Diagnostic and scoping assessment

of

FINANCIAL PROTECTION COMPONENT OF THE JAMUNA RIVER SUSTAINABLE MANAGEMENT

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The Diagnostic and Scoping Assessment for the Jamuna River Sustainable Management project highlights the protection gaps and need for improved financial protection against frequent floods in the target areas. The goal is to create a resilient financial system capable of rapid disaster response, ensuring long-term economic stability for vulnerable communities along the Jamuna River.

DIAGNOSTIC AND SCOPING ASSESSMENT OF FINANCIAL PROTECTION COMPONENT OF THE JAMUNA RIVER SUSTAINABLE MANAGEMENT

September 2024

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FOREWORD

Bangladesh, with its unique geophysical attributes, intricate river systems, and socio-economic conditions, stands as one of the most vulnerable nations to climate-induced hazards. Over the years, the Jamuna River Basin has been particularly susceptible to extreme flooding events due to the convergence of heavy monsoon rainfall, rising sediment loads, and dynamic river systems. Climate change further exacerbates this vulnerability, leading to more frequent and intense flooding, with severe socio-economic impacts on millions of people in flood-prone regions. The livelihoods of communities, agricultural productivity, critical infrastructure, and overall resilience continue to be challenged by these recurring events.

Recognizing these pressing challenges, the World Bank, in collaboration with the Government of Bangladesh, initiated the Jamuna River Sustainable Management Project to enhance the climate resilience and navigation capacity of the river system. A pivotal aspect of this initiative is the development of Component 3, which focuses on Disaster Risk Finance (DRF) and aims to reduce the financial impacts of floods on vulnerable communities in the Jamuna River Basin. This component seeks to implement two innovative macro-level flood risk transfer products: a community protection fund and parametric risk transfer. These solutions will provide financial liquidity for immediate response to mitigate the economic impacts of recurrent and extreme flood events, thereby supporting timely recovery and resilience-building efforts.

This scoping assessment has been designed to evaluate the current flood risks, assess existing flood risk management programs, and identify protection gaps within the Jamuna River Basin. The assessment offers a comprehensive overview of current flood risk programs delivered by humanitarian and development partners, identifying technical, financial, and operational capacities that can support the implementation of flood risk financing initiatives. It also explores the potential for gender-responsive approaches, acknowledging that women in Bangladesh, due to socio-cultural norms and limited access to resources, often face disproportionate higher risks during and after disaster events.

Furthermore, the assessment identifies critical protection gaps at the community level, particularly across four highly flood-prone upazilas (sub-districts): Kalihati, Sirajganj Sadar, Fulchhari, and Gaibandha Sadar. Each upazila was analyzed in terms of flood risk exposure, vulnerabilities, and the adequacy of current coping capacities. The study highlights disparities in resource allocation and relief distribution, particularly in terms of the differential vulnerabilities faced by men and women and underlines the urgent need for gender-responsive disaster risk financing strategies.

This forward-looking report provides key insights into how innovative financial solutions, when integrated with disaster risk reduction efforts and gender considerations, can significantly contribute to reducing the financial and social burden of floods. The findings from this scoping assessment are intended to guide the future implementation of Component 3, ensuring that disaster risk financing mechanisms are targeted, inclusive, and sustainable, and ultimately contribute to building the resilience of flood-affected communities in the Jamuna River Basin.

As Bangladesh continues to grapple with the increasing challenges of climate change, this project serves as a critical step towards ensuring that vulnerable communities, particularly women and marginalized groups, are equipped with the necessary financial tools to withstand future flood risks.

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ACRONYMS

Abbreviation	Full Form
ADB	Asian Development Bank
DAE	Department of Agriculture Extension
DDM	Department of Disaster Management
DGHS	Director General of Health Services
DMCs	Disaster Management Committees
DPHE	Department of Public Health and Engineering
DRF	Disaster Risk Financing
DLS	Department of Livestock
ECHO	European Civil Protection and Humanitarian Aid Operations
EGPP	Employment Generation Program for the Poorest
ESDO	Eco-Social Development Organization
FCDO	Foreign, Commonwealth & Development Office (UK)
FbF	Forecast-Based Financing
FFWC	Flood Forecasting and Warning Centre
FIVBD	Friends In Village Development Bangladesh
GBV	Gender-Based Violence
GCF	Green Climate Fund
GFDRR	Global Facility for Disaster Reduction and Recovery
GFFO	German Federal Foreign Office
GIHA	Gender in Humanitarian Action
GIS	Geographic Information System
GoB	Government of Bangladesh
GloFAS	Global Flood Awareness System (GloFAS)
GUK	Gana Unnayan Kendra
HCTT	Humanitarian Coordination Task Team
HEA	Household Economy Approach
IFRC	International Federation of Red Cross and Red Crescent Societies
JIAF	Joint Inter-Sectoral Analysis Framework
MMS	Manab Mukti Sangstha
MoDMR	Ministry of Disaster Management and Relief

Abbreviation	Full Form
NAWG	Needs Assessment Working Group
NASA NRT	NASA Near Real-Time
NDP	National Development Programme
NDRCC	National Disaster Response Coordination Centre
NGOs	Non-Governmental Organizations
NIRAPAD	Network for Information, Response, And Preparedness Activities on Disaster
POPI	People's Oriented Program Implementation(POPI)
RIMES	Regional Integrated Multi-Hazard Early Warning System for Africa and Asia
SPSS	Statistical Package for the Social Sciences
SRH	Sexual and Reproductive Health
SDC	Swiss Agency for Development and Cooperation
SUFAL-II	Scaling up Flood Forecast Based- Action and Learning in Bangladesh (SUFAL) – Phase II
ToR	Terms of Reference
UN CERF	United Nations Central Emergency Response Fund
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children's Emergency Fund
UNOSAT	United Nations Operational Satellite Applications Programme
UNRCO	United Nations Resident Coordinator Office
USAID	United States Agency for International Development
USD	United States Dollar
WASH	Water, Sanitation, and Hygiene

KEY FINDINGS AND RECOMMENDATIONS

Through secondary data analysis and key informant interviews, this assessment has captured a number of key findings relevant to the design and implementation of a government flood protection project in Bangladesh. Firstly, across four project sites the exploration of protection gaps (historic exposure to floods and relief needs versus assistance provided) have generated recommendations on site selection, priority sectors and response modalities. Secondly, analysis of 6 existing flood protection programs delivered by humanitarian partners have revealed operational systems already in place and lessons learnt that can be leveraged for program execution.

Key Findings and recommendations are listed in below section-

A. Findings: Profile of the Project Sites and Site Selection

A.1. Findings: Flood Risks, Impact Scenarios and Potential Risks

- **High Flood Risk**: The four potential project sites (Kalihati, Sirajganj Sadar, Fulchhari, and Gaibandha Sadar upazilas) in the Jamuna River Basin are highly susceptible to flooding due to their geographical location and historical flood events, with recent floods in 2016, 2017, 2019, and 2020 exacerbating their vulnerability.
- **High Flood Frequency and Inundation**: All four upazilas are highly impacted by flood. Overall, across all four upazilas, 28% of the total area was flooded once, 16% twice, 15% three times, and 10% four times. This data reveals that while a significant portion of land in these regions experienced repeated flooding, the frequency and extent of flooding vary notably across the upazilas. *(Figure 4.8)*
- **Higher Socio-Economic Vulnerability:** According to the INFORM Vulnerability Index, all upazilas except Kalihati have high vulnerability levels and inadequate coping capacities, making them particularly susceptible to flood impacts. *(Table 1.1)*
- **Population Affected:** Fulchhari had the highest number of affected people, ranging from 69,662 in 2020 to a peak of 156,770 in 2019, with an average of around 115,011 affected annually. Gaibandha Sadar followed a similar trend, with its affected population varying between 47,508 in 2020 and

124,525 in 2019, averaging about 86,100 people per year. Kalihati's affected population ranged from 39,539 in 2016 to 76,819 in 2017, averaging around 63,475 annually, while Sirajganj Sadar had the lowest number of affected people, fluctuating between 19,203 in 2019 and 47,012 in 2017, with an average of approximately 35,742 people annually. Fulchhari and Gaibandha Sadar consistently face higher flood impacts compared to Kalihati and Sirajganj Sadar, with population displacement and flood-affected populations varying significantly across the years. *(Figure 4.10)*

A.2. Findings: Protection GAP

- **Economic Gaps are High** : Historic response allocations covered only an equivalent of 16% of the economic loss and the findings depicts that there was total gap of 26.19 million USD comparing to economic loss.*(Table 4.19)*
- **Comparison of Response Resource Allocation Gap**: From floods in the four years assessed (2016, 2017, 2019 and 2020), in Gaibandha Sadar and Sirajganj Sadar the average resource gaps between response allocations and economic losses were above 89% whereas Fulchhari experienced average gaps of 75% and average gaps in Kalihati were 41%. (*Table 4.19)*
- **Entitlement Gap:** Across four upazilas during monsoon floods from 2016 to 2020, highlighting a total gap of USD 17.89 million are calculated in reference to three-month entitlement*. (Table 4.22).*
- **Comparison of Entitlement Gap** : The highest financial gap estimated in 2019 (USD 6.13 million), followed by 2017 (USD 5.29 million), 2016 (USD 3.75 million), and 2020 (USD 2.66 million). Fulchhari and Gaibandha Sadar consistently faced higher financial gaps, with Fulchhari's gap peaking at USD 3.05 million in 2019. The overall gap percentages ranged between 67% and 84%, with the lowest gaps observed in 2020. Kalihati experienced a relatively small but consistent gap, while Sirajganj Sadar saw the smallest financial needs across all years. *(Table 4.22).*
- **Significant Coverage Gaps:** Mostly the response efforts reached all the population in need who were affected by flood. However the support was equivalent to one month's need whereas humanitarian guideline and strategies *(HCTT Nexus Strategy and Unified Cash+ Framework of Bangladesh: For Anticipatory Action and Response)* identified severe and

extreme group households affected by flood, need at least three months support. Findings of this coverage gap revealed that there were notable gaps between household needs and support provided.

- **Higher Coverage Gaps Beyond One Month's Support:** Fulchhari and Gaibandha Sadar face the largest gaps in household support during monsoon floods, with Fulchhari having the highest shortfall in 2019 (over 20,000 households unreached). Kalihati consistently shows 100% gaps in 2016 and 2017 (i.e. no households received more than one month of support), but the absolute number of households gap is lower compared to Fulchhari and Gaibandha Sadar. Sirajganj Sadar experiences smaller gaps, especially in 2020, where only 1,067 households were unsupported. Overall, percentage gaps are high across upazilas, Fulchhari and Gaibandha Sadar experience the largest absolute household gaps. *(Table 4.23 and 4.24)*

A.3. Findings: Potential Inundation and Population at Future Flood Risk

- **High Inundation and Impact Risks:** Fulchhari has the highest percentage of potential inundation, with 46.7% of its area at risk and a potential impact population of 75,907, indicating a significant vulnerability. Gaibandha Sadar follows with 34.73% of its area potentially inundated, affecting 55,771 people. Kalihati has 30.62% of its land at risk, with 41,828 people potentially impacted. Sirajganj Sadar has the lowest percentage of potential inundation at 26.19%, with 23,456 people potentially affected. Overall, the four upazilas have a combined 34.56% of their area at risk of flooding, potentially impacting 196,963 people.*(Table 4.25)*

A. Recommendation : Site Selections

Based on above key findings from flood inundation, impact, protection gap and potential inundation the selection and prioritizing of sites are recommended for implementing partner of the project. Stratified site selection is recommended through the ranking of upazilas (table A) and then up to union including the extent of potential inundation, frequency of flooding, and the potential impact on the households, protection gap, poverty ration[1] .

Table A: Potential inundation and severity ranking of upazila for geographical priority

Upazila	%Potential Inundation Area	Potential Impact Population per 1000	Economic Gap (Resource Allocation vs Economic loos) in Million USD	Entitlement Gap (Entitlement vs Resource Allocation) in Million USD	Coverage Gaps (Gaps in Household Reach for Two month' s comprehensive support)	Coverage Gaps (Gaps in Household Reach for Three month' s comprehensive support)	Percentage of Extreme Poor Household	Priority Rank for Intervention
Fulchhari	46.7	690	8.44	8.41	45,129	59,206	3.04	1
Gaibandha Sadar	34.0	172	6.25	5.93	31,222	42,009	6.63	2
Kalihati	24.5	142	5.89	2.17	11,714	13,845	0.66	3
Sirajganj Sadar	23.6	56	5.61	1.32	3,827	10,508	4.57	4

Findings show all the four upazilas are highly prone to flood and persistent protection gaps remain prominent for major four flood in the Jamuna River basin. Comparing among these four upazila, Fulchhari is the highest risk prone upazila and Gaibandha sadar, Kalihati and Sirajganj sadar came after in that order. It is recommended that the project prioritizes upazilas as per the above priority ranking

Further analysis of potential impact population who falls in severe and extreme group as target group in case of flooding in project areas is presented in Table B. For example, in Fulchhari, the estimated number of households requiring assistance in a significant flood (approximately 1 in 5 to 1 in 20 years magnitude) is around 13,850 households. As presented previously, a substantial majority of

[1] *These indicators have been selected based on the Risk Indexing of the HCTT nexus strategies 2021-2025 of UN in Bangladesh and MoDMR and available indicators has been utilized for priority ranking.*

these households will receive one month of assistance from government or non-government partners, but the gap is in the additional two months of support needed to cover minimum household requirements for survival and to maintain welfare (as per national HCTT guidelines).

Table B : Demographic priority for the number of populations need support by upazila

Upazila	Potential Impact Population in Need (Severe Group HH[2])	Population Impact Population in Need (Extreme Group HH[3])	Total Households in Severe and Extreme Group	Average Household Size
Fulchhari	6,452	7,373	13,825	3.73
Gaibandha Sadar	4,912	5,614	10,526	3.82
Kalihati	2,965	1,977	4,942	3.86
Sirajganj Sadar	1,597	1,597	3,194	4.11
Grand Total	**15,926**	**16,561**	**32,487**	**3.73**

Further to cascading the risk layer to union level has been assessed, based on the composite normalized weightage-based indexing[4] by indicators[5] has been utilized to identify priority unions by upazilas for prioritizing interventions in for this project shown in table B. Further the indices are stratified to union (total 47 union in 4 upazilas) level through ranking of risk for prioritized geographic area and population for each union, show in annex 6 . This annex list will guide the MoF and implementing agency to prioritize the area and household number by union.

B. Findings : Needs of the Community, Responses Initiative and Household Coping Mechanism

[2] *Severe- Elevated and increasing deterioration of physical or mental wellbeing and human rights, AND Regular threats to human rights and/or accelerated erosion of strategies and/or assets, AND Moderate strain on basic services and moderate inability to meet basic needs for survival, protection, and dignity.*

[3] *Extreme- Elevated mortality or risk of death AND Widespread violations of human rights and/or unsustainable reliance on negative coping strategies, AND High strain on basic services and/or extreme inability to meet basic needs for survival, protection, and dignity.*

[4] *Potential Inundation Areas (20%); Frequency of Flooding(20%); Composite Risk Level of Inundation and Frequency (10%); Potential Impact Population per 1000(10%); Potential Impact Population in Severe Group HH(10%); Affected Population in Extreme Group HH(10%); Number of Extreme Poor Household(10%) and Number of Household Depending on Agriculture (10%)*

[5] *These indicators have been selected based on the Risk Indexing of the HCTT Nexus Strategy (2021-2025) of UN in Bangladesh and MoDMR and available indicators has been utilized for priority ranking. The 50% of weightage has been assigned on physical exposure of flood inundation, frequency of flooding and risk level of flooding. Other 50% weightage has been implied on flood vulnerable population group and socio-economically vulnerable group.*

- **Priority Needs Shifts with Flood Duration**: The priority needs for flood response vary with the duration and severity of flooding. In 2020, with a prolonged flood duration of 105 days, protection emerged as the top priority, indicating a shift towards addressing safety and human rights concerns. In shorter floods, such as those in 2016 (23 days) and 2019 (18 days), the primary focus was on immediate life-sustaining needs: Food Security and Nutrition, Shelter, and WASH (Water, Sanitation, and Hygiene). This reflects the urgency of addressing basic survival needs in the initial phases of disaster response. (Section 4.2.3, Figure 4.13)
- **Consistency in Priority Sectors**: Across multiple years, Food Security and Nutrition consistently ranked as a high priority (*Figure 4.12*), underscoring its critical importance in addressing the basic needs of affected populations during and after floods.
- **Key Response Programme:** Key support includes emergency relief through food aid, shelter, and clean water; financial assistance in the form of cash transfers and subsidies; healthcare services via medical camps and mental health support; infrastructure repair and housing rehabilitation; and livelihood support such as agricultural assistance and cash-for-work programs. Disaster risk reduction initiatives, including early warning systems and resilient infrastructure development, are also prioritized (T*able 4.14*).
- **Types of Support Provided After Flood:** The government has historically provided 12 types of support across sectors such as food security, shelter, health, and WASH, including cash transfers, rice, makeshift tents, and hygiene kits. Non-government partners focused on five main areas: WASH (40.96%), food security and nutrition (20.59%), education (12.30%), risk communication (11.58%), and shelter (8.49%), ensuring access to clean water, essential food, education, awareness, and temporary housing. Other sectors like health, child protection, and integrated gender-based violence support also contributed to the flood response.*(table 4.15 and table 4.16)*
- **Negative Coping Tactics:** Households commonly resort to negative coping strategies such as borrowing money (87.1%), selling assets (60.3%), and reducing food expenditure (36.3%) during floods, which can perpetuate vulnerability (*HCTT 2023*).

- **Impact on Vulnerable Groups:** Financial stress leads to harmful outcomes like school dropouts (11.3%) and reduced healthcare spending, particularly affecting women, children, and people with disabilities, underscoring the severe socioeconomic impact of floods. (F*igure 4.18*)

B. Recommendations : Priority Sectors for Support

Given these insights from sectoral priority needs, support provided (*section 4.2.3),* household coping by community in previous floods (2016, 2017,2019,2020) and impact scenarios, it is recommended to prioritize the following types of support for flood protection initiatives in the Jamuna River basin.

Support Sectors	Priority Ranking
Food Security and Agriculture	1
Livelihood and Economic Support	2
WASH (Water, Sanitation, and Hygiene)	3

C. Findings: Existing Flood Protection Programs

This research identified flood-protection programs (pre-arranged funds and action plans, ready to be triggered when future flood risks) across the relevant project areas. Six projects were identified and have been investigated focusing on the key components . The assessed projects have been categorized into three themes:

Theme 1- Parametric Flood Insurance: One project (Oxfam) took out an insurance policy on behalf of farmers that provides coverage based on predefined indicators of flood losses

Theme 2- Pre-arranged Flood Anticipatory Action Mechanisms Through Anticipatory Action : Four projects use flood forecasts to implement pre-agreed anticipatory actions prior to the flood occurrence (main components are, Forecast-based Planning, Pre-Agreed Actions, Rapid Implementation).

Theme 3- Disaster Risk Financing (DRF) : One project (Start Fund Bangladesh) uses financial strategies and mechanisms that provide rapid, predictable funding to mitigate, respond to, and recover from disasters. (main components are, Contingency planning, Predictability , Pre-approved Projects, Pre-crisis Interventions, Joint Trigger Mechanisms, Joint Initiatives)

The research revealed that there is significant scope to build on the existing operational footprint of these projects and links to beneficiary communities.

Project Name	Theme of the Project	Geographic* Scope[6]
OXFAM (REE-CALL)	Parametric Insurance	Gaibandha (Fulchhari) and Sirajganj (Chauhali)
BDRCS	Anticipatory action	All upazilas of Sirajganj and Gaibandha.
SFB	Disaster Risk Financing	All upazilas of Sirajganj and Gaibandha district. Initiated the extension of the working areas in all upazilas of Tangail
SAVE The Children BD (SAFE)	Anticipatory action	Gaibandha (Fulchhari, Gaibandha Sadar)
WFP	Anticipatory action	All upazilas of Sirajganj and Gaibandha
CARE (SUFAL Project)	Anticipatory action	Gaibandha (Saghata, Fulchhari)

** Upazila names are provided in bracket*

D. Findings : Flood Risk Model and Monitoring

All the assessed projects have their own standard operating procedure and anticipatory action protocols directed by pre-defined flood risk model based on set of stratified threshold and trigger and linked to action. Findings from the major components of the flood risk model are-

[6] Geographic scope assesses to evaluate in the project activity are implement or planned to implement in the assessment areas. These projects have broader geographic scope beyond our assessment are.

- **Two Types of Flood Risk Models are Used:** The assessed six projects utilize mainly two types of flood risk model; CARE (SUFAL) and SAVE (SAFE) projects have localized gauge station-based monitoring systems while the other four projects utilize basin specific national level forecast models and indices.
- **Pre-Activation and Action Phases:** Most projects incorporate both pre-activation and action phases in their flood risk models. They set thresholds for early warning and take proactive measures before the actual flood event, reflecting a frequent practice of using lead times to prepare and respond to potential floods (termed Anticipatory Action).
- **Use of Forecast Models:** Projects commonly use forecast models like GloFAS and FFWC to determine triggers for pre-activation and action. This approach involves leveraging technical partners (like RIMES or their own technical team) to enhance the accuracy and timeliness of flood risk assessments. Several projects collaborate with and solely depend on technical partners such as FFWC and RIMES to develop and monitor thresholds and triggers for project area specific localized threshold and trigger.
- **Variable Lead Times:** While projects differ in specific lead times (based on the forecast the pre-defined activity triggered before the flooding), there is a general pattern of setting pre-activation lead times ranging from 10 to 30 days, and action lead times of about 5 days ahead of the flood. This variation demonstrates a shared focus on balancing early preparation with timely intervention.

D. Recommendation: Flood Risk Data and Analytics

Emerging from the findings are a number of key recommendations and/or requirements in designing, defining threshold triggers as well as forecast models for efficient risk management and flood risk financing.

D.1. Recommended Approach for Design

☑ **Ensure Risk Informed Model:** The model should be developed based on scientifically assessed flood risk profile of the area by integrating detailed

risk analysis, including gender related risk, past event's impact assessments, and vulnerability information.

☑ **Consider localized threshold** : Develop localized threshold and trigger based on localized risk assessment and historical events.

D.2. Threshold and Trigger

☑ **Incorporate Probabilistic Forecasts:** For anticipatory action (ahead of the flood peak), it is recommended to use probabilistic forecasts from credible sources (combination of GloFAS and FFWC forecast data is recommended) to define activation thresholds, ensuring they are responsive to imminent flood risks and allowing for timely interventions before the flood.

☑ **Utilize Multi-Tier Triggers:** For anticipatory action and disaster risk financing employ a combination of pre-activation and action triggers to balance early warnings with actionable thresholds, enhancing both preparedness and response. Pre-activation should intend to provide longer lead time based on long range forecasts which not necessarily provide the actual location of impact rather provides a basin or area, which enable agencies and communities to take preparatory action. Whereas action trigger should be based on the localized forecast with necessary certainty providing shorter lead time and act or support guidance by preparatory actions just before the peak of flood.

☑ **Enhance Lead Times:** Ensure lead times for both pre-activation and action triggers are sufficient to allow for adequate preparation while being responsive to the urgency of the situation. However probability aspect of the forecast should be taken into consideration (e.g. at least 50% probability of certain forecast referring forecasting system of GloFAS)

☑ **Strengthen Technical Collaborations and Utilize Blended Forecast Sources:** Integrate global, national and local level forecast sources for ensuring accuracy. Collaborate with meteorological and hydrological agencies (preferably GloFAS and FFWC) to improve the accuracy and reliability of flood forecasts and trigger mechanisms.

E. Findings: Operational Modality and Support Type

- **Diverse Operational Modalities:** The Government of Bangladesh employs varied delivery modalities for flood response, including in-kind distributions, cash transfers (both in hand and via mobile money), and direct infrastructure repairs, coordinated mainly through the Ministry of Disaster Management and Relief (MoDMR) in coordination with local administrations. (Table 4.17)
- **Higher number In-Kind Support and Higher Amount through Cash-Based Support for Post Flood Response**: In-kind distributions are the predominant modality in terms of covering the population where 41.01% of beneficiaries and accounting for 64.93% of activities. However cash-based intervention is predominantly utilized for majority of fund disbursement for response activities. Cash in hand and mobile money transfer methods represented 43.89% of total funds disbursed, emphasizing the prominence of direct financial support in response efforts, complementing other forms of aid like in-kind support (32.42%) and advocacy measures (22.87%). *(Table 4.18)*
- **Cash Support Commonality Among Parametric, Insurance, Anticipatory and DRF Projects:** All the assessed parametric insurance, anticipatory action and DRF projects support through cash distribution and most of them distribute through mobile banking. *(Table 4.7)*
- **Gendered Preferences for Cash Transfers**: Community preferences for receiving cash assistance show significant gender differences, with women favoring cash in hand (63.7%), while men show a stronger preference for mobile money transfers (43.8%) in comparing to women (34.1%), influenced by factors like access to technology and cultural norms. *(Figure 4.16).*

E. Recommendation: Response Modality and Efficient Operation (Cash Disbursement Channel and Stakeholders)

E.1. Recommended Support Type:

☑ **CASH Based Interventions are Recommended :** Based on the common practice of assessed project as well post flood response modality, the cash-based intervention are recommended for flood risk management and flood risk based early action project.

E.2. Recommended Cash Transfer Modality:

☑ **Prioritize Mobile Money Transfer (MMT):** Given the benefits of security, efficiency, and scalability along with community preference prioritize Mobile Money Transfer (MMT) as the preferred modality for cash transfers. MMT, supported by pre-agreements with financial partners, ensures timely and reliable disbursements.

☑ **Ensure Robust Financial Arrangements:** Establish comprehensive arrangements with financial institutions, such as pre-agreements or ex-ante financing instruments. This will facilitate smooth and uninterrupted cash transfers, mitigating the risk of delays.

☑ **Implement Gender-Sensitive Delivery Mechanisms:** Integrate gender-sensitive practices across all money transfer modalities. This includes ensuring that distribution processes are inclusive and accessible, with specific provisions to address the needs of women and other vulnerable groups.

☑ **Evaluate Cash in Hand for Specific Contexts:** Use cash in hand only in contexts where mobile money is not feasible or accessible. Ensure that any cash-in-hand distribution is carefully planned to accommodate community preferences and provide separate distribution options for women.

☑ **Regularly Review and Adapt:** Continuously assess the effectiveness of the chosen cash transfer modality and make adjustments based on feedback and operational challenges. This includes reviewing the adequacy of gender-sensitive measures and the performance of financial partners.

F. Findings: Entitled Amount/ Cash Packages for Households

- **Use of National Guidelines:** Half of the assessed projects, including BDRCS (FbF), Start Fund Bangladesh and WFP-SKS (FbF), follow standardized guidelines from the Humanitarian Coordination Task Team (HCTT) and the Cash Working Group to ensure consistency with national standards. These common practices draw on the Unified Cash+ Framework of Bangladesh: For Anticipatory Action and Response (HCTT 2023) which aim to meet 60% of the Minimum Expenditure Basket (BDT 10,375, see figure 4.18), equivalent to BDT 6,000 (USD 60) /month/household (round up) for monsoon flood.
- **Community Consultations:** SAVE-SKS (SAFE) and CARE (SUFAL) determine their package values through consultations with local communities, ensuring that the financial support is tailored to meet specific local needs.

F. Recommendation: Determining the Amount / Cash Packages for Households

F.1. Recommended Cash Package and Support Duration

(Based on common practices and HCTT standard)

- ☑ **Household Cash Packages:** For the intended project the multipurpose cash transfer value is recommended as 60 USD per household per month as per guidelines (HCTT 2023). (*details provided in section "4.3.2.3 Entitlement Gap").*
- ☑ **Duration of the support:** Nationally all entities engaged in the response and anticipatory action efforts, are recommended to use the same multipurpose cash value for the nationally agreed HCTT(2020) recommended timeframe (1 to 3 months) concerning the historical impact and needs of the community. Thus, mostly all the household in project areas are at least being supported for one month, the intended project recommended to offer additional support to for the remaining 1 or 2 months and to cover the entitlements, The implementation partner are

recommended to coordinate with local DMCs and non-government agencies to identify the households and give a further 1 or 2 months of support packages.

F.2. Recommended key concerns for determining the cash packages

However, implementing agencies also can determine the cash packages aligning the project objectives and goal. In such case the following steps should be followed to determine cash packages.

- ☑ **Project Scope and Objectives**: Align the support amount with the project's goals, such as whether it focuses on short-term emergency relief or long-term recovery and resilience building.
- ☑ **Stakeholder Input:** Engage with local communities and stakeholders to determine realistic and effective support aligning the national standard combine on their input and needs of assessments.
- ☑ **Challenges in Cash based intervention:** Accessing cash before or after a flood in the Jamuna River Basin poses significant challenges. The most critical issue, faced by 60.7% of respondents, is blocked roads and lack of access. Additionally, 56.6% express concerns that local agents may not operate during floods. Complexity in mobile money transfer services affects 43.6% of respondents, and 13.4% highlight transportation and road accessibility issues for persons with disabilities. These challenges underscore the importance of ensuring physical access and the operational reliability of cash distribution channels during flood emergencies.*(HCTT 2023)*

G. Findings: Beneficiary Targeting and Selection

- ◎ **All projects targeting flood-affected areas** in the Jamuna River Basin share a common focus on households experiencing socio-economic vulnerabilities, such as those with unstable incomes, women-headed families, the elderly, and people with disabilities.
- ◎ **Beneficiary selection methods** across projects in the Jamuna River Basin uniformly involve a thorough and participatory approach, including door-to-

door household data collection, vulnerability scoring through community consultations, and validation by local government authorities

- **Beneficiary selection process** across projects in the Jamuna River Basin are commonly based on community input and project or donor guidelines. Each project integrates local consultations and follows specific criteria derived from project goals, donor requirements, or baseline data, ensuring that selection is contextually relevant and aligned with community needs.

G. Recommendation: Efficient Beneficiary Targeting

Selecting appropriate beneficiaries is the key to effective implementation and impact of the project activities. The practices and approaches of the different projects have been analyzed and best practices are recommended here for the project delivery partner for efficient project implementation.

G.1. Recommended Eligibility Criteria of Beneficiary

- ☑ **Flood-affected Families**: Beneficiaries should be from families living in flood-prone areas who have been directly impacted by floods.
- ☑ **Socio-economic Vulnerability:** Households with no regular income source, socio-economically vulnerable families, and those relying on daily labor or low-income occupations such as farmers, boatmen, and fishermen should be prioritized as beneficiary.
- ☑ **Special Vulnerable Groups:** Emphasis should be placed on supporting women-headed families, families with elderly members, individuals with chronic illnesses, persons with disabilities (PWDs), pregnant women, widows, minorities, and children-headed, especially girls headed households.
- ☑ **Negative Coping Mechanisms:** Families that have experienced food scarcity, lost crops, or survived previous floods by selling assets, taking loans, or other negative coping strategies.

G.2. Recommended Beneficiary Selection Methods

- ☑ **Utilize Existing Lists:** Use existing beneficiary lists from government programs or other trusted sources (could be Start fund vulnerable database) as a starting point.

- ☑ **Engage in Community Consultation and Involvement:** Based on the preliminary area selection, **c**onduct community consultation meetings to identify and validate potential cluster of beneficiaries.
- ☑ **Implement Rigorous Data Collection and Verification:** Collect data through household visits, questionnaires, or volunteer surveys to assess eligibility. Analyze this data based on specific indicators and prepare preliminary lists for further validation.
- ☑ **Assign Weights and Score Indicators:** Develop a systematic approach by assigning weights to specific indicators and scoring households accordingly. This method ensures a fair and transparent selection process based on clearly defined criteria.
- ☑ **Collaborate with Local Authorities:** Involve local government representatives in the validation and verification processes. Obtain endorsements from union and upazila officials to finalize beneficiary lists, ensuring legitimacy and support from local authorities.
- ☑ **Periodic update: Periodically** (at least annually) update the collected beneficiary dataset through household visit and validation.

G.3. Recommended Gender Integration and Inclusion Approaches

- ☑ **Adopt Comprehensive Gender Policies:** Implement gender policies that guide the selection of beneficiaries and advance women's participation in decision-making and leadership process.
- ☑ **Ensure Gender-Focused Targeting:** Prioritize women as primary beneficiaries, particularly those who are heads of households, to ensure gender equity in support distribution.
- ☑ **Incorporate Gender-Sensitive Scoring Systems:** Utilize scoring systems that assign higher weights to female-headed households or those with vulnerable members such as persons with disabilities or lactating mothers.

G.4. Recommended Data collection and analysis

- ☑ **Standardize Beneficiary Data Collection Methods**: Utilize mobile-based surveys (e.g., Kobo Toolbox, Comcare) for efficient and accurate data collection.

- ☑ **Ensure Systematic Gender Analysis :** Ensure systematic gender analysis as early as possible in project preparation stage to identify specific gender gap, local possible solution, potential threat, and to identify relevant stakeholders to design gender related action that reduce gender gap related to disaster risk financing to ensure effective and sustainable change.
- ☑ **Implement Comprehensive Data Analysis and Validation Approaches:** Conduct multi-level validation processes involving community feedback and local government concurrence to ensure accuracy and legitimacy.
- ☑ **Leverage Technology for Data Storage:** Store beneficiary data in digital platforms like Kobo Toolbox or Excel-based systems for better accessibility and management.
- ☑ **Ensure Consistent Data Verification**: Adopt consistent verification methods, including community consultations and multi-tier checks by volunteers and project managers.

H. Findings: Stakeholders and Coordination

- ◎ **Primary Response by Government**: The Government of Bangladesh, primarily through the Ministry of Disaster Management and Relief (MoDMR), is the main responder to flood events, providing substantial support in the form of cash relief, food, and materials for reconstruction to affected populations in the four upazilas.
- ◎ **Complementary Support from Development Partners**: Alongside government efforts, various development partners and international and national NGOs provide complementary support. Notable contributors include UN CERF, FCDO, Start Fund Bangladesh, USAID and some Publicly raised fund by International NGOs among others.
- ◎ **Coordination**: The government response coordination is achieved through national and local disaster management committees, ensuring comprehensive and effective flood response. The joint response, led by the Ministry of Disaster Management and Relief (MoDMR), is well-coordinated and operationally diverse, involving both government and non-government partners. Non-governmental partners, under the Humanitarian Coordination

Task Team (HCTT). Particularly, anticipatory action and forecast based financing projects are coordinated through forecast based financing working group of Standing order on disaster of the Government of Bangladesh.

- ◎ **Diverse Funding Mechanisms:** Bangladesh employs a wide array of funding mechanisms, including domestic funds like the Disaster Risk Reduction Fund and Climate Change Trust Fund, as well as international sources for rapid response and recovery initiatives.

H. Recommendations : Stakeholders and Coordination

- ☑ **Coordinate Through the Centralized Coordination Body**: Project planning, implementation guideline and process are recommended to consider coordination with The Ministry of Disaster Management and Relief (MoDMR) and Ministry of Finance and other sectoral ministries. Project implementation under supervision of centralized project management committee consist of relevant sectoral ministries are recommended.
- ☑ **Collaborate and Coordinate with National FbF Working Group:** Leverage existing forecast-based financing mechanisms and anticipatory action frameworks to pre-position resources in collaboration and coordination with National Forecast-Based Financing Working Group for synergies of flood risk model and anticipatory action protocols as well as other operational coherence.
- ☑ **Coordination with GBV Cluster and GiHA Working Group**: Ensure coordination with MoWCA sub-national working group at district level and Gender-Based Violence (GBV) Cluster and GiHA Working Group at national level to address gender-based violence during any disaster
- ☑ **Develop Multi-Stakeholder Coordination Mechanisms:** Facilitate regular coordination meetings that involve key stakeholders, including international partners and NGOs under the Humanitarian Coordination Task Team (HCTT). This ensures alignment of objectives, resources, and timelines to efficiently complement and generate a wider impact of the project.

Section One

- **BACKGROUND AND INTRODUCTION**
- **OBJECTIVES**
- **METHODOLOGY**

Image Source : Ai Generated @ Midjourney

1. BACKGROUND AND INTRODUCTION

Bangladesh is a tropical delta-shaped country with complex geophysical characteristics and many rivers which makes it one of the most hazard-prone countries in the world. Bangladesh, with its distinctive geographical location, precarious socio-economic situations, increasing population, widespread poverty, and limited technological infrastructure, is highly susceptible to a wide variety of hazards. On the other hand, In the twenty-first century, climate change has emerged as a prominent global issue, presenting numerous difficulties and challenges. Its adverse effects pose a significant threat to the international community, particularly to developing nations that are highly susceptible to the severity, regularity, and intensity of disasters and severe weather events. Climate change manifests in various forms, including changes in temperature, precipitation patterns, growing sea levels, and indications of severe weather. Furthermore, its far-reaching consequences profoundly impact global economic, social, and political activities, causing disruptions to people's ways of life. Extensive literature supports the notion that developing countries, including Bangladesh, are particularly exposed to the impacts of climate change (Hossain et al., 2023) and Bangladesh experiences a range of intense disaster risk and climatic events, including floods, riverbank erosion, cyclones, waterlogging, salinity intrusion, landslides, storm surges, and droughts, earthquakes on an Annual Basis. These events pose substantial encounters to the way of life of its inhabitants.

Out all of these, natural hazards, monsoon flood is prominent due to its frequent occurrence and nature of destruction. Bangladesh, with its intricate network of rivers and low-lying topography, is acutely vulnerable to flooding. The convergence of the Ganges, Brahmaputra, and Meghna rivers, coupled with heavy monsoon rains, results in frequent and severe flooding events. The socio-economic impacts are profound, affecting millions of people, destroying homes, damaging infrastructure, and hindering economic progress. (Ahmed & Mirza, 2000; Brammer, 2010).

According to the Asian Development Bank (ADB) Report 2016, catastrophes have a significant impact on Bangladesh's GDP growth. A large and severe flood event (i.e. 1988 and 1998) could economic loss equivalent to 8%–9% of GDP

and for tropical cyclones around 5% of GDP. Given the low penetration rate of individual and business insurance and the lack of alternative financial coping mechanisms for disaster, the sovereign responsibility and the amount of risk that needs to be financed by the state are large.

The Jamuna River Basin, part of the larger Brahmaputra River system, is highly susceptible to flooding due to its geographical and climatic characteristics. This region experiences heavy monsoon rainfall, which, combined with the river's high sediment load and dynamic meandering, leads to frequent and severe flood events. The socio-economic impact of these floods is profound, affecting millions of people through displacement, loss of livelihoods, and damage to infrastructure. Additionally, climate change is exacerbating the situation, with rising sea levels and increased precipitation intensity contributing to more frequent and severe floods. (Brammer, 2014; Mirza, 2011).

Beyond the impact of flooding on assets, infrastructures and economy, socio-economic condition also poot footprint on most vulnerable groups. Impacts of these flood events are differently distributed among different regions, generations, age classes, income groups, occupations and genders[7]. Impacts of these catastrophic events are not even in the lives of men, women and other diverse group of population (people with different gender identity, people with disability, elderly, adolescent girls etc.) who mostly tend to be vulnerable to any shock. In Bangladesh context, women are less likely than men, have less access to and control over resources and basic services are disproportionately affected by the consequences of climate change. Social norms often restrict women's mobility and create social isolation and limit their decision –making power, charge them with reproductive roles (i.e., caring responsibility, collecting fuel, water and other household chores) resulting in burdened with unpaid care work. Impact of climate change exacerbates these pre-existing inequalities and has caused rise in gender-based violence as they are not able to meet those socially defined role easily. For example, gender-based violence surged by 65[8]% in

[7] *IPCC (2001). Climate Change 2001: Impacts, Adaptation and Vulnerability. Summary for Policymakers.*

8 Ashraf, M. A., & Azad, A. K. (2015), Gender Issues in Disaster: Understanding the Relationships of Vulnerability, Preparedness and Capacity

areas affected by Cyclone Amphan in 2020 in Bangladesh[9]. This situation has direct human, psychological, and economic costs, including through lost employment and productivity and increased demand for resources from social services and the justice and health care systems[10]. Considering these limitations, addressing gender in Disaster Risk Financing and Insurance Programme (DRFI) is imperative to address differential access to and use of financial instruments and insurance.

Considering the higher flood risk and embedded social and demographic vulnerability the Jamuna River basin, World bank initiated the Jamuna River Sustainable Management Project 1. The project aims to enhance climate resilience and navigation capacity along the Jamuna River. A key component of this project, component 3: disaster risk finance is dedicated to establishing a program to mitigate the financial impacts of floods on communities in selected flood-prone regions of the Jamuna River. The primary objective is to support the development of Component 3. To support the set of components 3, This report exploring the existing protection gaps and partnership opportunities that the government could prioritise action and location, as well as establish with local partners to design and implement the component for the projects are intended to implement by Government of Bangladesh in partnership with world bank.

The project targets four highly flood-prone upazilas in Jamuna River basin across three districts: Tangail, Sirajganj, and Gaibandha, these areas are highly susceptible to flooding due to their geographical location in the Jamuna River Basin. Climate change, with rising temperatures, has led to more intense and unpredictable rainfall during the monsoon season, increasing the likelihood of catastrophic flooding in this area. The region's history of frequent flooding, specifically in the years 2014, 2017, 2019, 2020, and 2022, has rendered it increasingly vulnerable and less resilient. The Bangladesh INFORM Subnational Risk Index 2022(*UNDRR and NIRAPAD, 2022*) has also identified all four upazilas (Kalihati, Sirajganj Sadar, Fulchhari, and Gaibandha Sadar) as highly susceptible to floods. Furthermore, the INFORM Vulnerability Index indicates

[9] Rapid Gender Analysis Cyclone Amphan 2020, UN Women available on https://asiapacific.unwomen.org/en/digital-library/publications/2020/06/rapid-gender-analysis-cyclone-amphan

[10] Incorporating Gender in Disaster Risk Financing and Insurance (DRFI) Projects: A Practice Guide, World Bank Group

that, with the exception of Kalihati Upazila, the other three Upazilas are highly vulnerable and lack adequate coping capacity.

Figure 1.1: Location of the project Upazilas

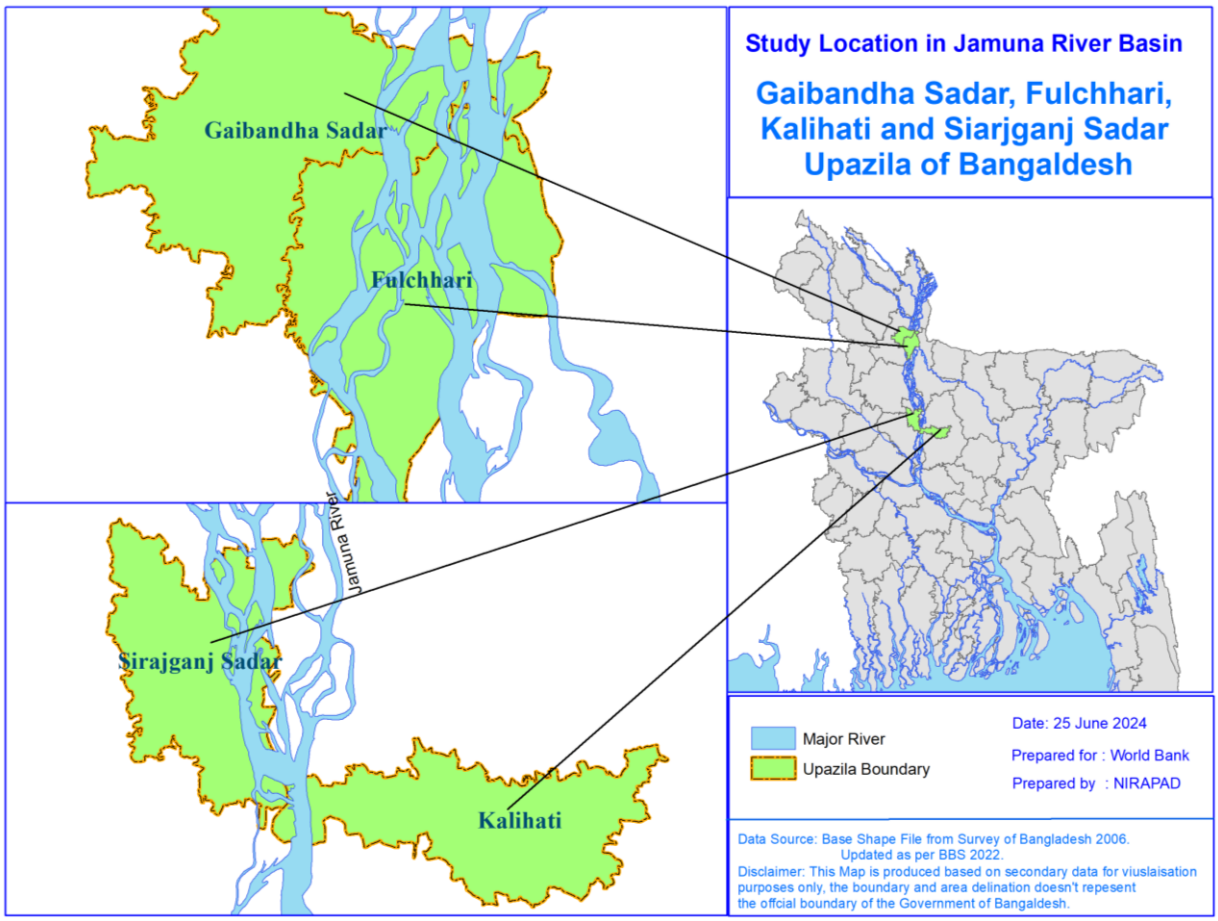


Table 1.1 : INFORM Risk Index of the Selected Districts and upazilas

District (Admin Level 2)	Upazila (Admin Level 3)	Flood Risk	RISK CLASS-Hazard Exposure	INFORM Vulnerability	RISK CLASS-Vulnerability	LACK OF COPING CAPACITY	RISK CLASS-Lack of Coping Capacity	INFORM RISK	RISK CLASS
Tangail	Kalihati	8.7	Very High	5.9	Medium	5.2	Medium	5.6	Medium
Sirajganj	Sirajganj Sadar	9.0	Very High	7.0	Very High	5.6	High	6.1	Very High
Gaibandha	Fulchhari	8.9	Very High	7.0	Very High	5.7	High	6.2	Very High
Gaibandha	Gaibandha Sadar	8.9	Very High	7.1	Very High	5.5	High	6.1	Very High

Source: UN Bangladesh, UNDRR and NIRAPAD, 2022

Exploring recent past flood incident in these areas reveals that these areas experienced significant seasonal flooding during the monsoon period, leading to widespread disruption. Floodwater inundated homes, agricultural fields, and critical infrastructure, causing extensive damage and displacement of communities. The agricultural sector, which is the primary livelihood for many residents, suffers greatly as crops are destroyed and arable land is eroded. Furthermore, recurrent flooding poses serious health risks, increasing the prevalence of waterborne diseases and making healthcare access challenging. The economic impact of these floods is profound, as recovery and rehabilitation efforts strain limited local resources, perpetuating a cycle of poverty and vulnerability.

Though there is scarcity of sex-disaggregated data for these particular areas, various reports and research in Bangladesh indicate that climate-induced disasters including flood, river erosion, pose increased challenges for women, as most of the households belong to lower socio-economic strata and mostly depend on natural resources and agriculture for their livelihoods which are impacted by climate change. Hence, the project's target areas are no exception when it comes to severe recurrent flooding.

Over time, Bangladesh has made significant progress in addressing gender inequality, including DRR and climate change areas through various policy and strategies(i.e. Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009; National Women Development Policy 2011; National Adaptation Plan 2020). However, there remains room for further progress when it comes to narrowing gender gaps in the country. For example, only about half of Bangladeshi adult women have access to a mobile phone (GSMA Mobile Gender Gap Report 2023), only 43% of them have a bank account(Global Findex Database, World Bank 2021)

With existing rapid response mechanism to flood by government and non-government agencies exist in Bangladesh, a number of new initiatives also have been taken into consideration to reduce the impact of flood. Recently Disaster risk financing and forecast-based early action appeared as critical strategies in mitigating the impact of natural disasters in Bangladesh. Disaster risk financing involves the strategic allocation of financial resources to manage the economic

impacts of disasters, ensuring rapid response and recovery. This approach includes mechanisms such as insurance, contingent credit, and emergency funds. Forecast-based early action (FbA) complements these efforts by utilizing weather forecasts and risk analysis to trigger pre-planned activities before a disaster strikes. This proactive approach aims to reduce potential damage and losses by enabling timely interventions. In Bangladesh, FbA has been instrumental in minimizing the adverse effects of floods and cyclones, safeguarding livelihoods, and enhancing community resilience (Sönke et al., 2018; World Bank, 2019). Beside another flood response instruments, parametric flood insurance also started being implemented in Bangladesh. Parametric flood insurance is an innovative financial instrument gaining traction in Bangladesh to address the economic impacts of flooding. Unlike traditional insurance, which pays out based on the assessed damage, parametric insurance triggers payouts based on predefined parameters, such as the level of rainfall or river flow. This approach enables quicker disbursement of funds, crucial for timely recovery and rebuilding efforts. In Bangladesh, parametric flood insurance is particularly valuable due to the country's frequent and severe flooding events. It provides a reliable safety net for vulnerable communities, farmers, and businesses, reducing the financial strain and enhancing resilience against climate-induced disasters. By offering swift financial relief, parametric flood insurance supports sustainable development and disaster preparedness in one of the world's most flood-prone regions (Clarke & Dercon, 2016; Surminski & Oramas-Dorta, 2014).

For the intended project of the Government of Bangladesh and World bank, as part of the preparation of the Jamuna River sustainable management project, the government requested to integrate activities that could support the lives and livelihoods of communities, which led to the decision on having a macro level program with two instruments, i.e: community protection fund and a parametric risk transfer for floods. The contingency fund would be deployed to complement internal budgetary mechanisms for response to more frequent events, while parametric risk transfer would deal with less frequent events and could provide rapid liquidity to support early recovery (Ozaki, 2016).

2. OBJECTIVES OF THE ASSESSMENT

This assessment aims to assess the scope of the financial protection component-3 of the World Bank's Jamuna River Sustainable Management Project-1 focusing to 'enhance climate resilience and navigation capacity along the Jamuna River'. This scoping assessment aims to investigate existing and potential flood risks , concomitant protection gaps in affected communities as well as stocktaking current practices of flood protection projects in the assessment areas to guide appropriate program planning with a goal that disaster risk financing, is dedicated to establishing a program to mitigate the financial impacts of floods on communities in selected flood-prone regions of the Jamuna River. The whole process of assessment and stocktaking will integrate gendered aspects based on available information.

This assessment has been guided by two major module specific objectives which comprise of gap analysis to identify areas of needs as well as assessing the operational compendium of the flood risk projects/ programs implemented/being implemented by development partners in Bangladesh. Thus, two objectives are elaborated below-

Objective one: Deep dive of 4-6 existing flood risk programs being delivered by humanitarian/development partners (Module 1): The module has scrutinized existing flood risk programs conducted by humanitarian and development partners, aiming to comprehensively address systematic and technical aspects of each project. Each project has been examined in detail to answer key questions including its objectives, geographic scope, stakeholders involved, financial aspects, beneficiaries and its modality, flood risk modeling along with the trigger threshold (existing and planned), delivery modality (including relief activities like cash distribution and engagement with digital payment service providers), coordination with the government (including levels of involvement and plans for eventual transfer of project elements), involvement of international and national/local NGOs, considerations for gender mainstreaming in program design, evaluations and also document the lessons learned, and future phase-out plans for the project. Through investigation and analysis, the module seeks to provide valuable insights for comparative assessment and potential improvement of flood risk programs.

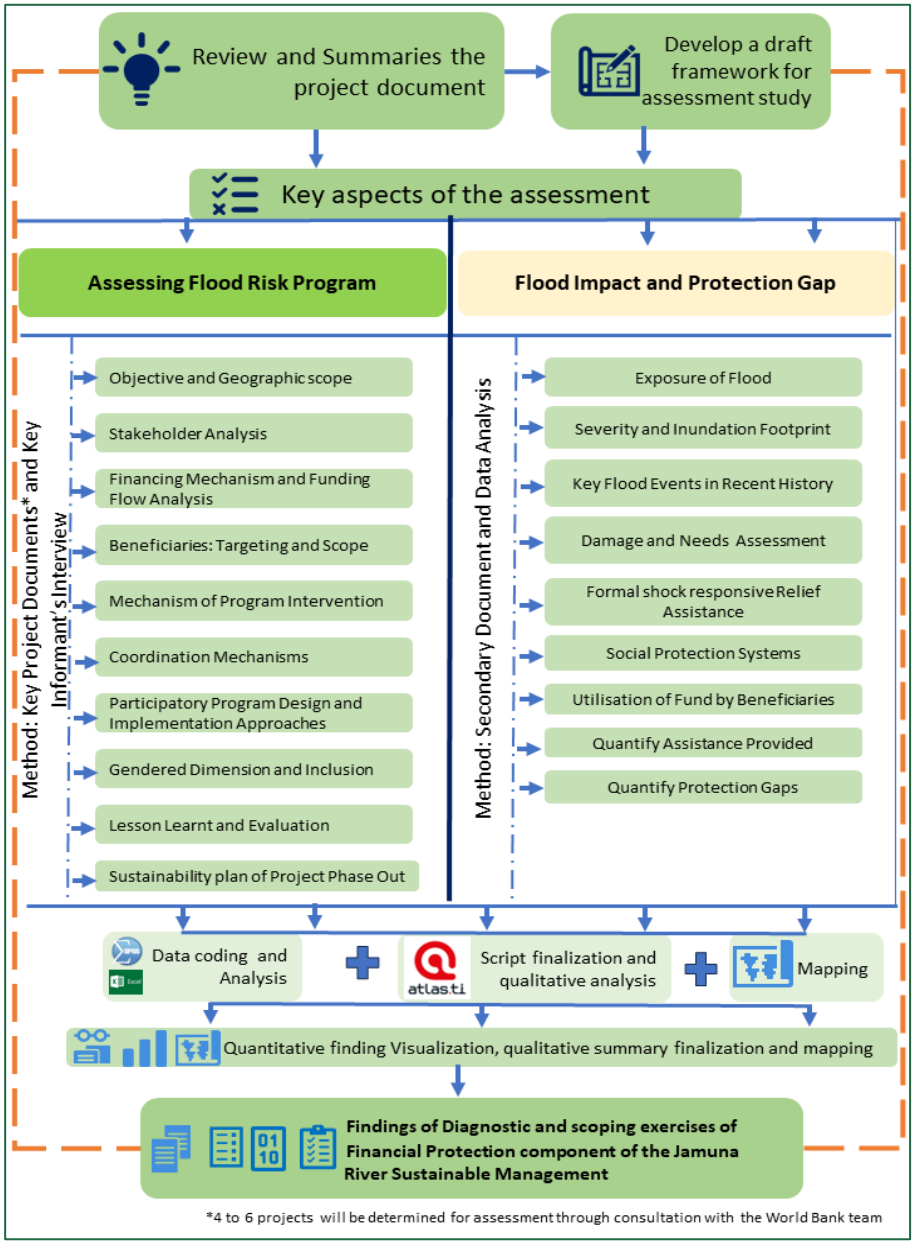
Objective Two: Assess and compare the 'protection gap' between and within the 4 selected sites in the Jamuna basin (Module 2)

The module two focused on identifying the "protection gap" across four project sites, referring to the disparity between allocation of resources and economic damages as well as resource needed and funded amount for vulnerable communities in the event of flooding. A light-touch review and desktop analysis of secondary information have been conducted. This analysis encompassed exposure to floods and comparison of historic disaster impacts, nature of floods, duration of floods and importantly relief needs versus provided relief and support. Several credible assessments of damage and needs of the flood, formal shock responsive relief quantity vs needs also have been quantified at upazila level for gap analysis. The protection gaps analysis for this research are built on three aspects, i.e. *a. allocation gap, b. coverage gaps and c. entitlement gaps.* By pinpointing areas or demographic groups with the most significant protection gaps as well as the most risk of flooding, the module aims to ensure targeted interventions for the most vulnerable geographic areas and communities. This section aims to shed light on the differentials in vulnerabilities of men and women during and after the flood because of gender-related socio-cultural norms.

3. CONCEPTUAL FRAMEWORK AND METHODOLOGY

The report aims to inform the design and development of pre-arranged financial solutions, including two macro-level flood risk transfer products, *i.e. 1.a community protection fund, and 1.b. Parametric risk transfer,* which are `fundamental for the sustainable management of flood risk in the Jamuna River Basin. These solutions will be established through historical evidence guided ecosystem conducive to their implementation, complemented by capacity building of key stakeholders and implementation support provided by proposed project. This integrated approach could make a significant milestone in managing flood risks effectively. To design these pre-arranged financial solutions, the project will undertake specific diagnostic and scoping exercises, guided by a well-defined framework.

Figure 3.1: Empirical methodology of the assessment



3.1 EMPIRICAL METHODOLOGY

This assessment work has been carried out using secondary data from both government and non-government agencies. Initially, NIRAPAD has conducted a scoping exercise for each indicator aligning the assessment framework. For collecting secondary data from various sources, NIRAPAD team has employed an indicator-specific data collection template. Besides, NIRAPAD has identified existing flood risk programs being delivered by humanitarian/development partners meeting the criteria in the terms of reference (*annex 2*) and facilitated consultation with the selected development partners to explore objectives, activities and support modalities of those initiatives to gather the relevant information in a way that allow for quick comparison of technical, financial and operational aspect of those projects.

The predefined terms of reference (ToR) specific framework, as shown in figure 3.1, has guided the process of data collection, analysis, and reporting.

3.1.1 Data Collection and Analysis for Module One:

Based on assessment objective and discussion with the WB team, a ToR (annex-1) for module one has been developed to identify the appropriate six disaster risk financing and anticipatory action projects (*list in annex-4*) being implemented in Jamuna River basin area. The projects have been selected based on the following criteria-

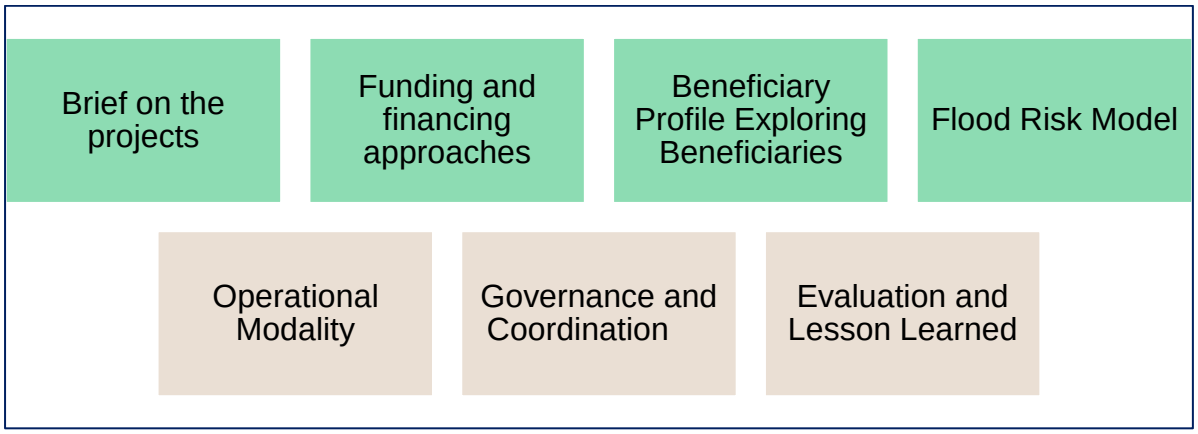
- Disaster risk financing or focused project (arranging finance and response actions ahead of future flood risks).
- Relevant geographic scope (refer table 1.1).
- Project utilizes flood risk modelling.
- Intervention involves cash distribution to the beneficiary.
- Project activity involves flood trigger-based system to deliver assistance

Thus, assessment objective focused checklist *(Annex 2)* for interviewing key personnel of the selected disaster risk financing project projects have been conducted.

The module specific sub domains of the checklist have guided narrative analysis of the collected interview data. Major sub domain for the analysis of module 1 was analyzed by following descriptive data analysis approaches in excel and

atlas.ti software to summarize key practices and collate of necessary information form the collected data as per the sub domain shown in figure

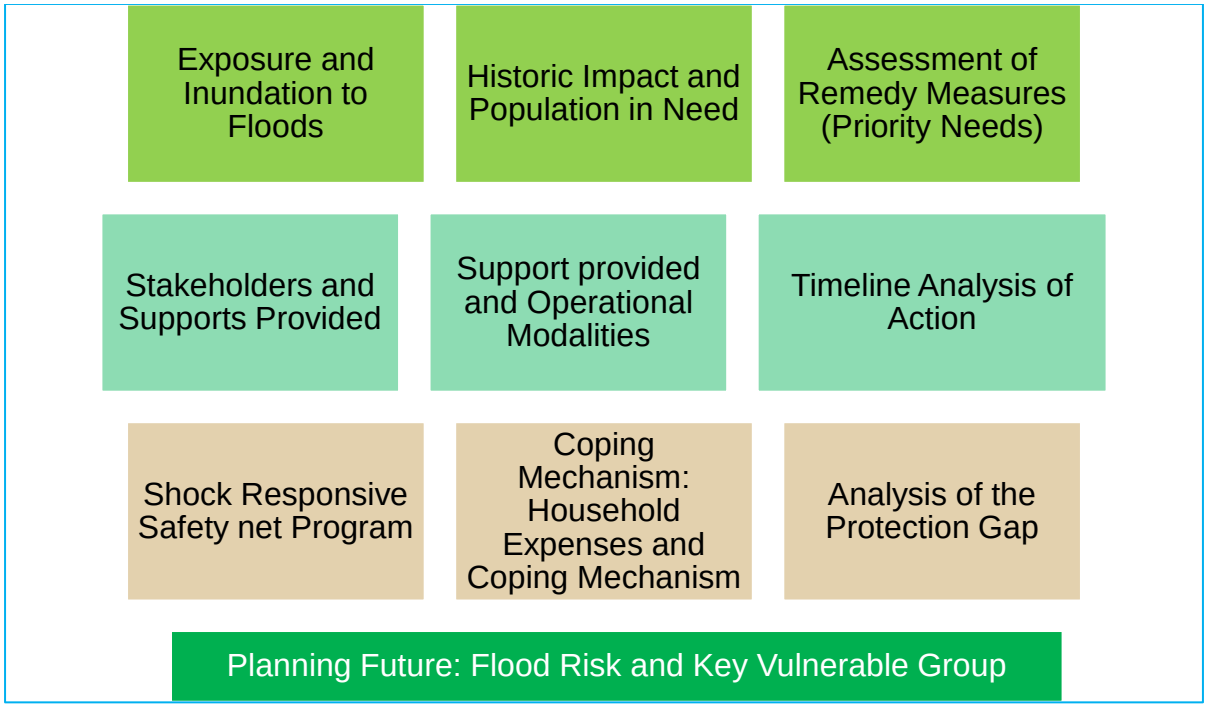
Figure 3.2: Sub Domain of the Analysis for Module one



3.1.2 Data Collection and Analysis Module Two:

In reference to the objective of module two, a list of key Indicators and potential sources of information have been identified and listed (annex 3), corresponding to the module-specific issues and indicators detailed in the ToR of the assessment. The key indicators have been finalized in consultation with the national expert group and World Bank team. Besides, consultation with development/humanitarian partners also helped to identify other potential sources for the required information.

Figure 3.3: Sub domain of the analysis for module two



The assessment has been built on secondary data from various sources and module specific analysis has been done focusing the major sub domain (figure 3.3) aligning the module objectives. Hence not all the required data were available from secondary source to the intended administration level (upazila). Thus, the assessment implied mixed analysis methods and statistical estimation where data were not available (e.g. upazila specific economic loss, population reach). For these cases, statistical modeling and scenario-based convergences has been done with an inference to the national historical data, practices, determining proxy indicators aligning national and global standards.

Advanced technologies such as Geographic Information Systems (GIS), remote sensing, Microsoft Excel, SPSS, and Tableau Public have been employed for multi-tiered analysis and visual representation of the data. Statistical methods and inference markers have been utilized by ensuring cross checking and validating with relevant facts and figures, present in table annex 1 along with detailed methods of statistical estimation.

3.2 LIMITATIONS OF THE STUDY:

Despite the well-articulated research plan as per the objective of the assessment, there were some constraints related to secondary data availability arose during the research period. Additionally, there were some limitations regarding upazila level data of flood impact and response information. Specifically for module two for analyzing the protection gap of flood response in four upazilas of Bangladesh, several limitations may arise that could impact the comprehensiveness and accuracy of the findings. Lack of availability of gender and diversity disaggregated data poses a great constraint to understand the capacity and vulnerability of the marginalized groups. Additionally, the lack of comprehensive information of the DRF project investigated also appeared as gaps for the analysis of information to capture and analyze the dimension, nature and learning of those projects.

Here are some potential limitations arose during the research:

◎ **Data Availability and Quality:**

Inconsistent Data: Data on flood impacts and responses was inconsistent, sometimes repetitive or incomplete.

Limited Disaggregation: Data was not sufficiently disaggregated by gender, age, disability, or other vulnerability factors, which can obscure specific protection needs and gaps.

◎ **Geographic Coverage**

All the impact and response data are provided at district level, thus small area estimation methods have been implied for estimating loss, support provided and analyzing gaps at upazila level.

◎ **Limited Event Dataset**

The analysis of protection gap and assistance requirements is largely based on four recent flood events (2016, 2017, 2019, and 2020). These do not cover the full range of flood events that could happen in the future, particularly much larger less frequent events for which the profile of households needing assistance, and the type of assistance required may be different.

◎ **Stakeholder Coordination**

Lack of coordination among government agencies resulted in gaps in all government response and recovery information by different sectoral ministries of GoB, which pose less reliability of the resource allocation gap has been identified at upazila. Also gaps in collaboration and coordination among Government, NGOs including women-led and women rights organizations, and international organizations for information management create divers' challenges like overlapping data, making it difficult to get a comprehensive view of protection gaps.

◎ **Underreporting**

Absence of proper information management for humanitarian response and recovery efforts by government and non-government agencies lead to underreporting of response information and other issues, such as gender-based violence or the needs of marginalized groups.

◎ Temporal Limitations

Changing Dynamics: The dynamic nature of flood impacts and responses means that protection gaps identified at one point in time may change rapidly. Thus, there were no available credible sources, which analyzed local protection gaps that compared needs versus assistance provided during past floods. Hence this research identified such protection gaps after a while of the events happened, thus result may be skewed at some level.

Historical Data: Historical operational data and coverage information were missing for some DRF/anticipatory projects which have been investigated through deep dive of module one. It appears non-government agencies don't have a proper system in place to document the historic initiatives and operational aspects.

◎ Information Type:

Humanitarian response and recovery data of Bangladesh are not stored in a well-articulated system. Most of the data formats were not suitable for analysis or digitally accessible which delayed the completion of the assessment. In brief, disaster impact and response information are not well organized in Bangladesh and its always complex to collate multiple paper-based sources. However nationally valid inference and appropriate statistical methods and multi-source cross validation have been implied to overcome these limitations to fulfill the objectives of this assessment.

SECTION TWO:

FINDINGS FROM DIAGNOSTIC AND SCOPING ASSESSMENT

Deep Dive of Existing Flood Risks Programs Being Delivered by Humanitarian/Development Partners in The Project Areas

Flood Impact, Historical Responses and Operational Aspects

Community Coping Strategies and Protection Gaps

Projection of the Potential Flood Impact Area and Population

Image Source : Ai Generated @ Midjourney

4. ASSESSMENT FINDINGS

4.1 : STOCKTAKING OF EXISTING FLOOD RISK PROGRAMS

4.1.1 Brief on The Projects:

Investigation of the six-disaster risk financing and anticipatory action projects was conducted to surface operational and technical aspects along with coordination dimensions to develop an operational compendium of the existing disaster risk financing projects in the assessment areas. The assessment objectives (outlined in the box below) guided the selection of the relevant projects though these are not mutually exclusive categories for selecting projects for stocktaking as there are areas of overlap in some projects.

Theme of the Assessed Project

Based on the nature of the project's objectives, threshold and trigger mechanisms, technical operational aspects, utilization of forecast products and also the forecast-based action type, these six projects have been categorized into three themes elaborated below and shown in table 4.1.

Parametric Flood Insurance: Parametric food insurance is a type of insurance policy that provides coverage based on predefined parameters or triggers, rather than on actual losses incurred.

Anticipatory Action: Anticipatory action refers to the implementation of pre-agreed early actions in the period between a forecast of an extreme event and its actual occurrence (main components are, Forecast-based Planning, Pre-Agreed Actions, Rapid Implementation).

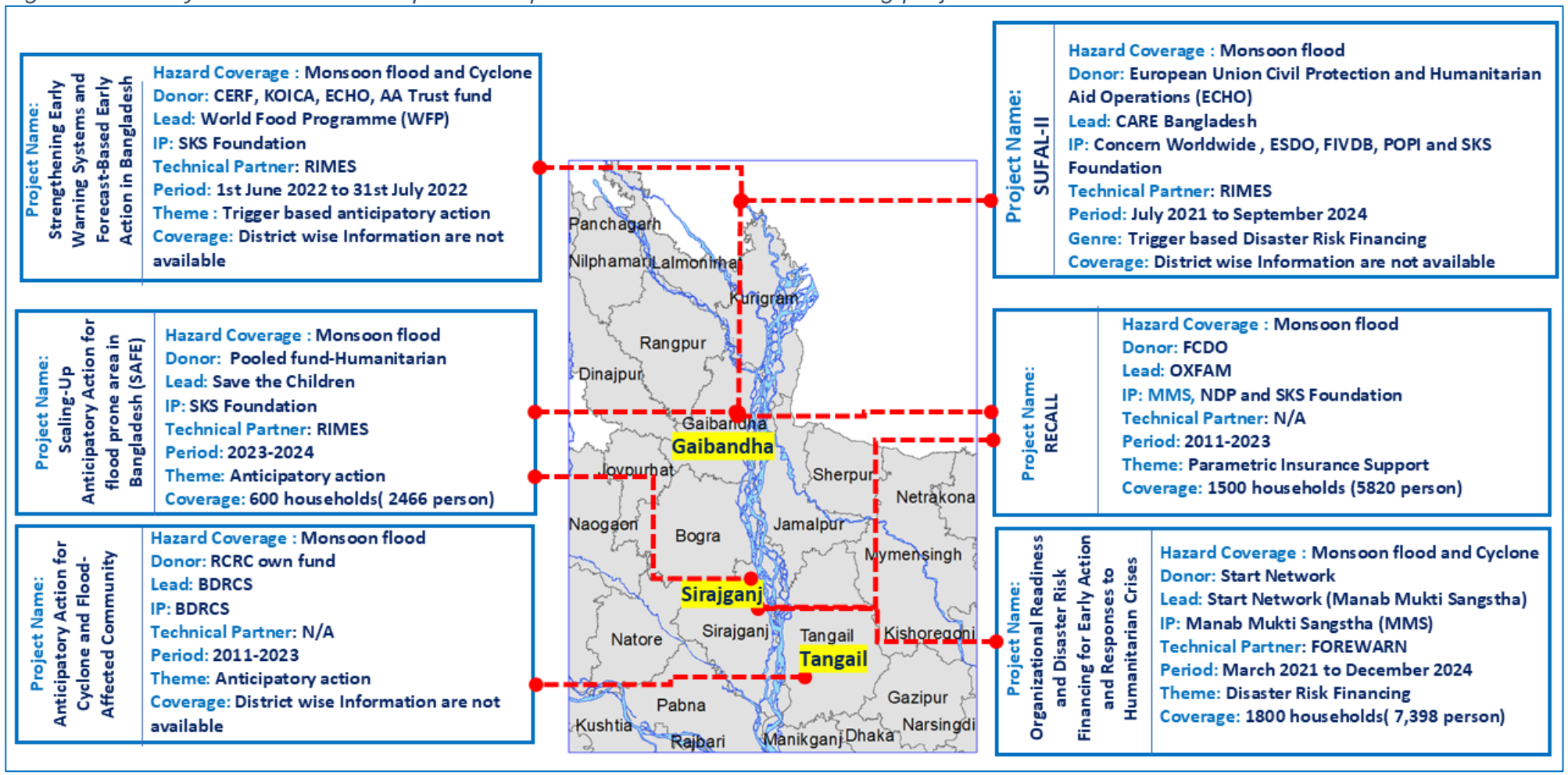
Disaster Risk Financing (DRF): DRF refers to financial strategies and mechanisms that provide rapid, predictable funding to mitigate, respond to, and recover from disasters. (main components are, Contingency planning, Predictability, Pre-approved Projects, Pre-crisis Interventions, Trigger Mechanisms, Joint Initiatives)

Table 4.1: List of existing projects in the assessment area and theme

Project Lead and IP Name	Project Name	Theme
BDRCS	Anticipatory Action for Cyclone and Flood-Affected Community	Anticipatory Action
CARE (SUFAL)	Scaling up Flood Forecast-based Action and Learning in Bangladesh (SUFAL-II)	Anticipatory Action
OXFAM-MMS	The Resilience through Economic Empowerment, Climate Adaptation, Leadership and Learning (REE-CALL)	Parametric Flood Insurance
SAVE-SKS	Scaling-Up Anticipatory Action for flood prone area in Bangladesh (SAFE)	Anticipatory Action
SFB-MMS	Organizational Readiness and Disaster Risk Financing for Early Action and Responses to Humanitarian Crises	Disaster Risk Financing
WFP-SKS	Strengthening Early Warning Systems and Forecast-Based Early Action in Bangladesh	Anticipatory Action

In the assessment upazilas, analysis of the different relevant projects has been conducted and presented in figure 4.1 by highlighting key aspects of the projects i.e., coverage, financial partners and other dimensions. It is noted that all of these projects have much wider coverage, but the following diagram presents the operational presence only for the intended project areas of the Ministry of Finance. This schematic infographic shows that most of the projects being implemented in Gaibandha and Sirajganj districts, whereas only one project is being implemented in Tangail district.

Figure 4.1: Key stakeholders and partnerships of the disaster risk financing projects in assessment area



Note: Assessed projects have broader coverage than the assessment upazilas. This infographic only shows the project information and coverage for four assessment upazila of three districts

4.1.1.2 Objectives, Geographic Scope and Coverage

Further detail on the projects categorized by specific themes, each with targeted objectives is shown in table 4.2. All the six projects have triggered their early actions in the assessed districts. Findings from the analysis from the stocktaking of the projects show that under the parametric Insurance theme, the REE-CALL OXFAM project aimed to provide flood risk transfer mechanisms to safeguard 1,500 marginalized farmers in Gaibandha and Sirajganj from financial losses, this project ran for a couple of years but is paused due to funding coming to an end. The Risk Informed Decision-Making through Anticipatory Action theme encompasses projects by BDRCS, SAVE-SKS (SAFE), WFP-SKS, and CARE-SUFAL, which are active today and aim to anticipate disasters, strengthen community resilience, and enable risk-informed decision-making across Gaibandha, Sirajganj, and Tangail, benefiting a total of 63,836 individuals and providing institutional support.

Table 4.2: Objectives, Geographic Scope and Coverage of the Disaster Risk Financing and Anticipatory Project

Theme	Projects	Objective	Geographic Scope*	Beneficiaries Reached*
Parametric Insurance	REE-CALL OXFAM	Flood Risk Transfer for marginalized farmers	Gaibandha, Sirajganj	1,500
Anticipatory Action	BDRCS, SAVE-SKS (SAFE), WFP-SKS, CARE-SUFAL Project	Anticipate disasters, strengthen resilience, enable risk-informed decision-making	Gaibandha, Sirajganj, Tangail	25,836 + 38,000 + Institutional support
Disaster Risk Financing	SFB-MMS	Disaster Risk Financing for early action and response	Sirajganj	1,800

** The actual number of total beneficiary reached only covered for the intended project areas (3 districts), however these projects have coverage in other districts both in cyclone and flood prone areas.*

The Disaster Risk Financing theme, represented by the SFB-MMS project, focuses on providing financial resources for early action and response in Sirajganj, benefiting 1,800 individuals.

These projects collectively aim to enhance disaster preparedness and resilience, addressing the unique needs of various vulnerable groups and regions through forecast based anticipatory action and disaster risk financing.

4.1.1.3 Interventions and Operational Methods

While looking at the interventions of the projects (table 4.3), it appears almost all of the projects have one or two interventions in common, and all of them are early action focused initiatives except the parametric insurance-based support.

Table 4.3: Interventions and Operational Methods of the Assessed Projects

Theme	Project Name	Intervention	Operational Methods
Parametric Insurance	REE-CALL OXFAM	✓ Awareness on Flood Risk Management ✓ Awareness on Financial Risk Management ✓ Flood Risk transfer through cash support as payout of the insurance	Parametric Insurance for flood-affected community (for Agri farmers). Insurance premium provided by Oxfam before the flood and community received the payout after flood
Anticipatory Action and Community Resilience	BDRCS, SAVE-SKS (SAFE), WFP-SKS, CARE-SUFAL Project	✓ Training volunteers ✓ Cash support to the beneficiaries ✓ Provide boat facilities ✓ Assist with portable houses ✓ Fresh water supply ✓ Early warning dissemination ✓ Community level intervention	✓ Pre-agreed early actions implemented before disaster ✓ Access to forecasts and early warning systems ✓ Risk-based initiatives ✓ Policy advocacy ✓ Evidence-based learnings
Disaster Risk Financing	SFB-MMS	✓ Volunteer group formation and training ✓ Small scale risk mitigation schemes ✓ Cash support to vulnerable households ✓ In Kind support to vulnerable communities	Disaster risk financing as per contingency plan to reach the most vulnerable flood-affected community through pre awarded projects.

Firstly, initiatives such as awareness campaigns on flood and financial risk management by REE-CALL OXFAM aim to educate communities about mitigating risks as well as provide payout based on pre-defined parametric weather index to the households after the flood event. Direct support and services provided by organizations like BDRCS, SAVE-SKS, WFP-SKS, and CARE-SUFAL before the flood which include cash assistance, boat facilities, portable houses, fresh water supply, community level early interventions and volunteer training to enhance community resilience and response capabilities. These efforts are complemented by robust risk management and early warning systems, encompassing activities like flood risk transfers, early warning dissemination, vulnerability mapping, and anticipatory action planning. Community empowerment and resilience-building strategies involve pre-agreed early actions, capacity building for government and private sector stakeholders, and advocacy for evidence-based risk initiatives and policies. Beneficiary data management and validation prior to the flood season, conducted by Start Fund Bangladesh(SFB) and WFP, ensure accurate targeting and response effectiveness, while collaborative research and institutional capacity enhancements further strengthen disaster preparedness efforts.

“Key Issue of Intervention: Cash Based Interventions are Common”

In summary cash-based intervention and cash to households based on forecast driven predefined threshold are more prominent and common among agencies as it appears as central strategy in preparedness and early response initiative of all projects. Agency’s preference is for cash-based intervention guided by community consultation and market assessment, due to its flexibility, speed as well as empowering affected communities.

4.1.1.4 Gender Considerations in Program Design

The assessed projects demonstrate varied approaches to gender integration within their project design frameworks. This analysis draws on several projects, each demonstrating a commitment to gender-responsive approaches, presented in table 4.4.

For the **parametric weather-based insurance project** by OXFAM, gender integration was prioritized from the design phase, with a deliberate plan to have 90% of the beneficiaries be women. This approach recognizes the importance of addressing gender-specific vulnerabilities and ensuring that women, who are often disproportionately affected by financial risks, are the primary recipients of the project's benefits.

In the Anticipatory Action projects led by BDRCS, SAVE-SKS (SAFE), WFP-SKS, and CARE-SUFAL, gender integration is evident in the tailored beneficiary selection processes. The BDRCS project employs a weighted scoring system that gives additional points to women and women-headed households, ensuring their substantial participation as beneficiaries. This approach is particularly effective in ensuring that women, who may face greater challenges in disaster scenarios, are adequately supported. SAVE-SKS (SAFE) follows its gender policy throughout the project design and implementation phases, ensuring that gender equality is a core objective. This policy guides beneficiary selection and support delivery, aligning with the overall goals of gender integration. The WFP-SKS project also incorporates a gender-focused approach by designing its participant selection process to prioritize women, especially those from vulnerable households, such as those headed by widows or women headed households. The project delivery is tailored to be women-friendly, ensuring that their specific needs are met. The CARE-SUFAL project emphasizes the involvement of women in local-level committees and volunteer groups, particularly in localized anticipatory actions. The project ensures that women are not only beneficiaries but also active participants in decision-making processes, enhancing the overall impact on gender equality.

Table 4.4: Gender aspects into program design

Theme	Project Name	Approaches of Gender Integration
Parametric Insurance	REE-CALL OXFAM	Considering the gendered aspects the project has planned to have 90% of project beneficiaries from women . This has been planned during the project design phase.
Anticipatory Action	BDRCS; SAVE-SKS (SAFE); WFP-SKS; CARE-SUFAL	**BDRCS:** The design of the project embeds additional weighted scoring to women and women headed households to ensure women's participation as beneficiary. The project is designed in a way that directs when the overall project beneficiary is being selected based on wide range of vulnerability score, women and women headed household get weighted scores to ensure effective participation of women in the projects **SAVE-SKS (SAFE):** SKS follows it's gender policy for project design, selecting beneficiaries, project support delivery aligning the goal and objectives of the gender policy for integration of women in projects. **WFP-SKS:** Along with above mention SKS policy and practices WFP's project participant selection process has designed to target women as the key project participants and women friendly project delivery such as weightage on indicator such as women from poor household, widowed and women headed households. **CARE-SUFAL Project:** The design phase emphasized the integration of women in the local level committees and volunteer group for localized anticipatory actions along with prioritizing women as beneficiary through prescribed beneficiary selection process.
Disaster Risk Financing	SFB-MMS	The design phase of the DRF project is guided by the localized contingency plan developed in coordination with all member agencies and local government. The contingency plan guided the member agencies to design the project by incorporating gender analysis in risk assessment, targeted beneficiary selection approach to prioritize women as beneficiary, gender-responsive activities designed to address the needs of women and girls, and participation and leadership of women in all process (i.e. beneficiary selection, validation, support delivery) through a comprehensive accountability and monitoring mechanism.

Lastly, the **Disaster Risk Financing (DRF) project** by Start Fund Bangladesh integrates gender considerations through a localized contingency plan. This plan incorporates gender analysis in risk assessments and ensures that women are prioritized as beneficiaries. The project also promotes the participation and leadership of women in all processes, including beneficiary selection, validation, and support delivery, supported by a comprehensive accountability and monitoring mechanism.

Above evidence illustrates the diverse approaches of integrating gender considerations into project design, ensuring that financial protection measures are equitable and effective in addressing the unique needs of women in the Jamuna River Basin.

“Contingency plan driven projects are more coherent and efficient in gender integration during project design ”

Start fund’s localized contingency plan driven projects of are more coherent and efficient in gender integration because they systematically incorporate gender considerations from the outset. By using structured frameworks, these projects identify gender-specific needs, enabling targeted interventions. Clear roles, pre-designed gender-responsive activities, and robust monitoring ensure that gender integration is consistent and effective. This proactive approach leads to better coordination and more timely, equitable outcomes for all gender groups.

4.1.2 Funding and Financing Approaches

Looking into funding aspects the first thing was to identify the financial partners and there are eight international development partners who have funded the assessed six trigger-based disaster risk financing or anticipatory action projects in the four assessment upazilas of three districts in Jamuna River basin. The following table 4.5 shows the financing landscape of the assessed projects.

4.1.2.1 Financing Partner:

The funding landscape of key projects focused on parametric insurance, anticipatory action, community resilience, and disaster risk financing, each backed by different non-government development partners, summarized in table 4.5.

Table 4.Funding and financial partnership of the assessed projects

Project Lead:	Financing Partner	Funding Status
OXFAM-REE-CALL	Foreign, Commonwealth and Development Office (FCDO)	Ended
BDRCS-Anticipatory Action	RCRC pool fund	Ongoing
MMS- Disaster Risk Financing	Foreign, Commonwealth and Development Office (FCDO) and Global Start Network	Ongoing (Start Fund's DRF Window)
SAVE The Children-SAFE	Pooled fund-Humanitarian Save the Children Bangladesh	Ongoing
WFP- Anticipatory Action	Korea International Cooperation Agency (KOICA); European Union Civil Protection and Humanitarian Aid Operations ,(ECHO); Central Emergency Response Fund (CERF),UN; and the Anticipatory Action (AA)-Trust fund supported by Germany and Ireland	Ongoing
CARE-SUFAL	European Union Civil Protection and Humanitarian Aid Operations (ECHO)	Ongoing

Among these, the European Union Civil Protection and Humanitarian Aid Operations (ECHO) stands out as the highest funder, supporting multiple projects such as WFP-SKS and CARE. Additionally, WFP-SKS benefits from a diverse group of financiers including KOICA, CERF, and the Anticipatory Action (AA) Trust Fund supported by Germany and Ireland. Other notable funders include the Foreign, Commonwealth and Development Office (FCDO) for OXFAM which has already ended, the RCRC pool fund for BDRCS, and the Start Network for SFB-MMS. These funding approaches collectively focus on enhancing community resilience, providing early action, and offering financial support to the most vulnerable flood vulnerable communities.

4.1.2.2 Details of Funding Scenarios and Utilization by Projects

Subsequently the next attempt was documenting the funding amount of these projects and proportional aspects of the fund in terms of pre-arranged/trigger-based fund have been assessed. The findings analyzed and presented in table 4.6.

Table 4.3: Total funds and proportion of operational aspects of funding

Project Lead and Project Name	Proportion Funds channeled towards project partners	Proportion of funds beneficiary received directly	Proportion of pre-arranged funds for trigger/risk model-based release (for Anticipation/DRF project)	Mechanism for pre-arranged fund
OXFAM (REE-CALL)	No Information	No Information	No Information	Insurance premium to insurance provider
BDRCS (FbF)	N/A	No Information	No Information	Pool Fund
SFB-MMS (DRF)	Depending in the submitted project proposal	93%	93%	Pool Fund

Project Lead and Project Name	Proportion Funds channeled towards project partners	Proportion of funds beneficiary received directly	Proportion of pre-arranged funds for trigger/risk model-based release (for Anticipation/DRF project)	Mechanism for pre-arranged fund
SAVE-SKS (SAFE)	100%	54%	54%	Project Contingency Fund
WFP-SKS (FbF)	No Information	No Information	No Information	Pool fund and Project Contingency Fund
CARE (SUFAL)	No Information	No Information	No Information	Project Contingency Fund

The finding provides insight into the mechanisms for pre-arranged funds utilized by various projects to ensure timely and efficient financial responses in anticipation of disasters. For the OXFAM (REE-CALL) project, the mechanism involves the use of insurance premiums paid to an insurance provider, although detailed proportions of fund distribution are not available. The BDRCS (FbF) project employs a pool fund mechanism, though specific data on fund proportions is not provided.

The SFB-MMS (DRF) project stands out with a high proportion of funds channeled toward project partners and beneficiaries, both at 93%, facilitated through a pool fund mechanism. SAVE-SKS (SAFE) project channels 100% of its funds to project partners, with 54% reaching beneficiaries directly, utilizing a project contingency fund for pre-arranged financial responses. The WFP-SKS (FbF) project also employs a combination of a pool fund and project contingency fund mechanisms, although specific proportions are not detailed. Similarly, the CARE (SUFAL) project relies on a project contingency fund mechanism, with no further financial distribution details provided.

In summary, these projects primarily leverage pool funds and project contingency funds to ensure that financial resources are readily available for rapid response in disaster anticipation and risk management.

4.1.2.3 Household Package Value and Entitlement

All assessed disaster risk financing projects being implemented in the assessment area have cash-based interventions and provide cash directly to household as early action or insurance payout (sometimes as part of a broader package of activities). The cash packages provided by household shows some diversification among projects. The key approaches to determine the household entitlements are also documented for each project and presented in table 4.7.

Table 4.4: Household cash packages and methods of the determination of the household response package

Project Lead and Project Name	HH package Value and Entitlement (total/one-off transfer)	Approaches of determining HH package
OXFAM (REE-CALL)	6,000 to 8,000 BDT	The insurance company surveyed to determine the average monthly income of a HH and which amounts needs to be compensated in case of a flood with a duration of 1 month.
BDRCS (FbF)	5,000 BDT	Cash Package of Cash working Group of HCTT
SFB-MMS (DRF)	3,000 BDT	Modified from the Minimum package determines by the Cash working Group based on needs of the community.
SAVE-SKS (SAFE)	4,000 BDT	HH amount determined as per community consultation .
WFP-SKS (FbF)	5,000 BDT	Usually, minimum package determines by the Cash working Group.
CARE (SUFAL)	5,000 BDT	SUFAL consortium determined the value with the consultation of the local government and community

The determination of household (HH) package values for flood-affected households in Bangladesh varies across agencies, reflecting different methodologies and priorities. OXFAM (REE-CALL) provides package values

ranging from 6,000 to 8,000 BDT based on the amount of agricultural land and crops, BDRCS (FbF) and WFP-SKS (FbF) set their package values at 5,000 BDT, and SFB-MMS (DRF) offers 3,000 BDT. SAVE-SKS (SAFE) provides 4,000 BDT, while CARE (SUFAL) offers 5,000 BDT. These values reflect a range of financial support tailored to meet the needs of flood-affected households.

The approaches for determining these HH package values also differ significantly. OXFAM (REE-CALL) uses economic surveys by insurance companies to align compensation with household income during flood events. BDRCS (FbF) and WFP-SKS (FbF) adhere to the standardized guidelines of the Humanitarian Coordination Task Team (HCTT) and the Cash Working Group, ensuring consistency across programs. Disaster risk financing mechanism project led by SFB-MMS shows unique feature as they contextualized the HCTT guidelines on cash packages based on disaster impact scenarios and community needs, thus they reduced the amount than minimum package set by the Cash Working Group if the disaster event was not severe. In contrast, SAVE-SKS (SAFE) and CARE (SUFAL) determine their package amounts through community consultations, ensuring that support is relevant and sufficient to meet local needs. Thus, half of the projects follows nationally determined household entitlement packages as per the Unified Cash+ Framework of Bangladesh: For Anticipatory Action and Response by HCTT which determined the cash package value based on the minimum expenditure baskets of the poor household in flood prone areas. And the other three projects determined the cash packages through community-based consultation.

“Unified national standard Cash Packages is Widely Practices ”

Comparative analysis highlights a blend of standardized and community-tailored approaches to delivering financial aid to flood-affected households. Despite of these varying approaches, most of the agencies followed unified cash packages determined by cost analysis of household needs through intensive community involvement .

4.1.3 Beneficiary Profile:

4.1.3.1 Targeting and Selecting Beneficiaries

Different beneficiary selection criteria and methods were used by projects to select beneficiaries for flood-related interventions. Table 4.8 outlines the specific eligibility criteria for beneficiaries, the methods used for beneficiary selection, and the basis for these criteria, detailing the involvement of different actors and processes in determining eligibility.

The financial protection and disaster risk management projects in the Jamuna River Basin universally prioritize flood-affected families or people living in the flood risk prone areas, particularly those living in flood-prone areas and facing socio-economic vulnerabilities. Common eligibility criteria include targeting households and those directly affected by floods with unstable income sources, women-headed families, the elderly, people with disabilities, and other marginalized groups. Key differences lie in the specific focus of each project. OXFAM (REE-CALL) and SAVE-SKS (SAFE) emphasize livelihood vulnerabilities, such as families experiencing food scarcity or those using negative coping mechanisms like selling assets. SFB-MMS (DRF) broadens its criteria to include daily laborers, boatmen, and fishermen, reflecting the direct impact of floods on these livelihoods. CARE (SUFAL-II) uniquely includes local government officials and private sector representatives, indicating a more community-wide and institutional approach. WFP-SKS (FbF) and BDRCS (FbF) both focus on households likely to be affected by future floods, with WFP also considering those impacted in the previous year.

Beneficiary selection methods across projects in the Jamuna River Basin demonstrate a thorough and participatory approach. While OXFAM uses lists from government social safety net programs, other projects follow similar processes involving community consultations, door-to-door visits, indicator weighting, and validation by local government authorities. The common approaches are door to door household data collection, vulnerability scoring through involvement of community consultations and validation by local government authorities to ensure accuracy and acceptance.

Table 4.5: Eligibility criteria and operational methods of beneficiary selection

Project Lead (Project Name)	Beneficiary eligibility criteria	Beneficiary selection methods	Basis of eligibility criteria (actors and process)
OXFAM (REE-CALL)	✓ Flood-affected families / marginalized farmers usually live-in flood-prone areas ✓ Don't own any crop cultivation land or don't have more than 33 Decimal (One Bigha) shared crop cultivation. ✓ Have no regular income source.	Primarily selected beneficiaries from the list of SSNP of Govt. Program, finalized in consultation with the local union parishad offices.	OXFAM staff as per the project objectives and goal.
BDRCS (FbF)	✓ Household have probability of being affected by the flood ✓ Socio-economically vulnerable household	✓ BDRCS collects data from households through their volunteers and then analyzes based on specific indicators, assigning weights accordingly. ✓ Preliminary selected households are cross-checked for validation through consultation with the community for validation. ✓ The validated list is vetted through union Chairman and upazila Nirbhai officer for further verification	BDRCS staff decided as per the early action protocols of the BDRCS.
SFB-MMS (DRF)	✓ Disaster affected vulnerable Family ✓ Women headed family ✓ Have no regular income source ✓ Special vulnerable group member like; PWD ✓ Elderly people, chronical sickness ✓ Daily labor, boat man, fisherman, etc. who are poor.	✓ Community consultation meeting for primary Beneficiary selection ✓ Door to Door home visit for data collection and eligibility checking ✓ Draft Final list preparation ✓ Draft list sharing with the Community and Local government ✓ List finalization by the approval from local government authority	✓According to the contingency plan driven criteria along with objectives of the projects and context analysis of areas and disasters. ✓Field information and baseline data .
SAVE-SKS (SAFE)	✓ Flood-affected families / marginalized families usually live in flood-prone areas. ✓ Families' livelihoods are vulnerable due to flooding every year.	✓ Initial Preparation ✓ Organize community consultation, ✓ Verification of the primary list ✓ Endorsement from local government representatives	Developed through Community Consultation Meeting (CCM). SKS Foundation considered the beneficiaries criteria based on local context.

Project Lead (Project Name)	Beneficiary eligibility criteria	Beneficiary selection methods	Basis of eligibility criteria (actors and process)
	✓ Family who has food scarcity in the previous flood and damage their crops. ✓ Family who are internally displaced and don't have access to safe shelter in the previous flood. ✓ Family who survived with negative coping mechanism strategy (selling their assets and livestock, Take loan). ✓ Having PWDs, Elderly, pregnant women, widows, minorities, or critically ill people. ✓ Child/Women headed family/ larger family.		
WFP-SKS (FbF)	✓ Household have probability of being affected by the flood ✓ Household affected by flood in previous year ✓ Socio economically vulnerable	✓ A draft list of vulnerable communities collected from respective Union Parishad ✓ Arrange mass gathering for sharing objective, draft list and preparation of tentative list of participants ✓ Community consultation ✓ Data collection/validation of possible participants through household visit ✓ Preparation of draft list and share with Union Parishad ✓ Finalization of list with approval and endorsement from competent authorities	Project staffs select indicators based on community consultation and donor/lead agency's guidelines.
CARE **(SUFAL-II)**	✓ Flood Vulnerable people ✓ Local disaster management committee members from flood vulnerable union (for capacity development) ✓ Flood Affected private sectors ✓ Community level beneficiaries- Women, Farmer, Youth	✓ UDMCs member of the project union ✓ A set of questionnaires to collect data from households ✓ Weight the indicators and score them ✓ Union level validation	✓ Government vulnerability assessment criteria primarily from BBS. ✓ The SUFAL consortium decides on criteria in consultation with UDMCs and through community input.

The basis for determining eligibility criteria involves a combination of project goals, community consultations, and guidelines from lead agencies or donors. Oxfam's criteria are set by project staff as per objectives and goals. BDRCS follows early action protocols, while SFB-MMS followed its criteria determined in local level contingency planning, and baseline data. SAVE-SKS develops criteria through community consultation meetings and considers the local context. WFP-SKS staff select indicators based on community consultation and donor guidelines. CARE (SUFAL-II) uses government vulnerability assessment criteria and decides on criteria through consultation with the Union Disaster Management Committee (UDMC) and community input. The common factor here is the reliance on community input and guidelines from project objectives or donor requirements to establish criteria.

Key Aspect of Beneficiary

"Eligibility criteria and selection approaches"

- Beneficiary eligibility criteria, selection methods, and the basis of eligibility criteria varied among projects in terms of operational aspects, however has all used a consistent and inclusive approach for identifying and validating the list of vulnerable communities affected by floods.

- A common emphasis is placed on socio-economic vulnerability, potential flood impact, and specific at-risk groups such as women-headed households, persons with disabilities, and elderly individuals.

- The selection methods uniformly involve household vulnerability data collection, followed by community consultations and validation by local authorities, ensuring that the selected beneficiaries are accurately identified and accepted by the community.

- The basis for eligibility criteria is predominantly informed by project goals, community input, and guidelines from donors or lead agencies, reflecting a participatory and context-specific approach.

4.1.4 Flood Event Data and Forecast Models:

4.1.4.1 Brief Summary of Flood Risk Model

The flood anticipatory action and disaster risk financing projects in Bangladesh aim to reduce the impact of floods through early warning systems and pre-emptive funding mechanisms. By using flood risk models and forecasts, the projects activate anticipatory actions before floods hit, such as distributing aid, preparing shelters, and protecting livelihoods. Disaster risk financing ensures rapid access to funds for communities at risk, allowing for timely interventions. This approach minimizes damage, speeds up recovery, and enhances community resilience. The projects integrate data-driven decision-making, local engagement, and financial instruments to strengthen flood preparedness in vulnerable areas.

“Summary of Flood event data and forecast models”

- **OXFAM (Recall):** Utilizes a localized threshold trigger mechanism in collaboration with an insurance company. OXFAM’s parametric flood insurance mainly provides support after the flood incidents and not related to the forecast rather it depends on the certain water level (assessed using manual gauges) for a certain period.

- **BDRCS (FbF**): Implements a localized threshold trigger mechanism developed with technical support from RCCC, BDRCS/GRC, and BMD. The model integrates detailed risk analysis, past event impact assessments, and vulnerability data to define thresholds and triggers.

- **SFB-MMS (DRF):** Employs a building block flood risk model managed by FOREWARN Bangladesh. It includes dynamic risk monitors, hazard warnings, and utilizes various data sources for real-time risk monitoring and response activation.

- **SAVE-SKS (SAFE):** Uses a national threshold trigger mechanism supported by FFWC and RIMES, involving local communities in model verification and trigger definition through consultations.

- **WFP-SKS (FbF):** Utilizes models from FFWC and BMD, establishing community trigger points based on government recommendations for timely response actions.

The approach to understanding and quantifying flood risk used by the assessed projects was built on localized comprehensive risk assessment, historical event data, evaluation of feasibility and usability of forecasts. The anticipation projects rely on forecast models which are designed to predict and take anticipatory actions effectively before the floods impact communities. These models integrate various data sources, including weather forecasts, historical flood data, and real-time vulnerability indicators, to establish thresholds and triggers for timely interventions. By anticipating potential flood events, these models enable proactive measures such as early warnings, financial preparedness, and community-based actions. Different organizations adopt varied approaches to flood risk model and early warning systems, forecasting and community actions. Each approach reflects the organization's specific needs and resources in managing flood risks.

4.1.4.2 Threshold, Trigger and Technical Partners

Organizations implement tailored flood risk models for anticipatory action and disaster risk financing to effectively manage and mitigate flood impacts. These models used various thresholds and triggers based on forecasted water levels, historical data, and impact projections to guide pre-activation and action steps. Collaboration with technical partners is predominant in developing and monitoring thresholds and triggers which enhances the accuracy and effectiveness of these models. Each organization adapts its approach to local conditions and available resources to optimize flood preparedness and response, shown in table 4.9.

Table 4.6: Threshold and triggers of the projects

Project Lead and Name	Threshold and Trigger	Lead Time (Forecast)	Technical Partners for Trigger Development
OXFAM (REE-CALL)	**Activation**: Floodwater remains more than one centimeter above the danger level for 26 days at a stretch for selected gauge station in the project areas(water level data monitored and declared by FFWC).	Provide support after the flood	Collaboration with an insurance company and FFWC
BDRCS (FbF)	**Pre-activation trigger:** Water flow at Bahadurabad gauge station (forecasted by GloFAS with lead time 15 days) likely (50 per cent probability of 51 ensembles discharge forecast or above) to cross the 1 in 5-year return period and flowing over at least for three days **Action trigger**: Water level forecast at Bahadurabad gauge station by FFWC (five-day lead time) cross the danger level +0.85 meter and remain above for 3 days. And potential impact of a loss of household assets of over 25% with an affected population of over 40%.	**Pre-activation:** 15 Days **Action:** 5 days	RCRC Climate Centre, BDRCS/GRC, and FFWC

Project Lead and Name	Threshold and Trigger	Lead Time (Forecast)	Technical Partners for Trigger Development
SFB-MMS (DRF)	**Preparedness Trigger**: 2-5 years return period of flood forecasted with more than 50% of probability of flooding by GloFAS with 30% to 50% of potential impact population **Action trigger**: 5-20 years return period of flood forecasted by GloFAS with more than 50% probability of flooding and more than 50% potential impact population	**Pre-activation:** 30 Days **Action:** 5 days	FOREWARN Bangladesh
SAVE-SKS (SAFE)	No information provided	No information provided	FFWC, RIMES
WFP-SKS (FbF)*	**Readiness trigger:** More than 50% probability that (15 days lead time) forecast water discharge > 1-in-5-year return period flood level for 3 consecutive days by GloFAS **Action trigger:*** Water level flow over Danger Level + 0.85 meters forecasted by the FFWC with 5-days lead time, and probabilistic forecast by (GloFAS/RIMES) with longer lead times show a sustained or increasing trend of the water discharge for at least three consecutive days.	**Pre-activation-** 15 Days **Action-** 5 days	Bangladesh Water Development Board, BDRCS,
CARE (SUFAL)	**Pre-alert**: Triggers when water flow within 1 meter of danger level with 50-60% probability monitored from project installed gauge station, **Action** : Trigger at 75% probability of a flood occurring and when at least 5 days flooding is expected as per therisk model and gauge station data of SUFAL project, forecasted by RIMES for the locality	**Pre-activation-** 10 to 15 Days **Action-** 5 to 7 days	FFWC, RIMES

Findings depict that, out of six assessed projects, five projects provided technical information of threshold and trigger. All the threshold trigger has been decided based on the historical flood event vs historical forecast as well as flood risk of the areas.

“Common Practices: Threshold and Triggers”

- **Threshold and Trigger**: Most projects use a combination of forecasted and actual measurements for setting thresholds and triggers, including return period forecasts and specific water levels. Except SUFAL project of CARE all of them use either FFWC and GloFAS as source of forecast or combination of both

- **Lead Time**: Common pre-activation lead times across projects range from 10 to 15 days, with a 5-day action period before anticipated flooding. One project has a notably longer 30-day pre-activation period.

- **Technical Partners**: The majority of projects collaborate with key technical partners like FFWC and RIMES, emphasizing the use of expert support. One project is managed by a single organization, while another focuses on partnership with an insurance company.

- **Community Participation**: All the six projects integrated community and local level stakeholder’s participation during threshold setting.

4.1.4.3 Monitoring of Flood Risk Model

Further investigation focused on responsible organization and approaches of monitoring the actual scenario as per risk model. Each project’s early action protocols/ standard operating procedure defined the approaches of monitoring predefined forecast sources that meet the threshold for trigger, Beside the EAP also state the responsible organization for monitoring the flood risk models. Monitoring approaches vary across projects, often involving real-time data collection and community engagement, shown in table 4.10.

Table 4.7: Flood risk monitoring approaches and stakeholders

Project Lead and Name	Monitoring Approaches (as per threshold)	Responsible
OXFAM (REE-CALL)	Monitor FFWC water level data for the specific gauge (water level monitoring station) station in the project areas.	OXFAM Project Staffs and
BDRCS (FbF)	Regular online monitoring of GloFAS and FFWC forecast.	BDRCS technical team
SFB-MMS (DRF)	Regular online monitoring of GloFAS and FFWC forecast.	FOREWARN
SAVE-SKS (SAFE)	Seasonal online monitoring of FFWC forecast and in person monitoring of localized gauge station data	RIMES and local DMCs
WFP-SKS (FbF)*	Regular online monitoring of GloFAS and FFWC forecast.	WFP technical team
CARE (SUFAL)	Seasonal online monitoring of FFWC forecast and in person monitoring of localized gauge station data.	RIMES and local DMCs

The monitoring approaches for flood forecast models and gauge data models across different projects show both commonalities and unique strategies. Most projects, including those managed by BDRCS (FbF), SFB-MMS (DRF), and WFP-SKS (FbF), rely on regular online monitoring of GloFAS and FFWC forecasts. This consistent, technology-driven method ensures they receive continuous updates and can respond promptly based on forecast data. In contrast, projects like SAVE-SKS (SAFE) and CARE (SUFAL) adopt a hybrid approach, combining seasonal online monitoring of FFWC forecasts with in-person monitoring of localized gauge station data. This method allows for integrating broader seasonal trends with real-time local observations, offering a more nuanced understanding of flood impact . The parametric weather-based flood insurance project, OXFAM (REE-CALL), monitor FFWC water level data for the specific gauge (water level monitoring station) station in the project areas. These varied monitoring strategies reflect the tailored needs and capacities of each project, balancing the benefits of technology with on-the-ground data collection.

The responsibility of monitoring flood risk models is distributed among various technical teams and organizations, reflecting a diverse approach. In projects such as BDRCS (FbF) and WFP-SKS (FbF), dedicated technical teams within the respective organizations handle the monitoring duties. This internal management ensures that the organizations can maintain consistent oversight and quick response capabilities. SFB (DRF) relies on FOREWARN for its monitoring, indicating a centralized approach where a collaboration of national experts takes charge. On the other hand, projects like SAVE-SKS (SAFE) and CARE (SUFAL) involve both RIMES and local Disaster Management Committees (DMCs) in their monitoring activities. This collaboration brings together regional expertise with local insights, enhancing the overall effectiveness of the monitoring system.

"Key Issue: Flood Risk Monitoring"

- **Monitoring Approaches**: The predominant monitoring approach among the flood risk management projects is regular online monitoring of GloFAS and FFWC forecasts.
- **Internal Technical Teams:** Most projects, such as BDRCS (FbF) and WFP-SKS (FbF), rely on dedicated technical teams within their own organizations.
- **Specialized External Entities:** Some projects, like SFB-MMS (DRF), depend on specialized external entities such as FOREWARN for their monitoring needs.
- **Collaborative Models:** Projects like SAVE-SKS (SAFE) and CARE (SUFAL) involve a combination of regional and local entities, such as RIMES and local Disaster Management Committees (DMCs). These two have community participation in monitoring of flood risk model.

4.1.5 Operational Modality:

4.1.5.1 Operational Fund Flow, Stakeholders and Operational Approaches

The assessed projects shows that various organizations have implemented innovative strategies to provide early action and support to affected communities through different funding and disbursement mechanisms. Oxfam, in partnership with MMS monitors, provides insurance support and raises awareness, insurance partners disbursing funds directly to beneficiaries once flood thresholds are met. The Bangladesh Red Crescent Society (BDRCS) follows Early Action Plans (EAP) to provide cash and first aid support, utilizing boats for evacuation when necessary. The SFB-MMS partnership depicts that MMS received funds directly from SFB determined by meeting threshold and MMS provides cash and WASH input support based on contingency plans. Whereas SAVE the Children collaborates with SKS and provides cash to SKS upon threshold meets to deliver cash and non-food items, prioritizing community participation and mobile banking for cash transfers. The World Food Programme (WFP) supports through SKS based Forecast-Based Financing (FbF) guidelines, and they ensure timely funds transfer directly to household via mobile banking. Lastly, CARE, through its SUFAL initiative, empowers partner agencies to conduct community and household-level activities, focusing on cash disbursement and capacity-building with an emphasis on community involvement and mobile banking.

This funding approaches and overall fund flow has been shown in a schematic diagram for summary of the fund flow for each project through diagram in figure 4.2, 4.3, 4.4, 4.5, 4.6, 4.7.

Figure 4.2: Operational fund flow of OXFAM-RCALL Project

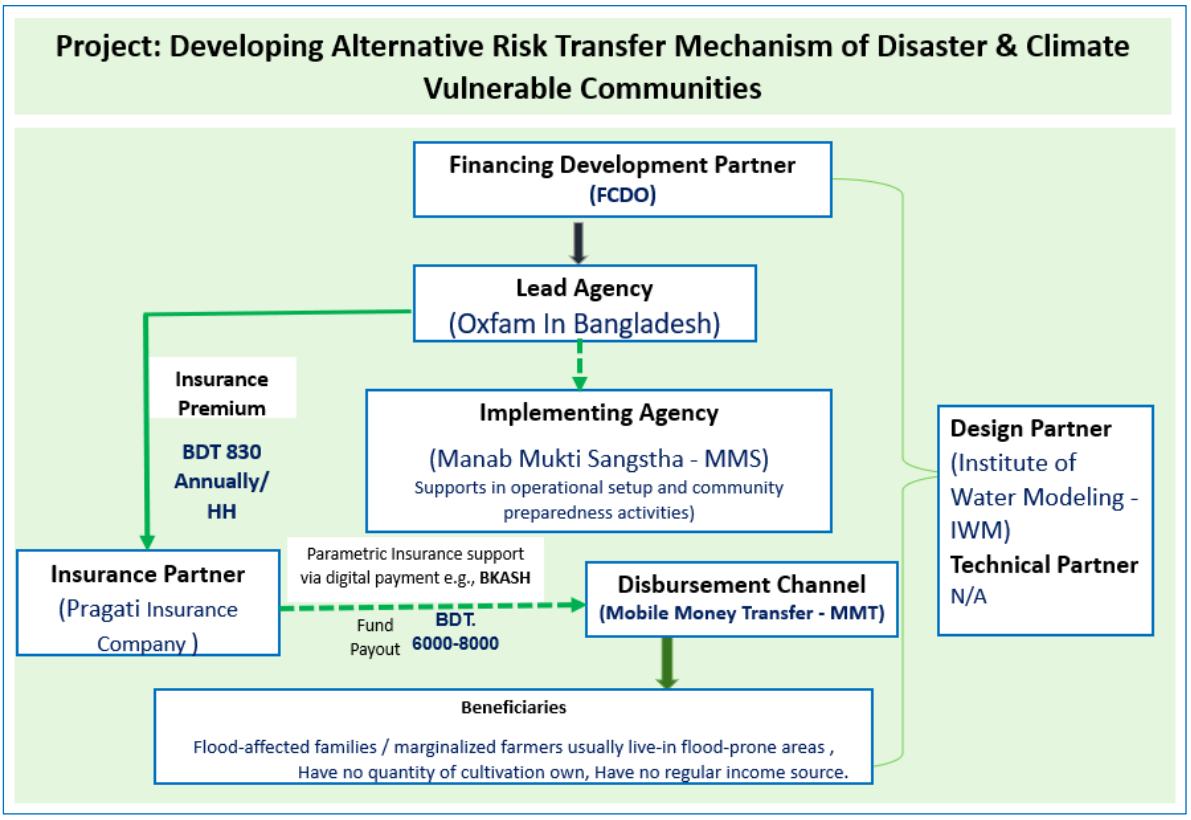


Figure 4.3: Operational fund flow of BDRCS anticipatory action project

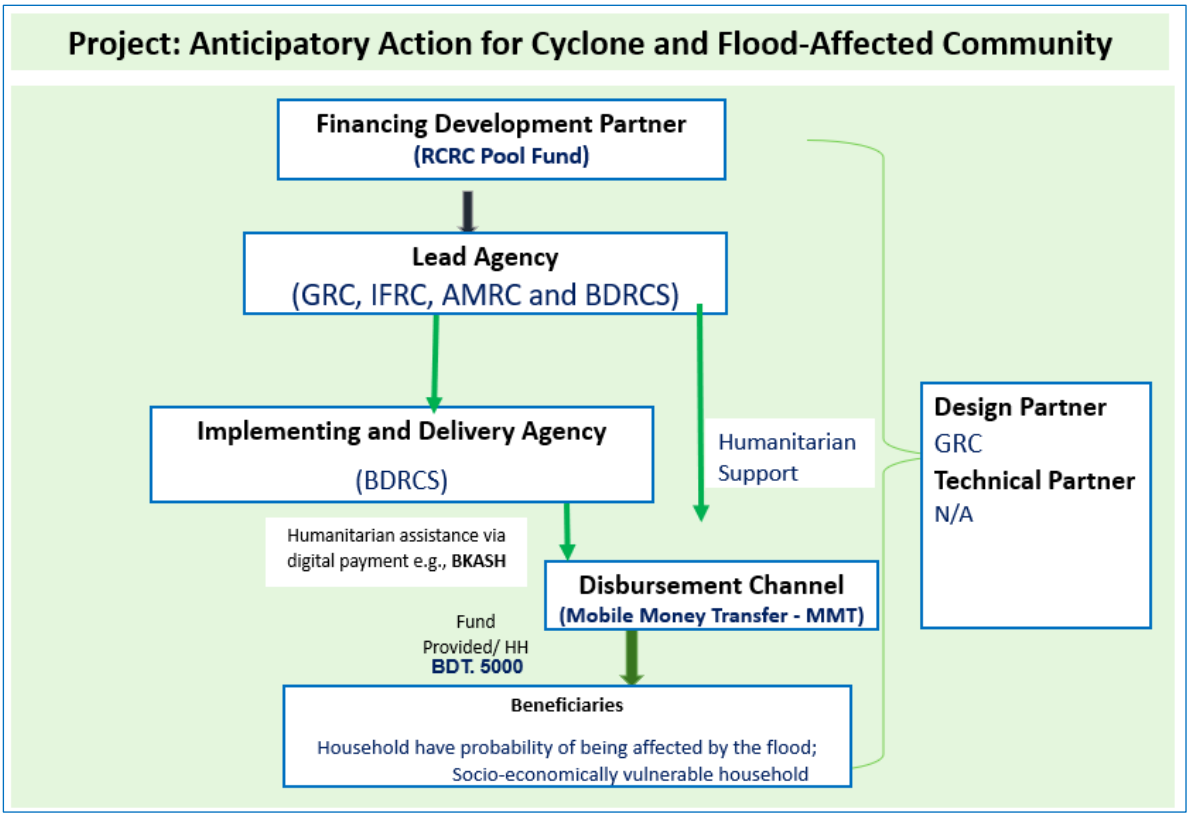


Figure 4.4: Operational fund flow of Start-MMS DRF project

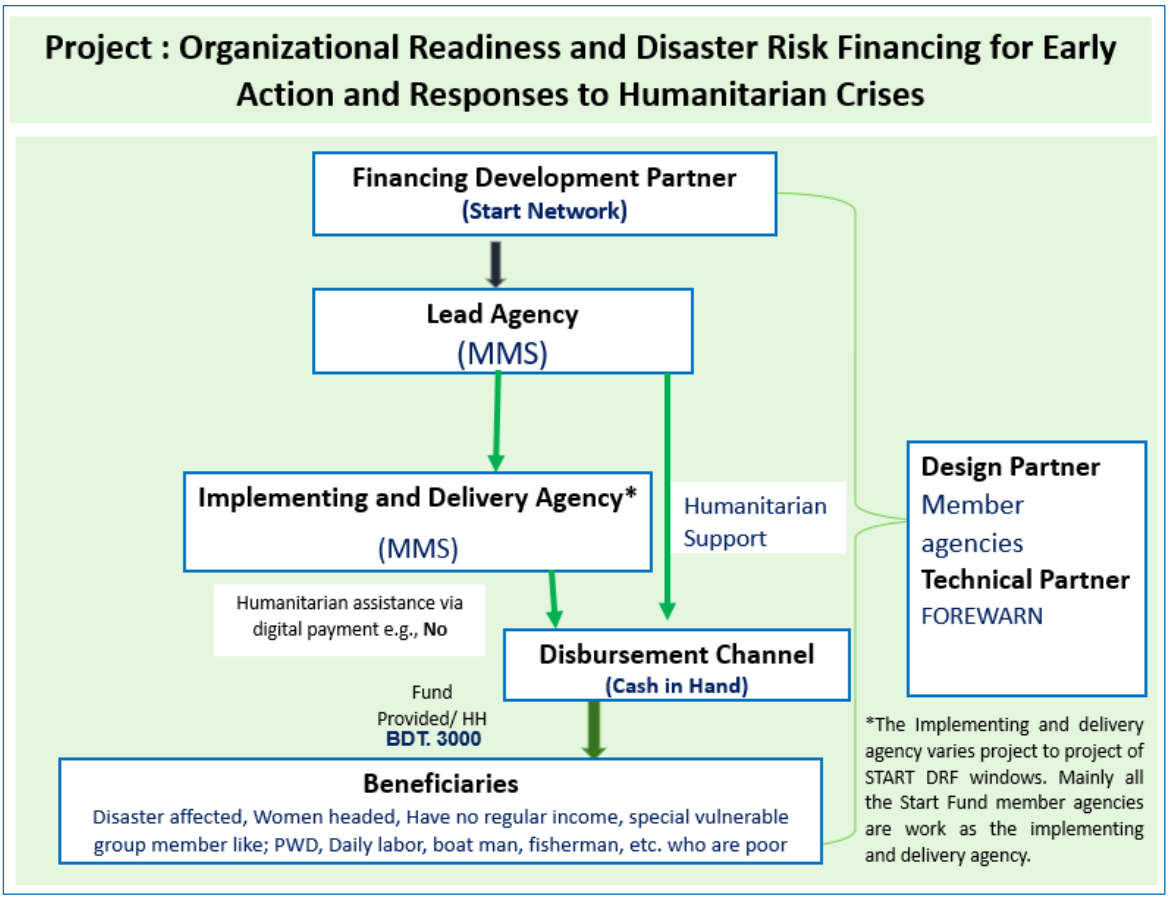


Figure 4.5: Operational fund flow of Save-SKS (SAFE project)

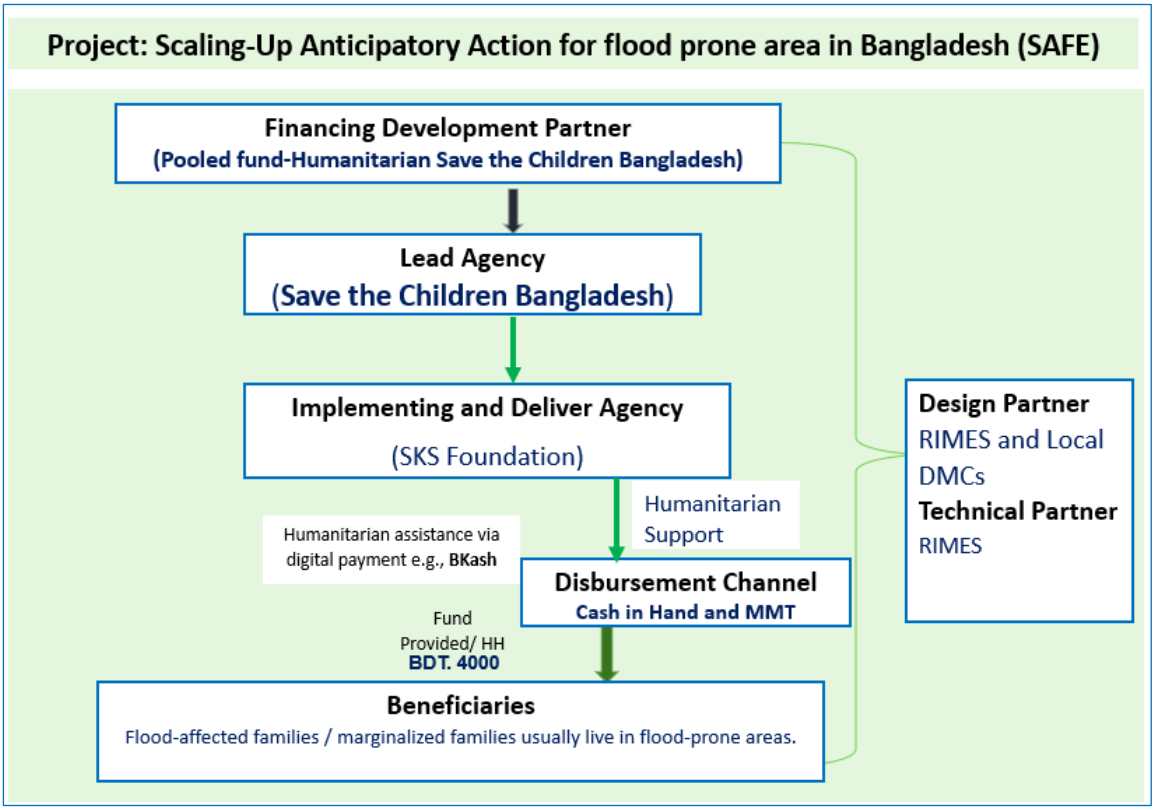


Figure 4.6: Operational fund flow of FbF project of WFP

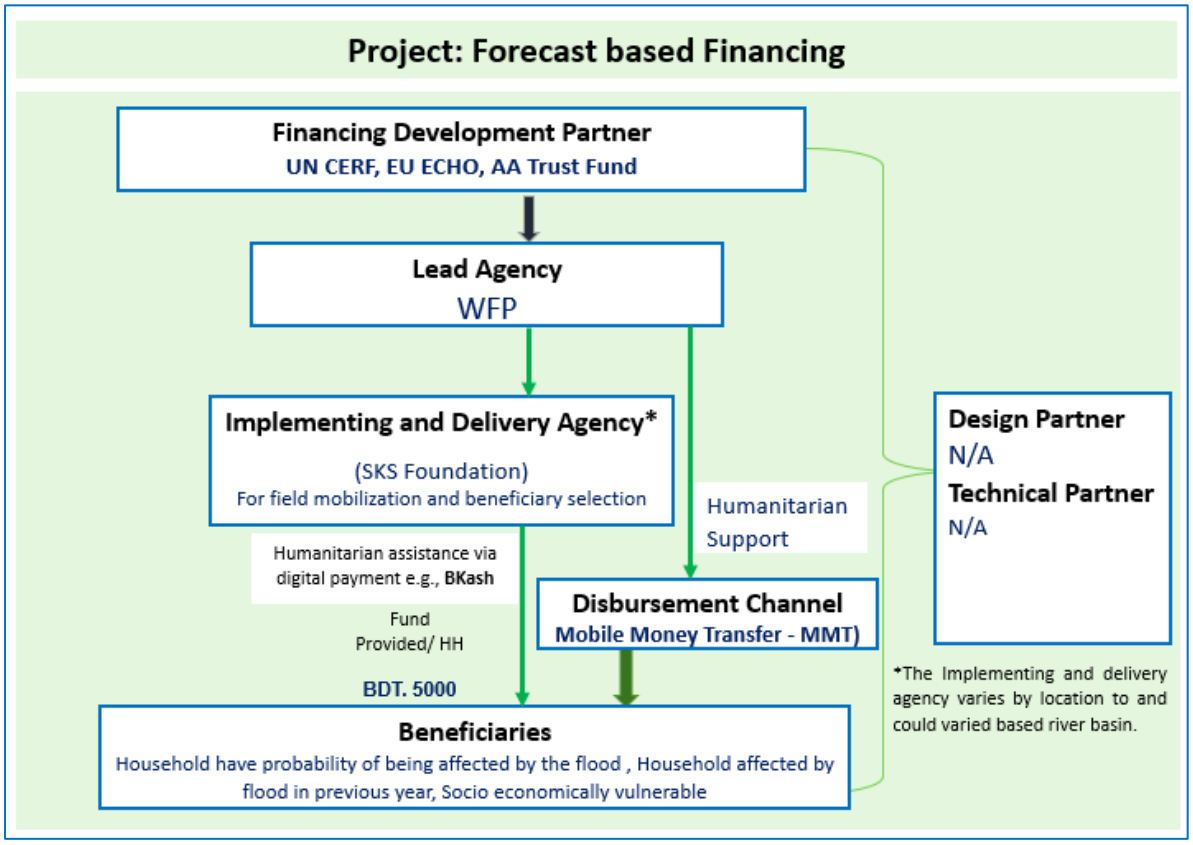
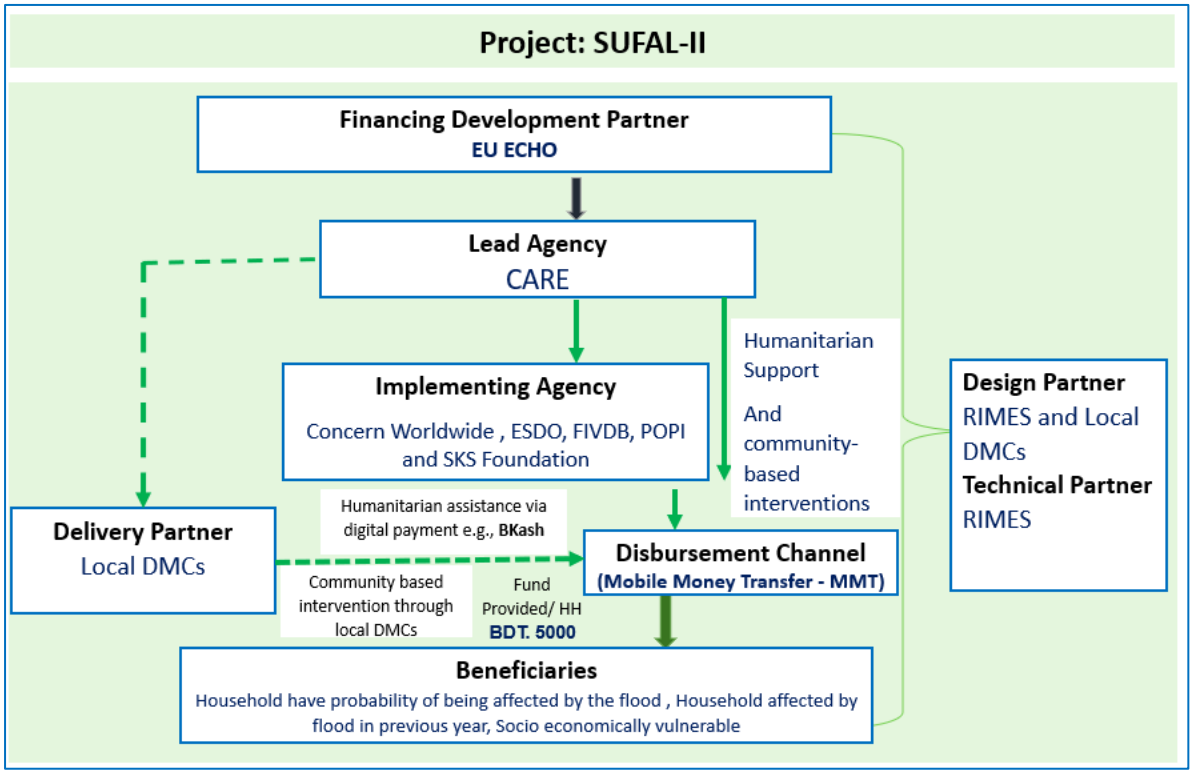


Figure 4.7 : Operational fund flow of SUFAL-II project



4.1.5.2 Support (Cash) Disbursement Approaches and Channel

This section examines various projects employing diverse cash transfer modalities for early action and early response to flood. The table 4.11 provides a detailed overview of each project's approach, highlighting key elements such as the cash transfer modality, financial partners, pre-arranged agreements with financial institutions, and the incorporation of gender-sensitive delivery mechanisms.

Table 4.8: Cash transfer modality. stakeholder and gender integration by projects

Project Lead and Name	**Cash Transfer Modality**	**Cash Transfer Partner**	**Arrangement with Financial Institute**	**Gender** Sensitive **Delivery Mechanism**
OXFAM (REE-CALL)	MMT	BKASH	Pre-agreement for disbursement	Supporting women to be familiar with mobile banking through capacity building on accessing mobile banking services.
BDRCS (FbF)	MMT	BKASH	Ex-ante financing instrument (Pre-agreement for disbursement)	Yes. Supporting women to be familiar with mobile banking through capacity building on accessing mobile banking services.
SFB-MMS (DRF)	Cash in Hand	Cash in Hand	Not applicable	Community Preference, arrange separate distribution booth for women. This could vary for other projects of Start fund Bangladesh.
SAVE-SKS (SAFE)	Cash in Hand and MMT	BKASH	Pre-agreement for disbursement	Yes. Supporting women to be familiar with mobile banking through capacity building on accessing mobile banking services.
WFP-SKS (FbF)	MMT	BKASH	Pre-agreement for disbursement	No Information

Project Lead and Name	Cash Transfer Modality	Cash Transfer Partner	Arrangement with Financial Institute	Gender Sensitive Delivery Mechanism
CARE (SUFAL)	MMT	BKASH	Pre-agreement for disbursement	Yes. Supporting women to be familiar with mobile banking through capacity building on accessing mobile banking services.

Findings demonstrate that most of the projects utilize Mobile Money Transfer (MMT) to facilitate cash distribution, specifically OXFAM (REE-CALL), BDRCS (FbF), WFP-SKS (FbF), and CARE (SUFAL). SAVE-SKS (SAFE) employs both MMT and cash in hand, while SFB-MMS (DRF) exclusively uses cash in hand, reflecting the community's preference.

BKASH is the common cash transfer partner for OXFAM (REE-CALL), BDRCS (FbF), SAVE-SKS (SAFE), WFP-SKS (FbF), and CARE (SUFAL), indicating a widespread reliance on this financial service provider. SFB-MMS (DRF), however, does not involve an external partner, opting to manage cash transfers directly.

All of the agencies who are providing mobile based cash support have pre-agreements with cash transfer partner (BKASH) for disbursement, ensuring a streamlined process to secure funds before a disaster occurs to enable rapid response. SFB-MMS (DRF) does not have an arrangement with a financial institute, aligning with its cash-in-hand approach.

These findings show that Mobile Money Transfers (MMT) are highly preferred by these projects and as well as by community due to its speed, convenience, and accessibility. MMT allows for rapid disbursement of funds directly to beneficiaries' mobile phones, ensuring immediate access to financial aid, which is crucial in emergency situations. Previous experiences shows that the MMT can transfer money to beneficiary’s account within two hours of the trigger activation and doesn’t require the logistics arrangement of cash distribution while cash in hand took at least one day. Mobile based money transfer also eliminates the need for physical cash handling, reducing the risk of theft and fraud. MMT is also accessible to people in remote or underserved areas where traditional banking services may be unavailable.

The digital nature of MMT provides transparency and accountability, allowing for efficient tracking and auditing of transactions. Agencies highlighted that BKASH is an ideal financial partner for cash transfer projects due to its widespread network, user-friendly platform, and secure transaction processes. Its extensive coverage across Bangladesh ensures easy access for beneficiaries, even in remote areas.

BDRCS (FbF), SAVE-SKS (SAFE), OXFAM (REE-CALL) and CARE (SUFAL) incorporate gender-sensitive delivery mechanisms, ensuring that cash transfers consider and address gender-specific needs and vulnerabilities as women do not need to and wait in queue in cash distribution center as they can get the money directly to their mobile banking. Thus, this system allows women to involve in financial activities and addresses security concerns of women. Except WFP-SKS (FbF), all of these agencies have built in system to enable women to utilize the mobile banking account where agencies focused on development of financial literacy though designated support. SFB-MMS (DRF) relies on the community's preference and arrange separate booth for women while distributing cash and providing support.

"Key Issue: Cash disbursement channel and approaches"

- **Cash Transfer Modalities**: Most projects use Mobile Money Transfer (MMT) for cash distribution where BKASH is the primary financial partner.

- **Financial Arrangements :** Most of the project have pre-agreements with mobile banking agency (BKASH) for disbursement, ensuring streamlined processes.

- **Gender-Sensitive Delivery Mechanisms:** Out of six projects, five project employed gender sensitive approaches for cash disbarment.

- **Recommendations Towards Effective Payout Channel**: All project recommends considering using mobile money transfer (MMT) channels for efficient and rapid fund disbursement. Tailored financial literacy focused training and capacity development of women in the project areas are recommended to ensure efficient access to mobile banking facilities.

Gender-sensitive delivery mechanisms in Mobile Money Transfers (MMT) prioritize women by addressing barriers to access and usage. Gender integration for delivery mechanism emphasized on targeted outreach and education campaigns inform women about mobile money benefits, while training programs build confidence in using these services. Some agency provided subsidized SIM cards ensures women can independently manage their funds. Community-based support, such as leveraging women's groups and peer networks, facilitates access. Advocacy tailored customer support further enhances women's financial inclusion and empowerment.

4.1.6 Coordination and Collaboration:

Coordination and collaboration aspects are embedded components of the project, although not a strategic objective, all the projects coordinate with local level coordination bodies and in some cases government authorities.

The table 4.12 provides a summary of the coordination mechanisms between key project leads and both government and non-government stakeholders in disaster risk management and anticipatory action projects in Bangladesh. It highlights how different organizations engage with relevant government ministries and coordinate with various working groups and international development partners to ensure strategic planning and effective implementation of disaster preparedness and response activities.

Table 4.9: Coordination and collaboration aspects of the assessed projects

Project Lead and Name	Government Coordination	Non-Government Coordination
OXFAM (REE-CALL)	Coordinated with MoWCA and FFWC during planning to implementation phase	Coordinated with international development partner through cash working Group
BDRCS (FbF)	Coordinated with MoDMR centrally for strategic planning and coordinate with local disaster management committees for implementation	Coordinated with relevant stakeholder through HCTT and Forecast based Financing Working Group
SFB-MMS (DRF)	Coordinate with Department of Disaster Management under MoDMR at national level for strategic planning and coordinate with local government administrations as well as sectoral ministries at local level for efficient implementation	Coordinated with relevant stakeholder through HCTT and Forecast based Financing Working Group
SAVE-SKS (SAFE)	Coordinated with MoDMR centrally for strategic planning and coordinate with local disaster	Coordinated with relevant stakeholder through HCTT

Project Lead and Name	Government Coordination	Non-Government Coordination
	management committees for implementation	and Forecast based Financing Working Group
WFP-SKS (FbF)	Coordinated with MoDMR centrally for strategic planning and coordinate with local disaster management committees for implementation	Coordinated with relevant stakeholder through HCTT and Forecast based Financing Working Group
CARE (SUFAL)	Coordinated with MoDMR centrally for strategic planning and coordinate with local disaster management committees for implementation	Coordinated with relevant stakeholder through HCTT and Forecast based Financing Working Group

Government coordination largely involves strategic planning at the national level, primarily with the Ministry of Women and Children Affairs (MoWCA) or the Ministry of Disaster Management and Relief (MoDMR) and extends to local disaster management committees for implementation. Non-government coordination is facilitated through key platforms like the Cash Working Group, the Humanitarian Coordination Task Team (HCTT), and the Forecast-based Financing Working Group, allowing these organizations to engage international development partners and other relevant stakeholders for effective collaboration across sectors.

4.2 IMPACT, RESPONSE AND OPERATIONAL ASPECTS

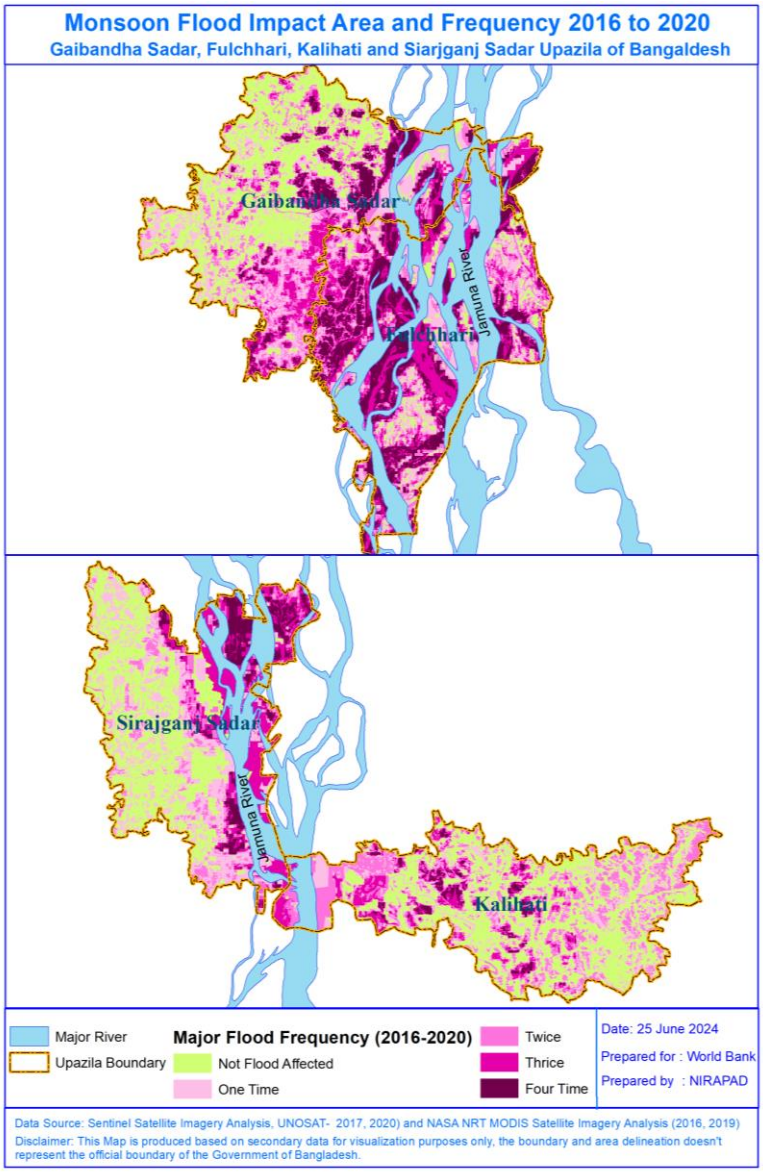
This section focuses on identifying the "protection gap" across the four project sites, referring to the disparity between historic allocation of resources compared to economic damages and assistance requirements for vulnerable communities in the event of flooding. First exposure to floods and comparison of historic disaster impacts is explored, then relief needs versus provided relief and support.

4.2.1 Exposure and Inundation to Floods

The four projects upazila are highly prone to flood on a regular basis . During the past ten years, the project areas have been impacted by four major floods in (2016, 2017, 2019 and 2020) . These major flood incidents specific analysis shows that about 70% of the four upazilas have been flooded one or every other year from 2016 to 2020.

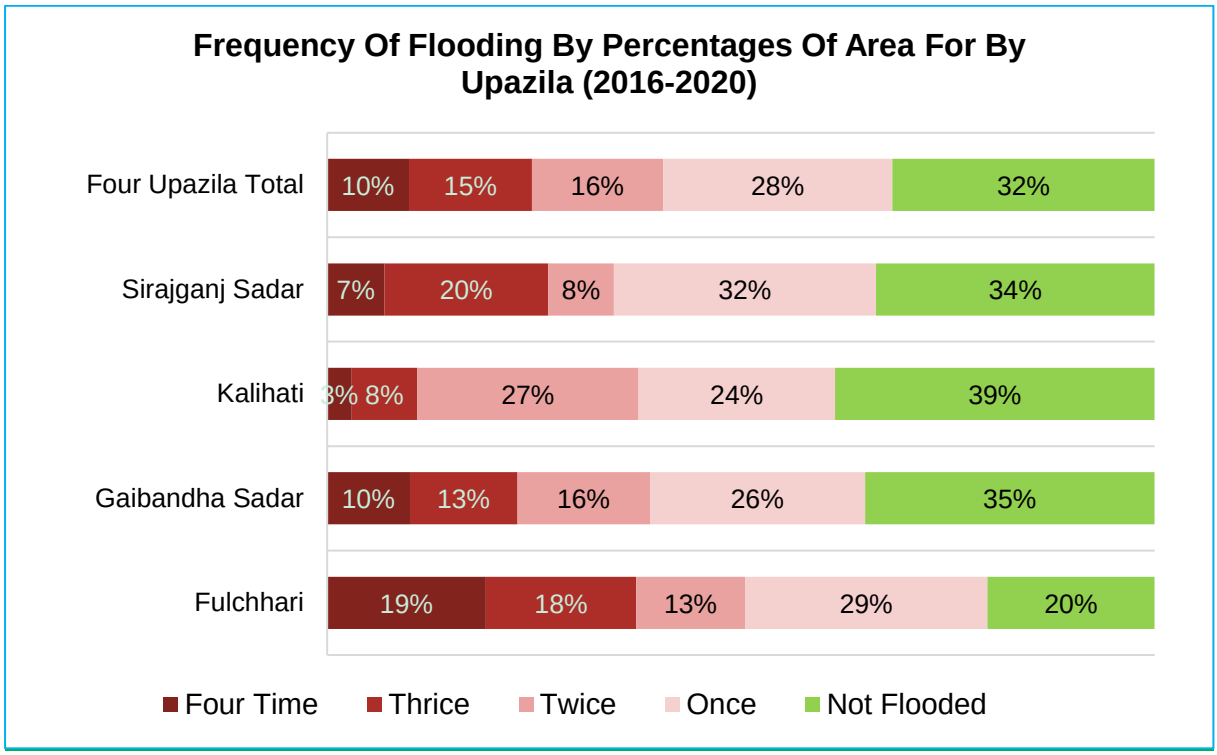
Analysis across the four upazilas, (Fulchhari, Gaibandha Sadar, Kalihati, and Sirajganj Sadar) highlight the extent to which areas were affected by flooding one to four times over a given period (2016-2020). Fulchhari saw a significant portion of its land flooded multiple times, with 29% of the area experiencing flooding once and 19% enduring flooding four

Map 4.1 Flood frequency and flood prone areas in four major floods in the assessment area



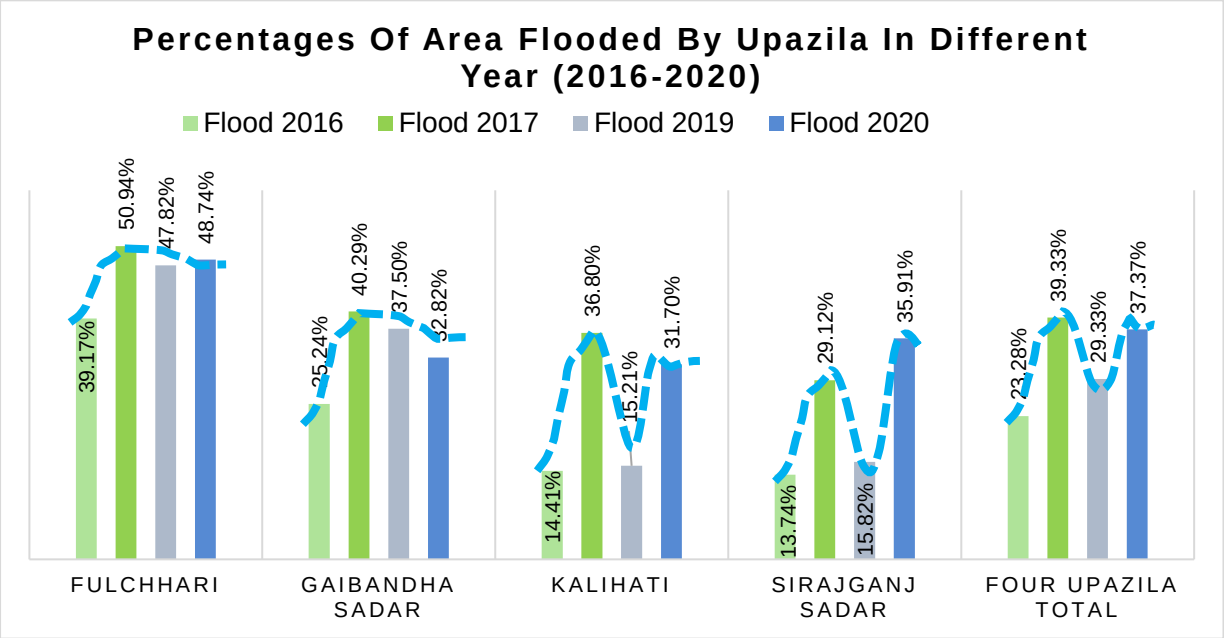
times, indicating frequent inundation. Gaibandha Sadar exhibited a more balanced distribution, with 26% of the area flooded once and 10% affected four times. Kalihati displayed a notable pattern, where 27% of its land was flooded twice—the highest among the upazilas—while only 3% was flooded four times, reflecting lower recurrence. Sirajganj Sadar had the largest portion of land flooded once (32%) but smaller percentages of land flooded two to four times. Overall, Fulchhari's higher frequency of flood inundation and distribution of flooding underscore its vulnerability compared to the other upazilas. Comparing to other three upazilas, Fulchhari's geographic location and absence of flood protection embankment made recurrent victims of flooding whereas the long city protection embankment in Sirajganj Sadar ensures lees recurrency of flooding .

Figure 4.8: Frequency of Flooding by Percentage of area for by upazila (2016-2020)



At the same time the analysis of year-specific flooding data reveals significant variation in the areas affected by floods across the four upazilas of Fulchhari, Gaibandha Sadar, Kalihati, and Sirajganj Sadar, shown in figure 4.9.

Figure 4.9: Percentages of Area Flooded by Upazila in different year

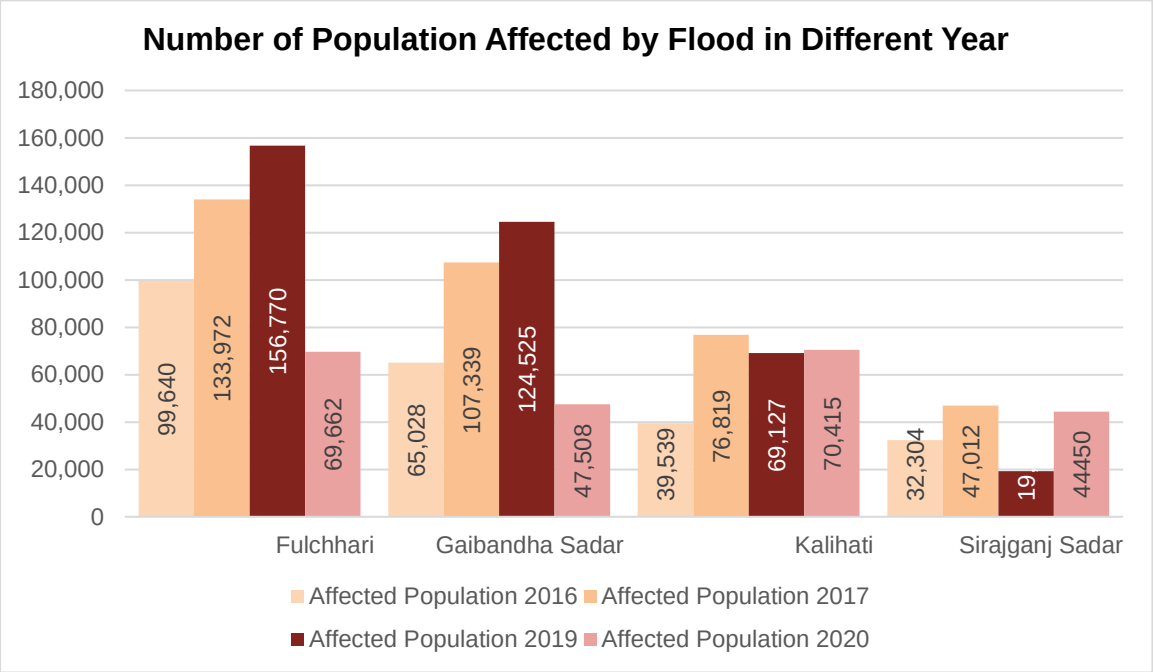


Fulchhari consistently experiences the highest flooding, with percentages of 39.2% in 2016, peaking at almost 50% in 2017, 2019, and in 2020. Gaibandha Sadar follows, showing notable increases from 25.2% in 2016 to 40.3% in 2017, and subsequently 37.5% in 2019 and 32.8% in 2020. Kalihati and Sirajganj Sadar exhibit more variability, with Kalihati having a significant flood year in 2017 (36.8%) and lower impacts in 2016 (14.4%) and 2019 (15.2%), while Sirajganj Sadar shows a rising trend, particularly in 2020 (35.9%). The overall trend indicates the most severe flooding year was 2017, with Fulchhari being the most affected upazila and the increasing proportion of area affected across all 4 sites has been seen since 2016.

4.2.2 Historic Impact and Population in Need

The analysis of the number of affected populations by floods across different upazilas from 2016 to 2020 reveals significant fluctuations and trends, where affected population refer total estimated number of people living in areas which have been inundated by flood water.

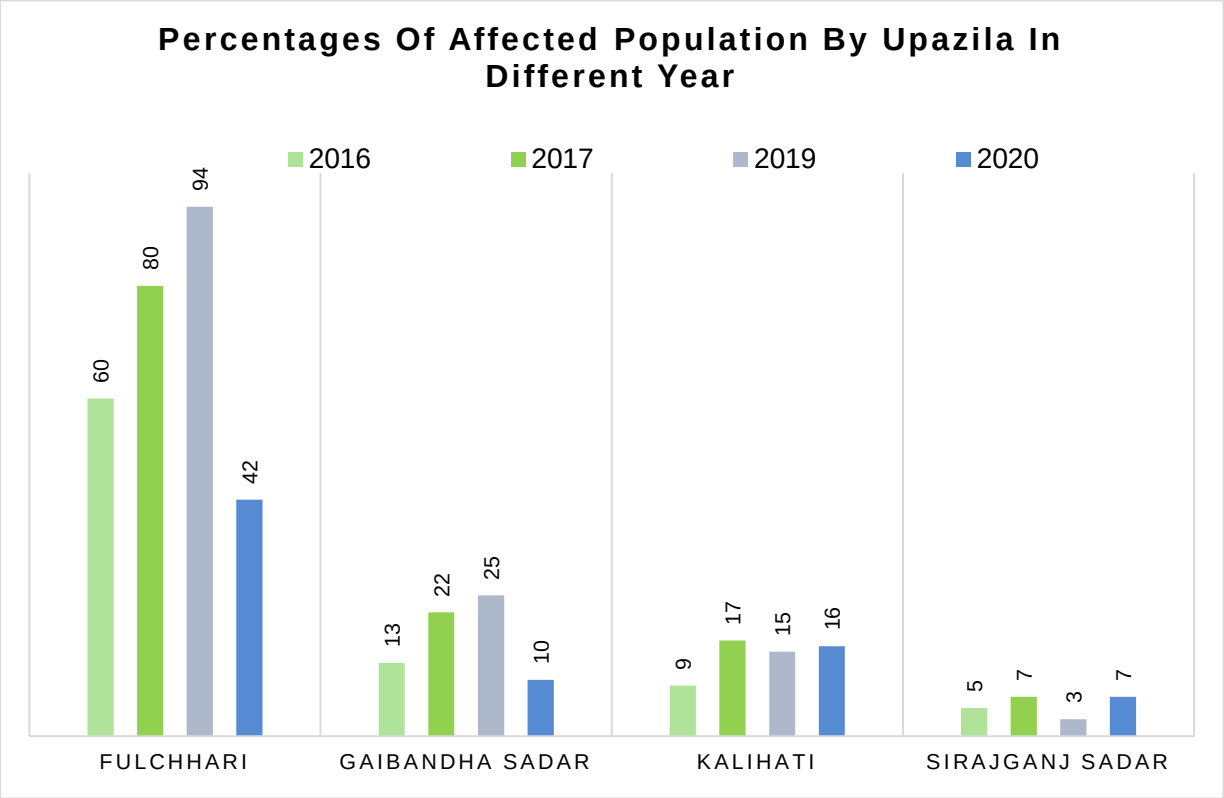
Figure 4.10: Number of affected populations by different flood and upazila



Source: Analysis of Flood Situation Report (2016,2017,2019,2020) NDRCC, MODMR .

Figure 4.10 visualized the number of affected population y upazila by different flood year. Fulchhari upazila experienced the highest number of affected individuals in all four years flood ranging from 69,662 to 156,770. Gaibandha Sadar experiences the second highest population affected ranging from 65,028 in 2016 to 124,525 in 2019. In Tangail district, Kalihati upazila has a significantly higher affected population though it's appeared as 3rd in terms of affected population except 2020. Sirajganj Sadar in Sirajganj district had the lowest affected population overall. The data indicates that 2017 was a particularly severe year for flood impacts across most upazilas, with Fulchhari and Gaibandha Sadar being the most affected in terms of population.

Figure 4.11: Percentages of Affected Population by Upazila in different year



Source: Analysis of Flood Situation Report (2016,2017,2019,2020) NDRCC, MODMR .

To deep dive further into the inundation areas (figure 4.9) in comparison to percentages of affected population(figure 4.11), the greater differences has been seen between 2019 and 2020 in Fulchhari, given only around 50% of the areas are inundated when almost 94% of population are affected in 2019 whereas in 2020, Fulchhari has affected population drops to 42% compared to 94% the year before when area affected remains similar at around 50%. It has been found that the 2019 flood was devastating and rapid flow caused severe damages to the flood protection infrastructure and inundated the settlement and urban areas, in contrast 2020 flood was slow on set accompanied with heavy rainfall for days. Thus, all low-lying areas have been inundated which has less settlement, which resulted lower percentage of population affected in 2020 though inundation area was almost same.

4.2.3 Assessment of Remedy Measures (Priority Needs)

The assessment of remedy measures guides response and recovery financing. For all major disasters the coordinated assessment is conducted by the Needs Assessment Working Group, led by jointly Department of Disaster Management and CARE Bangladesh, being developed in coordination with non-government development partners and sectoral ministries.. The assessment findings of the priority remedy measure show diversity by the different flood years (figure 4.12).

Figure 4.12: Sectoral Priority Needs by Monsoon Flood Year

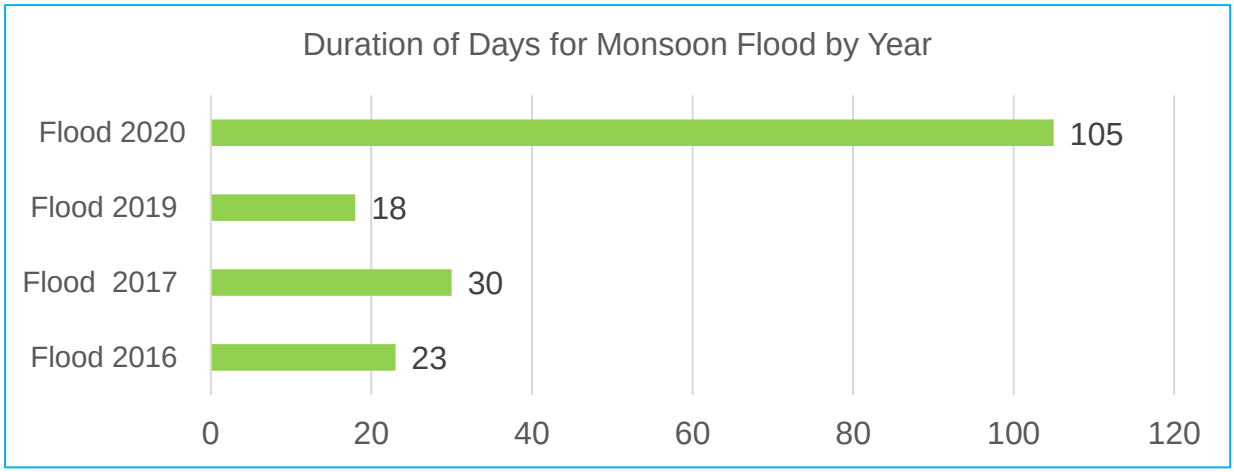
Year	1st priority	2nd priority	3rd priority	4th priority	5th priority
2016	WASH	Food Security and Nutrition	Shelter	Health Including SRH	Protection
2017	Food Security and Nutrition	Shelter	WASH	No information	No information
2019	Food Security and Nutrition	Shelter	WASH	Health including SRH	Protection
2020	Protection	WASH	Food Security and Nutrition	Shelter	Health Including SRH

Source: Joint Needs Assessment Report, Needs Assessment Working Group, Bangladesh (2016,2017,2019,2020)

The prioritization of sectors and the duration of flood incidents in Bangladesh for the years 2016, 2017, 2019, and 2020 reveal important interrelations between the severity and impact of flooding events and the corresponding emergency

response needs. In 2016, the flood lasted for 23 days, with WASH (Water, Sanitation, and Hygiene) being the top priority, followed by Food Security and Nutrition, Shelter, Health including Sexual and Reproductive Health (SRH), and Protection

Figure 4.13: Duration of the Monsoon Flood by Year



Source: Annual Flood Report, Flood Forecasting Warning Centre, 2016,2017,2019,2020)

Longer duration floods (such as in 2020) correlate with a broader and more complex set of needs, emphasizing protection, which suggests greater concerns for safety and human rights issues over an extended period. In contrast, shorter flood durations in previous years prioritized immediate life-sustaining needs such as Food Security and Nutrition, Shelter, and WASH. This interrelation underscores how the extent and duration of flood events directly influence the prioritization of emergency response sectors, highlighting the evolving and dynamic nature of humanitarian needs in prolonged disaster situations.

4.2.4 Stakeholders and Support Provided

The Government of Bangladesh is the main duty bearer and first responder of for any disaster event in Bangladesh. On behalf of the Government, sectoral ministries support the flood affected community and population in distress. The response is solely coordinated by the Ministry of Disaster Management and Relief (MoDMR) who leads disaster response efforts, including early warning systems, evacuation planning, and coordination of relief operations through

local administrations. The humanitarian coordination task team (HCTT) work as complementary coordination mechanism led jointly by MoDMR and UNRCO Bangladesh where the efforts of non-government development partners are planned in coherence to the government response and recovery efforts.

The analysis of the humanitarian response overview dashboard of the HCTT informed that along with the government, development partners and international NGOs and national NGOs (shown in table 4.13) provide complementary support to flood affected population.

Table 4.10: Government and non-Government development responding stakeholders in project areas

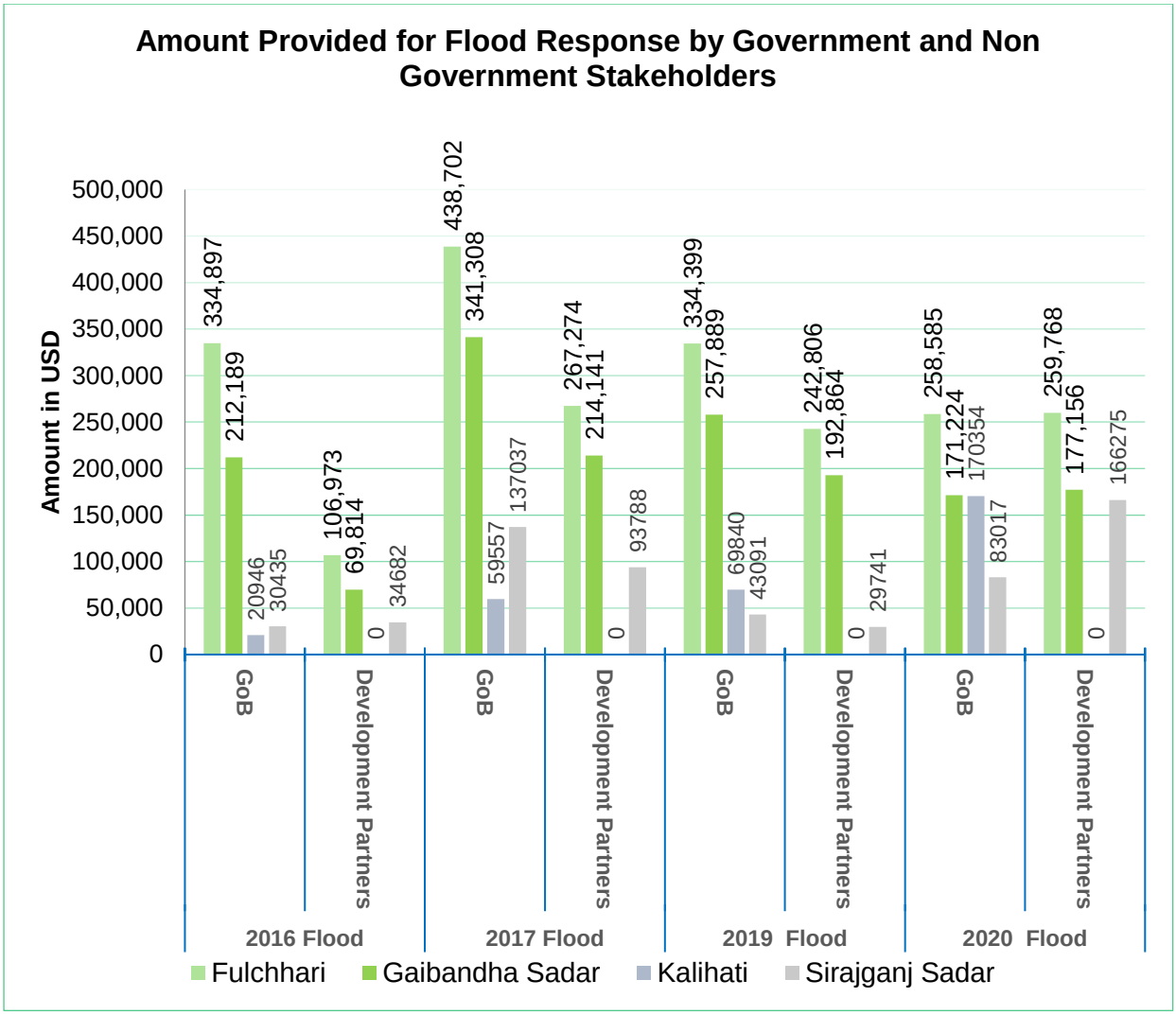
Main Responder: Ministry of Disaster Management and Relief, Government of Bangladesh **Complementary Response Stakeholders are-**		
Development Partner	**Lead Project Awarded agency**	**Implementing Agency**
UN CERF	World Food Program	RDRS Bangladesh
ECHO	Islamic Relief Bangladesh	Islamic Relief Bangladesh
SDC	Friendship	Friendship
FCDO	Start Fund Bangladesh	SKS Foundation
ERIKS	UNFPA	CARE Bangladesh
Save the Children International	Save the Children International	Environment and Population Research Centre
USAID-OFDA/BHA	Environment and Population Research Centre	Bangladesh Red Crescent Society
UNICEF Pool Fund	Educo Bangladesh	National Development Programme
USAID-OFDA/BHA	UNDP	GUK
Child Fund Korea		NDP
		MMS
		Save The Children Bangladesh

The major support for flood affected population provided by the ministry of Disaster Management and Relief covers the Gratuitous Relief Cash, Gratuitous Relief Rice, Dry food package, Corrugated Iron Sheets, Cash for House Reconstruction, Child food and feed for livestock (NDRCC 2016, 2017,

2019,2020). Hence the four project upazilas have been regularly affected by flood, Ministry of Disaster Management had provided substantial amount of relief.

At the same time development partners also provide emergency relief support under the coordination of Humanitarian coordination Task Team Bangladesh. The following figure 4.14 illustrates the amount of response in USD for monsoon flood by upazila for different flood year.

Figure 4.14: Response amount by Government and non-government development partners



Source: Analysis of Flood Situation Report (2016,2017,2019,2020) NDRCC, MODMR and calculation of in-kind support into monetary value based on the local price. and 4W analysis of Needs Assessment Working Group, 2019 and 2020; HCTT Humanitarian Response Dashboard (2019, 2020).

The figure 4.14 provides a comparative overview of the financial contributions from the Government of Bangladesh (GoB) and Development Partners in

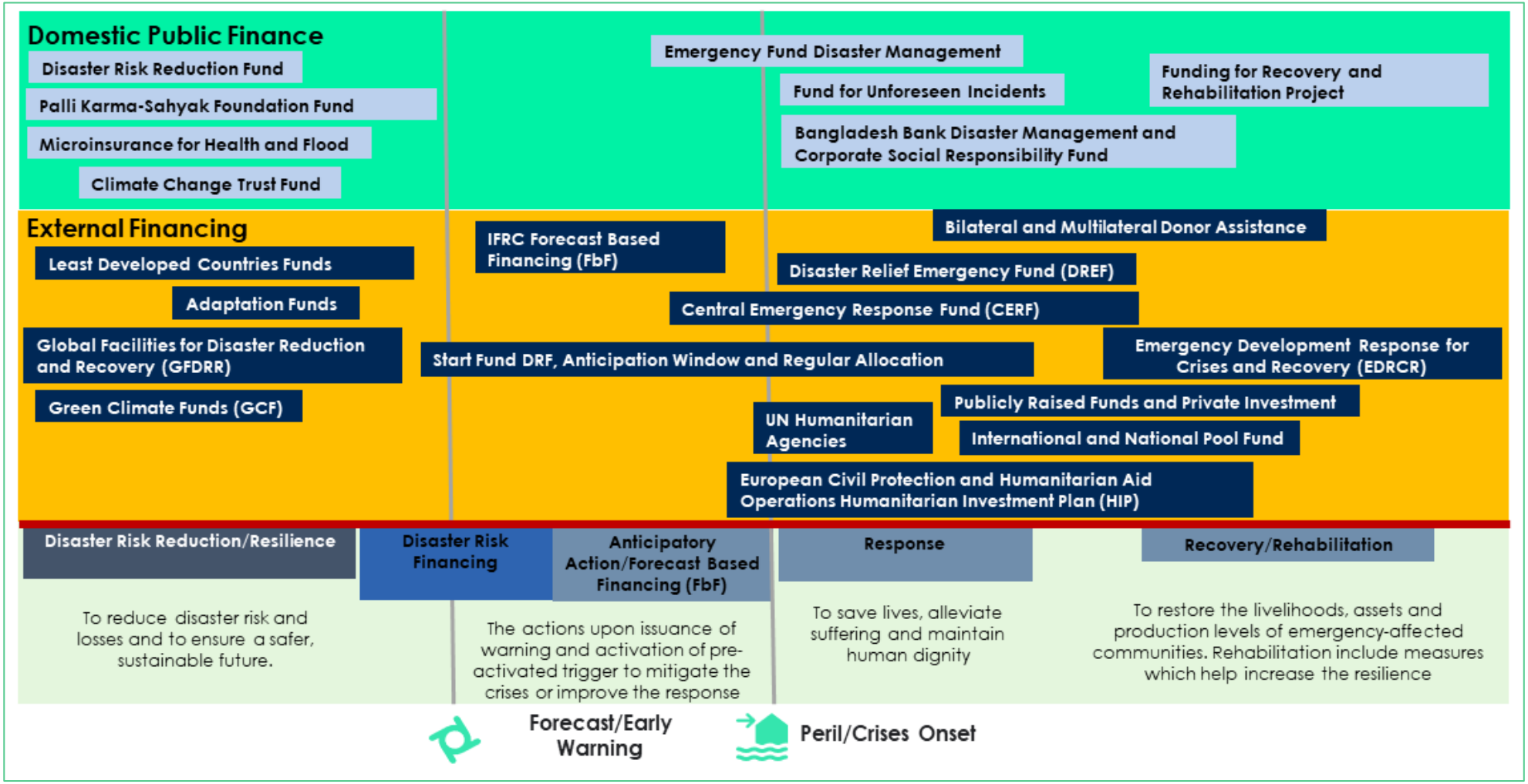
response to flood events across four upazilas; Fulchhari, Gaibandha Sadar, Kalihati, and Sirajganj Sadar from 2016 to 2020.

In Fulchhari, the GoB consistently allocated substantial funds, peaking at 438,702 in 2017, while Development Partners' contributions varied, reaching their highest at 267,274 in the same year. Gaibandha Sadar also saw significant funding from both sources, with the highest GoB allocation of 341,308 in 2017 and the largest Development Partners' contribution of 214,141 that year.

Kalihati upazila has not been receiving any support from development partners and funding for this upazila was solely from the GoB, with a marked increase in 2020 at 170,354, up from 20,946 in 2016. Sirajganj Sadar received more balanced contributions, with notable GoB funding of 137,037 in 2017 and Development Partners' peak support of 166,275 in 2020.

Overall, the findings of this section indicate substantial financial support from both the GoB and Development Partners, with peak allocations in 2017 and significant increases in 2020 for certain upazilas, but funding amount dropped in Fulchhari and Gaibandha Sadar in 2019.

Figure 4.15: Funding Landscape- Wider Sources of Funding for Flood



Sources: After Multi-Hazard Risk Analysis, Start Fund Bangladesh, 2021.

The figure 4.15 outlines the diverse funding mechanisms employed in Bangladesh for addressing flood risks and responses, highlighting both domestic and external sources. Domestically, the Disaster Risk Reduction Fund, Palli Karma-Sahayak Foundation Fund, Microinsurance for Health and Flood, and Climate Change Trust Fund play crucial roles in mitigating disaster risks and promoting resilience. Additionally, emergency funds such as the Emergency Fund for Disaster Management and the Fund for Unforeseen Incidents provide crucial support during immediate disaster response phases. Externally, financial assistance is sourced from international mechanisms such as the Least Developed Countries Funds, Adaptation Funds, Global Facility for Disaster Reduction and Recovery (GFDRR), and Green Climate Funds (GCF). These trust funds aim to provide technical assistance toward government for disaster risk reduction. IFRC Forecast-Based Financing (FbF) and bilateral and multilateral donor assistance, support anticipatory actions, immediate disaster relief, and long-term recovery efforts. This comprehensive funding framework ensures a multi-faceted approach to managing flood risks, from early warning and preparedness to response and rehabilitation.

4.2.5 Support Type and Operational Modalities

Flooding is a common phenomenon and response to the flood is mandate of the government as well as international and national development partners. As main duty bearer, the government of Bangladesh lead and coordinate all response and recovery supports and also provides several types of support for flood response, focusing on both immediate relief and long-term recovery and resilience building.

4.2.5.1 Support Provided

The flood response is decided as per the Humanitarian Assistance Program Implementation Guideline 2012-2013 of the Ministry of Disaster Management and Relief which summarized in table 4.14 with key details of support type.

Table 4.11 : Type of support provided by Government

Emergency Relief	❖ **Food Aid**: Distribution of food items to flood-affected communities to ensure immediate sustenance. ❖ **Shelter**: Provision of temporary shelters and housing materials for displaced individuals. ❖ **Clean Water and Sanitation**: Ensuring access to safe drinking water and sanitation facilities to prevent waterborne diseases.
Financial Assistance	❖ **Cash Transfers**: Direct financial assistance to affected households to help them meet urgent needs. ❖ **Subsidies and Grants**: Financial support to farmers and businesses to aid recovery and mitigate economic losses.
Healthcare Services:	❖ **Medical Camps and Mobile Clinics**: Deployment of medical teams to provide healthcare services and prevent disease outbreaks. ❖ **Mental Health Support**: Psychological counseling and support for individuals affected by the trauma of flooding.
Infrastructure and Rehabilitation	❖ **Rebuilding Infrastructure**: Repairing and reconstructing damaged roads, bridges, schools, and other critical infrastructure. ❖ **Housing Rehabilitation**: Providing materials and support for rebuilding damaged homes.
Livelihood Support:	❖ **Income Generation Activities like Cash for Work** ❖ **Agricultural Support**: Distribution of seeds, fertilizers, and tools to help farmers resume agricultural activities. ❖ **Livestock Assistance**: Veterinary services and fodder supply to support livestock-dependent families.

Disaster Risk Reduction (DRR) Initiatives	❖ **Early Warning Systems**: Enhancing flood forecasting and early warning systems to provide timely alerts to communities. ❖ **Community Training**: Educating communities on flood preparedness and response strategies. ❖ **Building Resilient Infrastructure**: Constructing flood-resistant infrastructure and embankments to reduce future flood risks
Coordination and Planning	❖ **National and Local Disaster Management Committees**: Establishing committees to coordinate response efforts and ensure effective implementation of relief measures. ❖ **Contingency Planning**: Developing and updating disaster response plans to improve preparedness.

These supports are provided through various government agencies and in collaboration with non-governmental organizations (NGOs), international agencies, and local communities to ensure a comprehensive and effective flood response

Further analysis of the real time practices of response type shows the major support provided by the government during four major floods from 2016 to 2022 mainly comprises of 12 types of response by different sector ministries of the Government covering food security, livelihood support, wash, shelter and health support, shown in table 4.12.

Table 4.12: Response of the Government of Bangladesh for recent floods

GR CASH	CGI Sheets	GR Rice	Dry Food Package	Makeshift Tent	Water Purification Tablet

Livestock Feed	Medical Team	Cash for House Repair	Water Treatment Plant	Cash for Child Food	Hygiene Kit

Data Source: NDRCC, DPHE, DGHS, DAE, DLS of the Government of Bangladesh 2019 and 2020.

Table 4.13: Non-government development partner's beneficiary reached and activity ratio by support type

Type of Support Provided by Non-Government Agencies	% of Beneficiary coverages by Sectors	Percentages of project/activity
Animal Food	0.04%	0.14%
Assistive Device (AD) to the people with disabilities	0.00%	0.72%
Child Protection	2.36%	2.46%
DRR	0.01%	0.29%
Education	12.30%	0.29%
Food Security and Nutrition	20.59%	32.56%
Health	0.87%	1.45%
Integrated GBV and SRH	2.10%	9.99%
MPCG	0.69%	2.03%
Risk Communication/Awareness/ Prevention Message/ Advocacy	11.58%	1.88%
Shelter	8.49%	9.70%
WASH	40.96%	38.49%
Grand Total	**100.00%**	**100.00%**

Source: 4W analysis of Needs Assessment Working Group, 2019 and 2020; HCTT Humanitarian Response Dashboard (2019, 2020).

While looking at the support by the development partner for responding flood, it appeared that humanitarian response guided sector were prioritized according to the Monsoon Flood HCTT Humanitarian Response plan of 2016, 2017, 2019 and 2020. The response analysis from 4W of the monsoon flood monitoring 2019 and 2020 shows the major sectoral response coverage and projects shown in table 4.16.

The table 4.13 highlights the primary types of support provided by non-government agencies for flood response in the Jamuna River basin areas. The top five sectors by beneficiary coverage are WASH (40.96%), Food Security and Nutrition (20.59%), Education (12.30%), Risk Communication/Awareness (11.58%), and Shelter (8.49%). WASH services focus on providing clean drinking water and sanitation facilities, while food security efforts ensure essential nutrition. Education initiatives maintain access to schooling, risk communication promotes awareness and preparedness, and shelter support provides temporary housing. Other sectors, like health and child protection, also contribute but to a lesser extent.

4.2.5.2 Operational Modality

The operational Disaster Response Coordination Cell of Ministry of the Disaster Management and Relief and guidance of the Standing Order on the Disaster (SOD) articulate that flood response mechanism in Bangladesh are coordinated and operational in an efficient manner.

Investigating the operational aspect and delivery mechanism of the government of Bangladesh, it appears that of the government of Bangladesh are mainly channelized response in coordination with local government and local administration of the government of Bangladesh. The response delivery modalities are diverse from in kind, cash in hand to mobile money transfer depending on the response item and timing of the support. The following table 4.17 shows the snapshot of the delivery mechanism.

Table 4.14: Delivery modality of different support type by government

Type of Support by GoB	Delivery Modality
Emergency Relief items (Food and Non-Food items)	In kind
Cash Transfers	Cash in hand and mobile money transfer
Livelihood Support	In kind and cash for work
Infrastructure Rehabilitation	Direct repair work and cash in hand to the affected community
Healthcare Services	Deployment of medical teams and mobile clinics

Investigating the practices of the operational channel and modalities reveals that coordination with international development partners through the Humanitarian Coordination Task Team (HCTT) is embed part of all humanitarians and DRR efforts. These international development partners channelized resources and support to affected community by non-government national and international NGOs. Following table 4.18 visualizes overall operational modality, percentages of beneficiary coverage by modality and percentages of activities by modality.

Table 4.15: Non-government development partner's ratio of beneficiaries, project activities and total fund disbursement by different operational modality,

Operational Delivery Modality	Percentages of Beneficiary coverages	Percentages of project/activity	Percentages of fund disbursed
Advocacy/awareness/Safety Measures	38.06%	3.86%	22.87%
Cash in Hand	9.00%	15.16%	10.61%
In-kind	41.01%	64.93%	32.42%
Mobile Money transfer (MMT)	11.60%	13.22%	33.28%
Support to Institutions	0.33%	2.82%	0.82%

Source: 4W analysis of Needs Assessment Working Group, 2019 and 2020; HCTT Humanitarian Response Dashboard (2019, 2020).

The operational delivery modalities for the project show a varied approach to beneficiary coverage and sectoral distribution. The majority of beneficiaries, 41.01%, received support through in-kind distributions, which also accounted for the largest portion of project activities at 64.93%. Advocacy, awareness, and safety measures reached 38.06% of beneficiaries but represented only 3.86%

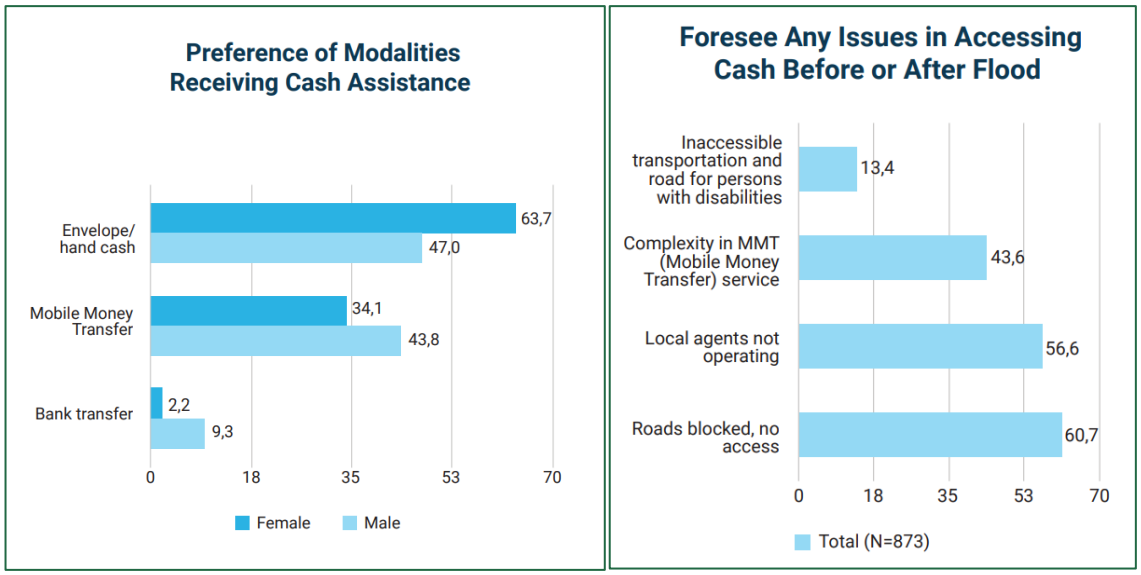
of the project activities, highlighting a significant focus on direct material support over educational or preventative measures. Cash in hand was utilized by 9.00% of beneficiaries, corresponding to 15.16% of the activities, reflecting a substantial investment in providing immediate financial aid. Mobile Money Transfers (MMT) covered 11.60% of beneficiaries and made up 13.22% of activities, indicating the use of digital financial solutions to enhance efficiency. Lastly, support to institutions was minimal, covering only 0.33% of beneficiaries and 2.82% of project activities, suggesting a lower emphasis on institutional capacity building within the project framework.

Further analysis on the standard package-based analysis and fund disbursed under different modality, it's clear that cash-based intervention appeared as major aspects of the response activities where cash in hand and mobile money transfer compress about 45% of the response amount and 32.42% of in-kind support along with 22.87% fund utilized for advocacy interventions.

To conclude, though the number of populations reach and activities higher for advocacy and in-kind support, however in terms of project fund utilization the cash-based interventions appeared as predominant response modality. Focusing the cash support, the HCTT Pre-crisis Assessment of Monsoon Flooding in Bangladesh 2023 elaborate the community preferences on the modality of cash based intervention along issues regarding access to cash. The study combined qualitative and quantitative fields in selected regions prone to monsoon flooding in both the Jamuna and Padma River basins covering 873 household surveys from 6 districts, 12 Upazilas, and 24 unions.

The first chart from figure 4.16 presents the preferred modalities for receiving cash assistance among the flood-affected community in the Jamuna River basin, differentiated by gender. It reveals that the majority of females (63.7%) prefer receiving cash in an envelope or hand cash, while 47.0% of males share this preference. Conversely, a higher percentage of males (43.8%) prefer mobile money transfers compared to females (34.1%). Bank transfers are the least preferred method, with only 2.2% of females and 9.3% of males favoring this option (HCTT 2023).

Figure 4.16: Community preference of cash receiving modality and issues regarding cash-based support



Source: Pre-crisis Assessment of Monsoon Flooding in Bangladesh, HCTT-2023

This finding also highlights the gendered differences in preferences for cash transfer methods, primarily due to varying access to and familiarity with technology, financial control dynamics, cultural norms, and security concerns. Men generally have better access to mobile phones and digital services and are more comfortable with mobile money transfers, whereas women may prefer cash due to lower access to technology, concerns about digital financial systems, and cultural barriers.

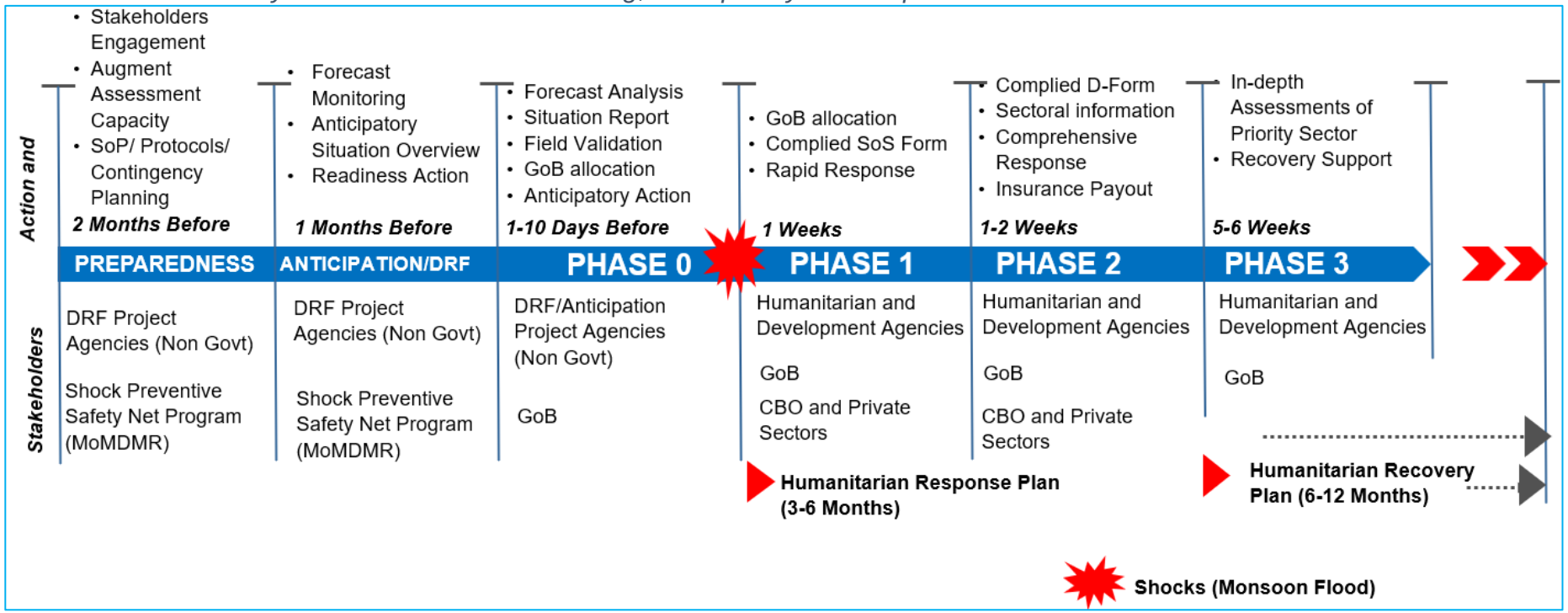
The second chart from figure 4.16 identifies potential issues that may arise in accessing cash before or after a flood in the Jamuna River basin. The most significant problem, faced by 60.7% of respondents, is blocked roads and lack of access . This is followed by 56.6% indicating that local agents might not be operational during floods. Complexity in mobile money transfer services is a concern for 43.6% of respondents, and 13.4% identify inaccessible transportation and roads as issues for persons with disabilities. (HCTT 2023). These insights guide the design of cash-based programs by emphasizing the need to ensure physical access and operational reliability of cash distribution channels during flood emergencies.

4.2.6 Timeline Analysis of Action

The comprehensive timeline for flood response in Bangladesh is a complex chronology based on historic needs and provision of assistance. Though there are some actions which overlap over time or overlap by action type, a comprehensive assessment of operational aspects of the flood response focusing the activities of the Ministry of Disaster Management and Relief and Humanitarian coordination Task teem the timeline (figure 4.17) has been developed.

Details of the timeline aligning the major activities and stakeholder shows, the preparedness phase, starting two months before the flood, involves stakeholder engagement and contingency planning by DRF Project Agencies and the Shock Preventive Safety Net Program under MoDMR. One month before the flood, the anticipation phase focuses on forecast monitoring and readiness actions by the same stakeholders. In the week leading up to the flood (Phase 0), activities include forecast analysis, situation reporting, and anticipatory actions involving DRF/Anticipation Project Agencies and the Government of Bangladesh (GoB).

Figure 4.17: Timeline analysis of Disaster risk financing, anticipatory and response action



Source: Joint Needs Assessment Report, Needs Assessment Working Group, Bangladesh (2016,2017,2019,2020) and Compilation from Damage and Situation Report of the Flood 2016,2017, 2019 and 2020, NDRCC, MODMR

Phase 1, which occurs one week before the flood, emphasizes rapid response and resource allocation by humanitarian and development agencies, GoB, CBOs, and the private sector, with a humanitarian response plan spanning 3-6 months. Phase 2, occurring 1-2 weeks after the flood, involves detailed sectoral assessments and comprehensive response efforts. Finally, Phase 3, taking place 5-6 weeks post-flood, focuses on in-depth assessments and recovery support, coordinated by humanitarian and development agencies and GoB.

4.2.6 Shock Responsive Safety Net Program

The Government of Bangladesh has implemented several social safety net programs being implemented by different sectoral ministries. unplanned growth of the social safety net portfolio has caused fragmented implementation, with 119 programs under 25 Ministries (Ministry of Finance, 2022).

Out of the 25 ministries, Ministry of Disaster Management and Relief (MoDMR) has the second highest share of Social Safety Net Programming (20 per cent of state budget), after the MoF pensions programming. Safety net programs which are being implemented by MoDMR are mainly focusing on shock response.

it is difficult to determine the role of whole SP systems in disaster response across the project areas as this information is not held centrally, some SP systems are already using shock-responsive approaches though all of them are mainly focusing on post response.

The implementation wing of Ministry of Disaster Management and Relief, namely Department of Disaster Management is mainly responsible for shock responsive safety net programme as they cover-

- The public Food Distribution System (PFDS) supplies food grains to various food-based safety nets,
- Food based public works programs (FFW and TR) and the OMS,
- Three other largest food based programs include VGF, GR and Vulnerable Group Development (VGD) programs. While VGF has a pre-defined benefit package and focuses on food security needs of poor households, GR offers both food and other transfers (e.g. blankets, CI sheet, cash, etc) to meet the needs of disaster affected poor households. VGD on the other hand combines food-based transfers with training on income generating activities and is targeted exclusively towards groups of women.)

The feasibility study on the potential use of cash-based social protection systems for floods in Bangladesh on the Shock Responsive Safety Net (SRSP) program in Bangladesh explored potential social safety net programs that could

be leveraged for anticipatory action as well as disaster risk financing, these are listed below:

- Old Age Allowance (OAA) by the Department of Social Services (DSS) under the MoSW
- Allowance for Widowed, Deserted and Destitute Women (VA) by DSS under the MoSW
- Gratuitous Relief (GR) – an emergency relief programme by the MoDMR
- Disability Allowance (DA) by DSS under the MoSW
- Employment Generation Programme for the Poorest (EGPP) – a public works programme by the MoDMR

Over time, this World Bank project could integrate and advocate for the integration of one or more of the above social safety net programs.

4.3 . COPING AND PROTECTION GAP:

4.3.1 Household Coping Mechanism

While analyzing impacts of flood and other form of disaster, women as a social category were prone to overgeneralization, and women's dependency and need were overemphasized[11],- they are not only survivors, rather they demonstrate as responder, leaders and resilient individuals. Men and women have differential experience in adopting coping mechanism. Men and boys tend to move out to nearby cities in search of earning livelihood and women shoulder more responsibility of household maintenance within limited resources as they have limited alternative livelihoods[12].

Household Negative coping tactics perceived as 'normal' in the flood prone areas, as vulnerability influences their reliance on negative coping tactics that have become normalized due to the recurrent nature of monsoon floods (HCTT, 2023). These negative coping tactics may include measures detrimental to the longer-term prosperity and well-being of households such as taking on high-interest loans, selling off assets, girls' forced marriages, compromising children's education, reduced food intake by women and girls[13], or engaging in hazardous work to make ends meet during and after flood events. While these tactics may provide immediate relief, they can perpetuate a cycle of vulnerability and limit the long-term resilience of the affected communities. The recent findings of the Pre-crisis Assessment of Monsoon Flooding in 2023 by HCTT exhibits the regular negative coping practices in six flood prone districts (Kurigram, Gaibandha, Sirajganj, Jamalpur, Tangail, Shariatpur) and the findings shows in figure 4.18.

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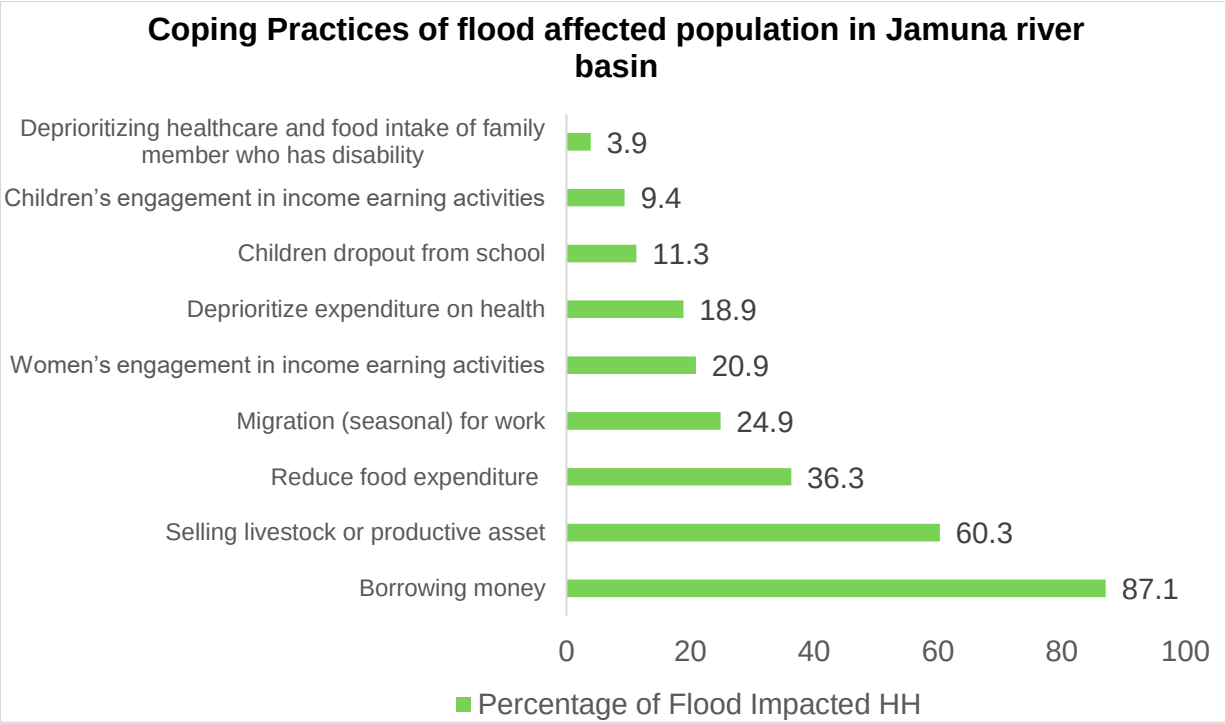
[11] Fordham, M. (2009). We can make things better for each other: Women and girls organize to reduce disasters in Central America. In E. Enarson & P. G. Dhar Chakrabarti (Eds.), Women, gender and disaster: Global issues and initiatives (pp. 176–188). SAGE.

[12] Impact of Flood Induced Migration on Livelihood and Gender Relation: A Study on Chilmari, Kurigram, by MD. Mahabub Choudhury & Marjina Masud, International Journal of Engineering Applied Sciences and Technology, 2020 Vol. 5, Issue 5, ISSN No. 2455-2143, Pages 1-7 Published Online September 2020 in IJEAST (http://www.ijeast.com

[13] Gender and Disaster in Bangladesh, Mahbuba Nasreen, October 2022 on https://doi.org/10.1093/acrefore/9780199389407.013.380

Figure 4.18 : Coping practices of flood affected population in Jamuna river basin



Source: Pre-crisis assessment of monsoon flooding in Bangladesh, 2023 (HCTT)

The findings on coping mechanism highlights various negative coping practices adopted by flood-prone people, with borrowing money being the most common, reported by 87.1% of respondents . They particularly take loans in an informal way from the local rich person which generally has very high interest and difficult to repay, which further hinders the economic recovery of households. A significant portion, 60.3%, resorted to selling livestock or productive assets. To manage financial strain, 36.3% of respondents reduced food expenditure, while 24.9% engaged in seasonal migration for work. Women increasingly participated in income-earning activities, with 20.9% reporting this change. Financial pressure led 18.9% to deprioritize healthcare expenses. Notably, 11.3% of children dropped out of school, and 9.4% of children engaged in income-earning activities. Additionally, 3.9% of respondents deprioritized healthcare and food intake for family members with disabilities, reflecting severe socioeconomic stress and the detrimental impact of floods on vulnerable communities (HCTT 2023).

4.3.2 Analysis of The Protection Gap

The Jamuna River basin, in particular, experiences frequent and severe flooding, resulting in substantial economic losses and posing significant challenges to response efforts. However, the allocation of resources for flood response and recovery often falls short of what is needed to adequately address these impacts. This gap exacerbates vulnerabilities, leaving affected communities struggling to rebuild and recover.

Domain of Protection Gap

A. Allocation Gap: Disparity between economic loss and response allocation.
B. Entitlement Gap: Disparity between household entitlement and response amount.
C. Coverage Gap: Disparity between population in need and population reached.

Understanding and addressing this disparity, and how it varies across different geographic areas, is essential for developing more effective and equitable flood response strategies in Bangladesh. The protection gap in flood response has been analyzed through three different dimensions, first one highlights the disparity between the actual economic and response amount, second window has investigated the entitlement vs response, and third dimension investigate the gaps in population in need and population reached. This gap is evident in the economic losses incurred, the mismatch between entitled support and received aid, and the difference between the number of people in need and those reached by response efforts. The gap has been estimated focusing on four major monsoon floods in the recent past in 2016, 2017, 2019 and 2020.

Flooding in the Jamuna River basin leads to widespread economic devastation, affecting agriculture, infrastructure, housing, and livelihoods (Rahman & Islam, 2019). Despite ongoing efforts to mitigate these impacts, flood protection infrastructure often proves inadequate or poorly maintained, leaving communities exposed to severe economic losses (Khan & Hossain, 2020). Moreover, there is a significant gap between the financial resources allocated for flood response and the actual needs of the affected populations. The entitlement versus response amount highlights this issue, with many affected

individuals not receiving the aid they are entitled to due to funding shortages and logistical challenges (Ahmed & Neelormi, 2019).

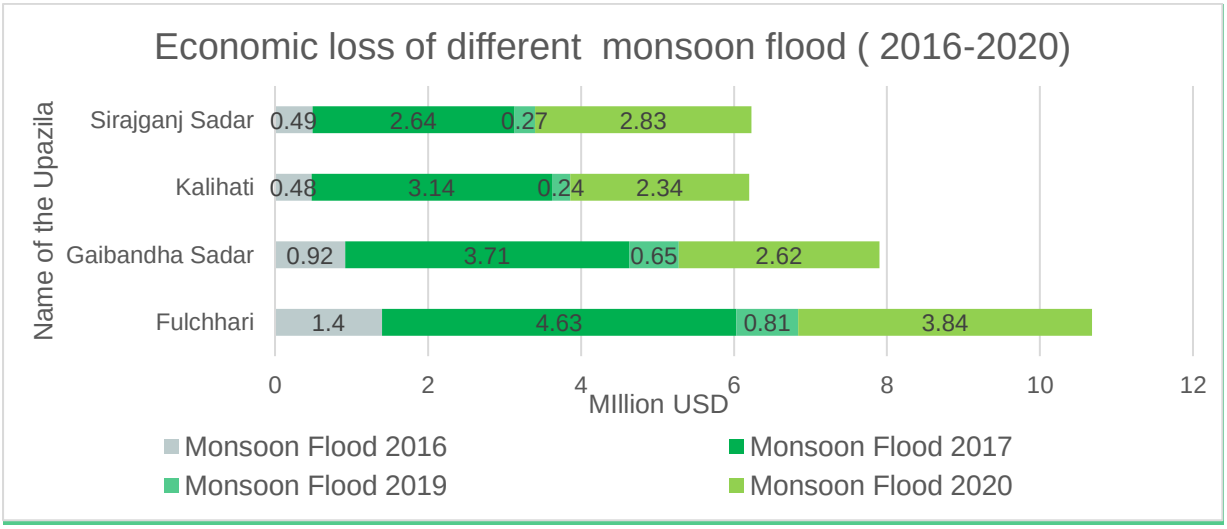
Furthermore, the gap between people in need and those reached by response efforts underscores the inefficiencies in the current flood response mechanisms. Limited resources, delayed response times, and coordination challenges among government agencies, non-governmental organizations, and international aid bodies contribute to this disparity (Haque & Jahan, 2020). Addressing the protection gap in flood response for the Jamuna River basin requires a comprehensive and coordinated approach, focusing on improving infrastructure, increasing financial resources, and enhancing the efficiency of aid distribution to ensure that the most vulnerable populations receive the support they need (Begum & Khan, 2017).

Despite the huge response efforts of the government of Bangladesh and complementary support by the international development partners, its appeared that there are potential protection gaps. However, the analysis of the protection gaps has inherent limitation due to unavailability of response amount and response information of all government ministries.

4.3.2.1 Resource Allocation Gap:

The disparity between economic loss and resource allocation for monsoon flood response in the assessed upazilas was inferred through analysis of economic loss, allocated resources and disparities among these two.

Figure 4.19: Economic loss by floods by upazila



Source: Small area estimation[14] based on D form report of MoDMR 2016, 2017, 2019, 2020

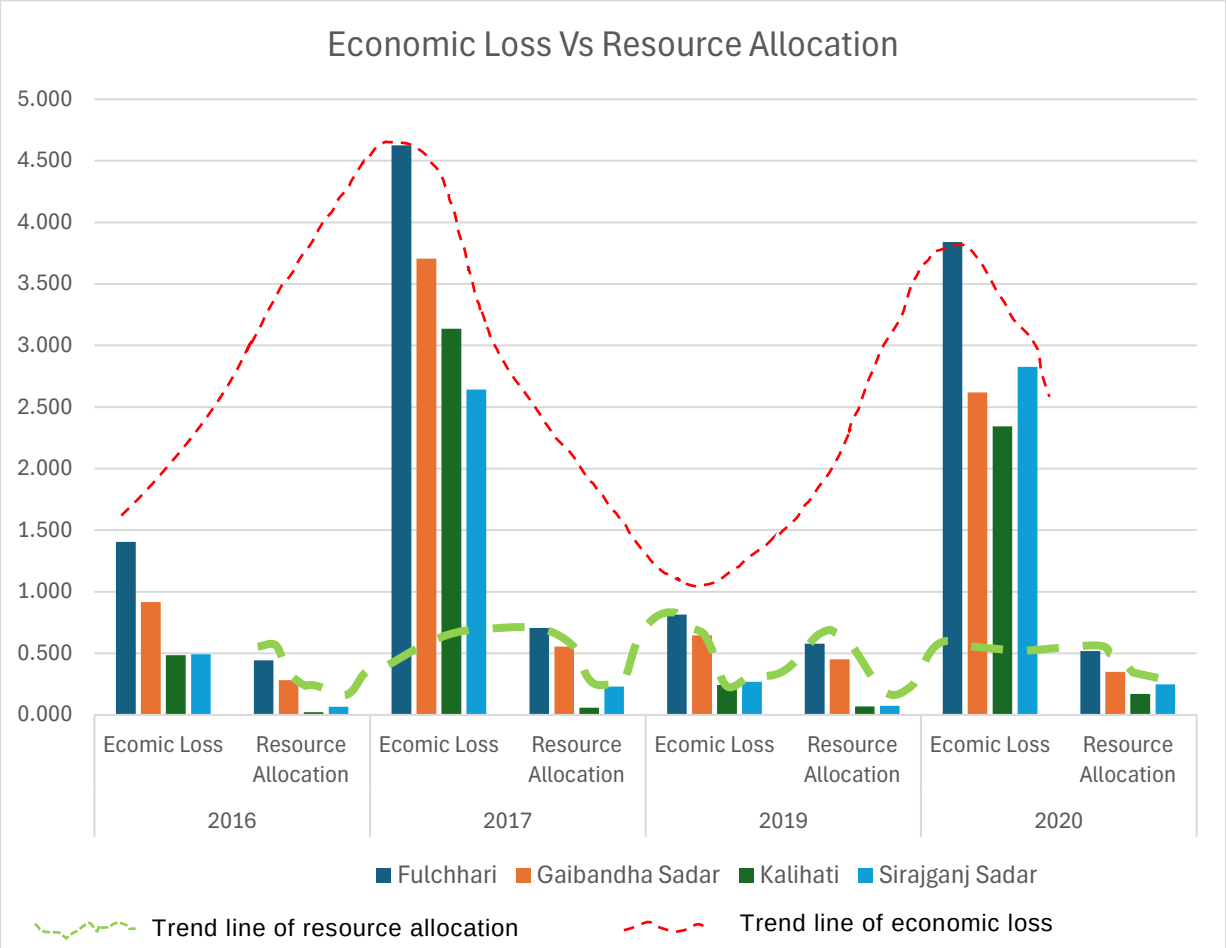
The figure 4.19 shows economic losses in million USD across four upazilas in Bangladesh due to monsoon floods in 2016, 2017, 2019, and 2020. The highest losses were recorded in 2017 (14.11 million USD), followed by 2020 (11.63 million USD), with the lowest in 2019 (1.97 million USD). Fulchhari consistently experienced the greatest share of economic loss compared to the other upazilas in each of the 4 monsoon floods. Gaibandha Sadar also saw significant loss in 2017 (3.71 million USD) and 2020 (2.62 million USD). Kalihati and Sirajganj Sadar followed similar patterns, with their highest losses in 2017 and relatively lower impacts in 2019. It is noticeable that, Fulchhari consistently experiences the greatest share of economic loss among the other upazilas in each of the four-monsoon flood .

Overall, while economic losses fluctuated annually and varied by upazila, governmental and non-governmental allocations combinedly aimed to address these challenges with varying degrees of success. Fulchhari emerged as a focal point due to its higher vulnerability and corresponding higher resource allocations during peak flood years.

However comparative analysis of total economic loss and combined effort of resource allocation depicts substantial gaps presented in figure 4.20.

[14] *The economic loss of flood at upazila level has been statistically estimated based on inundation areas and economic loss by per square kilometer inundation.*

Figure 4.20: Allocation of resources and economic Loss



*Source: **For Government** - Small area estimation based on D Form and NDRCC flood incident report of MoDMR 2016, 2017, 2019, 2020 and*
***For Non-Government-** HCTT response plan 2016, 2017, 2019, 2020 and HCTT response monitoring dashboard 2019, 2020*

The data reveals a consistent pattern of under-allocation of resources relative to economic losses caused by monsoon floods from 2016 to 2020, with significant variations across upazilas. In 2017, the economic losses were the highest, totaling $14.11 million, with Fulchhari experiencing the largest loss at $4.63 million, followed closely by Gaibandha Sadar, Kalihati, and Sirajganj Sadar. However, the resource allocation that year was starkly insufficient, amounting to only $1.55 million, with Fulchhari receiving the most ($0.71 million), but Kalihati receiving a minimal $0.06 million despite its substantial loss of $3.14 million. The same pattern of disproportionate resource allocation is evident in 2020, when the total economic loss stood at $11.63 million, yet only $1.29 million was allocated. Once again, Fulchhari saw the highest allocation of $0.52 million,

while Kalihati, with the third-highest loss of $2.34 million, received only $0.17 million. A similar trend was observed in 2016 and 2019, where economic losses were relatively lower, but allocations remained insufficient to cover the damages. The trend analysis shows that while the economic loss fluctuated over the years, but resource allocation remain similar thus reflects the response capacity of the government and non-government agencies are more or less same despite the variation of economic loss.

The protection gap in terms of resource allocation for response, calculated as the difference between economic losses and resource allocations, highlights disparities in response effectiveness. However humanitarian response is not supposed to cover full economic loss, but this analysis gives a sense of how the assistance is distributed across the areas compares to the distribution of economic losses. Table 4.19 depicts the response resource allocation gaps measured in million USD and percentages, between the economic losses due to floods and the allocated resources across different upazilas in various flood years.

The financial gap data from 2016 to 2020 reveals that Fulchhari has the highest absolute funding shortfall, with a total of $8.44 million, despite having a lower percentage gap compared to some other upazilas. Gaibandha Sadar follows closely with a gap of $6.25 million, also exhibiting a high percentage gap of 79%. Kalihati shows the third-largest absolute gap at $5.89 million, but its percentage gap is the highest across the board at 94.38%, indicating a more acute shortfall relative to its needs. Sirajganj Sadar, despite having the highest percentage gaps in some years, has the lowest absolute shortfall at $5.61 million. This shows that although Kalihati consistently has the highest percentage gaps, Fulchhari and Gaibandha Sadar have the largest absolute financial gaps over the period.

Table 4.16 : Economic gap in million USD and percentages of response gap

Flood Year	Upazila	Fulchhari	Gaibandha Sadar	Kalihati	Sirajganj Sadar	Total
Flood 2016	**USD**	0.962	0.634	0.464	0.427	**2.49**
	Percentages	69%	69%	96%	87%	**75%**
Flood 2017	**USD**	3.919	3.15	3.076	2.411	**12.56**
	Percentages	85%	85%	98%	91%	**89%**
Flood 2019	**USD**	0.237	0.196	0.173	0.196	**0.8**
	Percentages	29%	30%	71%	73%	**41%**
Flood 2020	**USD**	3.323	2.271	2.174	2.578	**10.35**
	Percentages	87%	87%	93%	91%	**89%**
	Total USD	**8.44**	**6.25**	**5.89**	**5.61**	**26.19**
	Percentage of Total	**79.00%**	**79.25%**	**94.38%**	**90.01%**	**84.46%**

*Source: **For Government** - Small area estimation based on NDRCC flood incident report of MoDMR 2016, 2017, 2019, 2020 and*
***For Non-Government-** HCTT response plan 2016, 2017, 2019, 2020 and HCTT response monitoring dashboard 2019, 2020*

[Note: This gap analysis only considers the Government and non-Government agencies' response amount. The recovery and rehabilitation support data by the sectoral ministries of the government and community coping efforts data are not available from secondary sources, hence those data are not considered to analyze these gaps which may show skewed result than the actual scenarios.]

In summary, Fulchhari has the overall highest economic gap in absolute terms (monetary value), and highest gap in each of the four flood incidents compared to other sites. Overall, these findings underscore that in terms of response allocation and economic loss these upazilas are largely deprived of required support. .The government resource allocation patterns show that the allocation is mostly same for all administrative areas despite contrasts in impact and economic loss. Thus, the higher gaps are prevalent in higher impacted upazila.

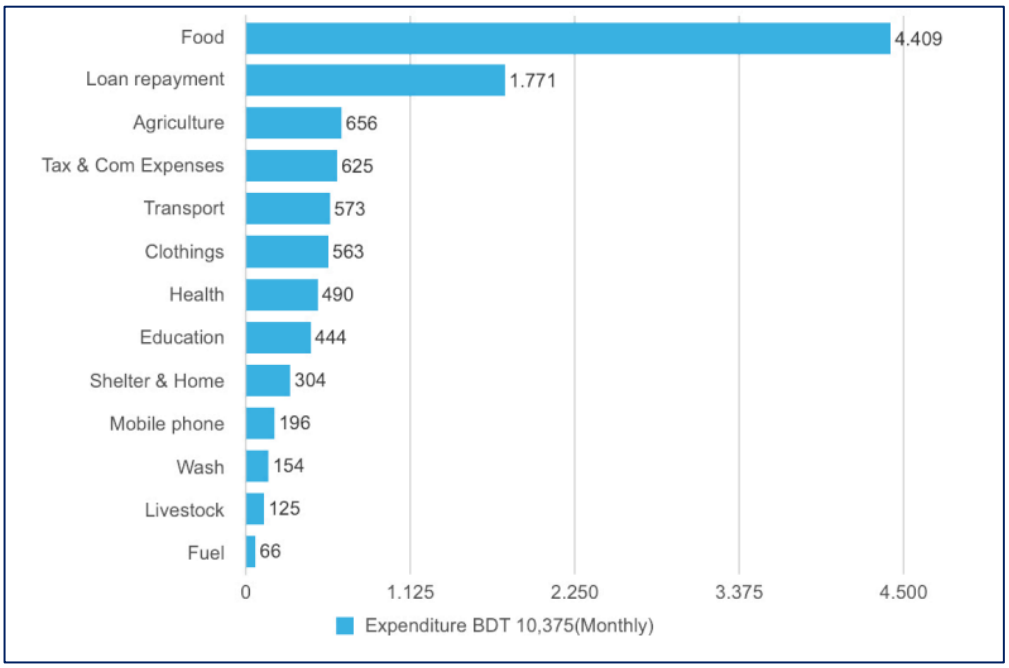
4.3.2.3 Entitlement Gap

In this section we review the gaps between entitled support and received aid, and how these vary across the four upazilas. The support entitlement of disaster affected populations was derived from the HCTT Nexus strategy 2021-2025 and lessons learned during the 2020 monsoon flood response in the COVID-19 pandemic. It is based on a minimum budget calculation for providing multi-sectoral assistance to

vulnerable households for 3 months for poor households in flood-prone areas of Bangladesh to covers the minimum cost required to cover basic needs, ensuring survival and dignity during and after a flood. It typically includes essential items like food, clean water, sanitation, shelter, healthcare, and other basic non-food items.

The minimum expenditure basket (MEB) is calculated based on local market prices and is tailored to reflect the specific needs and vulnerabilities of households in flood-prone regions, ensuring they can meet critical needs during emergencies shown in figure 4.21 (HCTT, 2023).

Figure 4.21: Minimum Expenditure basket for a poor household living in flood prone areas



Source: Unified Cash+ Framework of Bangladesh: For Anticipatory Action and Response, HCTT 2023

Figure 4.21 portrays the minimum expenditure basket of the poor households living in flood prone areas. The monthly expenditure of a rural household in Bangladesh amounts to BDT 10,375. The largest portion of this expenditure is dedicated to food, accounting for BDT 4,409. Other significant expenses include loan repayment (BDT 1,771), agriculture (BDT 656), and clothing (BDT 563). The household also allocates a significant portion of their income to education (BDT 444), health (BDT 490), and shelter and home-related expenses (BDT 304).(HCTT 2023)

The Inter cluster coordination groups agreed for a unified multi-purpose cash transfer value of 60% of the MEB considering the remaining 40% would be covered by peoples' own coping mechanisms, local capacities and other assistance including the relief distributed by the Government of Bangladesh. An estimated value for covering this 60% of the support has been calculated total US$180 for three month (US$60 per month) for each poor flood affected households. (*HCTT, 2020 and 2023*)

For the assessment area for identifying households who need support has been analyzed based on the concurrent standard from 2016 to 2020, which is poverty-based analysis of affected population to estimate the number of the households in need by upazila for the three months support (table 4.20) .

Table 4.17: Number Affected HH required support (for three Months)

Upazila	Total Households	Affected HH Need Support (2016)	Affected HH Need Support (2017)	Affected HH Need Support (2019)	Affected HH Need Support (2020)
Fulchhari	44,685	12,823	17,242	20,176	8,965
Gaibandha Sadar	130,668	7,932	13,093	15,189	5,795
Kalihati	116,351	2,139	4,156	3,740	3,810
Sirajganj Sadar	153,589	2,434	3,542	1,447	3,360
Total	**445,293**	**25,328**	**38,033**	**40,552**	**21,929**

Source: Poverty based small area estimation based on NDRCC flood incident report of MoDMR 2016, 2017, 2019, 2020.

The findings highlight the varying numbers of households requiring support across different flood years in four studied upazilas of Bangladesh. Aligning the higher impact Fulchhari consistently had the highest number of affected households needing support, peaking at 20,176 in 2017 and contributing significantly to the total figures for each respective year. Gaibandha sadar also experienced substantial demand for support in all the major four year's flood. Kalihati and Sirajganj Sadar generally reported lower but still considerable numbers of households needing assistance across the years studied.

These figures underscore the critical humanitarian impact of monsoon floods on local communities, particularly in high-risk areas like Fulchhari and Gaibandha

Sadar. The need for support varied annually based on the severity of flooding, with 2019 and 2017 showing the highest overall demand across all upazilas.

Thus, HCTT nexus strategy 2020 and Unified Cash Plus, 2023 study defined value (60 USD for 3 months) for each household was used to determine the required finance to ensure the entitlement of the flood affected household. Overall entitlement specific required finance and allocation of resources presented in table 4.18.

Table 4.18: Required finance to meet entitlement and allocation resources by Government and non-Government agencies(all figure in million USD)

Monsoon Flood	**Upazila**	Fulchhari	Gaibandha Sadar	Kalihati	Sirajganj Sadar	Total
2016	**Required to meet Entitlement**	2.308	1.428	0.385	0.438	**4.559**
	Resource Allocation	0.442	0.282	0.021	0.065	**0.810**
2017	**Required to Meet Entitlement**	3.104	2.357	0.748	0.638	**6.846**
	Resource Allocation	0.706	0.555	0.060	0.231	**1.552**
2019	**Required to Meet Entitlement**	3.632	2.734	0.673	0.260	**7.299**
	Resource Allocation	0.577	0.451	0.070	0.073	**1.171**
2020	**Required to Meet Entitlement**	1.614	1.043	0.686	0.605	**3.947**
	Resource Allocation	0.518	0.348	0.170	0.249	**1.286**
Total	**Total Required**	**10.66**	**7.56**	**2.49**	**1.94**	**22.65**
	Total Allocation	**2.24**	**1.63**	**0.32**	**0.61**	**4.82**
	Percentage of gap	**79%**	**78%**	**87%**	**69%**	**79%**

Source: Calculation based on household entitlement and number of household in need and NDRCC flood incident report of MoDMR 2016, 2017, 2019, 2020

This finding highlights significant disparities between required finance to meet entitlement and actual resource allocations across four major flood years in several upazilas along the Jamuna River. Fulchhari consistently demonstrated the largest gaps between required and allocated resources, indicating a substantial shortfall in funding necessary to address flood impacts adequately.

Similarly, Gaibandha Sadar also faced notable discrepancies between required and allocated resources in various flood years. Sirajganj Sadar and Kalihati consistently reported lower financial requirements aligning the lower number of household need supports (table 4.20) compared to other upazilas but also experienced challenges in meeting these needs with limited allocated resources.

Further table 4.22 illustrates significant ratio gaps between required financing to address flood impacts and the actual allocated finance across four major flood years in various upazilas.

Table 4.22: Gaps of required finance and allocated finance for monsoon flood response from 2016 to 2020

Monsoon Flood Year	Upazila	Fulchhari	Gaibandha Sadar	Kalihati	Sirajganj Sadar	Total
Flood 2016	Gaps in Million USD	1.87	1.15	0.36	0.37	**3.75**
	Percentage	81%	80%	95%	85%	**82%**
Flood 2017	Gaps in Million USD	2.40	1.80	0.69	0.41	**5.29**
	Percentage	77%	76%	92%	64%	**77%**
Flood 2019	Gaps in Million USD	3.05	2.28	0.60	0.19	**6.13**
	Percentages	84%	84%	90%	72%	**84%**
Flood 2020	Gaps in Million USD	1.10	0.69	0.52	0.36	**2.66**
	Percentages	68%	67%	75%	59%	**67%**
Total	Gaps in Million USD	**8.41**	**5.93**	**2.17**	**1.32**	**17.89**
	Percentages	**79%**	**78%**	**87%**	**69%**	**79%**

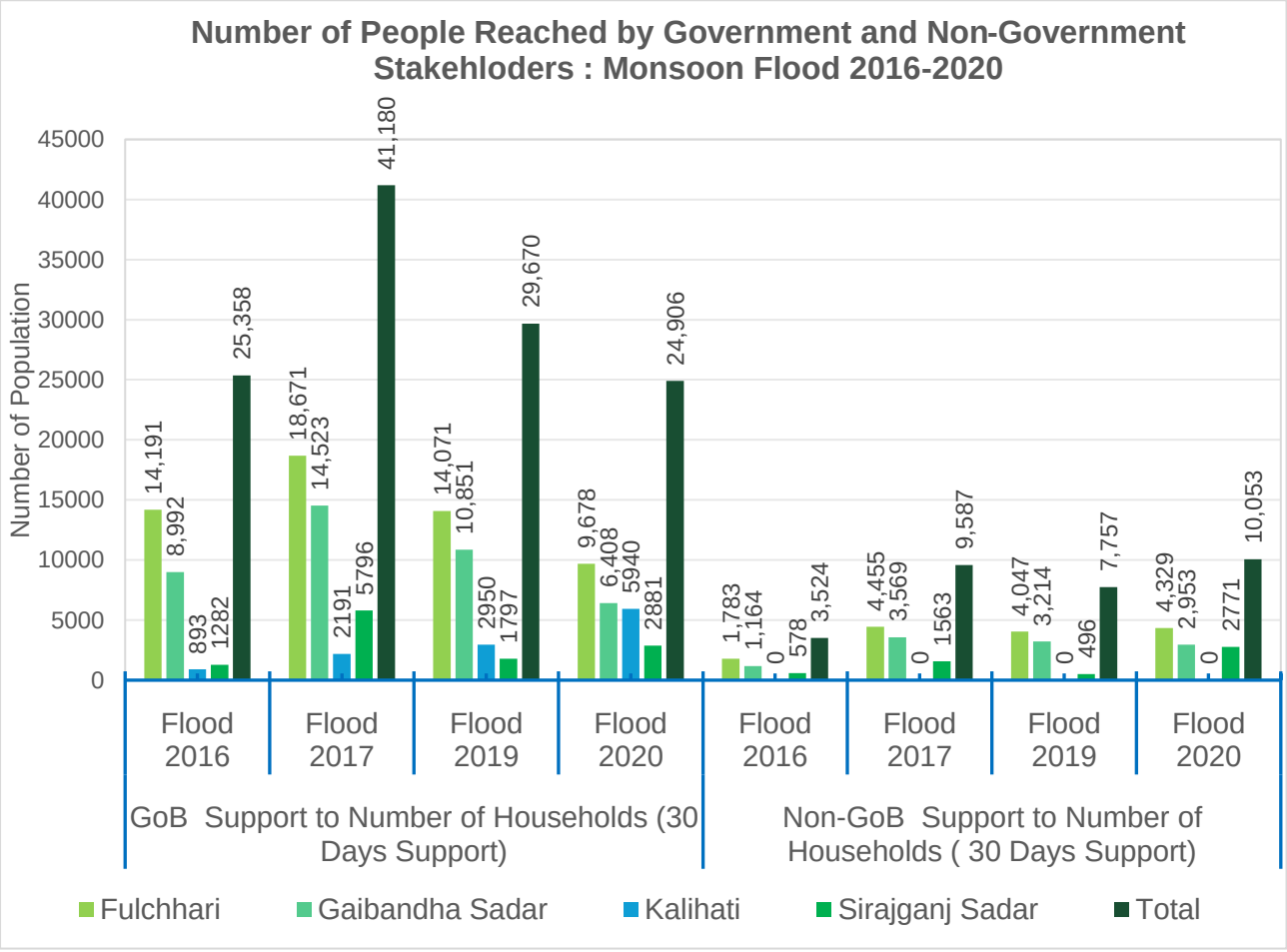
Source: Calculated based on household entitlement and number of households in need and NDRCC flood incident report of MoDMR 2016, 2017, 2019, 2020

The financing gaps for monsoon flood response from 2016 to 2020 show that Fulchhari consistently has the largest absolute gaps, totaling $8.41 million, followed by Gaibandha Sadar with $5.93 million. While Kalihati has a higher percentage gap (87%), its absolute gap is lower at $2.17 million, placing it third. Sirajganj Sadar, despite having a lower percentage gap of 68%, has the smallest absolute gap of $1.32 million. This highlights that although percentage gaps can be high, the actual financial shortfalls are much larger in Fulchhari and Gaibandha Sadar.

4.3.2.3 Coverage Gap

In this section we review the gap between population in need and population reached. Despite the huge response effort by the Government of Bangladesh and complementary supports by non-government development partners, this assessment shows each flood persistently kept its footprint in terms of the gaps in population coverage and providing required supports to all household in needs. The coverage gap has been analyzed by chronological analysis of total affected households, households with poor socio-economic backgrounds, who needs support and households reached by combined GoB and Non-government stakeholders. Figure 4.22 presents the Household reached by government and non-government stakeholders.

Figure 4.22: Household reached by government and non-government stakeholders



Source: For Government: NDRCC flood incident report of MoDMR 2016, 2017, 2019, 2020 and
For Non-Government: HCTT response plan and monitoring dashboard 2016,2017 and 4W response analysis of Needs Assessment Working Group 2019, 2020

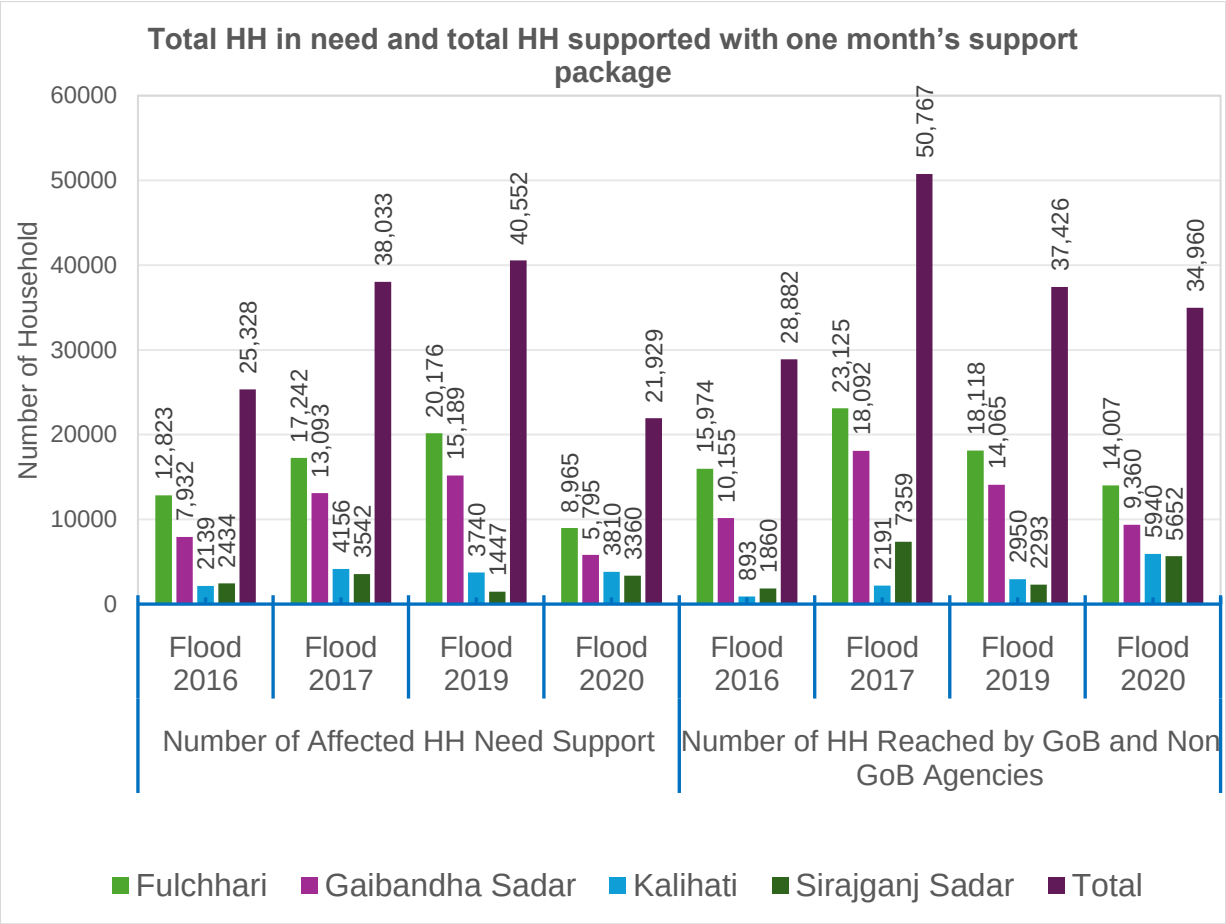
The analysis of household support across the affected Upazilas reveals significant variations in assistance provided by government (GoB) and non-government agencies during floods from 2016 to 2020.

Fulchhari stands out as the upazila where highest number of households received support, especially in 2016, 2017 and 2019, where both government and non-government actors prioritized it significantly. In contrast, Kalihati consistently received the lowest levels of support, particularly from non-government actors, showing a notable gap in outreach compared to other regions. Gaibandha Sadar received moderate support, with some fluctuations, generally receiving more attention from GoB actors than non-gob. Sirajganj Sadar, while receiving more support in 2019, remained relatively low in comparison, particularly in 2016 and 2020. Overall, the chart reveals a pattern of unequal resource allocation, with Gaibandha Sadar being a clear focus, while Kalihati appears to be consistently underserved.

Hence the affected household needs support for three months, however the traditional response of the government and non-government agencies only provide the entitled amount for one month. Figure 4.23 illustrates the scenarios of household needs life-saving support, and the assistance and number of households assisted combinedly by government (GoB) and non-government agencies during floods from 2016 to 2020 across four Upazilas. Fulchhari Upazila with highest number of populations in need, in all year where combined population reached also remain higher. Gaibandha Sadar, Kalihati and Sirajganj Sadar Upazilas displayed lower overall needs but significant variations in support provision, with Kalihati receiving minimal GoB support throughout, while Sirajganj Sadar experienced fluctuations in both need and support provision from both sectors.

In terms of the comparison between need and reach for all upazila, it shows that except 2019, number of households support for one month exceeds the number of household needs support after flood. Thus, it’s estimated that the area where the number of households reached exceeds the number of populations in need, has been utilized to support the household in extended phase.

Figure 4.23: Total HH in need and total HH supported with one month's support



Source: For Government: NDRCC flood incident report of MoDMR 2016, 2017, 2019, 2020 and
For Non-Government: HCTT response plan and monitoring dashboard 2016,2017 and 4W response analysis of Needs Assessment Working Group 2019, 2020

As per figure 4.23, the collective efforts of government and non-government agencies typically ensure that all households in need are supported with one month and for some households a few additional days' required support. However, when the need for three months' support is considered, it shows a different picture.

For the second month the combined response efforts shows some of the households are supported in some upazilas and huge gaps prevails for the two months supports , total ranging from 41% to 98% gaps among these four years. The details gaps of the second month's supports shown in table which reveals considerable gaps in second month's support.

Table 4.19: Household Reach and gaps considering two months support to flood affected households

Household reached and gap (two months supports)	Fulchhari	Gaibandha Sadar	Kalihati	Sirajganj Sadar	Total
HH Supported Monsson Flood 2016	3,151	2,223	0	0	5,374
HH Supported Monsson Flood 2016	5,883	4,999	0	3,817	14,699
HH Supported Monsson Flood 2016	0	0	0	846	846
HH Supported Monsson Flood 2016	5,042	3,565	2,130	2,293	13,030
GAPS in HH Reach 2016	9,672	5,709	2,139	2,434	1,9954
GAPS in HH Reach 2017	11,358	8,094	4,156	0	23,334
GAPS in HH Reach 2019	20,176	15,189	3,740	601	39,706
GAPS in HH Reach 2020	3,923	2,230	1,679	1,067	8,899
% of GAPS in HH Reach in 2016	75%	72%	100%	100%	79%
% of GAPS in HH Reach in 2017	66%	62%	100%	0%	61%
% of GAPS in HH Reach in 2019	100%	100%	100%	42%	98%
% of GAPS in HH Reach in 2020	44%	38%	44%	32%	41%

Source: NDRCC flood incident report of MoDMR 2016, 2017, 2019, 2020 and HCTT nexus strategy guided entitlement-based analysis.

The data from table 4.23 shows significant gaps in household (HH) reach for two months of support during the monsoon floods from 2016 to 2020, with substantial variations across the regions. Kalihati consistently exhibits the highest percentage gaps, with 100% in both 2016 and 2017, meaning no households received extended support. Even in 2020, the gap remains considerable at 44%, leaving 1,679 households unsupported. However, despite these high percentage gaps, the absolute number of households affected in Kalihati is smaller compared to other regions. Fulchhari, for instance, has a 100% gap in 2019, affecting 20,176 households—the highest gap in terms of absolute numbers. In 2016, Fulchhari had a 75% gap, impacting 9,672 households, and a 44% gap in 2020, leaving 3,923 households without support. Similarly, Gaibandha Sadar shows high gaps, with 100% in 2019, leaving 15,189 households unsupported. In 2016, the gap was 72%, affecting 5,709 households,

and by 2020, it decreased to 38%, still leaving 2,230 households unreached. Sirajganj Sadar had 100% gap in 2016, affecting 2,434 households, and in 2019, it had a gap of 42%, leaving 601 households without support. Interestingly, in 2017, Sirajganj Sadar showed no gap, indicating more households received support than expected. By 2020, its gap has been reduced to 32%, the lowest among all regions, affecting 1,067 households.

Although Kalihati shows consistently high percentage gaps, the impact in terms of the number of households is more significant in Fulchhari and Gaibandha Sadar, particularly in 2019, when both regions saw the highest numbers of unsupported households despite their similar percentage gaps. Thus, the absolute gaps in household reach in Fulchhari and Gaibandha Sadar are much larger, despite the consistent percentage gaps in Kalihati.

Further considering the three month's support, it's almost there is no household reached during third month after the flood shown in table 4.20.

The findings highlight significant gaps in household support for the three months following monsoon floods from 2016 to 2020, with notable variations in the number of affected households across upazilas.

Fulchhari consistently faces the largest gaps in household support. In 2019, it had the highest shortfall, with 20,176 households unreached. Similarly, 17,242 households were left unsupported in 2017, and 8,965 households in 2020. Despite matching 100% gaps with other areas, the total number of households impacted in Fulchhari is the highest. Gaibandha Sadar also shows large gaps, with 15,189 households left unsupported in 2019 and 13,093 households in 2017. Even in 2020, 5,795 households were unreached, making it another upazila with a high household gap despite the uniform 100% gap percentages.

Table 4.20: Household Reach and gaps considering three months support to flood affected households

Household reached and gap (three months supports)	Fulchhari	Gaibandha Sadar	Kalihati	Sirajganj Sadar	Total
HH Supported Monsson Flood 2016	0	0	0	0	0
HH Supported Monsson Flood 2016	0	0	0	275	275
HH Supported Monsson Flood 2016	0	0	0	0	0
HH Supported Monsson Flood 2016	0	0	0	0	0
GAPS in HH Reach 2016	12,823	7,932	2,139	2,434	25,328
GAPS in HH Reach 2017	17,242	13,093	4,156	3,267	37,758
GAPS in HH Reach 2019	20,176	15,189	3,740	1,447	40,552
GAPS in HH Reach 2020	8,965	5,795	3,810	3,360	21,929
% of GAPS in HH Reach in 2016	100%	100%	100%	100%	100%
% of GAPS in HH Reach in 2017	100%	100%	100%	92%	99%
% of GAPS in HH Reach in 2019	100%	100%	100%	100%	100%
% of GAPS in HH Reach in 2020 _	100%	100%	100%	100%	100%

Source: NDRCC flood incident report of MoDMR 2016, 2017, 2019, 2020 and HCTT nexus strategy guided entitlement-based analysis.

In contrast, Kalihati and Sirajganj Sadar show smaller household gaps, even though they experience similar percentage gaps. Kalihati saw 3,810 households unreached in 2020 and 4,156 households in 2017, while Sirajganj Sadar had 3,267 households unreached in 2017 and 1,447 households in 2019.

Overall, while percentage gaps remain high across all regions, especially in Kalihati Upazila, the absolute number of households left unsupported is much larger in Fulchhari and Gaibandha Sadar, making these areas the most critically affected by the gaps in three-month support following monsoon floods.

“Snapshot of the protection gap”

Resource Allocation Gap: The studied upazilas, especially Fulchhari and Gaibandha Sadar, faced significant gaps focusing economic loss, with resource allocations consistently covering only a small fraction of economic losses from floods. Kalihati and Sirajganj appeared as 3rd and 4th in terms of the amount of the resource allocation gaps.

Entitlement Gap: There were persistent gaps between the financial support needed by vulnerable households and the actual resources allocated, with Fulchhari and Gaibandha Sadar experiencing the largest shortfalls, up to 84%, highlighting regional disparities in support.

Coverage Gap: Coverage gaps are persistent from second months ranging the gaps from 38 to 100% in certain areas. Fulchhari consistently faces the largest gaps in absolute household numbers, despite similar percentage gaps across upazilas. In contrast, Kalihati shows the highest percentage gaps, with 100% in both 2016 and 2017, though the actual number of households unsupported is lower. For three months of support, the gaps remain stark, mostly 100% in all upazilas. While Kalihati has consistently high percentage gaps, Fulchhari and Gaibandha Sadar face much larger absolute coverage gaps. Sirajganj Sadar, by contrast, shows smaller coverage absolute gaps over the time**.**

4.4 POTENTIAL FLOOD RISK AND IMPACT POPULATION:

4.4.1 Flood Risk in The Assessment Area (Exposure and Impact):

This section looks towards future flood risk, firstly envisaged based on the historical flooding incident, inundation areas and affected population by each upazila. Thus, modeling of the impact and annual inundation scenarios for four major monsoon floods (2016,2017,2019 and 2020) in these upazilas have been utilized to identify potential flood inundation area and number of flood exposed population by upazila.

While looking at the overall exposed population to monsoon flooding, the actual scenarios show that there is difference in exposure and impact. It is important to recognize that not all flood-exposed households are equally impacted by floods, as factors such as geographical location, socioeconomic status, and access to resources significantly influence the degree of impact (Islam & Hasan, 2021; Rahman & Salehin, 2020). Thus refereeing the HCTT Nexus strategy 2021-2025 for Bangladesh has statistically identified an inference that 660 per 1,000 exposed people could be impacted by climate-related hazards in a disaster prone area. This inference had made based on the impact distribution data on 7 years flooding information of Bangladesh with 95 percent confidence level.

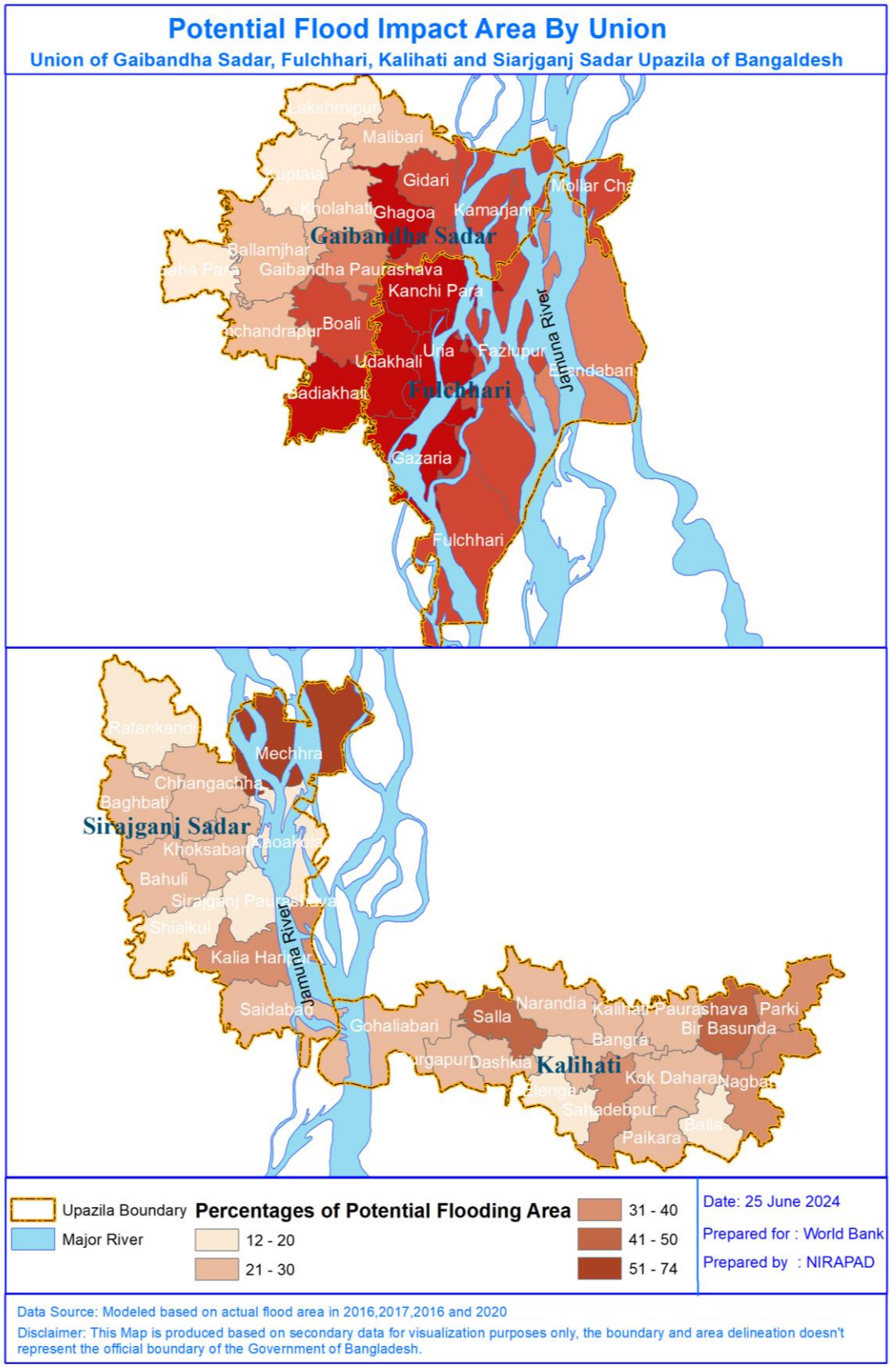
Thus, as first step, the potential exposed and potential impact population has been identified for each assessment upazila and all union of the upazilas in cases of major flooding in future in the Jamuna River basin and shown in table 4.25 and map 4.2 and map 4.3.

Table 4.21: Potential flood exposed area and population by upazila

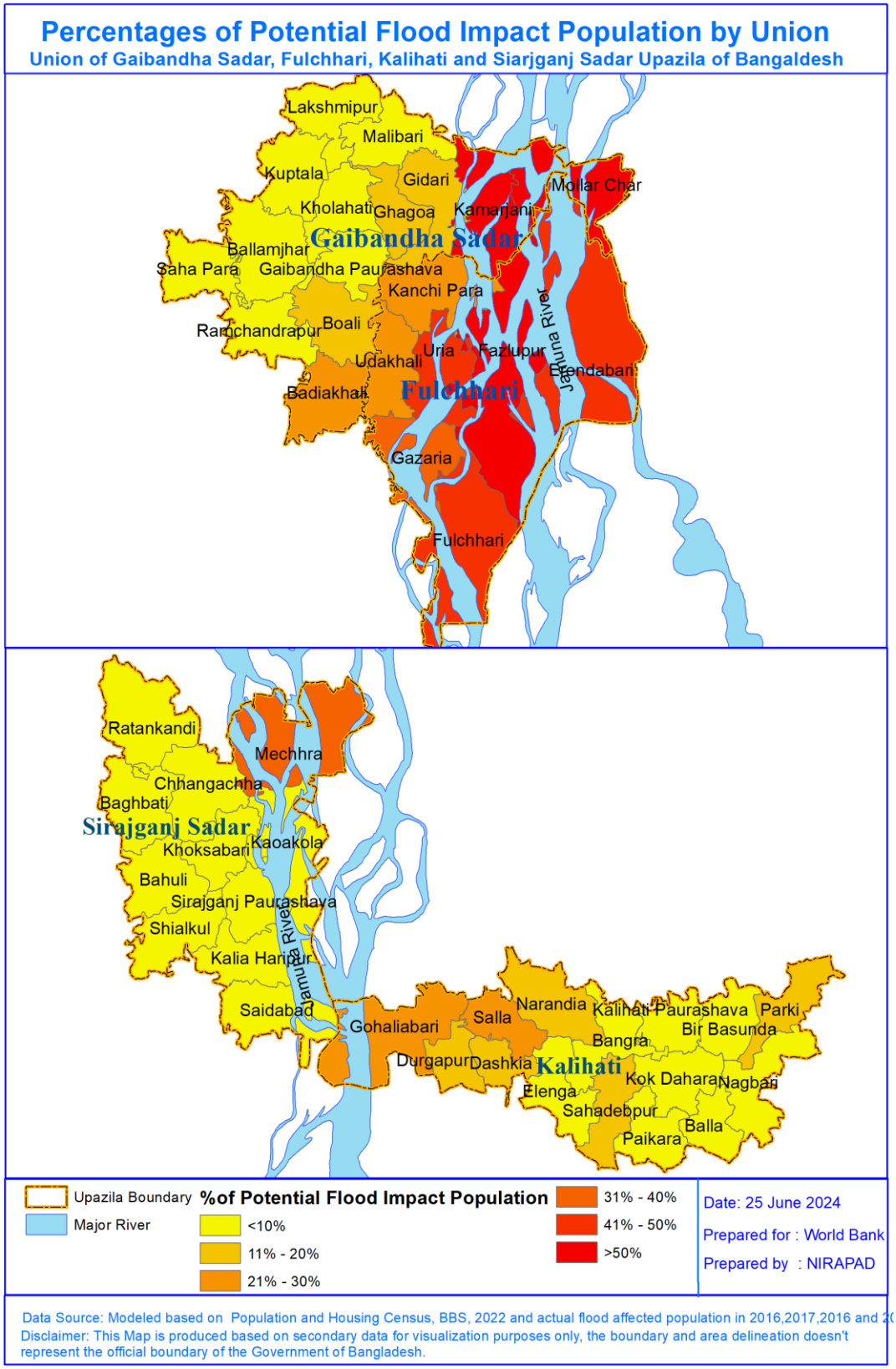
Upazila	Potential Flood Inundation Areas	% of Potential Flood Inundation area	Flood Exposed Population	Potential Impact Population	Potential Impact Population per 1000
Fulchhari	146.64	46.70%	115,011	75,907	391
Gaibandha Sadar	114.59	34.73%	84,502	55,771	116
Kalihati	91.88	30.62%	63,376	41,828	94
Sirajganj Sadar	84.14	26.19%	35,540	23,456	37
Grand Total	**437.27**	**34.56%**	**298,429**	**196,963**	**113**

Source: Modeled based Population and Housing Census, BBS, 2022 and actual flood affected population in 2016,2017,2016 and 2020

Map 4.2: Potential flood impact area



Map 4.3: potential flood impact population



Deep dive to the union level inundation and flooding shows that all the 47 union of the assessment upazilas have potentiality of different level of inundation (table 4.26 and except one union all other union are also likely to have impacted populations that require assistance (table 4.27) .

The analysis of potential inundation areas and population impact levels for the four Upazilas of the Jamuna River basin projects significant variations across the 47 unions. The categorized unions based on the percentage of potential inundation reveals that the majority of unions fall within the 20-30% inundation range, with 17 unions potentially experiencing this level of flooding. This is followed by 9 unions in the 10-20% inundation range and 8 unions in the 40-50% range. Notably, 7 unions face a severe risk of more than 50% potential inundation.

Table 4.22 : Number of unions in different percentages of potential inundation area

Percentages of Potential Inundation Area	**Number of Union**
10%-20%	9
20%-30%	17
30%-40%	6
40%-50%	8
>50%	7
Total	**47**

Table 4.23: Number of unions in different percentages of potential Impact population

Percentage of Potential Impact Population	**Number of Union**
<1%	1
1%-11%	26
11%-21%	7
21%-31%	6
31%-41%	1
41%-51%	3
>51%	3
Total	**47**

Source: Area modeled based on Sentinel satellite imagery analysis, UNOSAT- (2017, 2020) and NASA NRT MODIS satellite imagery analysis (2016, 2019);
Population modeled based Population and Housing Census, BBS, 2022 and actual flood affected population in 2016,2017,2016 and 2020

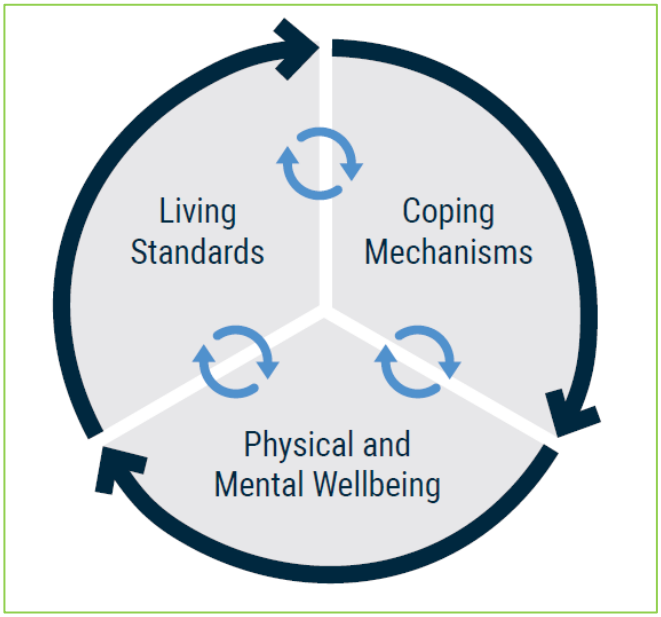
The next analysis of potential impact on populations within these unions shows a substantial number of unions (26 out of 47) have a projected population impact ranging between 1-11%. There are fewer unions with higher percentages of impacted populations, with 7 unions in the 11-21% range, and 6 unions in the 21-31% range. Only a few unions fall into the higher impact categories, with 1 union in the 31-41% range, and 3 unions each in the 41-51% and >51% ranges.

Overall, these tables indicate that while a significant portion of the unions might experience moderate to high inundation levels, the potential impact on populations varies widely, with most unions likely experiencing lower percentages of affected populations.

4.4.2 Potential Impact Population and Population in Need

In case of major flooding event in Jamuna River basin, there is potentiality of the flood impact in all the assessment areas ranging from high to low impact. And not all affected population require support as Various factors such as housing conditions, economic status, and social networks play a significant role in determining the level of impact experienced by different households *(Islam & Hasan, 2021; Rahman & Salehin, 2020).* Thus, Projecting the future people in by severity group of affected population has been developed from the analysis for each union of the assessment upazilas . This assessment has adopted the methodology of the climate-related multi-hazard risk analysis 2020 of Start Fund Bangladesh for estimating the severity of humanitarian conditions considering the major flood scenarios by contextualizing the Joint Intersectoral Analysis Framework (JIAF 2.0) of the IASC.

Figure 4.24: Dimensions of JIAF framework



The severity of humanitarian conditions is estimated by considering three humanitarian consequences- (i) living standards, (ii) coping mechanisms, and (iii) physical and mental wellbeing (figure 4.25). This study also estimated the severity of humanitarian conditions in assessment upazilas by considering the three humanitarian consequences suggested by JIAF: living standards, coping capacity, physical and mental wellbeing based on the available contextualized nine indicators presented in figure 4.26.

Figure 4.25: List of contextualized indicators used for projecting priority needs and population in need

Living Standards **The ability of the affected population to meet their basic needs.**	The basic needs are measured using the following indicators: ▪ poor people ▪ household dietary diversity score ▪ dwelling structure
Coping Capacity **The degree to which individuals, households, communities, and systems are coping or facing challenges with impact recovery.**	The severity of the coping strategies is measured using the following indicators: ▪ livelihood groups ▪ poor female headed HHs ▪ ethnic population
Physical and Mental Wellbeing **This refers exclusively to information and indicators about the physical and mental health of the potential impact population.**	Physical and mental health is measured using the following indicators: ▪ persons with disability ▪ elderly persons, ▪ prevalence of undernourishment (severely stunted children)

Further for identifying appropriate group and design program the potential impact population has been classified into five major categories presented in table 4.28 as per JIAF seriousness class, i.e. minimal impact group, stressed group, severe group, extreme group and catastrophe group. The flood affected households who fall in severe and extreme[15] group as per Joint Intersectoral analysis framework (JIAF) refers mainly to the socio economically and demographically vulnerable household group and these households need support for three months for survival if there is any major flood(at least 5 to 20 years return period of flooding).

[15] *Severe- Elevated and increasing deterioration of physical or mental wellbeing and human rights, AND Regular threats to human rights and/or accelerated erosion of strategies and/or assets, AND Moderate strain on basic services and moderate inability to meet basic needs for survival, protection, and dignity.*

[15] *Extreme- Elevated mortality or risk of death AND Widespread violations of human rights and/or unsustainable reliance on negative coping strategies, AND High strain on basic services and/or extreme inability to meet basic needs for survival, protection, and dignity.*

The assessment of potential flood impacts on households across four Upazilas in the Jamuna River basin reveals significant variability in the levels of need among the affected populations. In Fulchhari Upazila, out of 18,434 impacted households, 1,843 fall into the Minimal group, having access to essential basic services and the ability to meet basic needs for survival, protection, and dignity. However, 2,765 households are in the Stress group, utilizing stress coping strategies, and experiencing stressed basic services with a borderline inability to meet sectoral needs.

Table 4.24: Potential impact population and household in different severity category

Upazila	Potential Impact HH by Flood	Population in Need (Minimal Group HH[16])	Population in Need (Stress Group HH[17])	Population in Need (Severe Group HH[18])	Population in Need (Extreme Group HH[19])
Fulchhari	18,434	1,843	2,765	6,452	7,373
Gaibandha Sadar	14,034	1,403	2,105	4,912	5,614
Kalihati	9,883	1,977	2,965	2,965	1,977
Sirajganj Sadar	5,324	1,065	1,065	1597	1,597
Grand Total	**47,674**	**6,288**	**8,900**	**15,926**	**16,561**

Source: Based on the JIAF framework and JIAF impact group ratios from the HCTT nexus strategy Bangladesh.

Note: As per the three dimension (table 4.25) specific indicator-based analysis, there is no catastrophic group[20] HH in the assessment area.

[16] *Minimal- HH has essential basic services and ability to meet basic needs for survival, protection, and dignity*

[17] *Stress- HH experiences deterioration of physical or mental wellbeing Sporadic threats to human rights and/or use of stress coping strategy Stressed basic services and borderline inability to meet basic sectoral needs*

[18] *Severe- Elevated and increasing deterioration of physical or mental wellbeing and human rights, AND Regular threats to human rights and/or accelerated erosion of strategies and/or assets, AND Moderate strain on basic services and moderate inability to meet basic needs for survival, protection, and dignity.*

[19] *Extreme- Elevated mortality or risk of death AND Widespread violations of human rights and/or unsustainable reliance on negative coping strategies, AND High strain on basic services and/or extreme inability to meet basic needs for survival, protection, and dignity.*

[20] *Catastrophic- Widespread mortality or risk of death, AND Widespread and systemic violations of human rights and/ or exhaustion of coping options and mechanisms, AND Collapse of basic services and/or total inability to meet basic needs for survival, protection, and dignity.*

A substantial number, 6,452 households, fall into the Severe group, with accelerated erosion of coping strategies and assets, moderate strain on basic services, and an inability to meet basic needs. The Extreme group comprises 7,373 households, characterized by elevated mortality risk, widespread unsustainable reliance on negative coping strategies, high strain on basic services, and an extreme inability to meet basic needs.

In Gaibandha Sadar Upazila, out of 14,034 impacted households, 1,403 are estimated to be in the Minimal group, 2,105 in the Stress group, 4,912 in the Severe group, and 5,614 in the Extreme group. Similarly, in Kalihati Upazila, 9,883 households are affected, with 1,977 in the Minimal group, 2,965 in the Stress group, 2,965 in the Severe group, and 1,977 in the Extreme group. Lastly, Sirajganj Sadar Upazila has 5,324 impacted households, with 1,065 in the Minimal group, 1,065 in the Stress group, 1,597 in the Severe group, and 1,597 in the Extreme group. These findings highlight the diverse needs and varying degrees of vulnerability among the flood-affected populations, underscoring the necessity for tailored interventions to address the specific needs of each group effectively. However, In the context of monsoon flooding in Bangladesh it is recommended to support severe and extreme group households to ensure that the most vulnerable flood affected household could meet the survival threshold.

The same method guided identification of union level estimation of potential population impact and union level potential inundation areas expected to utilize identify most vulnerable union for prioritizing geographic area and flood risk of the area presented in table 4.29.

Table 4.25: Union specific flood risk by potential inundation area and potential impact population (for future flood events)

Union Name	Potential Inundation Areas SQKM	Percentages of Potential Inundation Areas	Frequency of Flooding from (2016 to 2020)	Potential Impact Population per 1000	Potential Impact HH by Flood	Affected Population in Severe Group HH	Affected Population in Extreme Group HH
Fulchhari upazila total	**146.64**	**46.70%**	**4**	**289**	**18434**	**6452**	**7373**
Udakhali	15	74.07%	4	422	2,130	757	865
Uria	16	68.74%	4	239	1,947	746	852
Kanchi Para	14	52.68%	4	324	1,858	681	779
Gazaria	15	50.66%	4	426	2,777	650	743
Fulchhari	24	45.36%	4	608	3,880	972	1,,111
Fazlupur	32	43.09%	4	447	3,680	1,358	1,552
Erendabari	30	34.86%	4	289	2,162	1,288	1,472
Gaibandha sadar upazila total	**114.60**	**34.73%**	**4**	**116**	**14,034**	**4,912**	**5,614**
Badiakhali	13	53.95%	4	228	1,841	644	736
Ghagoa	8	52.36%	4	190	1,113	390	445
Boali	12	48.03%	4	190	1,848	647	739
Kamarjani	15	45.24%	4	505	1,932	676	773
Gidari	11	44.84%	4	168	1,454	509	582
Mollar Char	13	40.94%	4	646	1,288	451	515
Gaibandha Paurashava	5	31.99%	4	42	699	245	280
Ramchandrapur	7	31.18%	3	80	677	237	271
Saha Para	5	27.08%	2	49	351	123	141
Ballamjhar	7	24.35%	3	48	641	224	256
Malibari	5	23.99%	4	77	627	219	251
Kholahati	6	23.26%	4	64	720	252	288

Union Name	Potential Inundation Areas SQKM	Percentages of Potential Inundation Areas	Frequency of Flooding from (2016 to 2020)	Potential Impact Population per 1000	Potential Impact HH by Flood	Affected Population in Severe Group HH	Affected Population in Extreme Group HH
Kuptala	4	20.11%	3	42	334	117	133
Lakshmipur	4	16.76%	4	56	509	178	204
Kalihati upazila total	**91.89**	**30.62%**	**4**	**94**	**9,883**	**2,965**	**1,,977**
Salla	7	49.14%	4	217	1,125	338	225
Bir Basunda	8	47.41%	2	91	453	136	91
Parki	10	38.15%	2	116	577	173	115
Nagbari	9	37.69%	2	68	569	171	114
Kalihati Paurashava	5	33.91%	2	30	283	85	57
Sahadebpur	6	30.95%	4	117	846	254	169
Paikara	6	28.87%	3	72	576	173	115
Gohaliabari	10	28.02%	4	272	1,487	446	297
Kok Dahara	6	27.46%	3	73	567	170	113
Bangra	5	26.67%	4	96	708	212	142
Durgapur	4	25.93%	4	149	642	192	128
Dashkia	3	25.18%	4	116	457	137	91
Narandia	6	25.11%	4	108	875	263	175
Elenga	4	19.65%	4	57	579	174	116
Balla	3	18.34%	2	13	139	47	23
Sirajganj Sadar upazila total	**84.14**	**26.19%**	**4**	**37**	**5,323**	**1,602**	**1,588**
Mechhra	26	51.14%	4	306	1,955	586	586
Kalia Haripur	9	31.30%	4	48	595	178	178
Sirajganj Paurashava	5	29.13%	2	4	168	50	50

Union Name	Potential Inundation Areas SQKM	Percentages of Potential Inundation Areas	Frequency of Flooding from (2016 to 2020)	Potential Impact Population per 1000	Potential Impact HH by Flood	Affected Population in Severe Group HH	Affected Population in Extreme Group HH
Saidabad	9	24.40%	4	48	570	171	171
Khoksabari	4	22.95%	4	40	315	94	94
Chhangachha	6	21.27%	4	43	438	131	131
Baghbati	5	20.60%	2	15	201	60	60
Bahuli	5	20.53%	2	18	171	51	51
Shialkul	5	19.53%	2	15	168	51	51
Ratankandi	6	17.16%	4	34	457	137	137
Kaoakola	4	12.02%	4	64	286	86	86
Grand Total	**437.27**	**34.56%**	**4**	**113**	**47,674**	**15,926**	**16,561**

5. CONCLUDING REMARKS

The report underscores the high flood risk in Bangladesh, particularly within the Jamuna River Basin and project areas, due to its complex geophysical features and increasing climate-related vulnerabilities. It highlights the significant socio-economic impacts of frequent and severe flooding, which affect communities' livelihoods, infrastructure, and health, exacerbating poverty and gender inequalities. Women, in particular, face disproportionate challenges due to social norms, limited access to resources, and heightened vulnerability in disaster scenarios.

In response, the report explores the scope of Jamuna River Sustainable Management Project, initiated by the Government of Bangladesh and the World Bank, focusing on disaster risk financing and flood protection. This report will support the development of macro-level solutions such as a community protection fund and parametric risk transfer for floods, aimed at reducing financial burdens and enhancing recovery efforts. The assessment identified protection gaps in flood-prone areas and evaluated existing flood risk programs. It found that while some disaster response mechanisms are in place and could be leveraged as delivery channels, gaps in coverage, allocation, and entitlements persist.

In conclusion, the findings from the analysis of flood response and risk management in the Jamuna River Basin provide a comprehensive set of recommendations for enhancing flood resilience and improving response effectiveness. The variability in priority needs based on flood duration highlights the necessity for a flexible and adaptive response strategy. Longer floods, such as those experienced in 2020, shift focus on protection and safety, while shorter floods necessitate immediate attention to food security, shelter, and WASH services.

The evaluation of existing flood protection programs reveals a diverse array of approaches, including parametric insurance, anticipatory action, and disaster risk financing. Each method offers distinct advantages: parametric insurance provides financial coverage based on predefined flood indicators, anticipatory action uses forecasts to implement early measures before floods occur, and

disaster risk financing ensures rapid and predictable funding for disaster response. The integration of these approaches demonstrates the value of a multifaceted strategy in managing flood risks and highlights the need for continued collaboration and innovation in flood management.

The findings on flood risk models and monitoring emphasize the importance of using both localized and basin-specific forecasts to enhance the accuracy and reliability of flood risk assessments. The adoption of probabilistic forecasts and multi-tiered triggers, along with improved technical collaborations and blended forecast sources, will enable more effective preparation and timely intervention.

Operational modalities and support types reveal a growing preference for cash-based interventions, particularly mobile money transfers, which offer security, efficiency, and scalability. Gender-sensitive practices in cash distribution are crucial for addressing the diverse needs of affected populations and ensuring equitable support. Establishing robust financial arrangements and regularly reviewing operational practices will further optimize the effectiveness of response efforts, balancing immediate relief with long-term recovery.

Beneficiary targeting and selection processes emphasize the importance of focusing on socio-economic vulnerabilities and incorporating gender considerations. Effective beneficiary selection involves using existing lists, engaging in community consultations, and employing rigorous data collection and verification methods. Prioritizing households with unstable incomes, women-headed families, and individuals with disabilities ensures that aid reaches those most in need. Implementing gender-sensitive scoring systems and leveraging technology for data management will enhance the fairness and impact of support distribution. The six flood protection projects reviewed are already deploying these approaches and their distribution channels could be leveraged by the Jamuna River Sustainable Management Project.

Finally, Coordination among stakeholders, including government bodies, development partners, and international organizations, is crucial for a comprehensive flood response. The Government of Bangladesh, through the Ministry of Disaster Management and Relief, plays a central role in coordinating response efforts. Complementary support from development partners and NGOs,

along with effective coordination through national and local disaster management committees, ensures a well-organized and efficient response. Leveraging existing frameworks, such as the Forecast-Based Financing Working Group, and facilitating multi-stakeholder coordination will align objectives, resources, and timelines, enhancing the overall impact of flood management initiatives.

In summary, implementing the recommended strategies and approaches will significantly strengthen flood preparedness, response, and recovery efforts in the Jamuna River Basin. By integrating adaptive anticipatory response frameworks, enhancing collaboration, and prioritizing the needs of vulnerable populations, flood resilience can be markedly improved. This comprehensive approach will lead to more effective disaster risk management and a stronger, more resilient community capable of withstanding and recovering from future flooding events.

6. ANNEXES

Annex 1: Data Acquisition, Inference and Calculation Methods For Sub Domain Of Module Two And Potential Impact Population

Sub Domain of Module	Data Acquisition and Processing	Inference and Calculation Methods
Exposure and Inundation to Floods	UNOSAT and NASA NRT satellite Imagery Analysis (2016,2017,2019,2020)	Overlay analysis of flood inundation and upazila shape file in GIS environment. Cross validation with D form data of NDRCC
Historic Impact and Population in Need	NDRCC Flood Impact Information at District level (2016,2017,2019,2020)	Small area estimation to upazila level by inference of populations affected and economic loss by per square kilometer inundation and poverty-based identification of population in need from the affected population.
Assessment of Remedy Measures (Priority Needs)	Joint Needs Assessment of NAWG of Flooding event in 2016, 2017, 2019 and 2020	Weightage analysis form the frequency and priority ranking of the sector to analyze priority sectors for interventions for flood protections.
Stakeholders and Supports Provided	NDRCC flood situation and resource Allocation information for GoB HCTT response monitoring information for the information of development partner	Compilation and collation form all response information by type of stakeholders by action timeframe refereeing disaster risk financing, anticipation and response projects.
Support Type and Operational Modalities	NDRCC flood situation report and resource allocation information at district level by MoDMR; HCTT Response Plan (2016,2017,2019,2020), and	Small area estimation to upazila level by implying union of the support type allocated by per affected population.

Sub Domain of Module	Data Acquisition and Processing	Inference and Calculation Methods
	Flood Monitoring Dashboard (2019,2020),	Analysis of project and population reached by sectors and operational modality
Timeline Analysis of Action	Information form NDRCC flood situation report (2016,2017,2019,2020); JNA of NAWG (2016,2017,2019,2020); HCTT response monitoring Dashboard HCTT Response Plan (2016,2017,2019,2020); and Flood Monitoring Dashboard (2019,2020	Compilation of information and classify with time frame focusing on flood event
Coping Mechanism: Household Expenses and Coping Mechanism	HEA in Flood Prone Region (SFB and NIRAPAD 2021); Pre-Crisis Assessment of Monsoon Flooding In Bangladesh: Humanitarian Coordination Task Team (HCTT), 2023.	Collate and interpretation of the coping practices
Analysis of the Protection Gap	Information from impact and loss sub domain and stakeholder and support provided	✓ Resource Allocation Gap ✓ Entitlement Gap ✓ Coverage Gap
Planning Future: Flood Risk and Key Vulnerable Group	Sub domain ✓ Exposure and Inundation to Floods ✓ Historic Impact and Population in Need ✓ stakeholder and support provided	Inference of potential impact population form HCTT nexus strategy. JIAF framework guided potential impact population in different severity group. Prioritization of union for ranking through statistical method (Normalization, Weight Assignment, Composite scoring and ranking of 7 indicators at union level).

Sub Domain of Module	Data Acquisition and Processing	Inference and Calculation Methods
Potential Inundation Area and Potential Impact Population	Historical GIS shape file of actual inundation areas by each year's flood.	Actual impact area GIS data analyzed and trend based modeled to identify the potential inundation areas. Thus, potential inundation areas overlayed with union population shape file to identify the potential exposed population.
Ranking for Geographic Priority	Potential Inundation Areas (20%); Frequency of Flooding(20%); Composite Risk Level of Inundation and Frequency (10%); Potential Impact Population per 1000(10%); Potential Impact Population in Severe Group HH(10%); Affected Population in Extreme Group HH(10%); Number of Extreme Poor Household(10%) and Number of Household Depending on Agriculture (10%)	Normalized value of each indicators and weighted based index as per the percentages value in the bracket.

Annex 2 : Concept Note- Deep Dive of Flood Risk Programs Being Delivered By Humanitarian/Development Partners

Concept Note

Deep dive of flood risk programs being delivered by humanitarian/development partners (module 1)

Diagnostic and Scoping Exercises
Financial Protection Component of the Jamuna River Sustainable Management Project 1 (P172499)

Background:

Considering the devastating impact if flood in Jamuna River basin region, the World bank has initiated a project namely Financial Protection Component of the Jamuna River Sustainable Management Project. The brief of the project as below-

1) The project aims to enhance climate resilience and navigation capacity along the Jamuna River. The project's disaster risk financing component of the project (Component 3) focuses on establishing a program to mitigate the financial impacts of floods on communities residing in the pre-selected flood-prone regions of Jamuna River.

2) Component 3 is divided into three sub-components: (i) design and development of pre-arranged financial solutions (including a macro-level flood risk transfer product and a community protection fund); (ii) establishing ecosystems for the implementation of pre-arranged financial solutions; and (iii) providing capacity building of key stakeholders and implementation support.

Table : Geographical Scope of the Project

Division	District	Upazila
Dhaka	Tangail	Kalihati
Rajshahi	Sirajganj	Sirajganj Sadar
Rangpur	Gaibandha	Fulchhari
Rangpur	Gaibandha	Gaibandha Sadar

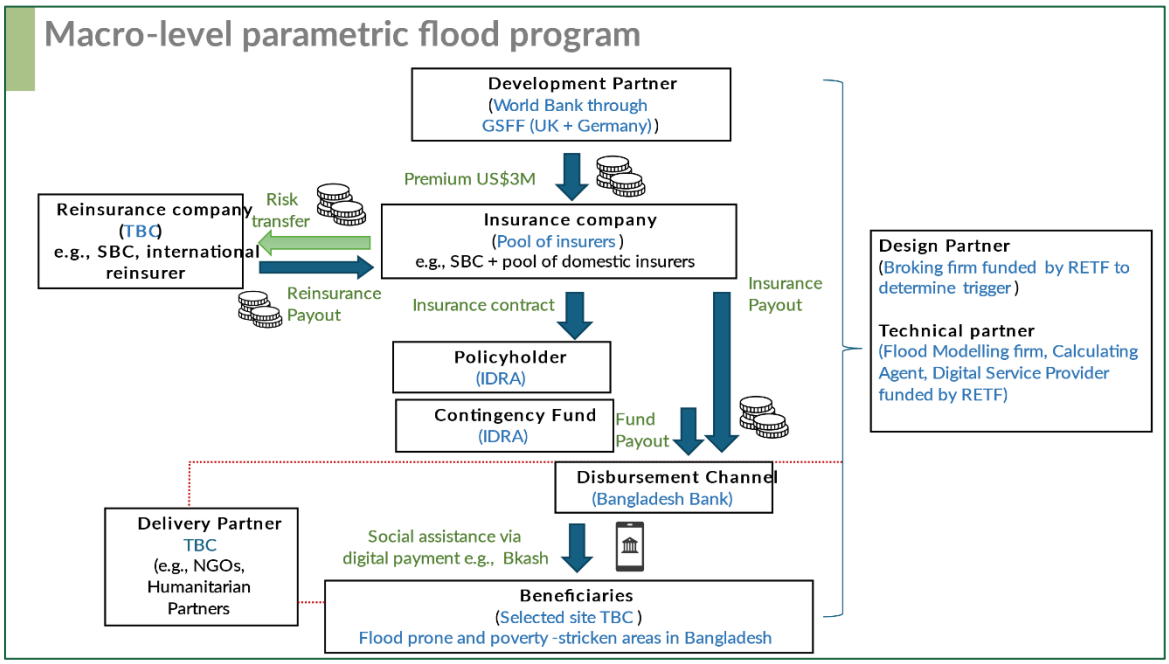
3) The pre-arranged financial solutions aim to alleviate flood-related financial burdens in vulnerable Jamuna River communities. Central to this approach is the establishment of a macro-level flood insurance policy, which will be overseen and administered by the Insurance Development and Regulatory Authority. This initiative offers disaster relief payments to climate-vulnerable communities during eligible flood events. By doing so, the policy seeks to ensure fiscal stability for government entities while also responding to the needs of communities. Additionally, the community protection fund, bolstered by the same macro-level insurance, mirrors its delivery mechanism to provide complementary

coverage to the same beneficiaries, thereby enhancing the insurance framework's effectiveness.

Initially during this phase, the project will work in four upazilas of 3 districts from Jamuna River basin. The names of the upazilas are shown in table 1.

To ensure effective and efficient outcome to support the set-up of component 3, the World Bank commissioned NIRAPAD to carry out diagnostic and scoping exercises to deep dive the impact scenarios, protection gaps and existing best practices by relevant projects to inform the implementation of the financial protection component of the Jamuna River Sustainable Management Project.

As per the diagram below, the project will benefit from a range of technical and delivery partnerships. One objective of the NIRAPAD research is to deepen understanding of existing flood trigger-based projects, that could potentially play a role in delivery of the project.



Scope of the relevant projects:

To reach the one objective of the assessment, a detailed process (technical and managerial) and governance focused documentation will be conducted for relevant selected project from flood risk programs being delivered by development partners in Bangladesh.

For selection of the relevant projects following criteria has been consider

- Disaster risk financing or anticipation focused project.
- Relevant Geographic Scope (refer table 1).
- Project utilizes Flood Risk Modelling.
- Intervention involves cash distribution to the beneficiary.
- Project activity Involves flood trigger-based system to deliver assistance.

What information we are documenting:

This stocktaking of the relevant project will focus on key programmatic and operational aspects from technical process to governance process of the project. The following key aspects will be documented from the project-

Geographic Coverage – Current project areas and also future expansion area if there is any.
Stakeholders involved.
Financing mechanism (type of fund and trigger-based fund)
Insurance or other type of risk transfer mechanism
Brief about the beneficiaries (Target beneficiaries, selection criteria and methodology)
Flood risk modelling.
Activity type and Delivery modality
Perquisite assessment (market, mobility)
Coordination with Government
Coordination with INGOs and national/local CSOs
Gendered action
Historiacal Payout
Evaluations and lessons learnt (if there is any)
Plans for future direction and sustainability of the project

Note: The documentation for this stocktaking will be conducted with the project lead personnel and relevant team members by structured checklist-based interview. Thus, the contribution of all agencies will be recognized in the scoping assessment report.

Annex 3 : Check List for Deep Dive Of Module 1

CHECK LIST FOR DEEP DIVE OF MODULE 1

Diagnostic and Scoping Exercises
Financial Protection Component of the Jamuna River Sustainable Management Project 1 (P172499)

Module 1: ***Deep dive of existing flood risk programs being delivered by humanitarian/development partners***

Considering the devastating impact if flood in Jamuna River basin region, the World bank has initiated a project namely Financial Protection Component of the Jamuna River Sustainable Management Project. To ensure efficient and coherent action of the project, World Bank commissioned a scoping exercise which include documenting and analyses governance as well as operational approaches of relevant projects and programs which being implemented in same geographic location. Thus, documentation will be conducted by following the objective focused checklist.

The following checklist will guide the stocktaking of the relevant projects which will be collated through this structured interview process of the key personnel of the project.

Details of the Responder	
Name of the Interviewee	
Designation of the Project Interviewee	
Email Address	
Mobile Number	

1. About the project	
1.1 Name of the Project	
1.2 Lead Agency	
1.3 Short Description of the Lead Agency	
1.4 Duration of the Project	

1.5 Objective of the program/Project	
1.6 Scope of the Project (Total beneficiary coverage and other action coverage)	
1.7 Relevant context for the project/Program	
1.8 Main activities (Deliverable and Outcome)	
How gender, disabilities and other inclusion issue is integrated across program design elements.	

1.9 Geographic Coverage

District	Upazila	Union

1.10 Is there any plan for expansion of the project area, If yes please mention the intended area	
2.0 Relevant Stakeholder and Financing	
2.1 Donors Project Partners	
2.2 Project Partners	
2.3 Implementing Partners	
2.4 Brief of the Implementing Partner	
2.5 Total Project Amount (in Million USD)	
2.6 Proportion of funds channeled toward project partners / implementing partners	
2.7 Proportionate of funds beneficiary received directly	
2.8 Proportion of pre-arranged funds for trigger/risk model-based release (For Anticipation/DRF project)	
2.9 W*here/how* any pre-arranged finance is being held (e.g in a contingency fund at the national level, Predefined regular project in a pooled fund at HQ level etc).	

2.10 Value of the assistance provided per beneficiary HH (e.g how much cash, for how many weeks/months (In USD)	
2.11 How the value pf the HH amount determines and who take the decision to determine the value. was this decided and by whom?	
Parametric Based Insurance (Only applicable for Insurance based project/program)	
2.11 Is there any other financial instrument, e.g. insurance or other form of risk transfer mechanism involved in the design of the program?	
2.12 Proportionate of fund for insurance premium (For parametric index-based insurance program)	
2.13 What's the insurance premium amount if applicable	Total = Per household=

2.14 What's the historical insurance payout so far since its inception? Please provide payout breakdown by year, e.g. year 2000 - payout = XX, beneficiaries = XX, region = XX, etc.

Year	Payout	Beneficiary	Location

2.15 What's the insurance Loss Ratio (payout divided by premium) by year and aggregate.

Year	Total Premium paid	Total Payout	Differences (Profit/Loss)

2.16 Is the insurance program still live? If not, when did the program stop operating? Please point out if there is a gap in which program paused. Why did it stop running or expired without continuation? Does the premium paid by project/Programs or Beneficiary or paid partially by both. Please explain.	
Project Beneficiary	
2.17 Who is the main beneficiary (Eligibility criteria of the beneficiary)	
2.18 Total number of beneficiaries	
2.19 Total Number of Beneficiaries for trigger/risk model-based response	

2.20 SADD and inclusion aspect of the Beneficiary

	Number	Percentages
Male		
Female		
Adolescent		
Person with Disability		
Other vulnerable group		

2.21 How gender, disabilities and other inclusion issue is integrated into beneficiary selection?	
2.22 Is there any other beneficiaries other than the ones who will receive funds after the scheme triggers? If so, please describe?	
2.23 Selection methodology of beneficiaries (step-by-step process of beneficiary identification and registration, indicators used to define who is eligible or not.	

2.24 Please explain how these indicators have been selected to identify beneficiaries and how you justify selection of these indicators? Who takes the decision to determine the selection criteria/indicators for selecting beneficiary?	
2.25 How do you collect beneficiary information?	
2.26 Is there any sperate accommodation/ system to capture gender sensitive beneficiary information form women? If yes , please elaborate.	
2.27 How do you finalize beneficiary selection after collection (technical and governance process)?)	
2.28 How does your project store, analyze and keep current beneficiary data	
2.29 How does the project/program maintain and update the beneficiary list over time, and who is responsible for this?	
3.0 Flood Risk Model	
3.1 Do you have any flood risk model in your project/program	
3.2 Briefly describe flood risk model (What is the sources of forecast information/ input data, output info, index used, parameters of the model, company who built the model, who is responsible to run the model, etc.?)	
3.3 How the trigger has been set and threshold defined? (index used, trigger thresholds/levels, multiple triggers or single trigger, hard or soft trigger or a combination, calculating agent, and how basis risk is managed).	
3.4 If you have a technical partner who provide scientific analysis for modeling, please provide the name of the organization and provide the brief on the partnership modality	
3.5 How does the project validate the flood risk model	
3.6 Is there any baseline research to build the flood risk model	
3.7 If gendered aspects has been a consideration in modeling and threshold/trigger set	
3.8 How is the flood risk model monitored in real-time and by whom?	

3.9 What happens when the model is triggered? Is the assistance automatic or is the trigger first reviewed – by whom? What decisions are made before assistance is initiated and by whom?	
3.10 Is there any financial instrument, e.g. insurance or other form of risk transfer involved the design of the program?	
3.12 If yes, what's the insurance trigger mechanism? Please clarify if it is parametric or indemnity based, what's the trigger threshold, index used, etc.	
4.0 Operational Modality	
4.1 Please provide a schematic operational and fund flow from decision making to implementation for the project/program.	
4.2 What type of activities does the project have?	Cash For Work / Cash / Non-Food Items / In kind / ….
4.3 Are these activities finalized ahead of time or are they dynamic depending on the situation e.g. magnitude of crisis? If you have contingency plans/SoP or documents that can be shared)	
4.4 If the project/program has cash-based intervention? If yes, how does the project disburse money ? if Hybrid please explain the reason?	Cash in Hand / Mobile Money / Voucher / Bank/hybrid(digital and cash in hand)
4.5 Does the community's preference take into consideration for cash transfer	
4.6 Does the project include gender aspects into consideration during delivery of cash?	
4.7 Number of days it takes from the moment the trigger is reached to when the payment is disbursed to beneficiaries, and how long it takes for the funds to reach the beneficiaries.	

4.8 If cash is disbursed through digital channels, please mention the name of the digital service provider	
4.9 What are your partnership modalities with digital platform of the service provider for cash transfer? Who hold the contract with digital financial service provider?	
5.0 Engagement and Coordination with Government	
5.1 Is the government involved in the project	
5.2 In which role does the government take part in the project	
5.3 Please describe involvement in project design, oversight, or implementation, specifying relevant government units	
5.4 Does the project have any plan to transfer project elements to Government	
5.5 Does MoWCA engaged at any point of the project? If yes, to what extent?	
5.6 In your opinion, are government counterparts aware of gender dimensions of flood protection processes?	
5.7 If Government is not directly taking part in the project, how do you coordinate with Government Stakeholder (from design to implementation)	
5.8 In your opinion, in long term is there any potential scope where government takes over some project elements? If yes, please briefly explain?	
6.0 Involvement of INGOs and CSOs	
6.1 How the Other INGOS and NGOs are coordinated from program design to implementation (Other than partners) Please briefly elaborate coordination for all steps (planning, designing, Risk model, beneficiary selection, implementation)	
7.0 Evaluation and Lessons learned	
7.1 What processes are in place to monitor the project (when threshold meets, action triggers and funds released) How do you track these and documents learning?	

7.2 Actual historical payout of the program (How much amount disbursed and when it was disbursed)	

7.3 How many people have received assistance to date though this system – potentially listed out by different years of activation)

Year	Activation	People reached (Direct)	Amount Disburses

7.4 Who is responsible for ensuring that beneficiaries receive the amount for anticipation and DRF project program ?	
7.5 If it's a parametric index-based insurance program/project who is responsible for payouts and who monitors that process?	
7.6 Is there any incident when the fund was exhausted (a situation when payout /fund disbursement should have been made but didn't for some reason,) ? Please provide the payout amount and date and reason.	
Is there any incident when payout was made when disaster didn't happen to the extend it was anticipated? Please provide the payout amount and date and reason.	
7.5 In your opinion, what could be the best channel to distribute cash to the community? From your project's experiences what modality (cash in hand/ digital cash) you recommend?	
7.6 What accountability aspects and feedback complaints mechanisms do you have in place?	
7.7 If the project has any, please summarize key findings from evaluations and lessons learned.	

7.8 Are there any gender-related lessons (or gaps) that you would like to mention?	
7.9 What is the future of the project in the inference to the directive goal and sustainability of action (As this type of actions are being credentials important to managing disaster risks and reducing loss of asset as well as sufferings of the vulnerable community, it is expected that these actions will be scale up and sustainable. So how your project/program plan to ensure continuity and sustainability beyond project period	

Additional Information and Guiding Documents:

We would like to have few more information-

a. Please provide any available secondary documentation on the project, this will not be circulated further by the evaluation team and World Bank team.

For example:

- Technical documents capturing flood risk model and trigger design
- Operational protocols for release of funds
- Contingency plans for assistance
- Details on beneficiary targeting / registration process
- Governance and decision-making

B. In your opinion if any parametric insurance program are planned to implemented in Bangladesh which agencies could be more efficient for supporting Insurance Development and Regulatory Authority (IDRA) for delivering the program components.

C. Do you know any specific secondary source of information which has upazila specific historic damage, loss and response information in Jamuna river basin area. If yes, please share the information sources with us.

Thanks .

Annex 4 : List of Indicators and Sources with Explanation for Module 2

Diagnostic and Scoping Exercises
Financial Protection Component of the Jamuna River Sustainable Management Project 1 (P172499)

List of Indicators and sources with Explanation for Module 2: **Assess and compare the 'protection gap' between and within the 4 selected sites in the Jamuna basin**

sl	Group	Indicator Name	Type	Admin Coverage	Source	Year Coverage	Methods
1	Exposure and Inundation	Physical Exposure (Absolute)	Area	Upazila	Flood Prone area Map and shape file (BARC)	Absolute flood prone area of the upazila	Spatial analysis by GIS
2	Exposure and Inundation	Inundation (absolute inundation depth) % of different level of inundation prone area	Area	Upazila	General Inundation Level map of Banglades h (BARC)	Absolute flood prone area of the upazila	Spatial analysis by GIS
3	Exposure and Inundation	Exposed Population and Households with SADDD	Population and Households with SADDD	Upazila	Multi Hazar Risk and Vulnerabilit y assessmen t (By DDM and World Bank) Gender assessmen t by GiHA	Published in 2018	Based on the population projection methods the exposed population will be estimated for 2024
4	Historical Impact (area)	Physical Exposure (Relative-Actual Inundation vs exposure)	Area	Upazila	Satellite Imagery of actual flood event	2016-2017-2019-2020	Spatial analysis by GIS

sl	Group	Indicator Name	Type	Admin Coverage	Source	Year Coverage	Methods
5	Historical Impact (Human-men, women and other diversity)	Number of Population (with SADDD) and household affected	Population and Households	District	NDRCC, NAWG Gender analysis by different organizatio ns	2014-2016-2017-2019-2020	Could be estimated for upazila based on statistical assessme nt of JNA data
6	Historical Impact (SADD)	Historical Impact (SADD0 Sex age disaggregat ed information)	SADD of impact population Types of sufferings, i.e disease due to outbreak of flood, stress level and mental health, increase of trafficking, school drop out, increase of child marriage. Triggers for social change after disaster events	District	NDRCC, NAWG Gender analysis by different organizatio ns	2014-2016-2017-2019-2020	Will be analyzed by statistical approach es by following district specific ratios of SADD) Qualitativ e data will be analyzed
7	Historical Impact (Economy & social)	Economic and social Impact by sectors	Loss amount by sectors	District	D form, MoDMR	2019, 2020	
			Degree of mobility affected, GBV cases, access to services of		Gender analysis report		Qualitativ e data will be analyzed

sl	Group	Indicator Name	Type	Admin Coverage	Source	Year Coverage	Methods
			women, girls, persons with disability and other social group				
8	Prioritized needs by affected community	Support Required by affected population based on historical flood	Name of the support sectors prioritized by affected community	District	Joint Needs Assessment (NAWG-CARE and DDM) Available gender analysis reports	2014-2016-2017-2019-2020	
9	Prioritized needs by affected community	Types of support required by community by different floods	Name of the support sectors prioritized by affected community by different year	District	Joint Needs Assessment (NAWG-CARE and DDM)	2014-2016-2017-2019-2020	Comparative analysis by severity flood and support required
10	Historical Provision(Response Amount)	Type and amount of support provided by Government	Amount by type	District	Joint Needs Assessment (NAWG-CARE and DDM and NDRCC)	2016-2017-2019-2020	
11	Historical Provision(Response Amount)	Type and amount of support provided by Humanitarian and civil society	Amount by type	District	Joint Needs Assessment (NAWG-CARE and DDM and NDRCC)	2016-2017-2019-2020	

sl	Group	Indicator Name	Type	Admin Coverage	Source	Year Coverage	Methods
12	Social Safety Net	Amount and type of shock responsive safety net	Amount by type	District	Department of Social Welfare. Union portal of the Government.	2022	
13	Coping Mechanism	Coping Strategies by affected household	Type of coping strategies by different group pf people	For HH in Flood plain region and HH in protected areas	SFB, NIRAPAD		
14	Insights and Recommendations	Gaps and Future Manifestation	Gaps in Needs vs Response	Overall, four upazila	Analyzed from above information		

Annex 5 : Selected Disaster Risk Financing Projects for Deep Dive of Module 1

Lead Agency	Implementing Agency	Project Location	Contact Focal
Save the Children	SKS Foundation	Gaibandha Fulchari	- Md. Mostak Hussain, Humanitarian Director, Oxfam, Bangaldesh - Khandoker Zahid Shorwar, Assistant Director-FIeld Operation, SKS Foundation.
CARE Bangladesh	SKS Foundation	Gaibandha Fulchari	- Kazi Rabeya Ame, Consortium coordinator, SUFAL, CARE, - Kh. Abdul Kader Razu, Co-ordinator Humanitarian. CW - Khandoker Zahid Shorwar, Assistant Director-FIeld Operation, SKS Foundation,
BDRCS	BDRCS	Tangail, Sirajganj, Gaibandha	- Md. Shahjahan, Assistant Director & Project Coordinator, FBF Project, BDRCS,
Start Bangladesh	MMS	Sirajganj Gaibandha	- Anamul Haque, DRF Manager, Start Bangladesh - Kazi Masuduzzaman, Deputy Director, NDP, - Khandoker Zahid Shorwar, Assistant Director-FIeld Operation, SKS Foundation, - Zehin Ahmed Setu, DRM Focel, MMS, Cell# 1716854510, Email: zehinahmed@gmail.com
Oxfam	MMS	Sirajganj, Kurigram	- Mohammad Emran Hasan, Head of Climate Justice, Oxfam, - Zehin Ahmed Setu, DRM Focel, MMS,
WFP	SKS Foundation	Gaibandh (Fulchari)	- Siddiqul Islam Khan, SPO, WFP - Khandoker Zahid Shorwar, Assistant Director-FIeld Operation, SKS Foundation.

Annex 6 : Composite Index-Based Rank of Unions For Prioritizing Sites and Target Group For Flood Protection Activities

Table 6.1: Composite index-based rank of unions of Fulchhari upazila for selecting sites and target group for flood protection activities

Upazila	Union	Composite Hazard Risk Level (Inundation and Frequency)	Affected Population per 1000	Household in Need (Severe Group)	Household in Need (Extreme Group)	Composite Risk Index	Rank based on Indexing
Fulchhari	Fazlupur	Very High	608	1,358	1,552	0.89	1
Fulchhari	Erendabari	High	447	1,288	1,472	0.83	2
Fulchhari	Fulchhari	Very High	426	972	1,111	0.75	3
Fulchhari	Udakhali	Very High	289	757	865	0.64	5
Fulchhari	Uria	Very High	422	746	852	0.62	6
Fulchhari	Kanchi Para	Very High	239	681	779	0.6	7
Fulchhari	Gazaria	Very High	324	650	743	0.58	11

Table 6.2 :Composite index-based rank of unions of Gaibandha sadar upazila for selecting sites and target group for flood protection activities

Upazila	Union	Composite Hazard Risk Level (Inundation and Frequency)	Affected Population per 1000	Household in Need (Severe Group)	Household in Need (Extreme Group)	Composite Risk Index	Rank based on Indexing
Gaibandha Sadar	Badiakhali	Very High	228	644	736	0.6	7
Gaibandha Sadar	Boali	Very High	190	647	739	0.6	7
Gaibandha Sadar	Kamarjani	Very High	505	676	773	0.6	7
Gaibandha Sadar	Gidari	Very High	168	509	582	0.56	12
Gaibandha Sadar	Mollar Char	Very High	646	451	515	0.55	13
Gaibandha Sadar	Ghagoa	Very High	190	390	445	0.49	14
Gaibandha Sadar	Kholahati	High	64	252	288	0.44	15
Gaibandha Sadar	Malibari	High	77	219	251	0.42	18
Gaibandha Sadar	Gaibandha Paurashava	High	42	245	280	0.42	18

Upazila	Union	Composite Hazard Risk Level (Inundation and Frequency)	Affected Population per 1000	Household in Need (Severe Group)	Household in Need (Extreme Group)	Composite Risk Index	Rank based on Indexing
Gaibandha Sadar	Lakshmipur	Medium	56	178	204	0.4	20
Gaibandha Sadar	Ballamjhar	Medium	48	224	256	0.38	26
Gaibandha Sadar	Ramchandrapur	High	80	237	271	0.36	29
Gaibandha Sadar	Kuptala	Medium	42	117	133	0.29	35
Gaibandha Sadar	Saha Para	Medium	49	123	141	0.22	39

Table 6.3: Composite index-based rank of unions of Kalihati upazila for selecting sites and target group for flood protection activities

Upazila	Union	Composite Hazard Risk Level (Inundation and Frequency)	Affected Population per 1000	Household in Need (Severe Group)	Household in Need (Extreme Group)	Composite Risk Index	Rank based on Indexing (Out of Toal 47 Upazila)
Kalihati	Gohaliabari	High	272	586	586	0.44	15
Kalihati	Salla	Very High	217	178	178	0.43	17
Kalihati	Narandia	High	108	137	137	0.39	23
Kalihati	Bangra	High	96	131	131	0.37	27
Kalihati	Sahadebpur	High	117	171	171	0.37	27
Kalihati	Durgapur	High	149	94	94	0.34	31
Kalihati	Elenga	Medium	57	86	86	0.32	32
Kalihati	Dashkia	High	116	50	50	0.31	33
Kalihati	Kok Dahara	Medium	73	60	60	0.26	36
Kalihati	Paikara	Medium	72	51	51	0.26	36
Kalihati	Bir Basunda	High	91	51	51	0.22	39
Kalihati	Nagbari	Medium	68	586	586	0.21	41
Kalihati	Parki	Medium	116	178	178	0.21	41

Upazila	Union	Composite Hazard Risk Level (Inundation and Frequency)	Affected Population per 1000	Household in Need (Severe Group)	Household in Need (Extreme Group)	Composite Risk Index	Rank based on Indexing (Out of Toal 47 Upazila)
Kalihati	Kalihati Paurashava	Medium	30	137	137	0.16	44
Kalihati	Balla	Low	13	131	131	0.08	47

Table 6.4: Composite index-based rank of unions of Sirajganj upazila for selecting sites and target group for flood protection activities

Upazila	Union	Composite Hazard Risk Level (Inundation and Frequency)	Affected Population per 1000	Household in Need (Severe Group)	Household in Need (Extreme Group)	Composite Risk Index	Rank based on Indexing (Out of Toal 47 Upazila)
Sirajganj Sadar	Mechhra	Very High	586	586	586	0.65	4
Sirajganj Sadar	Kalia Haripur	High	178	178	178	0.4	20
Sirajganj Sadar	Ratankandi	Medium	137	137	137	0.4	20
Sirajganj Sadar	Chhangachha	High	131	131	131	0.39	23
Sirajganj Sadar	Saidabad	High	171	171	171	0.39	23
Sirajganj Sadar	Khoksabari	High	94	94	94	0.35	30
Sirajganj Sadar	Kaoakola	Medium	86	86	86	0.3	34
Sirajganj Sadar	Sirajganj Paurashava	Medium	50	50	50	0.23	38
Sirajganj Sadar	Baghbati	Low	60	60	60	0.19	43
Sirajganj Sadar	Bahuli	Low	51	51	51	0.16	44
Sirajganj Sadar	Shialkul	Low	51	51	51	0.16	44

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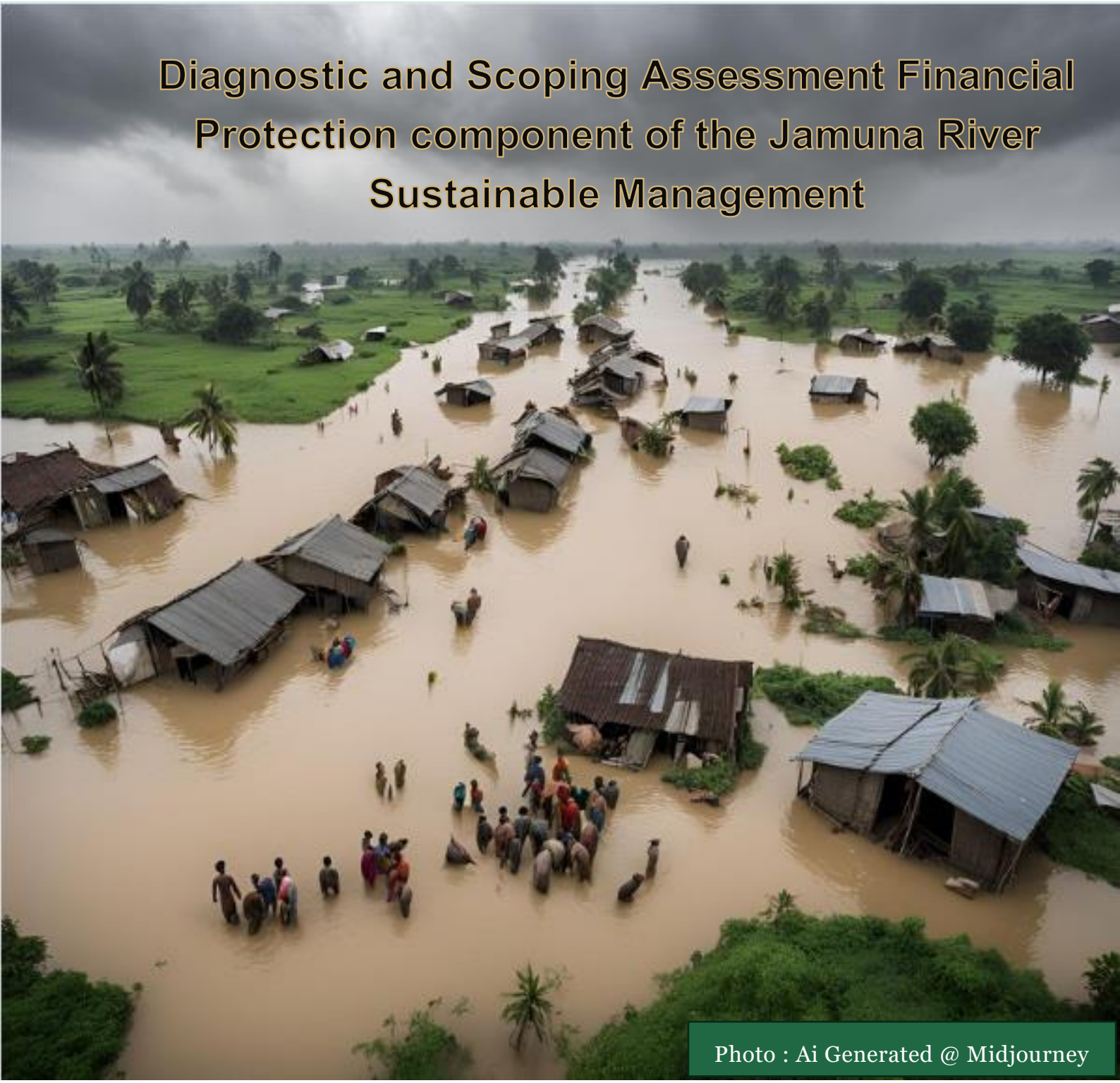

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Contact