.aspx)

**Topic 4: Implementation framework**

- The scheme has been designed as a business model for a social sector scheme with incentives built for each stakeholder.
- Building the institutional structure was found to be very important as experts are needed in various

fields. Many guidance documents were created by the Ministry toguide institutional development, includingguidance on who should staff the state nodal centres, how to deal with claims, etc.

- The scheme was designed to be implemented by for-profit insurance companies selected through open market tender. The premium then is determined by market forces, not by the design. The amount government will pay is capped but the cap has never been reached.
- Every state had to set up a state nodal agency to manage the scheme in the state, though the scheme itself is implemented by the insurance companies. The insurance companies would get the list of each family per villages, then would have to go to the villages, meet the families and make the biometric card on the spot. A government officer verifies each family when the card for them is created. There are lists across the country where eligible people are identified through means testing.

**Topic 5: Insurers**

- State governments through a competitive public bidding process selects a public or private insurance company. All the bids that are technically qualified go to the financial evaluation stage. The insurer with the lowest financial bid is then selected for providing health insurance in the state for a particular district/ cluster of districts. The financial bid is essentially an annual premium per enrolled beneficiary family.Each contract is specified on the basis of an individual district in a state and the insurer agrees to set up an office in each district.
- The selected insurance company prepares an enrolment plan in consultation with district authorities and enrols the listed families at village level enrolment camps as per the plan. At enrolment stations, one photograph of the family head, one photograph of the family and a finger print of each of five members of a listed beneficiary household gets captured through an enrolment kit consisting of a laptop, a smart card printer, a thumb reader and a camera. The beneficiary smartcard is printed at the enrolment site and handed over to the family, after collecting the registration fee of Rs. 30per card.
- The insurer is paid a premium for each household enrolled in RSBY. Therefore, the insurer has the motivation to enrol as many households as possible from the eligible (below the poverty line) list.
- The incentive for insurance companies is that they can show rapid growth in the number of people they have covered. The scheme also generates a lot of data that insurance companies can use to price their products. It also increases their outreach to village level, whichmay help them sell their crop insurance and other products. IRDA has put up a target for each insurance company to do business in rural areas so this is another motivating factor for insurance companies to participate in RSBY.
- The scheme is mostly implemented by public sector insurance companies, though private companies are also participating. Private companies are not prepared to operate in some states. A few states decided to pay hospitals directly, rather than engaging insurance companies.
- Problems with the insurance companies have included not giving cards to the proper people, rejecting claims unfairly etc. These problems aroseparticularly when the states bided aggressively so had to cut their operating costs to be profitable.
- Several measures were put in place to control the insurance companies.A clear guideline was created for claim rejection. Under the IRDA guideline, the insurance company must pay the hospital within 30 days, otherwise it is charged interest on the payment. Some states set up a committee to discuss all rejected claims with the insurance companies. Some states have set up IT systems where they receive the data for claims settlement. There is also a clause in the tender document that states that the insurance company can only employ 30% of the premium for operating expenses. IRDA has estimated that operating and administration costs for insurance companiesamount to about 18%. So the Ministry decided on 30% as it gives companies a profit of about 10%.
- If the claim ratio is less than 70%, the insurance company must repay the difference to the

government. The insurance companies thus have an incentive for settlement. Some states have raised the ratio in their own schemes to about 80%.

- The public sector insurance companies can contract Third Party Administrators (TPAs) to implement their insurance scheme. The states can have a constant check on the TPAs and in such cases the schemes are running well.

**Topic 6: Hospitals**

- After the insurance company is selected, they need to empanel both public and private health care providers in the project and nearby districts.Not for profit hospitals and trust hospitals are part of the network. The empanelled hospitals should install necessary hardware and software so that smart card transactions can be processed, and a special RSBY desk with a trained staff. The insurer must provide a list of RSBY empanelled hospitals to the beneficiaries at the time of enrolment.
- Rates were prepared for each type of surgery and hospitals had to agree to provide services at that rate only. The rates are 30 to 40% less than the market rates and are based on marginal costs. Costs are developed on the assumption that a hospital has an unused bed and capacity to extend its services.
- Rates are now fixed for approx. 1,500 conditions (surgeries). For medical conditions, such as dengue fever, a daily amount was set. There is one rate for "general"and one for ICU. The rate covers the medical expenses, bed, food everything.
- A hospital has an incentive to provide treatment to a large number of beneficiaries as it is paid per beneficiary treated. Even public hospitals have the incentive to treat beneficiaries under RSBY as the money from the insurer will flow directly to the concerned public hospital which they can use for their own purposes.
- RSBY is thus a source of earning for the hospitals. Health care is free at public hospitals, but RSBY provides extra income for the hospitals, which they might use to upgrade their facilities, increase wages, etc.
- Claims in the beginning were 4% from private hospitals but later rose to 42% (under the scheme 40% of hospitals are private and 60% are public).
- Initially, some public hospitals were not happy with the scheme design because they were overloaded and were happy for people to go to private hospitals. Others were the opposite. Support for the scheme grew once the public hospitals could see the income they were receiving for providing treatment.
- Insurers are expected to have an incentive to monitor participating hospitals in order to prevent unnecessary procedures or fraud resulting in excessive claims.If there are problems with a way a hospital is implementing the scheme (e.g. overcharging, unnecessary surgeries, etc.), there is a provision for the state government to blacklist the hospital.
- A risk is that individuals in the insurance companies and the hospital and the beneficiaries all collude. Another risk is fraud where the hospital charges a higher fee than it should but the individual is illiterate and is not aware of this.
- The government has removed 400 to 500 hospitals from the network because these practices were found.
- If hospitals are not available, it is hoped that RSBY might provide demand for hospital services that leads new hospitals to be set up in remote areas or to increase their number of beds, etc. However, there is no proper synchronisation of supply side and demand side reforms.

**Topic 7: Intermediaries**

- The inclusion of intermediaries such as NGOs and MFIs benefits the scheme as the intermediaries

have good access to the target group. Their incentive is payment for the services they render in reaching out to the beneficiaries.

**Topic 8: Cost and reach**

- 0.04% of GDP is spent by the government on premium subsidies for RSBY. Including the funding from state governments brings this to about 0.05%.
- The scheme is voluntary for the states. At its largest, the scheme was implemented in 26 states but now is implemented in 15. Many states started their own schemes.29 out of 36 states are now implementing RSBY or their own schemes.
- 53% of the target group in participating states is under RSBY. 6-8% of enrolled people have received treatment annually. The RSBY website shows there are 41,331,073 active smartcards and hospitalisation cases have reached 11,841,283, as of 31 03 2016 (http://www.rsby.gov.in/Overview.aspx).

**Topic 9: Premium and benefits**

- A registration fee of ~Rs. 30 is paid for each card. The government pays the premium. The central government pays 75% and the state governments 25%, but for North Eastern States and Jammu and Kashmir the ratio is 90:10. The scheme is fully subsidised for the poor and most of the labour classes, but taxi drivers must pay half the premium.
- The premium was initially 10 dollars per family of 5 for 500 dollars (Rs. 30,000) cover. Premiums have been coming down. The premium is now less than 5 dollars.
- As there was little data on what to cover, it was decided that everything up to 500 dollars, including pre-existing conditions, would be covered. Exclusions are few. They include suicide and maternity.

**Topic 10: Plans/ideas for the future and for improvement of the scheme**

- The hope is to make RSBY more attractive in terms of benefits and to expand from 110 million to about 500 million people covered. While the states have their own organisational structures for RSBY, the central government has no comparable structure. To support expansion of the scheme, there is a plan to set up a national health authority.
- Would like to go beyond inpatient health care to also have primary care to ensure that there is a continuous system of health care.

**Topic 11: Factors for success and lessons learnt**

- The scheme did well when there was commitment from individuals at the higher levels. Otherwise even with the institutions in place it did not perform well.
- People are not familiar with insurance, so their awareness was found to be critical to the success of the scheme. Awareness of the grievance mechanism is especially important. Awareness was raisedthrough face-to-face meetings (SHG meetings, etc.) and use of mass radio.
- Impact studies show people enrolled in RSBY have much greater access to health care services. OOP are also lower for those enrolled in RSBY, though this varies across states. Factors determining state level performance include governance and commitment from the highest bureaucratic levels (some are providing additional packages above what is offered by RSBY).
- Legalising the health insurance scheme through an act can make it difficult to make changes so it is best in the first years not to have an act. For long-term sustainability, once a robust design is in place it is good to have an act supporting the scheme. The learning before an act is introduced is important. Looseness in the act to allow flexibility to change the scheme is also important.

**Topic 12: Findings of MILK study on RSBY**

*This topic was not discussed but the information is included in these notes as it is relevant to understanding the strengths and weaknesses of RSBY*

- MILK Brief #26"The Business Case for Health Microinsurance in India" examines the sustainability of RSBY. Its findings include:
  - The emergence of RSBY is having a competitive impact on private health microinsurance programmes, forcing them to consider offering complementary services.
  - RSBY and other older government supported schemes, such as Yeshasvini, achieve scale well beyond what the private health microinsurance programmes have. However, subsidies appear to drive higher loss ratios than those seen in non-subsidised programmes. Also the publically supported programmes have little or no outpatient benefits.

**Participants, India side: N. Srinivasa Rao, Economic Advisor**
**Organisation: , Department of Financial Services, Ministry of Finance**
**Date and time: 15:30, 20 July**
**Place: Ministry of Finance, CP, New Delhi**

**Topic 1: Origin of financial inclusion in India**

- Financial inclusion in India began from about 2000 onwards. Thefirst aim was to have everyone involved in banking. Linking the banks with the SHG movement was a major breakthrough for getting the vulnerable into the banking system. So financial inclusion really began with the SHGs. Then policy evolved to require banks to establish rural branches.
- Pradhan Mantri Jan-Dhan Yojana (PMJDY) began in about 2013 and was a paradigm shift that allowed anyone to open a bank account and be part of the banking network.

**Topic 2: National Mission for Financial Inclusion (PMJDY)**

- PMJDY, orthe National Mission for Financial Inclusion, aims to ensure access to financial services, namely, banking/ savings and deposit accounts, remittance, credit, insurance, and pension in an affordable manner. The plan envisages universal access to banking facilities with at least one basic banking account for every household, financial literacy, access to credit, insurance and pension facility. In addition to the bank account, the participants receive a RuPay Debit card having inbuilt accident insurance cover of Rs. 1 lakh.
- The special benefits/features of PMJDY include: interest on deposit; no minimum balance required; life cover of Rs. 30,000 payable on death of the beneficiary, subject to fulfilment of the eligibility condition; easy transfer of money across the country; Direct Benefit Transfers into the account for those participating in government schemes; permission of overdraft up to Rs. 5,000 after 6 months satisfactory account operation; access to a pension product; and personal accidental insurance.
- As of 31 01 2015, 125,473,289 accounts had been opened.

**Topic 3: Microinsurance**

- IRDA had defined microinsurance as up to Rs. 50,000 insured. After PMJDY this was raised to Rs. 200,000.
- Microinsurance is“riding” on the bank accounts. Life cover was made available to anyone who opened an account in addition to accident cover under the RuPay card. The schemes are self-subscribed with low key cover. For life and accident coverthe premium is determined actuarially. Premiums are kept to 1 rupee per month.Anyone who gives permission for auto debit of Rs. 12 receives the cover.
- The Ministry of Finance took the leadership in design of the schemes. Public and private sector insurance companies are involved. An SOP requires pay out in 60 days. Claim pay-out ratio is 92%.
- The banks make a tie up with the insurance companies to implement the scheme for a personalised group cover of Rs. 200,000. Out of Rs. 330 premium, the insurance company gets Rs. 289, Rs. 30 goes to the business correspondents and Rs. 11 goes to bank handling charges. Banks will be receiving in total Rs. 41. For the For the Rs. 12 scheme, the business correspondent getsRs. 1, Rs. 1 goes to handling charges, and Rs. 10 goes to the insurance companies.
- The General Insurance Council and the Life Insurance Council have consolidated all the information from the insurance companies. The Councils de-duplicate claims in case one person tries to have more than one holding of the same policy.
- When insurance is tied to savings through auto-debit, a complete accounting system for insurance is not required. Term insurance is a difficult sale, but through auto-debit as long as this takes place every year then one effectively has term insurance.

**Topic 4: Business correspondents (bank mitras)**

- Accounts can be opened in any bank branch or business correspondent (bank mitra) outlet.
- The business correspondents (bank mitras) model has taken off. This has brought services into the less accessible areas. Business correspondents receive about Rs. 5,000 a month payment plus about Rs. 10,000 through commissions.

**Participants, India side: Atanu Majumdar, Director, Vaibhav Sharma, Climate Catastrophe Specialist**
**Organisation: Microinsurance Academy (MIA)**
**Date and time: 11:00, 21 July**
**Place: Nehru Place, New Delhi**

**Topic 1: Origins of MIA**

- In 2007, Sarvajan Unnati Bodhini was established as a charitable trust in New Delhi, India under the Indian Trusts Act to advance the development of microinsurance. To achieve this, Sarvajan Unnati Bodhini created MIA as its implementing body. MIA's mission is to empower and enable poor communities to play an active role in reducing their financial vulnerabilities through innovative approaches in microinsurance.Professor David M. Dror, an international expert in microinsurance, is the Founding Chairman and Managing Director of MIA.
- MIA has been working in India since 2007. It has worked in Bihar with tribal populations, and with villages in hill areas of Nepal, and drought prone areas. MIA is funded by grants and operates under the Companies Act. The focus of MIA was initially on community-based health insurance, then later expanded to include crop and livestock insurance.

**Topic 1: MIA community-based mutual scheme**

- Insurance normally involves the insurance company and the insured. MIA is trying to change this paradigm with the community being involved in product selection and claims settlement. David Dror believes that MIA's approach helps communities better understand insurance and make better choices, increases their willingness to pay relevant amounts, and leads to greater participation as it reaches communities rather than single individuals. MIA opposes subsidisation of premiums as such funds are finite.
- The key features of the MIA model are:
  - *Pooled community money*: The model protects the poor from indebtedness by creating a mechanism wherein the community pools the money (premium) to cover the costs of health-related events. Households pay a premiumfor coverage against specific events, such as drought or illness.
  - *Tailored insurance with community input and local risk data*: Local risks and willingness of the community to pay are assessed. The risks are shared with the community to help them understand their risk exposure. MIA engages beneficiaries in designing benefits/insurance packages, assessing suitability of the package and facilitating administration of the scheme.
  - *Community-run*: MIA helps to set up the operating infrastructure by training community members to manage the scheme.
- The operating architecture includes a local field partner, an insurance coordinator, insurance activists, claims committee, villagers and MIA.
  - Local field partner: Strong local implementations partners—usually a local organisation or NGO with established credentials working in the target areas—are chosen through capacity assessments that look into (1) capacity, (2) experience and (3) trustworthiness. They works with the claims committee, insurance activists and villagers during implementation and management

of the scheme, and provide support to MIA on communications, baseline survey, etc. MIA works with the SHG federations. Its basic idea is that all members of the SHG should join the scheme. This has the potential to enable both lower transaction costs and reduced adverse selection. Usually most or all of the people join.

- Insurance coordinator: This is a locally appointed official who manages membership and financial records using MIA's data management software, and establishes and maintains relationships with the health care providers. Salary is paid by the field partner with financial support from MIA.
- Insurance activists: Provided by the field partner, the insurance activities work door-to-door on enrolment and education, and facilitate treatment and claims. Salaries are paid by the field partner with financial support from MIA.
- Claims committee: This consists of 6–8 representatives designated by the community from between 10–12 villages. The claims committee (microinsurance unit) manages the common fund of pooled premiums, assess claims and pay outs. It meets once a month, receiving a sitting fee.
- MIA: MIA acts neither as a provider nor as an insurer or an intermediary.It acts as a catalyst and engages communities to devise and implement community-based health insurance with local resources.The most notable feature of the model is that there is no external insurance provider or insurer involved, and no subsidy support for premiums.MIA's roles are (i) conduct the local study the study, (ii) develop the training materials, (iii) assist the claim committees on governance and capacity for about a year.

◎ The process of product design is as follows: MIA first conducts a local risk study from a district sample of households into prevalence of disease, morbidity, use of healthcare services/infrastructure and costs incurred to avail services, etc. It then holds a design workshop with the community. 5-6 benefit packages are selected by the community gatekeepers. MIA uses a field-tested, game-like tool called CHAT—Choosing Healthplans All Together—to enable the local community to jointly define the benefit package that covers their most relevant needs. In CHAT, illiterate and innumerate persons can participate and decide on the composition and price of their health insurance. The packages are displayed on a "chatboard" then presented en masse through many small cluster meetings of maybe 10 people each. Repeat meetings are held as necessary to select packages. From this process the most favoured package is selected. In some cases more than one package may be selected, though it has been found that this leads to adverse selection.

**Topic 2: Health insurance**

◎ In general acommunity-based health insurance scheme involves pre-payment and pooling of resources to cover healthcare costs. They are designed with a not-for-profit objective to target poor households and treat the household rather than an individual as the unit of insurance.

◎ In the case of health insurance, MIA has never worked with an insurance company.

◎ The claims committee reports to MIA, which may propose modification of the premium based on actual claims. The claim loss ratio is about 70%.

◎ For health, the benefit package is associated with hospitalisation. So regardless of the reason, the cost is reimbursed, with an event cap of Rs. 3,000 and a family cap of Rs. 7,000. Also, wage compensation at a rate decided by the community is provided. The premium reflects this payout rate.

◎ In 2017, the World Bank published a case study on MIA's approach to community-based health insurance, which provides some insights into the impact of the scheme.

**Topic 3: Crop insurance**

- A weather-based crop insurance scheme is being implemented in Bihar. In this case, the community would have to carry a large risk as a claim is paid to everyone, so 100% of the risk is underwritten by an insurance company. Operational costs are subsidised, but not premiums.

**Topic 4: Sustainability**

- The average renew ratio is 40-60%, though it has reached 80% in Nepal, which has 5 years' experience.
- The operational costs of claim committees are funded by donors. Each claims committee needs Rs. 100,000-200,000 per month for its operations.
- Funding on insurance education is key but donors are not interested in paying for this. They would prefer to pay a subsidy on insurance as they want numbers to demonstrate scale.
- The process of generating sufficient revenues to constitute contingency reserves takes several years and depends on the number of members and level of the premium. All MIA-supported community-based health schemes have recorded increases in premium income due to a higher number of members and, to a lesser extent, to a higher premium per person per year.
- In the initial years, MIA subsidises the administrative costs of the schemes, but this support is temporary.

**Topic 5: Ideas for moving forward**

- In the MIA model, the size of individual units— the community groups where the pooling of contribution takes place—is very small. This puts the individual units at risk in case of catastrophic co-variant events that could wipe out the entire resource pool of the unit. One idea is to scale up the model by creating federated structures to mitigate these risks. The federated structures would retain the operational autonomy of each scheme while spreading the risks across a larger group.

**Participants, India side: Avinanda Ghosh, General Manager**
**Organisation: Agriculture Insurance Company of India Ltd.**
**Date and time: 10:00, 22 July**
**Place: Vasant Kunj, New Delhi**

**Topic 1: Crop insurance schemes – key issue**

- The problem of crop insurance was how to serve the poorest and remotest farmer in an affordable way. The solution put forward was the area approach.
- There are many technical challenges facing crop insurance. First, there is no object of insurance (not like a car, which has a value). Crop insurance is taken at the beginning of the growing season so what to insure is the first technical question. The sum of liability must first be determined.

**Topic 2: Comprehensive crop insurance scheme (CCIS)**

- The comprehensive crop insurance scheme (CCIS) launched in 1985addressed this issue by working out the sum for each agro-climate zone. The district level monitoring committee (a state body) with experts from agriculture, weather, etc. determined the cost of cultivation for each crop type for each block. This became the rationale for a loan from the bank to the farmers. Crop insurance then steps in and gives the claim to the farmers' bank accounts. In case of an unforeseen event, the loan is still repaid. Only the borrowers were covered. The premium was 1.2 – 2% and was paid by the farmers. Without subsidisation, the premium would have been 4 to 5 times higher. The approach kept the premium low and affordable. Premium rates for market valuation were 10-20%, which

farmers were not able to pay. The Claim pay outs exceeded premiums received fivefold.

- CCIS was practiced until 1999. It had several problems: (1) Penetration: It was a tough task to convince the farmer to pay the heavily subsidised premium. The insurance was compulsory so the farmer saw it as a form of taxation. (2) Limited to borrowers: The farmers who dtake loans are the poorest farmers. Only the prosperous farmers were being catered to.

**Topic 3: National Agricultural Insurance Scheme (NAIS)**

- A new scheme– the National Agricultural Insurance Scheme (NAIS) – replaced CCIS in 1999. The biggest paradigm shift was that the non-loanee farmers were now involved. About 76% of farmers were non-loanees (now about 60%). These are poor farmers without the collateral to acquire loans.
- For loanee farmers, the bank automatically takes Rs. 400 out of Rs. 20,000 of the loan as a premium. The bank then makes a summary statement of total amount lent out and total premium collected. The premium is sent to the General Insurance Company (GIC). This was the system for CCIS and was carried over into the NAIS. Non-loanees under NAIS have to self-declare their crop and area to be planted, and the then authorise deduction of premium from their bank account. The bank makes a summary statement and again gives the collected premiumsto the GIC. So, the system is voluntary for non-loanees.The new scheme gave remote farmers access to insurance through their bank accounts at the local branches. No hard cash changes hands, meaning less potential for leakage of funds.
- The other big paradigm shift of NAIS was that the GIC stopped being a post office. It became an insurer in its own right andthe Agricultural Insurance Company (AIC) became liable. However, the scheme could not survive with claims far exceeding the premium collected, yetpolitically it was not possible to charge at the market rate. So, it was decided that the GIC would pay out up to the amount of premiums collected. If claims exceed premiums collected, the government pays the excess. This mechanism meant that the GIC could accumulate large reserves.

**Topic 4: Modified NAIS (MNAIS)**

- In 2003, AIC was formed and took over the work of GIC on agricultural insurance. With a clear focus, it could quickly increase penetration.
- Other changes came into NAIS to increase penetration and risk cover. Modified NAIS (MNAIS) replaced NIAS in 2007 and ran up to 2016. The yield-based loss approach was replaced with cost harvest lost. Farmers were much happier with this, especially those in coastal areas who could lose their crops while drying them for about 2 weeks in the field immediately after the harvest.
- Self-insurance was also introduced. Indemnity limits were set for specific areas – could be 60%, 80% or 90% of the actual yield below the historical average.

**Topic 5: Weather-based crop insurance**

- Weather-based crop insurance (WBCI) developed in parallel with the yield-based crop insurance. This is a proxy parameter insurance. There is a very good correlation in every agro-climate zone between a number of weather parameters and crop yields. Rainfall thresholds are set for various time periods in the cropping cycle. Inputs were sought from the agricultural universities to develop the scheme.
- The Indian Meteorological Dept. provides the weather data; however,their weather stations are few and far between. AIC has engaged private or semi-government companies involved in weather forecasting who provide weather data to provide more intensive monitoring. Many automatic weather stations were set up and they arenow quite cheap.
- But farmers could not relate to WBCI so well and the scheme became quite political. It is still running as R (Restructured) WBCI, whichwas introduced in 2016.

- AICs Rabi Weather Insurance provides protection against adverse deviation in a range of weather parameters like frost, heat, relative humidity, rainfall, etc. between December and April. Crops covered include wheat, potato, etc. Maximum liability is linked to the cost of cultivation, which differs between crops. The insured is compensated against the likelihood of diminished crop yield.

**Topic 6: Pradhan Mantri Fasal Bima Yojana (PMFBY) (Prime Minister's Crop Insurance Scheme)**

- PMBFY was launched from the kharif of 2016.
- The scheme is implemented on an 'Area Approach basis', i.e. there are defined areas for each notified crop for widespread calamities with the assumption that all the insured farmers for a crop face similar risk exposures and experience similar extent of crop loss.
- All crops with sufficient data and farmers are eligible. The scheme is compulsory for loanee farmers. Others can participate voluntarily. The rate of insurance charges are pre-set and reflect crop type and season. Smart phones and Remote Sensing are used for quick settlement of claims.
- The government has listed 16 companies, includingAIC, who are willing to do crop insurance. In each state a tender is made on who to allot the scheme to.In every state, twice a year before each season (kharif and rabi) the state agricultural department organises the bidding process. Public and private sector companies can compete.The scheme is given to whoever offers the lowest gross premium.
- There are some large changes in the scheme compared to its predecessor. For example, premiums are the same across the country; a 2% premium is paid by farmers for any crop anywhere in the country. The balance is still subsidised. Subsidies are borne 50% each by central and state governments.

**Topic 7: Reach**

- There are now 14.1 crore of landholdings in India. For insurance purposes, we can say that there are about 20 crore of insurable holdings, as there are 2 annual crops on 60% of holdings. About 5 crore are covered under agricultural insurance.
- 3.2 crore farmers had been brought under all crop insurance coverage in 2015, and this number had been increasing little by little year by year. In 2016, it jumped to over 5 crore as the prime minister had been strongly promoting crop insurance. The collected premium jumped from Rs. 35 billion to Rs. 70 billion in one year.

**Topic 8: Challenges**

- For PMFBY, publicity and awareness from the government was absolutely critical in driving uptake of insurance.
- Anti-selection is a problem as a farmer may suddenly decide to insure when he hears that heavy rains are likely to come. This can partly be overcome through multi-season policies, rather than simple season term insurance.
- A problem with involving the private insurance companies is that they will only bid for places where they expect less claims

**Participants, India side: Senior executives, including Chandra Shekhar Gosh, Founder, MD and CEO**
**Organisation: Bandhan Financial Services Pvt. Ltd.**
**Date and time: All day24 July**
**Place: Bandhan self-help group, local branch and training centre, Rajpur; Bandhan Bank HQ, Kolkata; Bandha Bank Branch, Salt Lake**

**Topic 1: Evolution of Bandhan Bank**

- Bandhan was set up in 2001 as an NGO under Section 25 Societies Registration Act. It faced a number of problems: acquiring staff was difficult; any surplus had to go back into the NGO; banks were reluctant to lend to the NGO as it was not required to maintain a CAR.
- A decision was taken to become a bank in order to offer full financial services andraise deposits to bring down the cost of funds.
- Bandhan Bank was inaugurated on August 23 2015. It is the first bank to be set up in the eastern part of India afterindependence.
- Bandhan Bank now has 840 branches and 10.5 million members with Rs.232.29 billion deposits and a loan book of Rs.235.75 billion.

**Topic 2: Microfinance services**

- Bandhan Bank lends to individuals through their groups. At the time of joining, clients should have less than Rs. 60,000 annual income, though clients with greater income are also accepted.
- The group meets weekly with a "doorstep banking officer". The officers are both male and female.One Doorstep Banking Office visits 4 to 5 groups of about 25 women each every day.
- The loan maximum is Rs. 100,000. Loans for microenterprises have a higher limit, but a tax number is required. The basic loan is collected in 52 or 104 instalments. Loan instalments can be delayed for about a week.
- There are 2 types of loans. The first is a primary loan, which is business-oriented. These loans are either Rs. 1,000-25,000 or Rs. 25,000-100,000. The interest rate is 18.52%. The second is a secondary loan of Rs. 1,000 – 10,000, which can be taken for health or education. The interest rate is 10%, i.e. equal to the cost of lending. A secondary loan can only be taken when there is a primary loan.
- The education loan of up to Rs. 10,000 is for October to May when fees have to be paid.
- For the health loan distribution is quick with no need for a weekly meeting. Repayment is very good, even better than primary loans.
- All interest rates are on a declining balance.
- There are no compulsory savings. There are flexible voluntary savings with 4% interest and commitment term savings.
- If the husband or wife passes away, Bandhan Bank receives the principle amount of the loan from the insurance company it has contracted. The outstanding amount is written off and the remainder is given to the husband or wife.

**Topic 3: Discussion with one women's group**

- Most of the women were schooled through to about year 5. The meeting is held in one of the group member's house.
- 5 or more of the women are interested in loans above the Rs. 100,000 limit. Many hold accounts with other banks.
- Most women answered that they decided with their husbands how the loans would be used though gave the money to their men.
- If the group is not happy with their field officer, they can call a helpline number and request the person to be replaced. This happened on one occasion with this group.

**Topic 4: Changes and plans after becoming a bank**

- Small finance banks in India are basically regulated MFIs that can take deposits. 70% of their loans should be below Rs. 25 lakhs. Bandhan Bank is now entirely regulated by RBI. As a bank, Bandhan must pay 33% tax.
- After becoming a bank, the scope of products has increased. They now include microenterprise loans and savings products. Confidence of the public in the services and the employees in job security has increased. Interest rates on loans were cut by 4%.

| Term deposits | |
|---|---|
| Term | Interest paid |
| 7-14 days | 3.5 |
| 15 days – less than 2 months | 4.0 |
| 2 months – less than 3 months | 4.0 |
| 3 months – less than 6 months | 4.5 |
| 6 months – less than 1 year | 7.0 |
| 1 year | 7.25 |
| 1 year – less than 2 years | 7.25 |
| 2 years – less than 5 years | 6.9 |
| 5 years – less than 7 years | 6.5 |
| 7 years – 10 years | 6.5 |
| Senior citizen - additional | 0.5 |

- Bandhan Bank has a general banking service and a microfinance service, each of which is provided through dedicated branches. Having the general banking service allows Bandhan Bank to accumulate deposits from the general public which it can then use to fund its microloans. Prior to being licensed as a bank, it had to loan at commercial rates (12%). It then lent out to its members at about 22%. After becoming a bank it has been able to reduce the interest rate on primary loans to 18%.
- The government has a loan scheme for affordable housing providing up to Rs. 12 lakhs. Bandhan Bank is now considering designing a housing loan, for which strong demand is anticipated. 15-20% of microfinance loans are used for housing reconstruction or extension. However a housing loan is a long term loan and thus a risky investment for the bank. Also, if a person does not make instalments the bank cannot take any effective action, as trying to take the house away from the person would cause a lot of unrest. The housing loan might be best for people who have slightly higher income.
- Bandhan Bank is aiming to increase non-microfinance loans to 25% of the portfolio, which will increase the bank's rating as the microfinance loans are by nature unsecured.
- The current MIS uses handheld PoS (point of sale) devices but Bandhanhas a plan to go totally mobile using biometric identification and a mobile app.
- There is a plan for an IPO.
- Bandhan Bank sees a lot of potential working with the MSME sector.

**Topic 5: Inauguration of 3rd batch of Bandhan NextGen Banker's Programme**

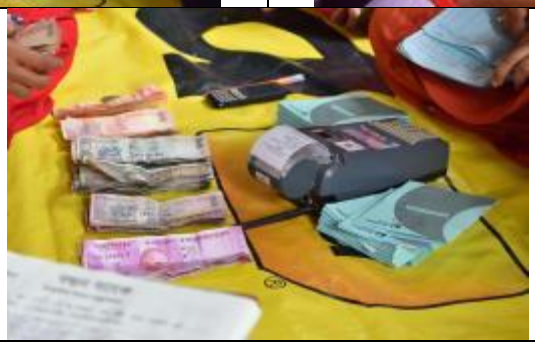
- Professor Khalily and Dr. Scheyvens were requested to attend and address a large group of Bandhan Bank inductees at the Bank's new training centre in Rajpur. The role of the training centre was explained by Dr. Achintan Bhattacharya. The main observation made was the Bandhan Bank is investing heavily in creating a strong cadre of professional staff through its induction programme.

**Topic 6: Suggestions for Bangladesh**

- Bangladesh should set up a credit information bureau (CIB), which it has been working on for 5 years. There are licensed 4 credit bureaus in India.
- The government should set controls on member savings, e.g. loaned amount should be less than savings.
- One objective should be to bring down the cost of lending so interest rates can be reduced. The government could put a limit on the cost of operation.

**Women's group, Bandhan Bank, Rajpur**





**Participants, India side: Anjan Das Gupta, Managing Director, and several consultants**
**Organisation: ASA International India Microfinance Pvt. Ltd**
**Date and time: 10:00, 25 July**
**Place: ASA India HQ, Salt Lake, Kolkata**

**Topic 1: Overview of Asia International India**

- ASA India is a non-banking finance corporation (NBFC). ASA International is operating in over 10 countries globally. In India it is operating in 6 mainly eastern states – the financial excluded regions. There is no joint liability and this is considered one strength of the model.
- The model used in India is the same as in Bangladesh. There are microfinance services and non-financial interventions such as tutorial centres for poor children (not limited to clients) who are dropouts.
- ASA India has 2 loan products: (1) 1 year up to Rs. 30,000 (2 weeks moratorium at beginning provided); (2) 2 year product up to Rs. 60,000. 23-25.3% interest is charged on a declining balance. The interest that can be charged based on regulations is 2.75% times the base rate set by RBI or 10% above operation costs.
- Currently, there are 16 tutorial centres with around 80 students in each centre. These are mainly for years 6 to 10 where dropout rates are highest, with boys dropping out of school and girls getting married. This is supported in part by Lions International

- Lions International has also funded some branches and activities such as eye camps, health camps, construction of bathrooms, etc.
- Loans are financed by equity and with borrowing from various institutions.
- ASA India now has 320,000 clients and is increasing its client base by 25,000 people each month.
- MFIs have faced 2 crises in India: the Andhra Pradesh crisis in 2010 and demonetisation. A challenge for MFIs is mission drifting. The two crises were the results of mission drifting.
- RBI made a rule that only 2 MFIs can lend to one person. But, the business correspondent model and the small banks can also provide loans to this person and this rule does not apply to them. ASA has stuck to the 2 lender rule.

**Topic 2: Shocks and insurance**

- Loan payment is relaxed for the whole community in case of covariate shock. No penalty or overdue interest is charged. For idiosyncratic shocks, the issue of non-repayment it taken up at the group meeting.
- A premium of Rs. 5,000 for credit life insurance is paid via ASA to the insurance company and covers borrower. If a person diesthe insurance company issues 2 checks: one to ASA for the outstanding amount and the rest to the community. As soon as ASA hears of a death, it stops loan recovery. It does not wait to receive the death certificate. The insurance company requires a death certificate for payout, which can be a problem in the remotest rural areas.
- ASA India has no asset or livestock insurance schemes.

**Topic 3: Housing loans**

- ASA cannot provide housing loans as a MF- NBFC can only loan for income generation activities and up to the prescribed limit.

**Participants, India side: Dr. Amit Mitra, Finance Minister, Government of West Bengal;Hari Krishna Dwivedi, Principal Secretary, Department of Finance and Department of Excise; Sanjeev Chopra, Additional Chief Secretary, Agricultural Department**
**Organisation:, Government of West Bengal**
**Date and time: Afternoon,25 July**
**Place: Finance Department, Government of West Bengal, Kolkata**

**Topic 1: Role of state governments**

- The Finance Department of the Government of West Bengal is responsible for the management of the finances of the State Government. Its role includes mobilisation of resources and allocation of resources for infrastructural development, social welfare, human development and administrative purposes.

**Participants, India side: Nilesh Sathe, Member (Life), Mr. Jayanth Kumar, Chief General Manager - Life, and one other officer – Chief General Manager, General Insurance**
**Organisation: Insurance Regulation and Development Authority (IRDA)**
**Date and time: 11:00, 26 July**
**Place: IRDA HQ, Hyderabad**

**Topic 1: IRDA and insurance in India - overview**

- Prior to 1956 India had 240 small life insurance companies. Many were unreliable. These were amalgamated as the LIC in 1956. In 1972, general insurance was nationalised in a similar fashion. The GIC with 4 non-life subsidiaries had a monopoly, so in 1994, insurance was again opened up to the private sector. The IRDA Act 1999 was introduced to regulate this new open context.
- As described in the Act,IRDA is a board-run autonomous body. The policy decisions are taken by the board. It has 4 members – finance and investment, actuary, life, non-life – plus 5 outsiders.
- IRDA is unique in that it is a regulator with a development role. Regulation is made by first making an exposure draft available through the website. Comments are received and incorporated. An Insurance Advisory Board (15 members) also provides comments. The Insurance Advisory Boardhas business, brokers, chartered accounts, etc. on it so can be described as a stakeholder board. Once amended the final draft goes to the IRDA board for agreement. The regulation is then submitted to parliament.
- IRDA monitors claims management of insurance companies through onsite checks of a sample of claims and monthly reporting of the insurers on claim ratios. All grievances submitted to companies enter the IRDA site after 15 days and IRDA takes up the issue of unsettled claims with the companies. A grievance committee is in place. If IRDA sees improper treatment of claims, it can apply a monetary penalty and request all similar claims to be reopened. In the worst case the license can be cancelled.
- IRDA recommends 30 days claim settlement after intimation, except in cases were more investigation on a claim is required.
- The strengths of the system is claims settlement. There have never been many grievances. Maintaining persistency for individual insurance is the greatest challenge.

**Topic 2: Insurance regulations and licensed insurers**

- Regulations require the insurers to do a proportion of their business in the rural and social sectors. IRDA sets the proportion and this differs according to the age of the insurer. In the case of non-life, 7% and 5% are the maximums for the rural and social sectors, respectively. There is a lot of debate over the merits of this approach.
- An insurer can be a life insurer, non-life insurer, health insurer, or reinsurer. There is no composite insurer (e.g. life and non-life).

- Section 45 of the Insurance Act (contestability clause) has made the position of the insured much stronger. A life insurer cannot deny a claim once the insurance has been continued for 3 years.
- For life, India has 24 insurers but the top 5 have 90% of market share. There are 28 nonlife insurers. There are 2 reinsurers as well as international reinsurers with licensed branches (Swiss Re, Munich Re, SCORE Re, Hanover Re, etc.).
- There are several self-regulatory organisations that are regulated by an independent body, e.g. the Life Insurance Council, General Insurance Council, etc. These bodies focus on matters such as market conduct and best business practices.
- A regulatory gap exists in that cooperative societies provide insurance but do not come under regulatory supervision.
- From 2009 onwards insurance penetration for life declined because of a reduction in unit-linked products.

**Topic 3: Microinsurance regulations, products and outreach**

- The nodal department for microinsurance within IRDA is the life insurance department. Microinsurance in the non-life sphere has not taken off as expected.
- Microinsurance regulations were notified in 2005. Microinsurance includes life insurance, health insurance, personal accident cover, cover for livestock, dwellings and micro assets, and crop insurance
- Combined products (life and non-life) were made possible through tie-ups between licensed life and general insurers, but this was not really taken up.
- The regulation did not support the model of standard alone microinsurance providers in India; rather,the partner agent model was the mainstay of the 2005 regulations. Agents are allowed to claim 15% as commission in the first year, though this declines to about 7% in the second year. Regional banks and associations can act as agents, but the regular banks cannot.
- To make microinsurance an interest of the insurance companies, India has mandated insurance for the rural and social sectors. But, overall the SHGs and co-operatives have been more successful than the companies in developing and delivering microinsurance.
- The regulation put caps on the amount insured. These were raised in the 2015 regulation. The capis now Rs. 2 lakhs for both term insurance and endowment. The products need to be filed as a microinsurance product (these are listed on the IRDA website) with their premium.
- Problems were observed after the 2005 regulations were introduced: Standalone microinsurance agents did not deliver the desired progress; the product range was too limited; economic conditions affected the targeted market segment; on nonlife side, only individual retail businesses are covered; and market conduct issues.
- The microinsurance regulation 2015 expanded the microinsurance agency base; enhanced product cover; provided customer protection and convenience measures; and produced measures for improving market conduct. Specifically,
    - The 2015 regulation made it possible for more entities to become microinsurance agents – regional rural banks, business correspondents of banks, urban cooperative banks, other cooperatives, etc.
    - Product parameters were enhanced with removal of some restrictions. Add-on riders were permitted.
    - Customer convenience was enhanced through allowing flexible premium payment options, allowing remittances of premiums in advance, benefits of partial withdrawal from second policy year onwards, and guaranteed surrender value even after one yearly premium is paid.
    - Measures for better market conduct and customer protection through issue of premium acknowledgements on collection, due diligence by insurer on potential agents, agents made

responsible for claim intimation and settlement, code of conduct, etc.

- As with the 2005 regulation, the partner (insurer) – agent model remained the delivery model envisioned by the 2015 regulation. Mutuals are outside the regulation.
- The registered microinsurance products are life (26), non-life (67), and health (16).
- Group microinsurance products are growing rapidly while individual products have reached a plateau. Groupproducts have very low premiums.The entire group segment is credit-life insurance.
- The general microinsurance products that have been popular are livestock and pump insurance.

**Topic 4: Challenges and ideas for moving forward**

- Product pricing, assessing the reserves to be kept, etc. require highly technical knowledge. This requires the insurer to have scale.
- The partner agent model may work better if the agents have greater roles in servicing, but this also raises risks.
- When funded by loans, there is less moral hazard for insurance of aquaculture, poultry and cattle as there are a lot of checks on the animals (tagging) etc. When not funded by loans, insurance companies are not interested in insuring the animals as this information has not been generated so the checks are not in place.

**Participants, India side: Satheesh Arjilli, Vice President, Insurance and Pensions; Dr. K.V. Gouri, Managing Director**
**Organisation: BASIX Consulting and Technology Services Ltd**
**Date and time: 15:00, 26 July**
**Place: BASIX HQ, Hyderabad**

**Topic 1: BASIX overview**

- BASIX started in 1996 as a for-profit company. There are 16 companies under it, including companies for financial inclusion and microinsurance. BASIX is now totally Indian owned.
- BASIXhas a license from RBI for a non-banking finance company and is operating as a MFI. BASIX began providing credit through SHG and JLG models, with funding from TATA Trust and Ford Foundation.Later, funding was secured from 19 Indian banks.

**Topic 2: Approach to financial services and current status**

- BASIX provides 3 services: credit services, agricultural and livestock development services and institutional development services.Every farmer under BASIX gets access to fee-based agricultural services.
- BASIX initiated insurance services in 2001. Its insurance portfolio is now very limited and it is now mostly involved in consulting on insurance. BASIX is a corporate agent of 2 insurance companies and does not take any commission. It has a license from IRDA to act as an agent. It used to charge each household Rs. 10 per month for administration, but IRDA ruled against administrative charges. So, BASIX moved to commission financing with the insurer giving BASIX 2% of the premium.
- It has a pension scheme with 80,000 customers managed by Unit Trust of India, but no new clients are joining.
- BASIX is still involved in microcredit but this is a much diminished programme after the 2010 Andhra Pradesh crisis forced it to lay off 8,000 of its 12,000 staff. Its microinsurance activities also diminished because of the crisis. Its number of branches has declined from 250 to50. BASIX had Rs. 3 crore month microinsurance premium; but now only has about 10% of this amount.

**Topic 3: ADB crop insurance project in Bangladesh**

- The government took Weather Index-Based Crop Insurance (WIBCI) project as an adaptation tool to reduce the risk of climate variability and extreme weather vulnerability in the agriculture sector. The project aims at increasing the resilience of farm households to climate and natural disaster risks

through safety nets against income shocks, access to credit and higher investment in agriculture. The project is funded by a $2 million grant from the Japan Fund for Poverty Reduction approved by the ADB.

- The state-owned Sadharan Bima Corporation (SBC) and the Bangladesh Meteorological Department (BMD) are jointly implementing the pilot project.BASIX is the lead consultant for this project. The project is being implemented in Noakhali, Rajshahi and Sirajganj districts on a pilot basis.Some 20 weather stations were installed at the rooftop of upazila headquarters to collect weather-related data in the three districts.
- The insurer is (SBC). 6,772 farmers have so far taken policies that insure damage from rains and droughts. SBC has settled claims worth BDT 1.7 million for damages of produce against 3,748 policies in Rajshahi and Noakhali.

## Appendix G

**Case study: Mutual benefit associations in the Philippines**

Mutual Benefit Associations (MBAs) are non-stock, non-profit corporations registered under the Securities and Exchange Commission. MBAs are required to have a minimum of 5,000 members with at least 5 million PHP in capital put up by their members. MBAs are also required to have a basic plan where all the members are covered (mandatory coverage). In addition to the basic plan, some MBAs develop additional products, such as endowment.

The 1974 Insurance Code provided a provision for MBAs, but their growth really took off after two regulatory developments. The first was in 2006 when microinsurance was defined and Microinsurance Mutual Benefit Associations (MI-MBAs) were identified as a new type of insurance entity. This enabled MFIs who had been providing insurance to their members informally to continue providing insurance in a regulated environment. The second was a circular in 2010 which required all entities practicing informal insurance activities to formalise their schemes by seeking authority from the Insurance Commission. Organising themselves as a MI-MBA was one of the options provided. Starting from six in 2006, the number of MI-MBAs had jumped to 18 by 2012. MBAs now have 61% of the microinsurance market share in the Philippines. Some of the smaller MFIs partnered with insurance companies and co-operative insurance societies.

MI-MBAs are separate and distinct from the MFIs. The borrowers and the savers of the MFIs are micro-entrepreneurs so they are mostly not members of the "regular" MBAs (these are the large MBAs that represent specific professional interest groups, e.g. the armed forces). The MFI clients automatically become members of an MBA established by their MFI. There are about 2,500 MFIs in the country, about 50 of which are large and the remainder small local initiatives, serving about 7 million members. Of these, 4.55 million are under the RIMANSI network of 17 MI-MBAs.

RIMANSI is a technical resource centre on microinsurance established by MFIs in the Philippines. RIMANSI has played an important role in supporting MFIs to establish MI-MBAs. RIMANSI has found that to be sustainable MI-MBAs should have a minimum of 20,000 members, even though the regulation only requires them to have 5,000 members. In addition to supporting the establishment of MI-MBAs, RIMANSI is also involved in product development and is now providing insurance products for smaller MFIs. It established a new organisation, RIMANSI Mutual Solutions, to support non-life and health microinsurance products that MBAs cannot offer.

The largest MBA in the RIMANSI network is Centre for Agricultural and Rural Development (CARD) MBA, which is the largest MBA in the Philippines. CARD MBA is part of the CARD MRI (Mutually Reinforcing Institutions) group, which consists of 15 institutions mostly involved with microfinance and rural banking. Of its almost 4.2 million clients, 2.4 million are loan clients. CARD accounts for 57% of the microfinance clients in the Philippines. CARD MBA is a provider of life insurance in the form of basic life, credit life, retirement savings fund and Golden Life Insurance. 12.9 million people are insured by CARD and 45% of life insurance holders in the country have their policies with CARD.

CARD MBA pursues three different business models:

1. Under the first model "partners" act as the agents of CARD MBA. The partners are three banks, one MFI and 21 co-operatives. As insurance agents, the partners are responsible for marketing and promotions, selling, collection and claims settlement. At the field level, CARD has its MBA coordinators, of which there are 1,576. These are female members of CARD. The microinsurance coordinators receive

a minimum monthly allowance and receive 50 PHP per policy/plan they sell.

2. In the second business model CARD has established an insurance agency to provide for the needs of its staff and property.

3. Under the third business model, CARD has a joint venture with Pioneer Insurance Company. CARD Pioneer is the first non-life microinsurance company in the Philippines. CARD Pioneer is classified as a regular commercial company subject to the regulation and taxes applicable to commercial companies. It was established in 2013 and began operating in 2014. CARD MBA holds 47 percent of the equity, CARD MRI 2 percent and the Pioneer Group 51 percent. CARD MBA is a distributor of the non-life insurance products provided by CARD Pioneer (Sagip plan, Kabuklod plan, CARD Care, Burial Assistance Plan and other traditional non-life insurance).

**Case study: Key features of Philippines microinsurance regulatory framework:**

The Philippines first introduced regulations for microinsurance in 2006. There were several reasons for this. First, the scale of informal insurance provided by the MFIs to their members was growing and there was a felt need to bring this under regulatory supervision. Second, partner-agency relationships between insurers and the MFIs were not scaling up. Third, there was a lack of coordination between and among financial regulators. The microinsurance regulations were introduced in 2006 and have been revised and elaborated a number of times since.

***Insurance Memorandum Circular 9-2006***

Insurance Memorandum Circular (IMC) 9-2006 defined microinsurance as "the insurance business activity of providing specific insurance products that meet the needs of the disadvantaged for risk protection and relief against distress or misfortune." It defined a microinsurance product as an insurance policy whereby (i) the amount of premium does not exceed 10 percent of the daily minimum wage of a non-agricultural worker in Metro Manila, and (ii) the maximum amount of life insurance coverage is not more than 500 times the daily minimum wage rate for non-agricultural workers in Metro Manila. It also required that microinsurance providers ensure that (i) the contract provisions can be easily understood by the insured, (ii) the documentation requirements are simple, and (iii) the manner and frequency of premium collections coincides with the cash-flow of, or otherwise not onerous for, the insured. It stipulated that any mutual benefit association wholly engaged in the business of providing microinsurance for their members will be referred to as a "Microinsurance MBA". It further stipulated that an MI-MBA has at least 5,000 members and a Guaranty Fund of not less than 5 million PHP, which must be increased to 12.5% of the required capital for domestic life insurance companies. The Circular also stated that to ensure stability, viability, and the delivery of appropriate services to their members, MI-MBAs will be evaluated and monitored on the basis of a set of performance standards to be established by the Insurance Commission.

***Insurance Memorandum Circular 1-2010***

IMC 1-2010 builds on IMC 9-2006. It reduces the amount of premium to a maximum of five percent of the daily minimum wage of a non-agricultural worker in Metro Manila and expanded the scope of providers of microinsurance to insurance companies, cooperative insurance societies and mutual benefit associations. The Circular paid particular attention to bundled insurance products, allowing any microinsurance products to be bundled, but requiring the individual components of the bundled

products to be underwritten separately. To facilitate the distribution of microinsurance products, it allows for microinsurance brokers/agents to be licensed by the Insurance Commission and specified their required qualification requirements, their rights to sell microinsurance products and services, and their capitalisation requirements. The key features of a microinsurance product were described in an annex. They relate to coverage, period of cover, risk and contingent events covered, terms and conditions, effectivity, claims settlement and dispute resolution. For life microinsurance contracts, grace period, contestability and suicide clause are elaborated. For non-life microinsurance products, notification before expiry is elaborated.

***Memorandum Circular (MC) 01-2010***

MC 01-2010 defines activities on insurance that need (and need not) be formalised. It requires all entities practicing informal insurance activities to formalise their schemes by seeking authority from the Insurance Commission. It provides several options to formalise informal schemes: (i) partner with commercial insurance companies that will provide group or individual coverage to its members, (ii) have its members join a cooperative insurance society or MI-MBA, and (iii) organise themselves into an insurance entity such as commercial company, cooperative insurance society or MI-MBA.

***Other regulations and circulars between 2010 and 2015***

- Joint IC-CDA-SEC Memorandum Circular No. 2-2010 "Guidelines on the Treatment of Funds Collected from Informal Insurance Activities"
- BSP Circular No. 683 "Marketing, Sale and Servicing of Microinsurance Products"
- IC Circular Letter No. 5-201I "Performance Standards for Microinsurance"
- IC Circular Letter No. 6-2011 "Guidelines for the Approval of Training Programs and Licensing of Microinsurance Agents"
- IC Circular 39-2011 "Re-approval of microinsurance products"
- Department of Finance Order 15-2012 (reduces the minimum paid-up capital requirement of commercial companies to 50 percent for those having at least 50 percent of their production in microinsurance)
- IC Circulars 15 to 18 -2013 on Alternative Dispute Resolution Mechanism for Microinsurance.

***Circular Letter (CL) 2015-54, Enhanced Microinsurance Regulatory Framework***

CL 2015-54 presents the “Enhanced Microinsurance Regulatory Framework”. It explains that the Enhanced Microinsurance Regulatory Framework was finalised by a Technical Working Group to establish the Framework, and that the Group was composed of representatives of the lnsurance Commission, Department of Finance, other government agencies, and private sectors.

The Framework first presents Government Policy on Microinsurance. Microinsurance is identified as one of the "alternative products" and "financial services" to be promoted in unserved and underserved areas of the country as part of the Government’s reform strategies on financial inclusion. The following section on Current Situation identifies a need to accelerate growth to realise the vision of protecting the majority of the poor with microinsurance. To achieve this vision, it identifies needs for greater clarity on the roles and responsibilities of brokers/agents, on reinsurance, and on product bundling. It then provides elaboration on these three issues. Microinsurance brokers, general agents and regular agents are defined. Microinsurance providers are given the right to cede a proportion of risk to a domestic insurance company, cooperative insurance society or reinsurance company. Ceding of risk to a foreign-licensed insurance risk bearing entity is also possible. With respect to bundling, the provisions build on

the earlier regulations, allowing for bundling of life and non-life products, and requiring approval from the Insurance Commission before a product is launched on the market.

***New frameworks***

Three new frameworks have been developed. These are (i) Micro Pre-Need Regulatory Framework, (ii) Agriculture Microinsurance Regulatory Framework, and (ii) Health Microinsurance Framework. The Micro Pre-Need Regulatory Framework aims to prepare Filipinos on certain future events that will require financial outflow – death, old age and children's education. The Micro Agri Framework covers both standard indemnity-based and parametric-based microinsurance covering a wide range of risks. Issued through CL 2015-53, it aims to be a disaster resiliency mechanism, creating a doorway to financial stability and business resiliency in the face of climate change. Regulations for the Provision of Health Microinsurance (MicroHealth) Products and Services have been issued through CL 2016-22, which defines MicroHealth, provides general principles, stipulates the scope and coverage, and sets requirements.

**Case study: Bandhan Bank, India**

Bandhan Bank is the first bank in eastern India to acquire a banking license since the country secured independence in 1948. It was incorporated on 23 December 2014 as a wholly owned subsidiary of Bandhan Financial Holdings, which is owned by Bandhan Financial Services Limited, the largest microfinance organisation in India. Bandhan Bank was inaugurated on August 23 2015 and currently has 840 branches, 10.5 million members with Rs. 232.29 billion of deposits, and a loan book of Rs. 235.75 billion.

***Microfinance services***

The origins of the Bandhan Bank were as a microfinance provider. Bandhan was set up in 2001 as an NGO under Section 25 of the Societies Registration Act. From the outset its focus was on financial services.

Its lending model involves providing loans to individuals through their groups. At the time of joining, clients should have less than Rs. 60,000 annual income, though clients with greater income are also accepted. The group meets weekly with a "doorstep banking officer". The officers are both male and female. One officer visits four to five groups of about 25 women each every day. If the group is not happy with their field officer, they can call a helpline number and request the person to be replaced. Another key feature of its delivery model is that it uses handheld point-of-sale (POS) devices to record transactions at meetings and to provide a record of these to each client.

The microfinance products offered by Bhandan Bank are relatively diverse and not limited to compulsory weekly savings and a basic loan product found in some other schemes. There is in fact no compulsory savings; rather, there are flexible voluntary savings with four percent interest and a commitment term savings. There are two types of micro loans. The first is a primary loan, which is business-oriented. These loans are either Rs. 1,000-25,000 or Rs. 25,000-100,000. The current interest rate is 18.52 percent; all interest rates are on a declining balance. The basic loan is collected in 52 or 104 instalments. The second is a secondary loan of Rs. 1,000 – 10,000, which can be taken for health or education. The interest rate is 10 percent, which is equal to the cost of lending. A secondary loan can only be taken by a client who has taken a primary loan. The education loan is for October to May when school fees are due. For the health loan, distribution is quick with no need for a weekly

meeting. Repayment is reported to be very good, even better than that of primary loans. Loans above the microcredit limit of Rs. 100,000 are also available for investment in microenterprises. Despite this diversity in loan types, discussions with one women's groups revealed that some of them were interested in larger loans and that many hold accounts with other banks.

Bandhan has an arrangement with Life Insurance Corporation of India under a corporate partnership approved by the Insurance Regulatory and Development Authority to provide life insurance to all its borrowers. If the borrower of their spouse passes away, Bandhan Bank receives the principle amount of the loan from Life Insurance Corporation of India. Using this the outstanding amount is written off and the remainder is given to the spouse.

***Why become a bank?***

As an NGO Bandhan faced a number of constraints. These included the difficulty of acquiring staff, the requirement to invest any surplus back into the NGO, and the reluctance of banks to lend to NGOs as they are not required to maintain a capital adequacy ratio (CAR). Another major constraint was that as an NGO it could not take deposits and had to lend at commercial rates of about 12 percent.

***What changed after becoming a bank?***

Bandhan Bank is now entirely regulated by the Reserve Bank of India and as a bank can provide general banking services, including taking deposits. Bandhan Bank has a general banking service and a microfinance service. There are branch offices specifically for the general banking services, in addition to the original branch offices for the microfinance services. In addition, it has installed over 260 ATMs, provides mobile and Internet banking and offers an international debit card.

Bandhan is no longer inhibited by the constraints on product offerings facing MFIs. After becoming a bank Bandhan has increased the scope of its products. It introduced both microenterprise loans and a range of savings products. It has been able to cut interest rates on its basic micro loan by four percent as a result of being able to collect savings deposits.

***What are the plans for the future?***

Bandhan Bank is placing a lot of emphasis on developing its general banking services. It is aiming to increase non-microfinance loans to 25 percent of the portfolio, which will increase the bank's rating as by their nature microfinance loans are unsecured. Bandhan Bank is considering designing a housing loan, for which strong demand is anticipated. Currently, 15-20 percent of microfinance loans are used for housing reconstruction or extension. It is also planning to start cross-selling of insurance products and mutual funds through its branches by September. Another planned change is to go totally mobile using biometric identification and a mobile application, including for its microfinance banking services. Bandhan Bank is also investing in human resources (it has over 25,000 staff) and has established a new training centre in Rajpur for inductees. It is also considering an initial public offering.

**Case study: Annapurna Community Based Insurance Programme, India**

Annapurna Pariwar is a group of five organisations working in slums in Pune and Mumbai since 1993. Of these five organisations, Annapurna Mahila State Coop Credit Society provides small loans to poor groups of self-employed women and men, while Annapurna Pariwar Vikas Samvardhan (APVS), or the Community Social Protection Programme, is responsible for microinsurance and pension schemes.

Annapurna adopted a credit-centric approach, as the poor people it works with are first and foremost interested in credit. Without the attraction of credit services, it is difficult to promote savings and insurance. Selling insurance policies to the poor is very difficult, but the poor can be insured by making insurance a rider on credit.

The founders of Annapurna are from banking backgrounds. They decided it would be more effective to establish a mutual (credit society) rather than a bank, because being a bank could lead to "mission drift" (loss of focus on the poor) and would require payment of income tax. They also decided against establishing an insurance company, as this would require them to meet the requirements of the Insurance Regulatory and Development Authority. Being a business correspondent (agent) for an insurance company was also not attractive, as Annapurna would have no influence on product design, and as its earlier experiences with insurance companies were not good; the level of claims rejections was very high.

In 2003, APVS was set up as a not for profit company owned by the borrowers of Annapurna Mahila State Coop Credit Society. APVS aims to empower poor self-employed women and their families by providing a comprehensive package of micro health, life and family insurance and pension services, along with health care services.

APVS manages three insurance products and 1 pension product.

1. Health microinsurance is compulsory and is exclusively for all loan borrowers of the Coop Credit Society. Membership of the immediate family is encouraged but is voluntary.
2. All the borrowers are insured for life under Community Based Life Insurance. The family of the borrower receives Rs. 15,000 as financial assistance after the borrower's death and loan amounts from Rs. 20,000 to Rs. 200,000 are written off.
3. All the borrowers are insured under Community Based Family Mutual Fund. Rs. 4,000 is given as financial assistance to the borrower in case of death of his/her spouse and Rs. 2000 in case of death of a family member. Up to three loan instalments are written off in case of the death of the spouse. Upcoming loan instalments are written off in case of asset loss from accidents.

***Micro health insurance scheme features***

The micro health insurance scheme was developed with actuarial guidance from MACIF and Inter Aide, France. Technical support including underwriting of claims was later provided by UPLIFT. 228,260 people are covered by the program. Clients who take a loan and their spouse and children are covered, and in laws and parents of the member can be optionally covered. Health cards with a family photograph and family information are provided to each member on enrolment. The cards are used at the time of hospital admissions to obtain the appropriate concession. A Health Care Providers' Network is created by signing an MOU with hospitals and healthcare providers. This helps obtain quality health care at lower costs for members. The MOU includes healthcare quality, discounted rates and premium services to members. Medical officers verify the claims and if required they call the network hospitals to check

whether concessions as per the MOU were given.

The premium for one or two people is Rs. 150/person, and Rs. 120/person for three people and above. The premium is paid to the fund of the respective branch and each branch tries to manage insurance claims with their own funds. The cover exists only for the loan duration.

The maximum coverage is Rs. 2,500 for one day treatment; Rs. 5,000 for general ailments; Rs. 7,500 for major ailments; Rs. 10,000 for very major ailments; and Rs. 15,000 for most serious ailments. Pre-existing conditions of new members are not covered. The community health program includes a 24/7 help line, with a doctor each stationed at the Mumbai and Pune offices, referrals to specialists, lab. tests and medicines at concessional rates. Also a medical officer visits each branch once a month and plans "guidance centres" where members can receive check-ups and medical guidance. From April 2016 – March 2017, 4,233 people used the 24/7 helpline and 3,469 people received treatment in hospitals under the scheme. In the same period, Rs. 6,570,275 was paid out on 1,616 claims.

A distinct feature of the micro health insurance scheme is that it is community-based. Claims processing begins with service executives in each branch office collecting the claim papers and sending them to the Head Office for processing. At the Head Office the claims are encoded using specialised software and claim decision sheets are prepared. The claims are assessed by "claims committees", who meet once a month and are comprised of elected by members representatives (mostly women from the slums). The community claims representatives receive training on rules for settlement and on use of the software. Once claims are approved, the payments are given out by the community representatives at the community meetings held monthly in every branch office.

The Claim Fund held by each branch is earmarked for payment of claims and is deduced based on actuarial calculations. Any left over money after paying claims goes into a Reserve Fund and the community can decide whether to appropriate the profit or keep it for future possible shocks.

***Sustainability and client satisfaction***

Membership rose from 192,195 to 228,260 individuals from 31 March 2016 to 31 March 2017. The claim ratio has never exceeded 95 percent over the past 14 years; operations have been profitable for the last six years. The renewal ratio exceeds 75%.

Studies by MicroSave found the APVS programme to be a unique self-sustainable programme having potential for further scale up. MicroSave concluded that the level of product customisation and detail cannot be replicated without proper market interaction, but that the product details and their justification provide guidance on how such products should be. It found the APVS product to be designed by high actuarial standards and that fund management is done in a sound way to ensure long term continuance of the programme.

**Case study: Drive for financial literacy in India**

Financial literacy was first recognised as a national issue in India when a surge in the number of distressed borrowers with personal and agricultural loans compelled the Reserve Bank of India (RBI) to come out with the concept of Financial Literacy and Credit Counselling Centres (FLCCs) in 2009. The broad objective of the FLCCs is to provide free financial literacy/education and credit counselling. Banks are permitted to set up Trusts/Societies for running the FLCCs, singly or jointly. To begin the process, lead banks were encouraged to take the initiative for setting up FLCCs in the district headquarters. RBI outlined the features of a model FLCC, as a form of guidance for the banks to follow. The guidance describes the types of credit counselling that can be provided. It also encouraged FLCCs to introduce a generic financial education module in vernacular language. Guidance was also provided on the selection, qualifications and training of counsellors, whose roles were considered to be especially important, including that they should not be existing staff of the banks, and that they should have sound knowledge of banking, law, finance, requisite communication and team building skills, etc. In the space of a few years over 135 FLCCs were established.

In 2012, RBI issued guidelines on Financial Literacy Centres. Under these guidelines, in addition to the existing FLCCs banks were encouraged to directly set up Financial Literacy Centres in each of the Lead District Manager (LDM) Offices. RBI anticipated that over 630 Financial Literacy Centres would be opened across the country, with at least one in each district. It also required all branches of Scheduled Commercial Banks to undertake financial literacy activities. The Financial Literacy Centres are expected to impart financial literacy in the form of simple messages like Why Save, Why Save early in your Life, Why Save with banks, Why borrow from Banks, Why borrow as far as possible for income generating activities, Why repay in time, Why insure yourself, Why Save for your retirement, etc. The Financial Literacy Centres and rural branches of the banks are expected to conduct outdoor financial literacy camps at least once a month, focusing on financially excluded people. Since the issuance of the guidelines, RBI has developed standard financial literacy material/ training modules for use by the banks.

In January 2016, RBI issued revised guidelines for the Financial Literacy Centres. This was after the formal launch of the Prime Minister's national programme on financial inclusion, Pradhan Mantri Jan-Dhan Yojana (PMJDY), on 28 August 2014. PMJDY aims to ensure that the entire population of India has access to financial services – savings and deposit accounts, remittance, credit, insurance, and pension – in an affordable manner. Under PMJDY, an account can be opened in any bank branch or Business Correspondent; a self-attested photograph and signatures or thumb print in the presence of officials of the bank are sufficient to open a "small account" for people who are unable to provide an "officially valid document". The benefits under PMJDY include interest on the deposit, accident insurance, life cover of Rs. 30,000, money transfer service, and an overdraft facility of up to RS. 5,000 for one person (preferably woman) in each household.

A concern after the launching of PMJDY became how to keep the already opened accounts active. Financial literacy was considered essential. The RBI revised guidelines for Financial Literacy Centres were framed with the understanding that financial literacy is central to the success of financial inclusion initiatives such as PMJDY, as it enables consumers to understand the benefits of formal products and providers and to make choices that fit their needs and represent good value for money. The revised guidelines encourage the Financial Literacy Centres and rural branches of banks to adopt a tailored approach to financial literacy for different target groups (e.g. farmers, micro and small entrepreneurs, school children, etc.) and call for adequate synchronisation at the ground level between the different stakeholders viz. LDM, DDM of NABARD, LDO of RBI, District and Local administration, Block level

officials, NGOs, self-help groups, business correspondents, farmers' clubs, panchayats, etc. during the conduct of financial literacy camps.

Outside these initiatives by RBI, many other efforts to promote financial literacy can be observed. For example, the National Institute of Securities Markets (NISM), a public trust established by the Securities and Exchange Board of India, set up the National Centre for Financial Education (NCFE) to promote financial literacy. One of the main programs started by NCFE is the National Financial Literacy Assessment Test (NFLAT). This test is designed to measure the level of financial literacy among school students of Classes VIII to X, and is primarily aimed at encouraging students to obtain basic financial knowledge on topics such as money, budgeting, investment, banking, savings, insurance, retirement planning and financial planning (https://ncfeindia.org/financial-education).

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