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Catalysing Change, Financing Transformative Adaptation to Improve Flood Resilience in Bangladesh

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Abstract

Bangladesh, a developing country at the forefront of climate crisis, has demonstrated outstanding economic growth. However, climate change impacts have caused substantial economic and non-economic losses, forcing millions of vulnerable people below the poverty line. Communities living in the char areas (riverine islands) are marginalized and suffer worst from the devastation of climate induced disasters. This study delves into the multifaceted aspects of transformative adaptation in the char communities of Bangladesh while considering a project funded by the Green Climate Fund and implemented by Palli Karma-Sahayak Foundation. The study has undertaken a qualitative research approach with an objective to assess whether certain adaptation interventions are transformative or not, for vulnerable communities living in remote char areas of Kurigram and Jamalpur districts of Bangladesh. Our findings suggest that institutional adaptation strategies have fulfilled some principles of transformative adaptation by generating financial incentives, eliminating substantial amounts of losses, ensuring the safety of women, providing agency to women, and providing nutritional support to households. However, the study has also identified some critical barriers such as lack of data-driven project design, political supremacy, deep-rooted structural inequalities, development neglect, and lack of transboundary resource management mechanism, which have threatened the sustainability of the outcomes of adaptation interventions. The study also highlighted the systemic issues in global financing mechanisms, and the lack of motivation among local entities for innovation and challenging the status quo. This study recommends that to bring a paradigm shift towards inclusive and transformative adaptation, there is a need for a greater integration of contexts into global financing modalities.

Keywords: Climate change adaptation; Climate finance; Gender empowerment; Bangladesh.

JEL classification: Q54, Q56, O16, J16, O53

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Co-founded by the Centre for Sustainable Finance (CSF) at SOAS University of London and the World Resources Institute, RAMP is currently managed by the CSF, which also acts as Secretariat for the RAMP University Network. For more information visit: https://www.soas.ac.uk/university-network

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"Development requires the removal of major sources of unfreedom: poverty, ignorance, and disease, as well as tyranny, lack of economic opportunity, and neglect of public facilities."

AMARTYA SEN

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1 Introduction

Bangladesh is a developing country at the forefront of the climate crisis (Abedin & Hosenuzzaman, 2023). It is ranked seventh in the world in terms of the impacts and vulnerabilities due to climate change (Eckstein, Künzel, & Schäfer, 2021). The country is facing unprecedented challenges to cope with the escalating impacts of recurrent natural and climate change induced disasters (Chowdhury, Hasan, & Islam, 2022). This is posing formidable obstacles to its development trajectory, especially as it aspires to be a lower middle-income country by next year (Hossain, Delin, & Mingying, 2022).

The extent of human vulnerability due to climate change, on a micro-scale, is linked to geographical location, socio-economic dynamics, environmental conditions, and political institutions (Ahmed & Haq, 2019). Different parts of the country are affected by extreme weather events like flood, drought, cyclone, river erosion, salinity, lightning, and coastal erosion almost every year. The country has an extensive network of 250 rivers and 80% of the land consists of the floodplain of the Ganga, Brahmaputra, and Meghna (GBM) basin (Brouwer, Akter, Brander, & Haque, 2007). Rivers are the lifeline of Bangladesh. Many originate in the Himalayan region and constitute 6.7% of the country (Saha & Pal, 2019). Therefore, river erosion, flooding and monsoon inundation are some natural and critical processes that the country faces every year. Roughly 20% of the country is inundated when regular monsoon precipitation occurs (Azad, et al., 2022). When inundation exceeds 33% of the land of the country, it is termed as a catastrophic flood.

There are two primary causes of flooding in Bangladesh. First, precipitation during monsoon on the vast and expansive catchment areas of the GBM basin creates an annual water discharge of 1,369,000 m^3, typically originating from outside the country (Islam & Sharabony, 2023). Second, the melting of ice and snow in the Himalayan region adds more water to the regular discharge (Talukder, et al., 2021). The recent floods in 2004 and 2020 in Bangladesh have inundated more than 65% of the country (Uddin & Matin, 2021). The water holding capacity of rivers has diminished due to excessive sedimentation and water flow variability, causing overflowing and overwhelming catchment areas. In a changing climatic context, Himalayan glaciers melting at a rate of 0.3–1 m/year pose a significant threat to the rivers in Asia including the rivers of Bangladesh (Guo-Yu & SHRESTHA, 2017). Erratic rainfall and melting of glaciers will result in floods with greater intensities and frequencies in Bangladesh. Since rivers are highly susceptible to environmental conditions, variations in water flow and sediment load may lead to instability and changes in river pattern and form (Dewan, et al., 2017).

Flooding and river erosion are closely linked disasters and have the greatest contributions to household damages and losses in Bangladesh (Rahman, et al., 2023). According to IPCC, these environmental events will intensify and substantially amplify the loss and damage associated with the livelihood of people (Ahmed, Ayeb-Karlsson, Geest, Huq, & Jordan, 2019). Flooding and river erosion destroy seven times more land than they form. Hence, these processes facilitate the emergence and disappearance of river islands, popularly known as char lands, in Bangladesh (Barua, Rahman, & Molla, 2019). In the Brahmaputra Jamuna River basin areas, vulnerable communities from char areas not only lose their household and agricultural properties, but also face recurrent forced displacement, food insecurity, and health hazards. Numerous studies suggest that the escalation of poverty rate in Bangladesh is strongly associated with

river erosion and flooding events (Kaiser, 2023). Communities living on chars are predominantly agrarian and they face severe challenges due to erosion and recurrent floods. These communities also experience multiple forced displacements in their lifetime.

Adaptation is a key strategic measure to address uncertainties while anticipating the short and long-term impacts of climate change effects (Biswas & Rahman, 2023). Since the livelihoods of char communities are dependent on climate-sensitive factors, sustainable adaptation is key to their survival. Bangladesh has been globally known for its adaptation journey. The country has successfully implemented home-grown adaptation strategies including early warning, cyclone preparedness and shelter, green infrastructure, climate-smart agriculture, and capacity building, all leading to community resilience (Li, 2023). However, due to unprecedented hydroclimatic disasters low adaptive capacity is still reported due to lack of access to land, financial insolvency, and weak social capital (Hossain, et al., 2023). In addition, there is criticism regarding the quality of the adaptation efforts in many countries, including Bangladesh (Westoby, et al., 2020). Inefficient adaptation financing can lead to reinforcement and redistribution of vulnerability (Schipper, 2020). Many studies have underscored the necessity of efficient adaptation and making 'vulnerability reduction' the primary goal of effective and transformative adaptation financing (Work, Rong, Song, & Scheidel, 2019). There is a growing need for challenging the business-as-usual and bringing multi-scalar transformations in adaptation approaches. Transformative adaptation is key to achieving resilience and it refers to a systematic development process that enhances the quality of life, strengthens socio-economic vibrancy, reduces vulnerabilities, and ensures inclusive and resilient futures (Kuhl, et al., 2021).

Numerous studies have specialized in climate change impacts and adaptation in Bangladesh; however, there are relatively few focusing on the transformative nature of adaptation in Bangladesh (Haque & Nahar, 2023). This case study research delves into transformative adaptation and flood resilience in Bangladesh. In this report, we have tried to not only diagnose the challenges, but to propose actionable solutions to contribute to a paradigm shift in the transformative adaptation finance landscape. The case study also highlights the complexities of adaptation financing, while recommending strategic approaches to enhance transformative adaptation for community resilience through appropriate financing mechanisms.

2 Methodology

2.1 Research Design

The proposed case study has embarked on a qualitative research approach to collect supportive information from the riverine communities of two selected districts of Bangladesh. Figure 1 shows the steps in the research. The study has consulted with other key stakeholders including representatives of local and global funding agencies, development sector personnel, and leading experts in climate change adaptation. "*Extended Community Climate Change Project- Flood (ECCCP- Flood)"* by The Palli Karma-Sahayak Foundation (PKSF) was selected for review to develop the case study. PKSF is accredited by Green

Climate Fund (GCF) and works through national and local level NGOs largely known as Partner Organizations (POs).

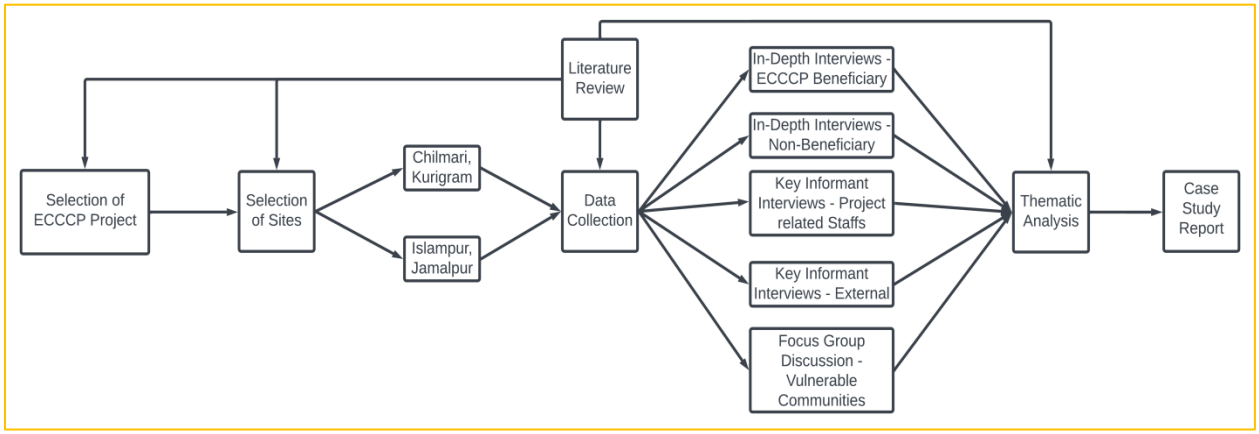

Figure 1 The research design

2.2 Study Sites

The study is focused around Chilmari Upazila in Kurigram district and Islampur Upazila in Jamalpur district, areas particularly vulnerable to severe flooding due to their geographical and riverine nature (Figure 2). Chilmari Upazila, precisely located at 25.5667°N 89.6917°E, spreads across 224.96 square kilometres and is intersected by the Brahmaputra River. It is home to a population of 122,841 across 30,966 households, with a literacy rate of 51.5%, and predominantly relies on agriculture for livelihood. Meanwhile, Islampur Upazila, precisely located at 25.0833°N 89.7917°E, spreads across 353.31 square kilometres and is intersected by the Jamuna and Old Brahmaputra River. It is home to a population of 298,429 across 74,963 households, with a literacy rate of 51.8%, and predominantly relies on agriculture for livelihood. This is largely due to its location next to the Garo hills and near the Jamuna River, which contributes to its challenging hydrological conditions.

The research specifically focuses on four char areas, two from each Upazila, selected based on the extent of flooding and river erosion issues reported by local NGOs. These areas represent a critical cross-section of the environmental and socio-economic challenges faced in these regions. Moreover, the inclusion of Kurigram district, particularly Chilmari Upazila, in recent scientific studies as one of the districts in Bangladesh most at risk due to climate change impacts, adds a vital dimension to the study. (Rahman, et al., 2023). The aim is to produce a comprehensive map of Chilmari and Islampur Upazilas, indicating the chosen char areas, and to include detailed information about key geographical features such as the Brahmaputra and Jamuna rivers. This map, combined with demographic, climate risk, and socio-economic data, is intended to provide a thorough understanding of the impact of financing transformative adaptation to improve flood resilience and climate change in these vulnerable areas.

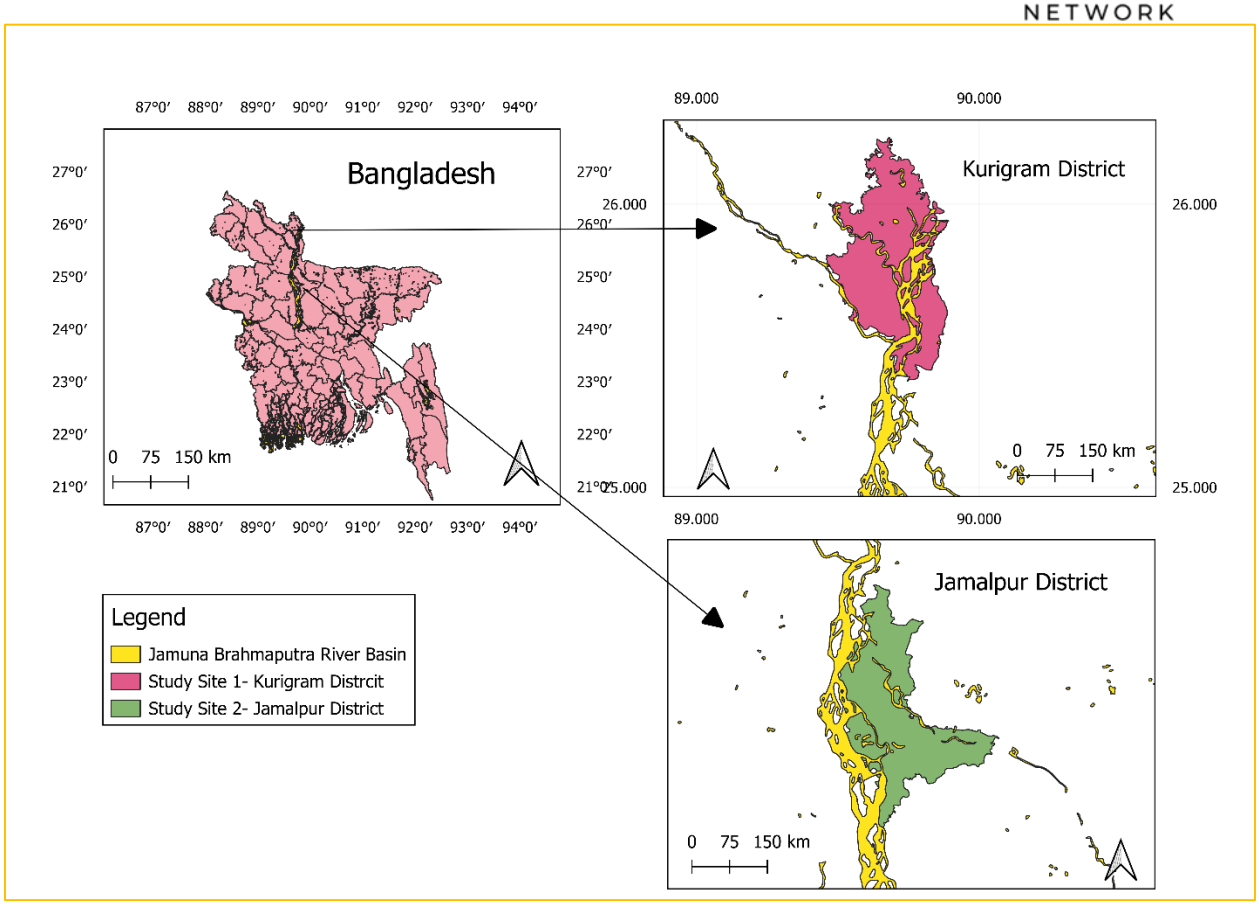

Figure 2 Study sites in the Jamuna Brahmaputra River Basin Area

2.3 Data Collection and Analysis

To achieve the objectives of the case study, in-depth interviews, key informant interviews, and focus group discussions were conducted in two study sites. Table 1 summarizes the data collection tools and respondents' information. In-depth interviews were conducted with beneficiaries to delve into their personal experiences with climate change impacts, and into the impacts of the ECCCP project on their lives and communities. In-depth interviews with non-beneficiaries were conducted with an aim to gain an outsiders' perspective on the outcomes of the ECCCP project activities. Focus group discussions were aimed at gathering collective insights and opinions on how adaptation to flood enhances their overall community resilience. Key informant interviews were conducted with project staff and with experts in the field of climate finance and climate change adaptation. The aim was to validate the findings from the field as well as gaining critical insights into the existing financial mechanisms for climate change adaptation in Bangladesh.

Table 1 Data collection summary

Tool	Respondent	Why	No.
In Depth Interviews	Project Beneficiaries	Recipients of adaptation services under the ECCCP project	30
In Depth Interviews	Non-beneficiaries	Did not receive any support from the project but belong to the same	10

Tool	Respondent	Why	No.
		community where project interventions were made.	
Key Informant Interviews	Project Related Stakeholder	Representatives from the implementing partner organization and from PKSF	5
Key Informant Interviews	Climate Finance and Adaptation Experts	Climate finance experts, climate change adaptation experts and disaster risk reduction experts	3
Focus Group Discussion	Vulnerable communities	People from char communities who face regular flood and river erosion	4

A manual thematic analysis was used to study the collected data. Thematic analysis involved the identification of the recurring themes and patterns across the different sources of data. In our analysis, we have embarked on a double loop process, meaning that themes have emerged from the transcripts of the interviews, as well as themes created during the literature review process. Relevant findings were grouped accordingly under each theme.

Figure 3 Data collection in the study sites.

3 Results

This section highlights the findings from the thematic analysis based on the data gathered during the fieldwork. The findings cover various aspects, including the sources of vulnerability, adaptation actions taken by the communities, ECCCP project interventions, and transformative processes associated with adaptation.

3.1 Past Experiences of Flooding

The char communities have previously encountered multifaceted challenges due to recurrent flooding and river erosion. Most of them have been forcibly displaced from their residences five to 20 times in their lifetime. They have experiences of living in makeshift arrangements or under the open sky, which demonstrates their arduous living conditions. The hardships were compounded for women since their mobility was restricted and access to sanitation facilities was absent. In addition, they had the burden of preparing food in an extremely challenging environment. Agricultural losses characterized by recurrent damage to crops such as paddy and mustard due to flood and erratic rainfall, have intensified the challenges of the communities.

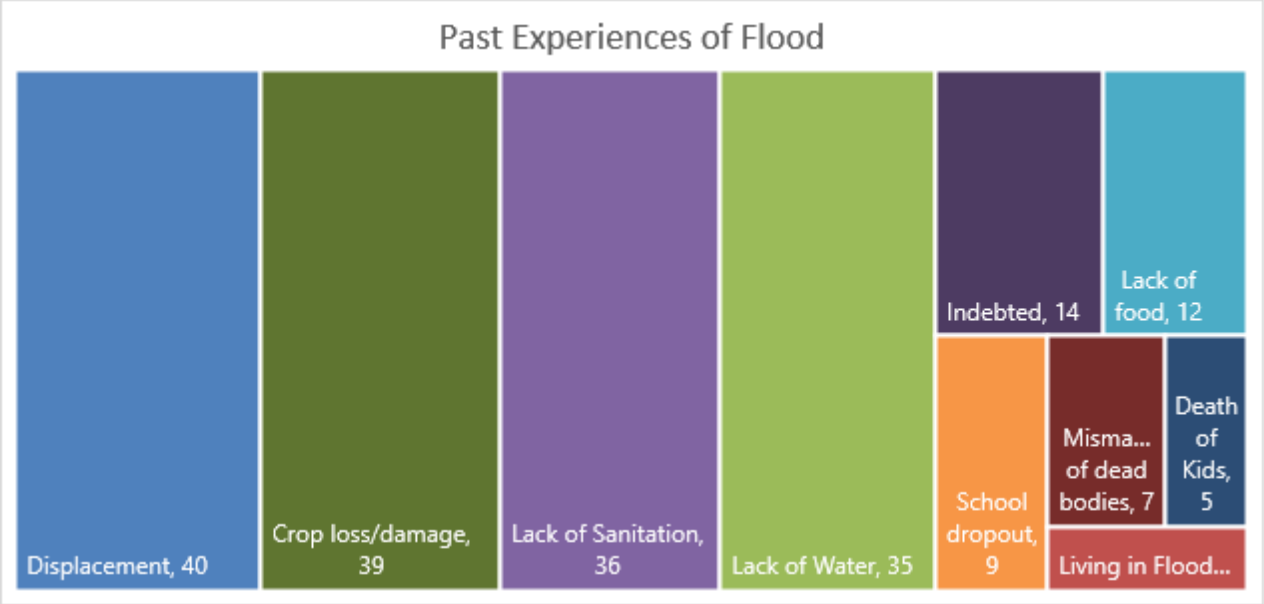

Figure 3 Key areas of impacts of flood from the past.

Inadequate water and food were critical concerns which had a profound impact on the health and nutrition of children. Loss of lives, particularly children under age five, were also reported by the respondents while reflecting on their past experiences of flooding.

Loss of livestock used to be the most common impact previously faced by the communities. Since livestock provides essential nutrients as well as a good source of income for them, they tried their best to protect it. In the worst-case scenario, they were forced to adopt negative coping mechanisms like selling their livestock at a much lower price to ensure survival for a few days of flooding. This has substantially reinforced their vulnerability in the past. Figure 4 highlights the areas of impact the communities encountered in the past, due to flood and river erosion.

3.2 Sources of Vulnerability

The communities in the study sites are vulnerable due to a combination of factors such as environmental conditions, geography, socioeconomic conditions, and infrastructure. It has been found that members of the communities have endured repeated displacement due to river erosion and flooding, up to 20 times

in their lifetime. Forced displacement incidents have created a long-lasting impact on their livelihoods, leading to unprecedented vulnerabilities.

First, the communities are reluctant to invest in permanent houses or modern agriculture, given the perception and experience of recurrent displacement they have. Therefore, they construct makeshift houses and rely on traditional agricultural practices. Traditional agricultural practices are usually more labor intensive, and family members – children and adults – eventually get involved in those activities. As a result, children after a certain period decide not to go to school. Consequently, the vulnerability perpetuates from one generation to the next.

Second, recurrent displacement experiences lead to communities not investing in small businesses. Hence, they rely on nearby weekly markets (locally called haat) for daily commodities and other goods. Since those markets are not easily accessible, they spend a whole day buying commodities. During an emergency, this isn't an option at all.

Lastly, past displacement experiences have compelled communities to adopt negative coping mechanisms. Hence, they are not willing to make investments for basic sanitation and water sources, posing additional challenges to their overall well-being.

Several factors related to geography, remoteness of the study areas, and river morphology, make communities vulnerable to floods and river erosion. Communities in the study sites live on char lands that have been stable for 20-30 years now, known as established char lands. They undertake agricultural cropping on both established and relatively new and temporary char lands. Char lands get flooded almost every year and communities adapt to flooding for agricultural activities. Though the plinth raise activities were implemented through a cluster basis, agricultural lands are still vulnerable to flooding and river erosion. Regarding household areas, each cluster where plinth levels were raised contains eight to 30 houses. Smaller clusters are disconnected by narrow channels where flood water enters. Narrow channels were not filled up by sand and soil because that increases the cost of the project and does not fall under the scope of work. Such narrow channels have increased the vulnerability of the whole cluster due to the prevailing risk of erosion. In addition, there is inherent vulnerability of the char lands, meaning that a 40-year-old established char may also face erosion at any time. The braided Jamuna Brahmaputra River has made the established and temporary chars vulnerable to erosion.

> Since I was in elementary school, I've been afraid of flooding and displacement. I witnessed the challenges my father and our family faced when our home was flooded. We had to live under a makeshift roof, and we lost some of our chickens, cows, and goats. To make matters worse, my father had to sell a cow at a much lower price just to urgently repair our house. Those memories are difficult to forget.
>
> **A WOMAN RESPONDENT FROM CHILMARI, KURIGRAM**

During flooding, the occurrence of theft increases in the study sites. As a result, community members experience the loss of valuable assets including money and jewelry. Such losses exacerbate their economic vulnerability and enhance their emotional distress as these assets constitute a substantial fraction of their wealth. In a different scenario, some members of the communities who are not ECCCP project

beneficiaries still face displacement and huge agricultural loss. Given the very weak law-enforcement capabilities, some of those members become more susceptible to engaging in criminal activities. Since most of the people in the community do not invest in assets, particularly items like boats, they lack the required means for relocation to safer places during floods. Such lack of resources for survival eventually traps them in an extremely vulnerable condition. While men can make certain makeshift arrangements to move (for example a boat made from banana trees), the movement of women is completely restricted. Though plinth raising provides them with a safer space, access to sanitary latrines and fresh water sources remains a challenge, especially for women and children.

As discussed earlier, communities are reluctant to invest in making assets and expect support from NGOs for survival. According to the interviews, a perception has developed among the communities that the impact of natural disasters is beyond their ability to manage, and it is the primary duty of the government and NGOs to provide them with necessary support. They also realized that many of the interventions only provide support for a short period of time. They have pointed out that there is uncertainty regarding the continuity and monitoring of the project outputs after the project cycle ends. Although there are certain capacity building elements in projects, they are often not aligned with the contextual needs and strengths of the communities. Therefore, communities have become dependent on external support when it comes to managing the impacts of flooding and river erosion.

The sources of vulnerabilities mentioned in all the interviews are visualized in Figure 5. The number below each term represents the frequency of mentions of those terms across all interviews. The underlying factors of vulnerability fall under five broad categories: physical vulnerability, vulnerability due to lack of basic amenities, agricultural vulnerability, deep rooted cultural norms and practices, and others. Physical vulnerability is determined by a combination of factors that threaten the existence of the char itself. According to respondents, rainfall and changes in water flow in the river has become more erratic and sudden. The chars that were previously considered stable are now facing risks of erosion. As there is no localized warning mechanism for floods, no preparedness measures can be taken. Study sites also lack basic amenities like schools, health care facilities, communication infrastructure, and financial institutions. Such conditions create a long-term societal impact on the community by putting them in the vicious cycle of poverty, malnutrition, food insecurity, social insecurity, and gender inequality. Agriculture is the primary mechanism to support livelihoods in char communities. However, inadequate support mechanisms as well as external volatility make the sector fragile. Underlying factors include a lack of appropriate supply chain, lack of access to credit, absence of agricultural consultation services, manual agricultural labor, recurrent crop failure, and price inflation. Factors associated with cultural norms and practices include a lack of agency for women when it comes to employment, migration, entrepreneurship, and decision making. Other factors include a lack of disaster shelters, increased out of pocket expenditure, and no warning for multi-hazards. Lack of formal shelters forces people to rely on social shelters, which often means leaving assets like livestock behind.

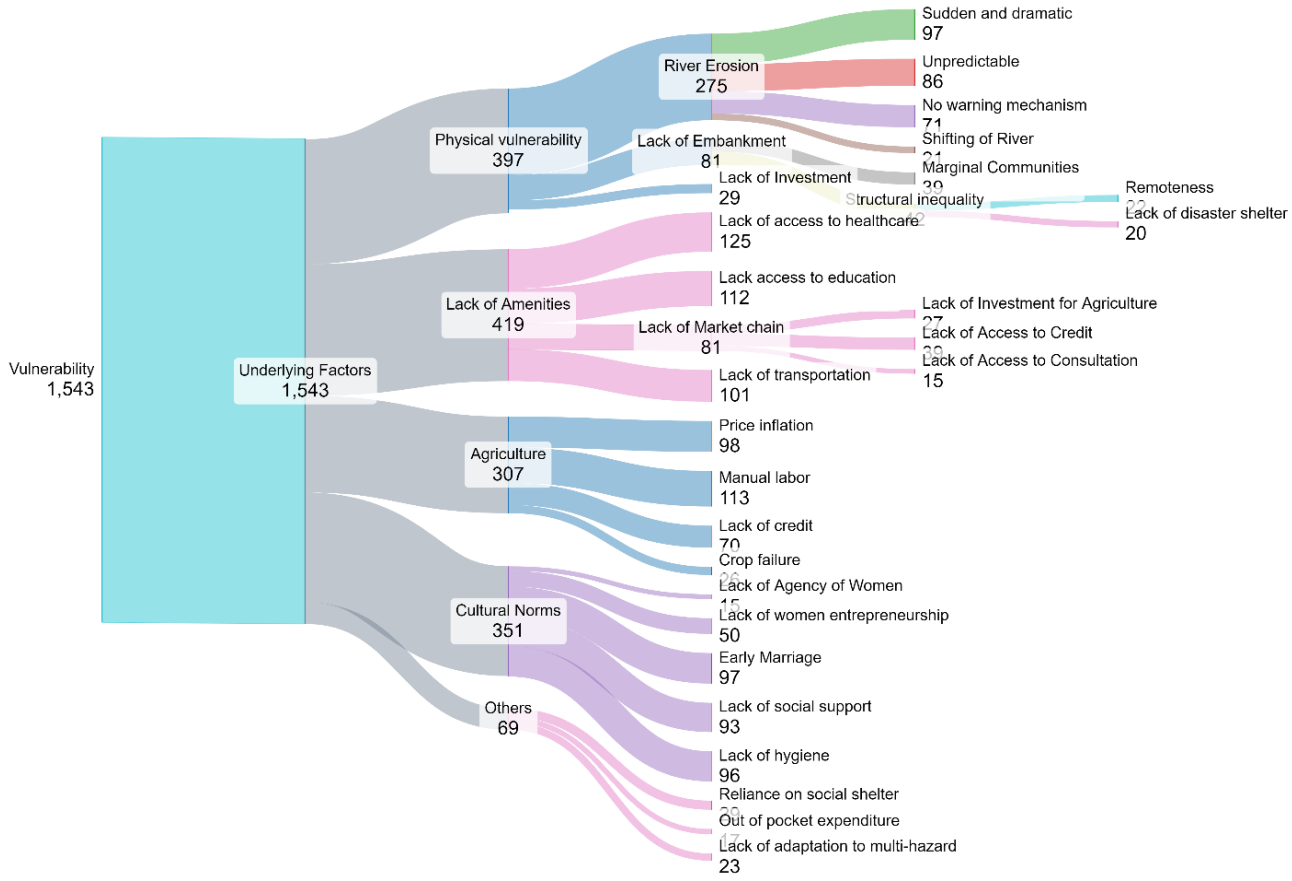

Figure 4 Underlying factors of vulnerability as emerged from the interviews.

3.2.1 Adaptation Strategies

In this section, we highlight two pivotal processes of adaptation by communities to floods. First, the adaptation supports embedded in the ECCCP project, which is a Green Climate Fund project implemented by Palli Karma-Sahayak Foundation (PKSF) though partner organizations in the study sites. And second, community driven self-adaptation strategies, including those historically practiced by the communities, and those inspired by the ECCCP project.

3.2.2 Adaptation Interventions from the Project

Five adaptation activities (Figure 6) were prioritized and identified for the ECCCP-Flood project, from an extensive pool of over 100 adaptation actions implemented through the community climate change project (CCCP). CCCP was a project under the Bangladesh Climate Change Resilience Fund (BCCRF) and implemented in many regions of Bangladesh with the aim of strengthening the resilience of vulnerable communities in the face of climate change ***(PKSF, 2014)***. One of the five adaptation activities in the ECCCP project is the plinth raise to make houses flood-proof, followed by the reconstruction of resilient houses on the raised plinths.

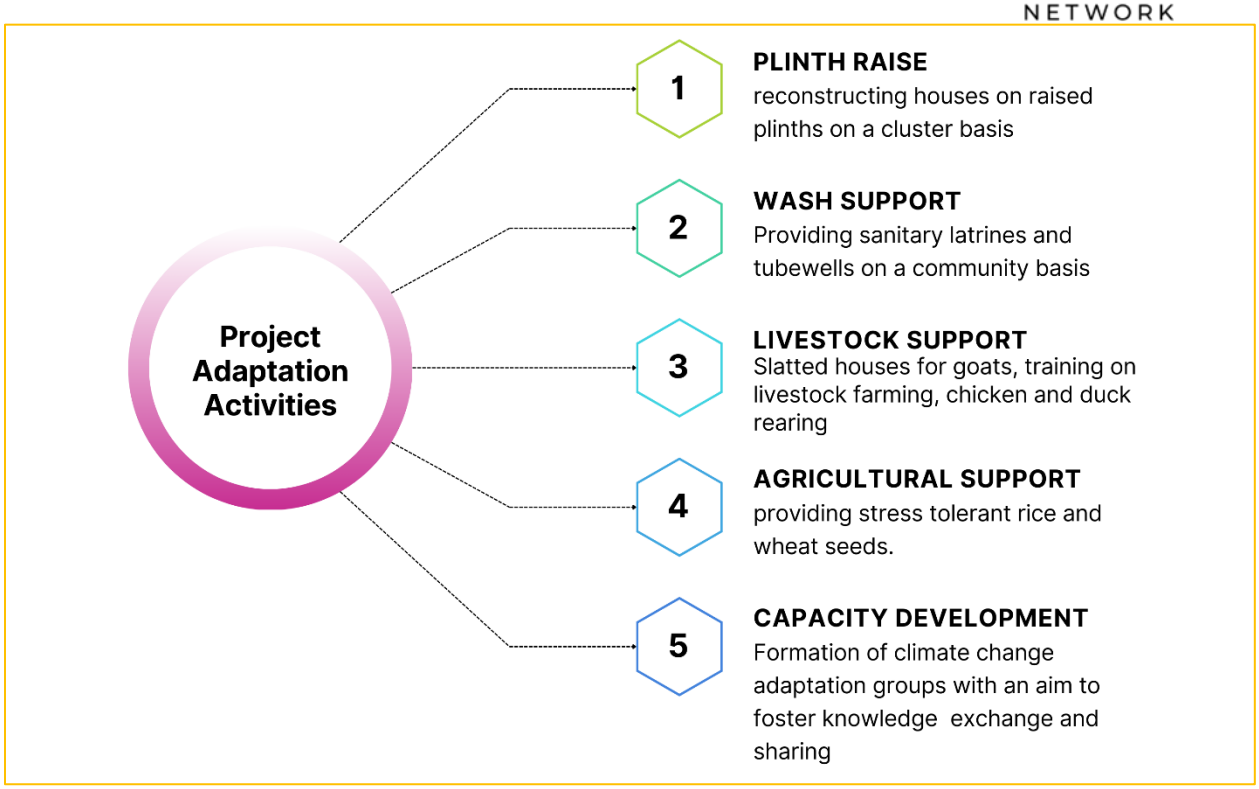

Figure 5 Adaptation interventions under the ECCCP-Flood project.

While determining the elevation of the plinth, implementing entities have carefully considered the water levels of the historical flooding events, especially considering the level of the devastating flood in 2019. They have maintained a plinth height above 1.5 meters – the water level of the flood in 2019. For plinths to raise, sand from river and newly formed unstable char lands, supplemented by locally soured soil were used. Soil was primarily used as the top layer of the plinth. In this entire process, the project staff have encountered several challenges. The most pressing was sourcing sand and soil from nearby locations to meet the cost-related requirements. The complicated legal aspects regarding property ownership caused a significant obstacle too, particularly when sand or soil had to be transferred from certain locations. For instance, it was difficult to remove sand from a section of a river because of potential disputes over property rights. This section of the river used to belong to someone, and they marked off the portion that is now part of the river. Reports suggest that some landowners were asking higher amounts of money for sand and soil, leading to increased costs.

To effectively navigate through the issues, IEs have embarked on collaborative efforts through consultation and consensus building, to ensure the smooth execution of the project activities. Since there was fixed allocation for plinth raise, addressing local issues to gather soil or sand may have increased the cost. IE's have had community consultation and through a participatory process, the community also paid a certain amount of money (roughly 10 USD per household) to bear the additional cost of implementation.

After the elevation of plinths, families have reconstructed their houses in a more resilient way. This reconstruction is important for making their homes safer against the frequent floods that affect the char area. While implementing the plinth raise activity, different methodologies were employed by the IEs. In one site, a particular IE has adopted a system where the clusters remain unconnected by a narrow space in between, as a cost-saving measure. However, empirical observations suggest that these clusters are more at risk of erosion during both flood and non-flood situations. During rainy seasons the river overflows and water may accumulate in the narrow patch and initiate the erosion of the clusters.

> Yes, the houses are stronger now. They don't rot or crack anymore. I still remember that there were bamboo made structure at my father's house. I saw my father used to replace those pillars of the house every year. It was costly and we had to do that by ourselves. But in current structure, houses will last for at least 8-10 years.
>
> **A WOMAN RESPONDENT FROM ISLAMPUR, JAMALPUR**

In contrast to this, an IE in another site anticipated that erosion may occur if the clusters are disconnected. With the support of the communities as well as the contractors, the narrow patch between the clusters was also filled up wherever possible. This anticipatory action reflects the significance of adaptive strategies and flexibility within the project activities by engaging communities to enhance the outcome of adaptation strategies. To further safeguard their elevated homes, families were asked to plant trees and grass around their houses as well as on the slopes of the plinths. Residents of the raised clusters were asked to plant Napier grass and Durba grass (Cynodon Dactylon) and other trees on the slopes to protect them from erosion during floods and due to high wind. People were seen cultivating papaya, guava, mango, moringa, banana and more on the slopes of the plinths. Such plantations have also increased the greenery of char lands while providing sheds to many during summer. Previously, people relied on bamboo and tin made houses due to repeated destruction by floods. Since their homes are now flood-proof, they have invested additional money to strengthen houses by using concrete pillars and tin. This has reduced the costs associated with repeated renovation and reconstruction. To maximize the impact of the project, the IEs endeavored to raise the plinth levels for at least three multiple households on a single cluster. This collective approach is particularly effective in the char area, allowing the IEs to provide more comprehensive support to the community. Understanding the economic needs of the char area, the IEs have also assisted in the process of livelihood security enhancement.

The second key adaptation activity under the ECCCP project was providing safe shelters (slatted house) for livestock such as sheep and goats. Additionally, the IEs have micro-credit loans of about 20,000 BDT for each eligible household. Each household could take the loan twice, one for rebuilding houses and another purchasing livestock. The loans are structured to be repaid within 16 months, and families were allowed to take one loan at a time. The NGO addresses the water needs by installing tube wells, although not for every household.

As part of the project interventions, selected vulnerable communities were provided with flood and stress tolerant rice and wheat seeds for cultivation. In addition, the IEs also provided the required training on farming the new varieties of rice and wheat. One major component of the adaptation package under the

ECCCP project focused on the capacity building and sharing of vulnerable communities. Climate Change Adaptation Groups (CCAGs) were formed in each cluster, and they were provided with training on community resilience imperatives. CCAGs practice the exchange of capacity and information through visiting other CCAGs in various project sites.

3.2.3 Community Adaptation Strategies

Reverse Migration as an adaptation strategy – Roughly three decades ago, a big portion of privately owned land was subjected to river erosion, forcing some of the families to relocate to other char areas and some families to migrate to cities including Dhaka. However, the family members have demarcated their lost land along the river, with the hope that new land will emerge, and they will resettle there. Subsequently, the people have witnessed the emergence of new char lands in the demarcated areas due to the shifting course of the river. As a result, some of the previously displaced families came back from Dhaka (reverse migration) to their demarcated land, which is now a new char, to live permanently. A subset of the migrants has also returned and are now actively engaged in managing assets and agriculture on the reconstituted land. Some returnee migrants reflected on their experiences by saying that residing on char land and cultivating their own plots was economically superior to living in urban areas characterized by unskilled employment.

Cost-cutting agricultural practices – Both men and women on the char lands are found to be very active in agriculture and they cultivate a diverse array of crops, including corn, black gram, ground nut, chillis, and rice. They gain financial prosperity from the profitable sale of harvests in the local market. They keep the cost of agricultural production low since they rely more on human labor and traditional techniques for preparing land, irrigation, harvesting and post-processing. It is important to state that both male and female family members work together in the agricultural activities on the char land. Families conserve a small fraction of the harvest that fulfills the needs of their basic food for the whole year. Moreover, growing vegetables through homestead gardening was found to be a regular practice in almost every household in the study areas. Such practice provides a perennial supply of vegetables for the families living in the char areas. Due to the plinth raise, the households do not get flooded, livestock remains protected, and homestead gardens do not get damaged.

Agricultural intensification – Communities are now able to anticipate potential agricultural losses due to flooding and river erosion. Hence, they have undertaken multi-cropping strategies on a single piece of land to mitigate the loss as much as possible. Once the flood water recedes, they quickly make the land cultivable and plant crops like wheat, mustard, and jute. Communities have also learned to take risks and do not stop cultivating despite the fear of losing crops.

Homestead gardening – Homestead gardening has become an integral part of community life. Homestead gardening provides a good number of benefits. It provides basic nutritional support to the family members, and it saves a substantial amount of money that they would require to buy vegetables.

Livestock and poultry farming – Almost all families living on the char land have stocks of livestock and poultry. Given the nature of the environment, duck is a popular choice for them since duck rearing on char land does not require duck feed. It makes duck rearing a more profitable and productive practice. They also provide homemade low-cost feed made from left-over food for chickens. Eggs provide the basic

source of protein for families. A fraction of the eggs are also saved for manual breeding. During haat days, some families also sell eggs to the local market. Many families have also opted for pigeon farming on a smaller scale. They have customized the slatted sheds of goats/sheep for rearing pigeons.

Figure 6 Self-adaptation efforts include ground nut cultivation, homestead gardening and pigeon farming.

Duck Rearing – Duck rearing on char areas is an outstanding adaptation strategy taken by the communities for several compelling reasons. First, ducks are free grazing animals and even during floods, their habitat does not require much attention. Second, in riverine areas there is an ample supply of food in nature for ducks. Therefore, there is low or no need for additional feed. Third, free grazing ducks are more resistant to diseases. Fourth, duck rearing is purely organic in nature, offering healthier nutrition sources for vulnerable communities. Fifth, duck rearing contributes to fulfilling the protein requirements of local households. Once households meet their protein and egg needs, any surplus can be sold in the market, providing an economic opportunity for the community. This sustainable practice not only ensures food security but also creates a potential income source. Lastly, ducks can swim and adapt well in water, which makes them well suited for flood conditions. This gives communities more benefits during challenging times like floods since they do not need to arrange separate shelters for ducks.

Pigeon Farming – Pigeon farming in char areas stands out as a strategic adaptation. Alongside livestock, pigeon farming is undertaken in the same shelter. First, pigeons require small and minimal infrastructure which can be made by the households using their left-over wood. Second, it doesn't require a separate structure to protect them so families can use the livestock shelter (slatted house). Third, pigeons can adapt well in this situation and roam around for organic foods, so they need little attention to their habitat. Fourth, in riverine areas, natural food sources are abundant for pigeons which reduces the need for additional feed. Fifth, pigeon farming is inherently organic and provides healthier nutrition for vulnerable communities. Lastly, pigeon farming contributes to fulfilling protein requirements locally. Excess eggs and

protein can be sold, offering economic opportunities. This sustainable practice ensures food security and income generation.

Agency of Women – Some women played a crucial role in the transformative adaptation process, as they spearheaded efforts to find sustainable financial solutions for their families. Living with their in-laws straight after marriage, some women courageously addressed financial concerns, while emphasizing the importance of family cohesion. They stressed the importance of exploring local economic opportunities as their husbands were residing in Dhaka for income. They highlighted the local avenues of income to explore via their husbands such as farming, cattle rearing, and poultry to meet their daily needs, as well as substantially reducing the reliance on income from Dhaka.

By strongly demonstrating their agency, these women persuaded their families to manage financial resources to mortgage land, and to embark on local farming ventures. Their convincing arguments led their families to arrange funds for mortgaging land for farming purposes. Since then, their families have expanded the scale of agriculture not only on mortgaged land, but also on land they now own. As a result, the need for their husbands to earn money in Dhaka has decreased significantly. Their husbands now travel to Dhaka only once or twice a year for additional financial support, if necessary. It is crucial to mention that these women and men take part in agricultural activities collectively. Such collaborative efforts eliminate

Figure 7 Collective engagement of man and woman in the post-harvest crop processing

the costs of hiring additional human resources for tasks, from cultivation to post-harvest processing. As mentioned earlier in this report, such efforts also reduce the cost of cultivation and enhance financial gains from agriculture. In addition, these collaborative engagements strengthen family and social cohesion leading to greater community resilience. The whole story reflects not only the climate change adaptation efforts but also the strong agency of women that promotes sustainable livelihoods.

Financial Adaptation – There are certain innovative aspects in the financing mechanism of the ECCCP project. From interviews, it is evident that a blend of global, national, and local financing mechanisms has enabled the transformation in both the adaptation processes and outcomes. Formal and informal labor

provided by the beneficiaries has been estimated to a certain monetary value. For instance, the project implementation entity did not arrange the soil for plinth raise. It was arranged by the households collectively within a community. Similarly, the installation of sanitary latrines required both monetary and non-monetary contributions from the households. Non-monetary contributions include digging holes to install the rings and slabs. Such monetary and non-monetary contributions have given the beneficiaries a sense of ownership of the resources provided by the project. In addition, PKSF has a loan arrangement as part of the project co-financing. Figure 9 shows the aspects of financial innovation in the project.

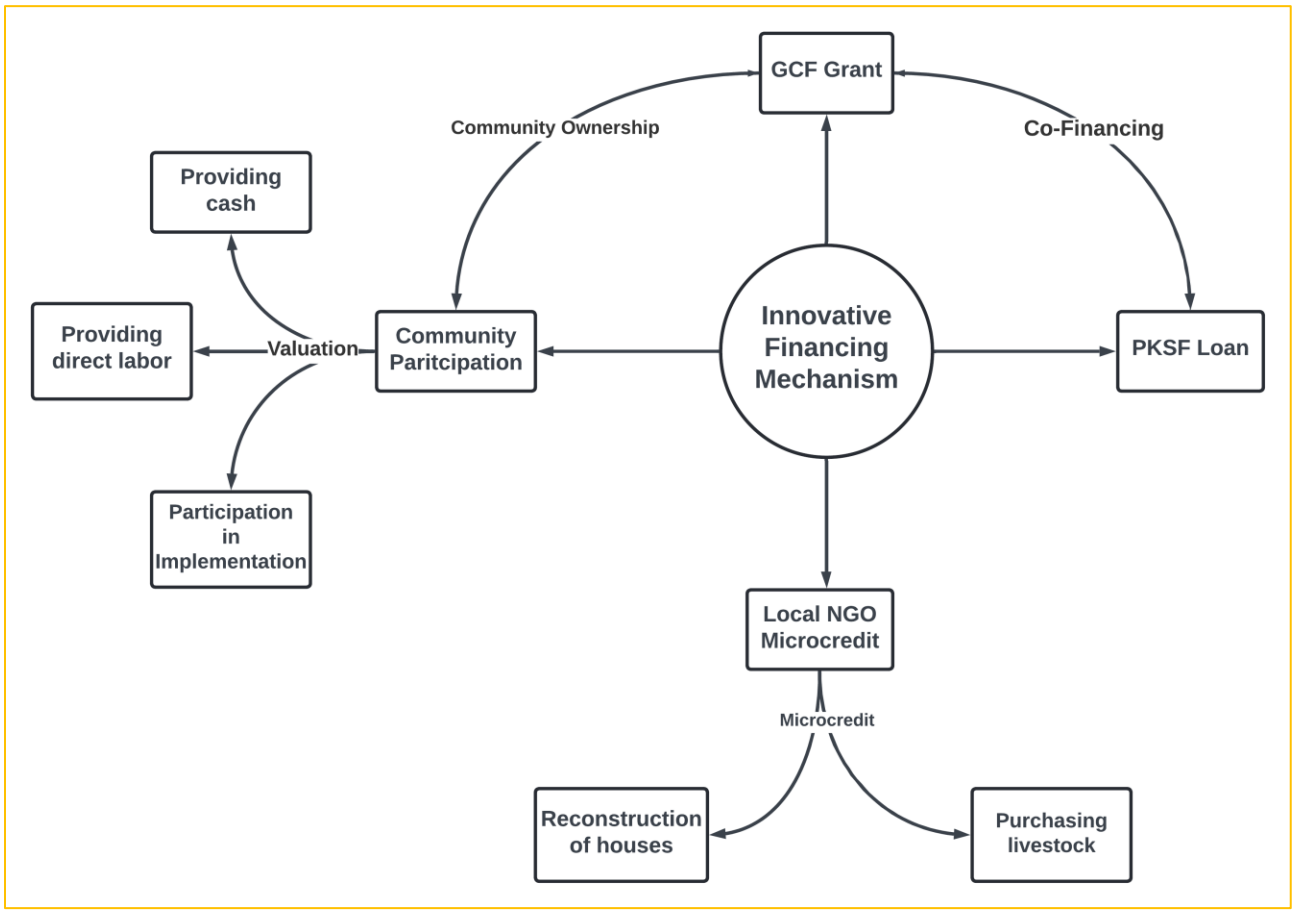

Figure 8 Components of innovation in the financing mechanism.

3.3 The Process of Transformation

Driving factors behind the transformation: The adaptation strategies taken by the communities and provided by the project, have contributed to some transformative changes leading to community resilience to flood. One of the most noteworthy developments is the prevention of recurrent displacement. Plinths were systematically raised on a cluster basis while meticulously determining the height, considering the recorded flood-water levels of the past two decades. Specifically, the plinth height was kept at 2 meters above the average floodwater level documented during major floods in the past. In 2022 and 2023, the flood water levels remained below the elevated house yard level and houses were not inundated. Recurrent displacement created a heavy financial burden on the communities. Each displacement instance had caused the costly endeavor of rebuilding houses on a new location. Prevention of displacement has eliminated the need for repeated construction of houses, thereby saving a significant portion of financial resources. Such financial savings mean people can explore other avenues for adaptation and a better livelihood. For instance, with greater savings many families now own boats. Previously, when male members needed to commute, they were dependent on borrowing a boat or spending a lot of money on transportation as boat owners would significantly raise the cost during floods. Having such assets gives them a sense of independence and flexibility. They can easily move to different locations for work and to the market to purchase any essential items during a flood. Also, during floods, when they need to cut and clean jute, it's much easier to transport with their own boat. The overall process of financial empowerment is illustrated in Figure 9. Prices of food and other essential items increase substantially during floods and purchasing essential foods puts an immense burden on vulnerable communities. As a result, they resort to detrimental coping mechanisms like significantly reducing their daily food intake, selling cows and goats at substantially lower prices, and selling valuable items like jewelry. It is found that during floods the price of a mature cow drops to half the regular price. A matured cow is usually sold for 90,000 BDT (760 USD) to 1.5 lacs BDT (1300 USD). The price gets even higher before Eid-Ul-Adha – one of the two major yearly Muslim celebrations. The adaptation effort has mitigated such impact, allowing communities to sell their livestock at full market value. Some negative coping strategies have life-threatening implications, especially for children and people in need of greater nutritional support. By creating and customizing space to cultivate vegetables, and farming poultry and livestock, communities now have a supply of home-grown produce, including vegetables, meat, eggs, and milk. This gives them the chance to rely less on the market and avoid the impact of inflation. In addition, selling left over items provides them with certain financial gains.

> The most important aspect of our life is a safe house. Plinth raise has provided us with a safe house. Everything including cattle feed remains dry, and we can also stay dry. We don't have to go anywhere else, leaving our homes. We don't have to move our cattle to other places. Everything stored in the cattle shed remains dry. Therefore, they don't get any disease either.
>
> **A WOMAN RESPONDENT FROM ISLAMPUR, JAMALPUR**

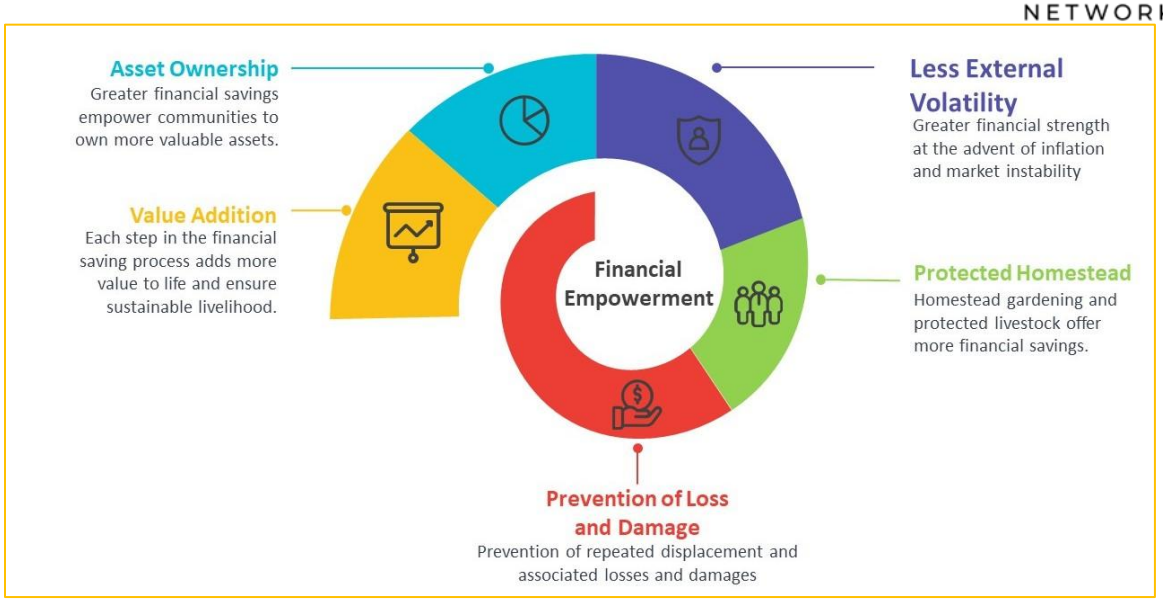

Figure 9 Towards financial empowerment through the prevention of damage and loss.

In a nutshell, such practices ensure food security and constant supply of nutritious foods even during emergencies. Figure 10 highlights some of transformative changes caused by direct adaptation interventions.

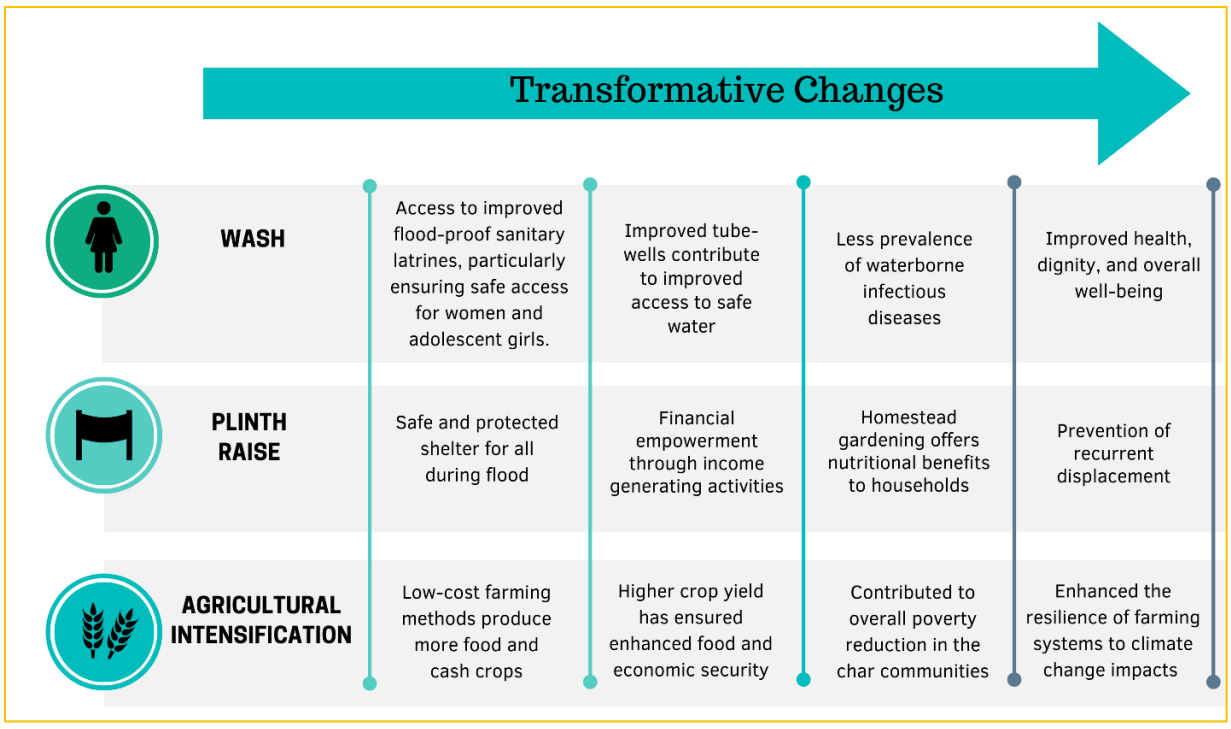

Figure 10 Some transformative changes due to adaptation efforts.

Selling livestock at much lower prices emerged as a common negative coping mechanism. Such mechanisms have burdened families with severe financial challenges. Livestock were sold during floods due to various reasons, primarily to cope with inflation. Many of the vulnerable communities resorted to

selling their livestock at much lower prices to procure daily essential items for survival. Lack of safe shelter exposed cows and goats to diseases, compelling people to either sell them at significantly lower prices or to slaughter them for consumption. Such negative coping mechanisms are now mitigated, as raised clusters provide safe shelter to livestock. Families are now better prepared to absorb financial shocks during and after flooding episodes.

It is well recognized that the inclusion and participation of women in development projects can significantly enhance the transformative outcomes of the interventions. This study also found several benefits of including women as primary beneficiaries and providing them with a certain level of agency. In the project areas, women have gained a greater sense of accomplishment and self-worth through inclusion and participation. Such accomplishments empowered them to challenge traditional perceptions regarding gender roles within the family and the community. In some cases, vulnerable women took the initiative to directly reach out to the Project Coordinator when their interests were not adequately being served in the community-led meetings. This eventually helped them to become included in the project as a beneficiary through a need assessment process. Through training and capacity building, women were able to challenge societal barriers and marital restrictions from in-laws.

Barriers to transformative adaptation: Despite the long-lasting benefits of transformative adaptation, several barriers were identified that hinder the process of transformation. Table 2 summarizes the key barriers for transformative adaptation in the study sites, along with their level of severity. The severity of each barrier is determined based on the frequency with which it was mentioned in the interviews by the respondents. It is crucial to state that key barriers identified in the field were shared with climate finance and adaptation experts for validation and triangulation.

Table 2 Barriers for transformative adaptation in the study sites

Key Barriers	**Description**	**Severity**
Data and Knowledge Gap	Data required to downscale the climatic risks in the context of Brahmaputra and Jamuna River Basin is not sufficient. Such data insufficiency has led to a gap in understanding the physical vulnerabilities of the river islands (chars) in the study areas. Apparently, there is inherent uncertainty regarding the stability of the char land, thereby impeding the assessment of the actual risks. As a result, interventions designed and implemented on these unstable lands may lack effectiveness. The risk of displacement eventually persists in the communities.	Very High
Lack of integrated Understanding of Resilience	There is lack of an integrated understanding of resilience in the context of char communities. Resilience is achieved when communities have access to all the required services they need for a sustainable livelihood. Though the project provides some of the basic livelihood supports, its impacts remain limited in bringing overall transformative changes. There is still a lack of access to health, education, and justice in the communities.	Medium

Key Barriers	Description	Severity
Result oriented myopia	The implementing NGOs seemed to suffer from result-oriented myopia, meaning that they were prioritizing short-term objectives over long-term impacts or sustainability. Such inclination stems from the need to ensure organizational and financial sustainability by securing more projects in the future. Observation reveals that the implementing entities are more experienced in delivering microfinance projects and have less exposure in the areas of transformative adaptation finance, particularly from global sources.	High
Political supremacy	The entrenched dominance of one-party politics and associated power dynamics poses a barrier to the transformative adaptation process in the study sites. Interviews highlight that the influence of a single party entity, being the state power for nearly two decades, significantly changes the local political landscape. The political hegemony has resulted in a convergence of previously opposing political leaders towards the ruling party, with an aim for survival and to expand politically owned businesses. As a result, many businesses, owned by the members and affiliates of the ruling party, have emerged who offer services like river dredging. Implementing entities have encountered challenges while initiating the plinth raise activities, since politically owned businesses lobbied aggressively for project contracts. Project staff have even received threats from the political leaders. In some cases of pervasive political influence, project activities could not be implemented in at least two sites. Therefore, political hegemony not only makes the procurement process complex, but also undermines the principles of transformative adaptation. Such influence exacerbates the vulnerability of the communities to flood and other climatic events.	High
Structural inequality	Structural inequality is manifested in numerous ways in the char areas of Kurigram and Jamalpur, leading to widespread vulnerability. Char communities lack essential services like healthcare, education, adequate infrastructure, and sanitation which demonstrates a strong 'development neglect'. They also have extremely limited access to local government institutions. People in char communities have been practicing farming based on local knowledge for decades. In this process, they have developed outstanding skills and resilience. While designing climate change adaptation projects, there is a lack of framework to incorporate local knowledge and skills. Such inequalities worsen their ability to adapt to the harsh environmental conditions.	Very High

Key Barriers	Description	Severity
Absence of transboundary river management	The Brahmaputra-Jamuna River Basin is characterized by high discharges and sediment transport from upstream. It has a lot of implications for flooding, erosion and formation of char lands, and riverbank erosion. Interviews highlighted that chars that were assumed stable are now facing sudden erosion, leading to vulnerability of the communities. Therefore, a collaborative mechanism for sharing hydrological information and data between the riparian countries (India, China, and Bangladesh) is essential to determine the physical vulnerability of the char lands. This will lead to effective design and implementation of adaptation interventions in the study sites.	Medium

4 Discussion

In the first part of this section, we will present an analysis of the transformative adaptation processes, supported by literature. Later, our focus will shift to the analysis of the finance mechanisms behind the adaptation interventions under the ECCCP project. This study has identified that the adaptation strategies have created some scope for financial gain for the households. Due to plinth raise, houses are protected and no longer require frequent repairing due to damage caused by flood. Though plinth raise offers a host of financial benefits, the cost effectiveness may not remain the same given the future impacts of climate change. To ensure adaptation finance to be transformative, there is a dire need for integration of other disaster risk reduction interventions along with plinth raise and house reconstruction activities, targeting the poor and extremely poor communities (Hochrainer-Stigler, Linnerooth-Bayer, & Mochizuki , 2019). Homestead vegetable and fruit cultivation has saved money as they do not need to buy day-to-day food supplies. They can also sell left-over vegetables and fruits to the local market. At the same time, cows, goats, sheep, and chicken fulfil the needs of protein and fat, and they can also sell milk and eggs in the market. A large amount of money is earned by selling cows and goats in the local market. Such money saving initiatives have enhanced their ability to ensure access to more capital. A wealth of research indicates that improved agricultural practices have positive influences on household nutrition status, leading to a lowered stunting of growth in children under five years of age through improved dietary intakes. (Issahaku, Manteaw, & Wrigley-Asante, 2023).

Over the past few years, the meaning of adaptation to climate change has moved far from the understanding of vulnerability, to finding answers to questions like ‘whether’, ‘why’, and ‘where’ adaptation is needed. That brings us onto topics of adequacy and effectiveness of adaptation to climate change. One common approach to determine whether an adaptation intervention is transformative or not depends on how the adaptation investments maximize the benefits of the intervention and minimize the certain costs (Singh, et al., 2022). In our study we have explored that the adaptation interventions have offered a host of other financial gains for the households. The prevention of recurrent displacement has eliminated the cost of repairing houses and the fear of losing valuable assets. It is estimated that approximately 300 - 500 USD is saved annually per household due to the elimination of repeated repairing activities. Some of the communities are financially more empowered and motivated to make further

economic investments. Another approach of determining the effectiveness of adaptation in terms of transformation focuses on whether there is any change in the overall capabilities of the vulnerable population. Such capabilities are characterized by material well-being, relational well-being, and subjective well-being (White, 2010). In relation to our study, we have seen a substantial change in the well-being of the communities. For instance, women were exercising a certain level of agency to make families more resilient. Cluster based houses, sanitary latrines and water sources on the raised plinths have ensured greater social cohesion. Communities are no longer in fear of displacement and losing valuable assets, leading to no negative coping mechanism being adopted by them. Adaptation becomes transformative when it aligns with the principles of sustainable development. Therefore, other interventions geared towards poverty reduction, ensuring adequate healthcare, and reducing gender inequality, supplement the adaptation efforts and generate sustainable outcomes (Nelson, Lemos, Eakin, & Lo, 2016). However, according to the observation in our study, deep rooted structural inequality has imposed the burden of 'development neglect' on the communities. Lack of access to many basic services including health and education have significantly reinforced the vulnerability to climate change. Therefore, a few adaptation interventions are not able to bring overall transformative changes in the communities in terms of resilience.

At this point of the discussion, we will take a critical stance to analyze the adaptation interventions that are discussed throughout this report. In literature, it is understood that transformative adaptation strategies protect vulnerable people, allow them to function to attain well-being, and give them the ability to largely address uncertainty (Schipper, Maladaptation: When Adaptation to Climate Change Goes Very Wrong, 2020; Fedele, Donatti, Harvey, Hannah, & Hole, 2019). In our study, we have already highlighted the transformative changes (also in Figure 11).

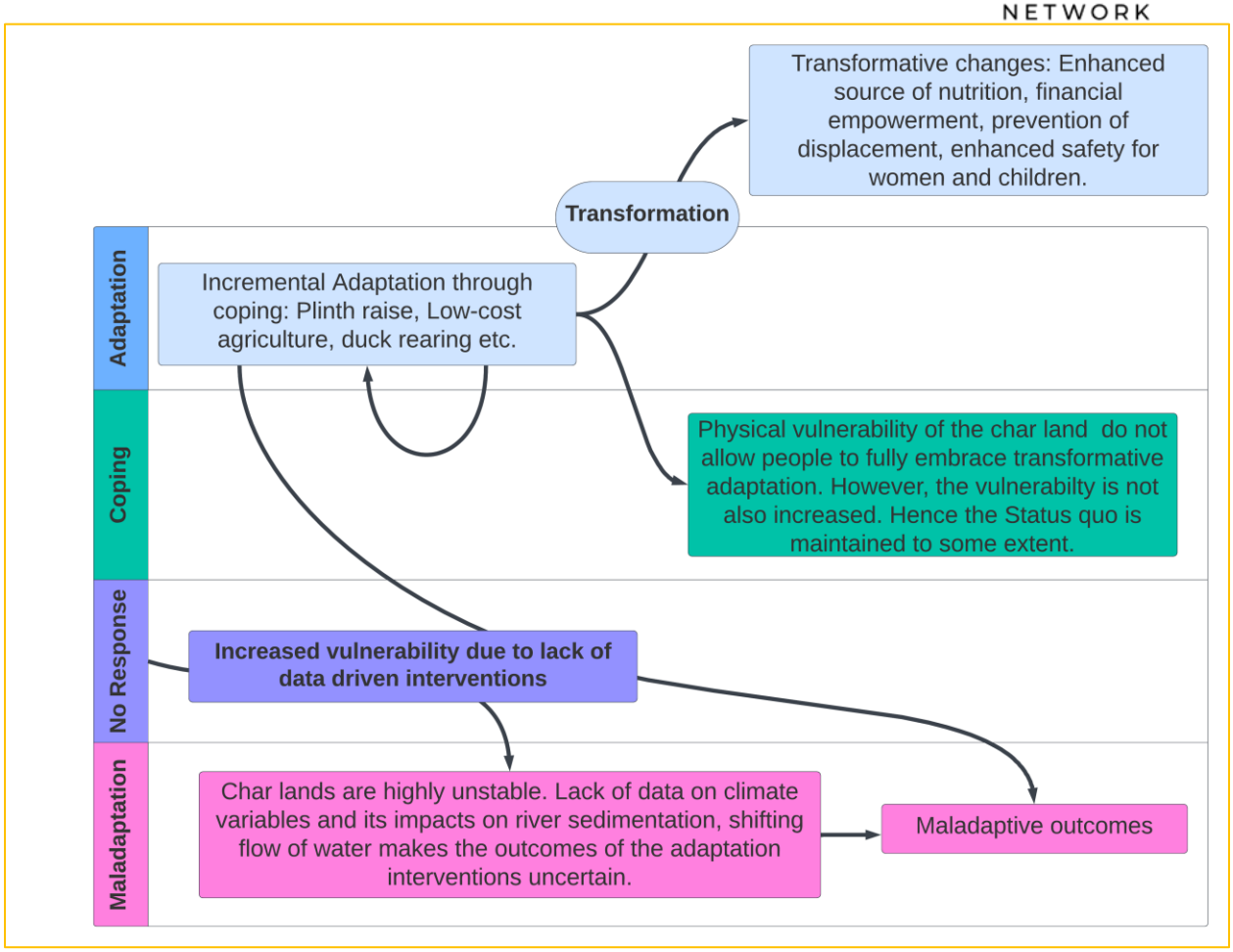

Figure 11 Possible outcome pathways of the adaptation interventions.

An adaptive strategy may bring maladaptive outcomes over time because the climate keeps changing, with the potential to aggravate impacts on both human and natural systems (Schipper, 2020). In our case, designing an adaptation project without paying adequate attention to the physical vulnerability of the char land from existing climate projections may put the project at risk of collapse. There is a need to conduct a 'community rationale' assessment to align project activities with community needs as well as to take community capacity into consideration. At the current mechanism, it is mostly a top-down approach where climate rationale is well integrated in the design of the project. However, community skills and resources were not taken into consideration. Hence, the plinth raise remained the key adaptation activity in the project and it ignored the physical vulnerability of the char land. Some studies report that the chars of the Jamuna Brahmaputra River basin area have become short-lived compared to the past (Oberhagemann, Sarker, & Huque, 2021). Therefore, to ensure adaptation is transformative, it requires regular analysis of river characteristics such as sedimentation rate, sediment load, water flow, and channel depth and width using remote sensing and GIS. There is a need for scaling up actions to prevent loss and damage faced by the communities. While accessing international climate funds is time consuming and bureaucratic, this undermines the necessity of quick funding modalities for communities to prepare for unprecedented and rapidly escalating challenges.

Though the ECCCP project has made substantial progress in terms of transformative adaptation, there are certain areas of concern. First, many people in the vulnerable communities were left out from the project due to their lack of access to resources like soil or land and lack of capacity to manage finance. In addition, the larger households required more soil to raise the plinth. They got excluded from the project interventions due to higher costs associated with higher soil requirements. This may be considered a learning point for the future. Future projects could implement supportive programs to support communities to arrange required resources. Learning the best adaptation practices from other countries can also be included in the project design. For instance, projects aiming towards transformative adaptation in India have components to actively engage communities in planning and implementing floor protection measures. Incentives in various forms can also shape the supporting mechanism to ensure inclusion. For instance, microfinance schemes with low-interest rates can be specifically designed for vulnerable communities to ensure they are included in the project activities. Non-economic incentives like ensuring access to social safety net schemes can be motivating for communities. Second, the terrain of the char lands is uneven, and houses are scattered across the area. To achieve the project criteria and to make the implementation process smoother, multiple households were grouped together to make cost-effective clusters while raising plinths. This has increased the density of households on a small cluster. Therefore, plinth raise for some selected households has given rise to a new social dynamic. People living in char areas usually have close ties with their neighbors and relatives. However, those who still live on low land often feel hesitant to seek assistance from the project beneficiaries during emergencies. Clusters still get waterlogged during rainy seasons leading to isolation due to lack of proper transportation. For financial reasons, some vulnerable people were also left out from other benefits of the project. For instance, a good number of households were not provided with WASH facilities due to their financial inability. Lack of access to sanitation exacerbates their vulnerability, especially impacting women and adolescent girls - despite living on the new cluster. People residing on the char lands of Jamuna-Brahmaputra River basin are exceptionally vulnerable to an array of climate events including flood, drought, tropical storms, heavy rains, and land erosion (Haque, Islam, Sikder, Islam, & Tabassum , 2023). However, the project only addresses certain flood-related vulnerability, leaving other impacts on livelihoods due to storms, heavy rain, and erosion unaddressed. Therefore, socioeconomic and health related vulnerabilities persist within the community. In addition, our study observes that several other NGOs are also focusing on similar activities addressing a certain part of vulnerability, leading to a gap in the overall resilience. It is crucial to state that NGOs do not even include vulnerable communities in the microfinance scheme given the continuous risks of erosion threatening the physical assets of the vulnerable communities.

In terms of the transformational characteristics of the financing mechanism, our study strongly felt the necessity for a paradigm shift to ensure greater transparency, accountability and stronger alignment of qualitative assessment with data. It indicates that there needs to be a balance between quality and quantity in financing for adaptation projects. This balance can be achieved through adopting more bottom-up approaches to understand the local narratives on how climate change affects livelihoods and develop a comprehensive contextualized needs assessment. This study identifies that current adaptation financing is heavily influenced by political actions and wrong perceptions. For instance, in char areas human migration is a natural process given the underlying reasons behind the causes of vulnerability. Hence, financing for transformative adaptation should focus on how to facilitate the migration process so that people can ensure improved livelihood as an outcome of migration. Currently, adaptation finance

addresses the local causes of vulnerability, but the broader underlying reasons remain unaddressed. Therefore, a little change is observed in the actual vulnerability in the long run. One of the key aspects of financing by global entities like Green Climate Fund is heavily criticized by interviewees due to the bureaucracies involved in accessing the funds. For instance, it took roughly five years to get the approval of funding from GCF after the application was submitted. By the time the project was approved, many of the contextual characteristics had already been changed. Interviews with key informants revealed that there is injustice in the funding mechanism itself. To access GCF fund, only an authorized national designated entity (NAE) can apply for funds. This hinders the process of empowerment of the local stakeholders who are at the forefront of the climate crisis and are the first responders as well as working closely with the vulnerable communities. Another very important aspect that emerged from the interviews focuses on making the funding process faster and more anticipatory. Since many of the disasters can be anticipated, forecast-based and anticipatory funding can substantially reduce the loss and damage due to disasters. In addition, such financing can reduce the cost of relief and rehabilitation. One such mechanism is forecast-based financing which allows quick release of funds based on flood predictions for reinforcing embankments, distributing emergency supplies, and preparing evacuation plans particularly for vulnerable populations. In such cases, a certain level of early warning is considered as a factor in triggering the release of funds. Local government offices in Bangladesh have some fund allocations that can be potentially brought under this mechanism.

At the end of the discussion session, we aim to highlight the pertinent issues but at a much greater scale related to transformative adaptation. We highlight that there is lack of data and evidence to support transformative adaptation project designing and implementation in countries like Bangladesh. The global financing mechanisms are systematically developed whereas the contextual needs where finance will come are not systematically assessed. In certain cases, global financing entities focus more on transparency and accountability, but less on the scale, impact, and intersections in a specific climate change context. On the other hand, national and local entities who receive the finance tend to focus on some selective adaptation strategies. There are twofold reasons behind it. First, local and national entities are politically motivated to bring more funds and distribute those to their constituencies. Second, they have the fear of failure when it comes to trying innovative adaptation strategies while challenging the status quo. Therefore, they avoid taking risks and focus on known, small-scale adaptation strategies. It is increasingly recognized that there must be a value addition in the overall funding mechanism which is currently missing.

5 Conclusion

In conclusion, we would like to highlight that the adaptation strategies that we identified and analyzed have greatly improved the overall resilience of vulnerable communities to flood. However, we also recognize that there are certain areas of concern where addressing those greater benefits of transformative adaptation could be achieved. We strongly recommend that there is still a need for the integration of bottom-up approaches in designing climate change adaptation projects in Bangladesh. Such approaches may include the assessment of community needs and the examination of physical vulnerability to identify the underlying reasons. The project outcomes are expected to be greatly enhanced if these aspects are included in the design phase of the project. We also highly recommend that

there is a need for value addition in the overall financing mechanism, from global to local level. It can be done through relating data to the local knowledge, addressing and contextualizing the diverse intersections of sustainable livelihoods, redesigning of international financing mechanisms to make it more realistic for developing countries, and streamlining adaptation funding with disaster risk reduction interventions.

References

Abedin, M., & Hosenuzzaman, M. (2023). Change in cropping pattern and soil health in relation to climate change and salinity in coastal Bangladesh. *Multi-Hazard Vulnerability and Resilience Building*, 315-332. doi:https://doi.org/10.1016/B978-0-323-95682-6.00006-1

Ahmed, I., Ayeb-Karlsson, S., Geest, K., Huq, S., & Jordan, J. (2019). Climate change, environmental stress and loss of livelihoods can push people towards illegal activities: a case study from coastal Bangladesh. *Climate and Development, 11*(10), 907-917. doi: https://doi.org/10.1080/17565529.2019.1586638

Ahmed, M., & Haq, S. (2019). Indigenous people's perceptions about climate change, forest resource management, and coping strategies: a comparative study in Bangladesh. *Environment, Development and Sustainability, 21*, 679-708. Retrieved from https://link.springer.com/article/10.1007/s10668-017-0055-1

Azad, M., Islam, A., Ayen, K., Rahman, M., Shahid, S., & Mallick, J. (2022). Changes in monsoon precipitation patterns over Bangladesh and its teleconnections with global climate. *Theoretical and Applied Climatology, 148*, 1261–1278. Retrieved from https://link.springer.com/article/10.1007/s00704-022-03996-8

Barua, P., Rahman, S., & Molla, M. (2019). Impact of river erosion on livelihood and coping strategies of displaced people in South-Eastern Bangladesh. *International Journal of Migration and Residential Mobility, 2*(1), 34-55. doi:https://doi.org/10.1504/IJMRM.2019.103275

Biswas, R., & Rahman, A. (2023). Adaptation to climate change: A study on regional climate change adaptation policy and practice framework. *Journal of Environmental Management, 336*.

Brouwer, R., Akter, S., Brander, L., & Haque, E. (2007). Socioeconomic vulnerability and adaptation to environmental risk: a case study of climate change and flooding in Bangladesh. *Risk Analysis, 27*(2), 313-326. doi:https://doi.org/10.1111/j.1539-6924.2007.00884.x

Chowdhury, M., Hasan, M., & Islam, S. (2022). Climate change adaptation in Bangladesh: Current practices, challenges and the way forward. *The Journal of Climate Change and Health, 6*. doi:https://doi.org/10.1016/j.joclim.2021.100108

Dewan, A., Corner, R., Saleem, A., Rahman, M., Haider, M., Rahman, M., & Sarker, M. (2017). Assessing channel changes of the Ganges-Padma River system in Bangladesh using Landsat and hydrological data. *Geomorphology, 276*, 257-279. doi:https://doi.org/10.1016/j.geomorph.2016.10.017

Eckstein, D., Künzel, V., & Schäfer, L. (2021). *Global Climate Risk Index 2021 Who suffers Most from Extreme Weather Events? Weather-related Loss Events in 2019 and 2000 to 2019.* Bonn: Germanwatch. Retrieved from https://www.germanwatch.org/en/19777

Fedele, G., Donatti, C., Harvey, C., Hannah, L., & Hole, D. (2019). Transformative adaptation to climate change for sustainable social-ecological systems. *Environmental Science & Policy, 101*, 116-125. doi:https://doi.org/10.1016/j.envsci.2019.07.001

Guo-Yu, R., & SHRESTHA, A. (2017). Climate change in the Hindu Kush Himalaya. *Advances in Climate Change Research*, 1-4.

Haque, M., Islam, S., Sikder, M., Islam, M., & Tabassum , A. (2023). Assessment of flood vulnerability in Jamuna floodplain: a case study in Jamalpur district, Bangladesh. *Natural Hazards, 116*, 341-363. doi:https://link.springer.com/article/10.1007/s11069-022-05677-1

Haque, S., & Nahar, N. (2023). Bangladesh: Climate Change Issues, Mitigation, and Adaptation in the Water Sector. *ACS EST Water, 3*(6), 1484–1501. doi:https://pubs.acs.org/doi/full/10.1021/acsestwater.2c00450

Hochrainer-Stigler, S., Linnerooth-Bayer, J., & Mochizuki , J. (2019). Flood Proofing Low-Income Houses in India: an Application of Climate-Sensitive Probabilistic Benefit-Cost Analysis. *Economics of Disasters and Climate Change, 3*, 23-38. Retrieved from https://link.springer.com/article/10.1007/s41885-018-0032-7#Sec13

Hossain, N., Nitu, N., Malak, M., Quader, M., Haque, M., & Akand, K. (2023). Livelihoods under pressure: insights from riverine community in Bangladesh. *Asian Geographer*. doi:https://doi.org/10.1080/10225706.2023.2217805

Hossain, S., Delin, H., & Mingying, M. (2022). Aftermath of climate change on Bangladesh economy: an analysis of the dynamic computable general equilibrium model. *Journal of Water and Climate Chang, 13*(7), 2597–2609. doi:https://doi.org/10.2166/wcc.2022.412

Islam, M., & Sharabony, A. (2023). Characteristics of Flood in the Meghna River Basin Within Bangladesh. In A. Islam, P. Shit, D. Datta, M. Islam, S. Roy, S. Ghosh, & B. Das, *Floods in the Ganga–Brahmaputra–Meghna Delta* (pp. 423–447). Cham: Springer.

Issahaku, D., Manteaw, B., & Wrigley-Asante, C. (2023). Climate change and food systems: Linking adaptive capacity and nutritional needs of low-income households in Ghana. *PLOS Climate, 2*(5). doi:https://doi.org/10.1371/journal.pclm.0000154

Kaiser, Z. (2023). Analysis of the livelihood and health of internally displaced persons due to riverbank erosion in Bangladesh. *Journal of Migration and Health, 7*. doi:https://doi.org/10.1016/j.jmh.2023.100157

Kuhl, L., Rahman, M., McCraine, S., Krause, D., Hossain, M., Bahadur, A., & Huq, S. (2021). Transformational Adaptation in the Context of Coastal Cities. *Annual Review of Environment and Resources*. doi:https://doi.org/10.1146/annurev-environ-012420-045211

Li, M. (2023). Adaptation to expected and unexpected weather fluctuations: Evidence from Bangladeshi smallholder farmers. *World Development, 161*. doi:https://doi.org/10.1016/j.worlddev.2022.106066

Nelson, D., Lemos, M., Eakin, H., & Lo, Y.-J. (2016). The limits of poverty reduction in support of climate change adaptation. *Environmental Research Letters, 11*(9). doi:10.1088/1748-9326/11/9/094011

Oberhagemann, K., Sarker, M., & Huque , I. (2021). The Morphology of Riverine Chars. In M. Zaman, & M. Alam, *Living on the Edge.* (pp. 121-140). Cham: Springer. doi:https://doi.org/10.1007/978-3-030-73592-0_8

PKSF. (2014). *CCCP Communique.* Dhaka: Palli Karma-Sahayak Foundation.

Rahman, M., Rahaman, M., Biswas, J., Rahman, N., Islam, M., Sarkar, M., . . . Maniruzzaman, M. (2023). Climate change and risk scenario in Bangladesh. *Asia-Pacific Journal of Regional Science, 7*, 381–404. Retrieved from https://link.springer.com/article/10.1007/s41685-022-00252-9#citeas

Saha, T., & Pal, S. (2019). Exploring physical wetland vulnerability of Atreyee river basin in India and Bangladesh using logistic regression and fuzzy logic approaches. *Ecological Indicators, 98*, 251-265. doi:https://doi.org/10.1016/j.ecolind.2018.11.009

Schipper, E. (2020). Maladaptation: When Adaptation to Climate Change Goes Very Wrong. *One Earth*.

Schipper, E. (2020). Maladaptation: When Adaptation to Climate Change Goes Very Wrong. *One Earth*. doi:https://doi.org/10.1016/j.oneear.2020.09.014

Singh, C., Iyer, S., New, M., Few, R., Kuchimanchi, B., Segnon, A., & Morchaing, D. (2022). Interrogating 'effectiveness' in climate change adaptation: 11 guiding principles for adaptation research and practice. *Climate and Development, 14*(7), 650-664. doi:https://doi.org/10.1080/17565529.2021.1964937

Talukder, B., Matthew, R., vanLoon, G., Bunch, M., Hipel, K., & Orbinski, J. (2021). Melting of Himalayan glaciers and planetary health. *Current Opinion in Environmental Sustainability, 50*, 98-108. doi:https://doi.org/10.1016/j.cosust.2021.02.002

Uddin, K., & Matin, M. (2021). Potential flood hazard zonation and flood shelter suitability mapping for disaster risk mitigation in Bangladesh using geospatial technology. *Progress in Disaster Science, 11*. doi:https://doi.org/10.1016/j.pdisas.2021.100185

Westoby, R., Rahman, M., McNamara, K., Huq, S., Clissold, R., & Khan, M. (2020). Sharing Adaptation Failure to Improve Adaptation Outcomes. *One Earth*.

White, S. (2010). Analysing wellbeing: A framework for development. *Development in Practice, 20*(2), 58–172. doi:https://doi.org/10.1080/09614520903564199

Work, C., Rong, V., Song, D., & Scheidel, A. (2019). Maladaptation and development as usual? Investigating climate change mitigation and adaptation projects in Cambodia. *Climate Policy, 19*(1), 47-62. doi:https://doi.org/10.1080/14693062.2018.1527677

***Note**: Images featured on the cover page and in the report were taken by Md. Ekhtekharul Islam during the fieldwork conducted from 18-29 December, 2023. Prior consent was obtained from human subjects before capturing photographs.*

Appendix A: List of Acronyms

ECCCP	Extended Community Climate Change Project- Flood
GCF	Green Climate Fund
GBM	Ganga, Brahmaputra, and Meghna
IE	Implementing Entity
IPCC	Inter-Governmental Panel on Climate Change
NDE	National Designate Entity
PKSF	Palli Karma-Sahayak Foundation
PO	Partner Organization
WASH	Water, sanitation, and hygiene

Appendix B: Checklists & Consent Letters

Checklist – In-depth Interviews with Project Beneficiaries

1. Have you experienced flooding or other disasters in your community? If so, could you share your experiences and the impact it had on your life and community? (focus both on before and after the project is implemented) (আপনি কি আপনার সম্প্রদায়ে বন্যা বা অন্যান্য দুর্যোগের সম্মুখীন হয়েছেন? যদি তাই হয়, আপনি কি আপনার অভিজ্ঞতা এবং আপনার জীবন এবং সম্প্রদায়ের উপর এর প্রভাব শেয়ার করতে পারেন?)

2. In your opinion, what positive changes or benefits has the ECCCP project brought to your life and community? Have you observed any negative consequences or challenges resulting from the project? (আপনার মতে, বন্যা স্থিতিস্থাপকতা প্রকল্প আপনার এবং আপনার সম্প্রদায়ের জন্য কোন ইতিবাচক পরিবর্তন বা সুবিধা এনেছে? আপনি কি প্রকল্পের ফলে কোন নেতিবাচক ফলাফল বা চ্যালেঞ্জ লক্ষ্য করেছেন?)

3. How has the community accepted the climate change adaptation strategies introduced by the project? Can you share specific examples of how these strategies have influenced daily life and community well-being? (প্রকল্প দ্বারা প্রবর্তিত জলবায়ু পরিবর্তন অভিযোজন কৌশলগুলি সম্প্রদায় কীভাবে গ্রহণ করেছে? আপনি কি এই কৌশলগুলি দৈনন্দিন জীবন এবং সম্প্রদায়ের মঙ্গলকে প্রভাবিত করেছে তার নির্দিষ্ট উদাহরণগুলি ভাগ করতে পারেন?)

4. Are these project activities able to withstand floods like the flood that happened 2017? Why or why not? (এই প্রকল্প কার্যক্রম কি 2017 সালের বন্যার মতো বন্যা প্রতিরোধ করতে সক্ষম?)

5. Can flood protection be obtained by raising plinths? How? Do you think this can provide protection in the long term? (বাড়ির আশপাশ উঁচু করে কি বন্যা থেকে সুরক্ষা পাওয়া যায়? এটা কি দীর্ঘমেয়াদি কোনো সুরক্ষা বলে আপনি মনে করেন?)

6. How frequently do you repair your houses provided by the project? Are they stronger than traditional houses? (প্রকল্প থেকে প্রদত্ত আপনার ঘরগুলি আপনি কত ঘন ঘন মেরামত করেন? তারা কি সাধারণ ঘরের চেয়ে শক্তিশালী?)

7. Do these houses provide additional comfort and safety for women? How? (এই ঘরগুলি কি মহিলাদের জন্য অতিরিক্ত আরাম এবং নিরাপত্তা প্রদান করে? কিভাবে?)

8. Do you think the sanitary latrines will long last? (আপনি কি মনে করেন স্যানিটারি ল্যাট্রিন দীর্ঘস্থায়ী হবে?)

9. Do climate resilient crops help to survive in a better way? (জলবায়ু স্থিতিস্থাপক ফসল কি ভাল উপায়ে বেঁচে থাকতে সাহায্য করবে?)

10. You get livestock from the project. How does it help? Do you know how to protect the livestock during flooding? (আপনি প্রকল্প থেকে গবাদি পশু পান। এটা কিভাবে সাহায্য করে? আপনি কি বন্যার সময় গবাদি পশু রক্ষা করতে জানেন?)

11. How does adding more women headed households in the project bring better outcomes? (ask differently to man and woman), To man: how receptive are you to the fact that women get more benefits through a project? To woman: How do you feel to be engaged in the project? What are the perceptions of men regarding this? (কিভাবে এই প্রকল্পে আরও বেশি মহিলা প্রধান পরিবার যুক্ত করা আরও ভাল ফলাফল নিয়ে আসে? (পুরুষ এবং মহিলাকে আলাদাভাবে জিজ্ঞাসা করুন), পুরুষের কাছে: একটি প্রকল্পের মাধ্যমে মহিলারা আরও সুবিধা পান এই বিষয়টিতে আপনি কতটা গ্রহণযোগ্য? মহিলার কাছে: প্রজেক্টে যুক্ত হতে পেরে কেমন লাগছে? এই বিষয়ে পুরুষদের উপলব্ধি কি?)

12. What alternative income arrangements have you made? (বিকল্প আয়ের কি কি ব্যবস্থা তৈরি করেছেন?)

13. Due to the support given by the project could you revert the costs: house repair cost, crop damage cost, loss of livestock, loss of income, transport cost to go and come back from shelter. (প্রকল্প থেকে প্রদত্ত সহায়তার কারণে আপনি খরচগুলি বাঁচাতে পারেন: বাড়ি মেরামতের খরচ, ফসলের ক্ষতির খরচ, গবাদি পশুর ক্ষতি, আয়ের ক্ষতি, আশ্রয় থেকে ফিরে আসার জন্য পরিবহন খরচ।)

14. Do you get early warning before flood? Is it easy to understand? Why or why not? (বন্যার আগে আপনি কি আগাম সতর্কতা পান? এটা বোঝা সহজ? কেন অথবা কেন নয়?)

15. Have you received any training to deal with the effects of climate change? What is your opinion on the effectiveness of these trainings? What things or things did you use from these trainings? And how? Have there been any changes to your overall finances? (জলুবায়ু পরিবর্তনের প্রভাব মোকাবিলা করতে আপনি কি কোনো ধরণের প্রশিক্ষন নিয়েছেন? এইসব প্রশিক্ষনের কার্যকারিতা নিয়ে আপনার মতামত কি? এইসব প্রশিক্ষন থেকে কি কি জিনিস বা বিষয় আপনি কাজে লাগিয়েছেন? এবং কিভাবে? আপনার সামগ্রিক আর্থিক কোনো পরিবর্তন হয়েছে কি?)

16. Do you still consider moving to a new place for livelihood? (আপনি কি এখনও জীবিকার জন্য একটি নতুন জায়গায় চলে যাওয়ার কথা বিবেচনা করেন?)

Checklist – In-depth interviews with project non-beneficiaries

1. Have you personally experienced flooding or other disasters in your community? If so, could you share your experiences and the impact it had on your life and community? (আপনি কি আপনার সম্প্রদায়ে বন্যা বা অন্যান্য দুর্যোগের সম্মুখীন হয়েছেন? যদি তাই হয়, আপনি কি আপনার অভিজ্ঞতা এবং আপনার জীবন এবং সম্প্রদায়ের উপর এর প্রভাব শেয়ার করতে পারেন?)

2. Are you aware of the flood resilience project being implemented in your community, even though you are not a direct beneficiary? How did you first learn about it? (আপনি কি প্রত্যক্ষ সুবিধাভোগী না হওয়া সত্ত্বেও আপনার সম্প্রদায়ে বন্যা প্রতিরোধী প্রকল্প বাস্তবায়নের বিষয়ে সচেতন? আপনি এটি সম্পর্কে প্রথম কিভাবে জানলেন?)

3. In your opinion, what positive changes or benefits has the ECCP project brought to your community? Have you observed any negative consequences or challenges resulting from the project? (আপনার মতে, বন্যা স্থিতিস্থাপকতা প্রকল্প আপনার সম্প্রদায়ের জন্য কোন ইতিবাচক পরিবর্তন বা সুবিধা এনেছে? আপনি কি প্রকল্পের ফলে কোন নেতিবাচক ফলাফল বা চ্যালেঞ্জ লক্ষ্য করেছেন?)

4. How has the community as a whole adapted to the flood resilience strategies introduced by the project, and what impact has it had on daily life? (প্রকল্প দ্বারা প্রবর্তিত জলবায়ু অভিযোজন কৌশলগুলির সাথে সম্প্রদায়টি কীভাবে সামগ্রিকভাবে খাপ খাইয়ে নিয়েছে এবং এটি দৈনন্দিন জীবনে কী প্রভাব ফেলেছে?)

5. Are these project activities able to withstand floods like the flood that happened 2017? (এই প্রকল্প কার্যক্রম কি 2017 সালের বন্যার মতো বন্যা প্রতিরোধ করতে সক্ষম?)

6. Have community members, including non-beneficiaries, experienced improved access to resources, such as information, infrastructure, or support, as a result of the ECCP project? ECCP (প্রকল্পের ফলে অ-সুবিধাভোগী সহ সম্প্রদায়ের সদস্যরা কি তথ্য, অবকাঠামো বা সহায়তার মতো সম্পদের উন্নত পরিষেবার অভিজ্ঞতা পেয়েছেন?)

7. Do you get early warning before flood? Is it easy to understand? Why or why not? (বন্যার আগে আপনি কি আগাম সতর্কতা পান? এটা বোঝা সহজ? কেন অথবা কেন নয়?)

8. Do you still consider moving to a new place for livelihood? (আপনি কি এখনও জীবিকার জন্য একটি নতুন জায়গায় চলে যাওয়ার কথা বিবেচনা করেন?)

Checklist for In-depth interview with Climate Change Adaptation Group (CCAG) Members

1. How do you identify the threats of climate change for your community? How do you anticipate the possible impacts from the threats? (আপনি কীভাবে আপনার সম্প্রদায়ের জন্য জলবায়ু পরিবর্তনের হুমকি চিহ্নিত করবেন? আপনি কিভাবে হুমকি থেকে সম্ভাব্য প্রভাব অনুমান করবেন?)

2. How do you plan to address those impacts? Any example of the process? (আপনি কিভাবে এই প্রভাবগুলি মোকাবেলা করার পরিকল্পনা করছেন? প্রক্রিয়ার কোন উদাহরণ?)

3. What adaptation strategies have been implemented as part of the flood resilience project? In your opinion, how effective have these strategies been in enhancing flood resilience within the community? (বন্যা প্রতিরোধী প্রকল্পের অংশ হিসাবে কোন অভিযোজন কৌশলগুলি বাস্তবায়িত হয়েছে? আপনার মতে, সম্প্রদায়ের মধ্যে বন্যার স্থিতিস্থাপকতা বাড়ানোর ক্ষেত্রে এই কৌশলগুলি কতটা কার্যকর হয়েছে?)

4. What are other adaptation strategies you may have taken beyond this ECCCP project? (এই ECCCP প্রকল্পের বাইরেও আপনি অন্য কোন অভিযোজন কৌশল গ্রহণ করেছেন?)

5. What do you consider the most significant successes or positive outcomes of the flood resilience project so far? Can you share any specific examples or success stories related to the project's impact on communities? (আপনি এখন পর্যন্ত বন্যা প্রতিরোধী প্রকল্পের সবচেয়ে উল্লেখযোগ্য সাফল্য বা ইতিবাচক ফলাফল কি বিবেচনা করেন? আপনি কি সম্প্রদায়ের উপর প্রকল্পের প্রভাব সম্পর্কিত কোন নির্দিষ্ট উদাহরণ বা সাফল্যের গল্প শেয়ার করতে পারেন?)

6. What skills did you gain from this group? And how to use those? (আপনি এই গ্রুপ থেকে কি দক্ষতা অর্জন করেছেন? এবং কিভাবে তাদের ব্যবহার করবেন?)

7. How did you share what you learned from this group with other members of your family and community? How are they benefiting? (এই গ্রুপ থেকে আপনি যা যা শিখেছেন তা আপনার পরিবারের বা সম্প্রদায়ের অন্য সদস্যদেরকে কিভাবে জানিয়েছেন? তারা কিভাব উপকৃত হচ্ছে?)

8. Does CCAG collaborate with local government institutions? How? What are the challenges they face? (CCAG কি স্থানীয় সরকার প্রতিষ্ঠানের সাথে সহযোগিতা করে? কিভাবে? কাজ করার সময় আপনি কোন চ্যালেঞ্জের সম্মুখীন হন?)

9. What challenges has the Climate Change Adaptation Group encountered in implementing the project initiatives? How have these challenges been addressed, and what strategies have been employed to overcome them? (প্রকল্প উদ্যোগ বাস্তবায়নে জলবায়ু পরিবর্তন অভিযোজন গ্রুপ কোন চ্যালেঞ্জের সম্মুখীন হয়েছে? এই চ্যালেঞ্জগুলিকে কীভাবে মোকাবেলা করা হয়েছে এবং সেগুলি অতিক্রম করার জন্য কী কৌশলগুলি ব্যবহার করা হয়েছে?)

10. Looking ahead, what are the group's priorities and goals for the continued implementation of the flood resilience project? (ভবিষ্যতে, বন্যা প্রতিরোধী প্রকল্পের অব্যাহত বাস্তবায়নের জন্য গ্রুপের অগ্রাধিকার এবং লক্ষ্যগুলি কী কী?)

11. After this project is ended, how will you manage this group? (এই প্রকল্পটি শেষ হওয়ার পরে, আপনি কীভাবে এই গ্রুপটি পরিচালনা করবেন?)

Checklist -Key Informant Interviews with Project Implementation Entity (NDP/SSS)

1. How are the ECCCP activities different from other projects? homestead plinth raising, flood-resilient crops cultivation, goat/sheep rearing in slatted sheds, drinking water and sanitation, as well as improving knowledge on climate change. Are these able to bring transformation?

2. How are the beneficiaries selected in the project?

3. Why did you prioritize the women headed households in your project?

4. How did the project include traditional knowledge and practices in project activities?

5. Diversion of water in the upstream has long been an issue affecting the region (Kurigram). How do you frame this issue while taking a climate change adaptation project?

6. GBM Delta brings a lot of sediments that get deposited downstream, and the river is losing the carrying capacity. How do you think a proper management of sediment could supplement the project activities?

7. What kind of local capacity-building efforts were integrated into the project?

8. How has the project ensured that its impacts are long-lasting? Are there plans or strategies to scale up the project or replicate it in other regions?