CENTRE FOR POLICY DIALOGUE

Promotes inclusive policymaking

POLICY BRIEF

2021 (01)

Flood Management Perspectives in Bangladesh

An Assessment of Monsoon Flood in 2020

Md. Zafar Sadique and ***Md. Kamruzzaman***

Highlights

While the country was already feeling the brunt of the COVID-19 pandemic, the monsoon flood in 2020 added to the miseries of the vulnerable segment of population.

This study has assessed the impact of the flood from various dimensions, including an assessment of the pre- and post-flood management by the government, along with a set of policy recommendations to improve the government's future flood management efforts and initiatives.

The government should revisit and update poverty map and address their vulnerabilities accordingly—by offering corrective measures, necessary relief items, appropriate rehabilitation programmes, and allowing favourable financing scheme.

The government should focus on prioritising repair and maintenance, ensuring local participation, and addressing capacity constraint in terms of services delivery.

cpd.org.bd

cpd.org.bd

cpdbd

CPDBangladesh

House 40/C, Road 11 (new)
Dhanmondi, Dhaka-1209
Bangladesh
Telephone: (+88 02) 55001185, 48118090, 58156979
Fax: (+88 02) 55001181
E-mail: info@cpd.org.bd

1. Background

The recent flood in 2020, which began in late June, led to the inundation to vast areas of agricultural lands and homesteads, and caused partial or complete damage to public infrastructures. As a result, livelihoods were affected, and economic opportunities had to be forgone. The situation report prepared by the Ministry of Disaster Management and Relief (MoDMR) reported that, as of 4 August 2020, about 54.5 lakhs people had been affected, which represents over 6 per cent of the population in the affected 33 districts. While the country was already feeling the brunt of the COVID-19 pandemic, the flood added to the miseries of the vulnerable segment of population.

It is to be noted that due to its unique geographical setting, physiographic characteristics, and a large and distinct hydraulic system, Bangladesh is one of the most flood-prone regions in the world (Rahman & Salehin, 2013). Typically, one-fifth to one-third of the country gets inundated due to overflowing of rivers during monsoon (Southgate et al., 2013). Throughout history, floods had caused considerable destruction and increased sufferings in Bangladesh, especially in 1974, 1984 1987, 1988, 1998, 2004 and 2017.

An early assessment of flood in 2020 had revealed that 15 districts were the worst affected, which ranged from moderately to severely impacted (NAWG, 2020). Jamalpur, Kurigram and Lalmonirhat were among the most affected districts whereas Rajbari, Bogura and Manikganj were among the moderately affected ones. The second spell of the flood was observed from 9 July 2020 when water levels began to rise again in the Brahmaputra and Upper Meghna basins and later in the Padma basin (Start Network, 2020). This prolonged presence of flood over two months at stretch had aggravated the situation, particularly the prospect of *aman* rice. In addition to siltation, several districts including Faridpur had also been engulfed in water after embankments had collapsed at many points.

In responding to the flood, the Government of Bangladesh (GoB) and the non-government organisations (NGOs) have taken several measures during and post-flood period to address and mitigate the adverse impacts. The government's response measures included—distribution of necessary items, such as rice, cash, corrugated iron, and animal food, and also undertaking agricultural rehabilitation schemes.

This study has attempted to assess the impact of the monsoon flood in 2020 from various dimensions, including an assessment of the pre- and post-flood management by the government, along with a set of policy recommendations to improve the government's future flood management efforts and initiatives. Previously, CPD carried out assessment studies concerning floods in 2004, 2007 and 2017.

The broad objective of CPD's assessment is to understand the overall flood situation, the consequent damages and the response on the ground. Specific objectives of the assessment are:

a) to understand the intensity and impact of the flood;
b) to assess the adequacy and efficacy of overall relief and rehabilitation activities undertaken by the government;
c) to review the public food stock situation and its distribution during the time of flood;
d) to assess the damages due to flood and the needs of the flood-affected people, and
e) to articulate a set of recommendations to reduce the adverse effects.

2. Methodology of the Study

The CPD study team collected information from both primary and secondary sources. Maintaining the COVID-19 health restrictions, primary information was collated through telephonic interviews with Upazila Nirbahi Officers (UNOs) from *Gopalganj, Gaibandha, Jamalpur,* and *Sunamganj*; representatives from NGOs in *Gaibandha* and *Sirajganj*, and journalists from *haor* areas. In light of the COVID-19 situation, the CPD team was unable to undertake field investigation.

Relevant Government Orders (GOs) as regards relief activities, agricultural rehabilitation schemes were reviewed to analyse the efficacy of these measures. Relevant data supplements were collected from official sources including the Ministry of Disaster Management and Relief (MoDMR), Department of Disaster Management (DDM), Bangladesh Bureau of Statistics (BBS), Department of Food (DoF), and Department of Agricultural Extension (DAE). Other flood related non-state agency reports were also reviewed to get the perspectives right. However, support measures and programmes undertaken by various non-state organisations were not covered by the study.

The findings of the study were validated through a virtual public dialogue organised by CPD on 19 August 2020. The policy dialogue was attended by a number of high-level policymakers including the State Minister of Ministry of Disaster Management and Relief, top- and local-level government officials, representatives from the civil society, subject experts, academics, and journalists. Based on observations from the dialogue, critically analysed by the researchers, a set of recommendations were further pronounced.

3. Assessment of Flood in 2020

3.1 Assessment of damage and loss from flood 2020

A comparative analysis between the major floods (2004, 2007, 2017 and 2020) in the last two decades shows that the number of affected districts, upazilas, unions, households and people have gone down (Table 1). Additionally, the number of fatalities also shows a downward trend, with the lowest fatalities reported in 2020. However, as the population has increased over the years, the adverse impact of the flood is likely to be felt by a larger number of people from vulnerable groups. The incidence of flood coincided with COVID-19 pandemic, which further amplified the sufferings of the people. Hence, it is vital to understand the damages and losses incurred due to the flood in 2020.

Table 1: Comparable scenarios concerning recent floods

Particulars	Flood 2004	Flood 2007	Floods in 2017		Flood in 2020*
			April 2017	August 2017	
Affected districts	39	39	6	32	33
Affected upazilas	265	256	60	208	162
Affected unions	NA	2,057	450	1,324	1065
Affected pourashavas	NA	67	NA	64	NA
Affected HHs (Full/ Partial) (lakhs)	74.68	22.87	10.31	17.34	11.97
Affected people (lakhs)	3.63	1.07	46.68	82.02	50.29
Death (Drowning, snake bite etc)	747	554	10	147	44

*as of 14 August 2020.

Source: MoDMR (2020) and BBS Statistical Yearbook various issues.

Initially, CPD attempted to arrive at a monetary value for the damages caused by the 2020 flood. Due to unavailability of D-form[1] from the DDM, comprehensive damage estimate was not possible. Hence, the study team reviewed available and credible sources to report on the list of damages. Among others, the Needs Assessment Working Group (NAWG), led by the DDM and CARE, conducted an early assessment of the flood. As of 6 August 2020, an amount equivalent to BDT 357 crore (USD 42 million) worth of crops had been damaged according to the report (NAWG, 2020). NAWG also reported that out of 334 most affected unions, embankments in 220 unions had been damaged including 4 km long embankment in 97 unions (NAWG, 2020). A report by BRAC (2020) had also assessed damages and losses of nearly BDT 6,000 crore (equivalent to USD 704.67 million), as of 14 September 2020. They also reported a significant number of inundated households, loss of crops, damaged roads, sanitations, and educational institutes.

3.2 Relief distribution process

In order to assess the adequacy of the targeting method and the distribution of relief, it is important to understand how relief demands are addressed in the first place. Key informant interviews (KIIs) with several UNOs working across Bangladesh revealed the process of assessing relief demand and targeting of affected people. In general, upazila disaster management committee, humanitarian assistance committee and grassroots political leaders work together to carry out the needs analysis. Requests placed by affected people via 333 (emergency response hotline number) and upazila control room are also taken. In some cases, demand for relief is also assessed through:

- Poverty mapping using district-level poverty data (updated in 2016);
- Database of people called *Paribar Porichiti* which includes information on various socioeconomic indicators including house ownership and income; and
- Number of affected people living in shelters.

Following the initial appraisal, the volume of relief demand is submitted to the Deputy Commissioner (DC) from upazila level, which is then passed on to the MoDMR. Volume, i.e. how many reliefs in a package and frequency, i.e. how many times to be distributed, of packages vary based on needs at the upazila level.

[1]D-Form provides official information for determining losses and damages at the union/district level. The D-form contains loss/damage related data on affected number of people, fatalities, and households; and loss of properties and livestock; area of agricultural lands, roads, embankments; number of damaged culverts, schools and other institutions.

Local Union Parishad Chairman usually arranges relief distribution. Administrative officials at the local level are entasked to oversee relief distribution process. The KIIs revealed that such an approach often results in non-participatory decision making, which lacks inclusivity.

3.3 Assessment of the government relief activities in 2020

Table 2 below provides an overview of the relief efforts by the GoB until 14 August 2020. Thus, CPD assessed the efficacy of relief coverage through two approaches.

Table 2: Type of relief provided by GoB

Details	Allocation	Disbursed	Stock as % of allocation
GR rice (MT)	19,510	12,818	34.3%
GR cash (BDT cr.)	4.27	2.89	32.3%
Dry food (packets)	1,68,000	1,41,286	15.9%
Animal food (BDT cr.)	3.3	2.04	38.2%
Children's food (BDT cr.)	1.54	1.01	65.9%
House building grant (BDT cr.)	0.12	0.03	75.0%
CI Sheet (bundle)	400	100	75.0%

Note: GR = Gratuitous relief; MT = Metric ton.
Source: MoDMR (2020).

First, the coverage was assessed by assuming that each household to be comprised of 4.2 members and received (i) 20 kg of rice, (ii) BDT 1000 and (iii) one packet of dry food. Based on the calculations from the first approach, the district-wise household coverage of relief was plotted against poverty rates and the number of affected households to understand whether proper targeting had taken place. It is to be noted that as the D-forms were not available, it was also difficult to know the level of damage caused by the flood. In this regard, the study assessed the coverage of GR rice and GR cash. The findings of the two approaches are provided below:

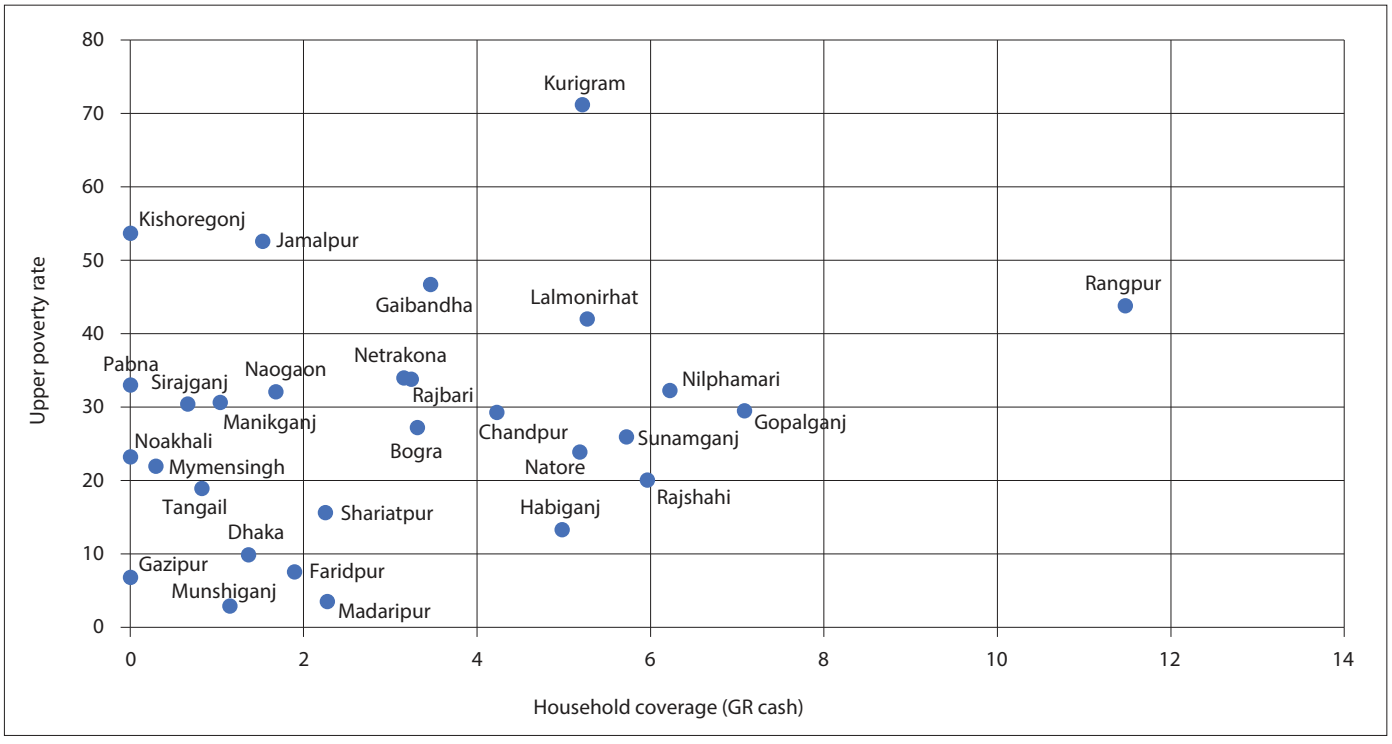
Approach 1: The following estimates were made under Approach 1:

a) If each family consumes 1.5 kg rice per day, 20 kg of rice will last only 13 days. Moreover, 46.2 kg rice per family will be needed to provide support for 30 days;
b) Among the affected households, about 54 per cent could be covered with current disbursement of rice. Another 11,128 MT of rice will be required to cover the rest of the affected households;
c) GR cash outreach is just 2 per cent of the affected households. At least BDT 117 crore will be needed to cover the remainder 98 per cent of the affected households;
d) Of the affected population, only 12 per cent have received a packet of dry food. Additional 10.56 lakh packets would be needed to cover the remainder households.

Approach 2: As mentioned earlier, under Approach 2, the coverage of selected relief items was assessed based on upper poverty rate and number of affected households. Overall, the analysis revealed that the government's targets were largely based on poverty rates. As a result, several districts with a high number of affected households had low coverage. The findings are provided below:

Coverage of GR cash. Figure 1 provides a scatter plot of GR cash coverage of households against upper poverty rate. The plot shows that cash

Figure 1: District-wise upper poverty rate by household coverage (GR cash)* *(in per cent)*



*as of 14 August 2020.
Source: Authors' illustrations based on data from the MoDMR (2020) and BBS (2019).

distribution is consistent with poverty rates except for some outliers. Kurigram and Jamalpur districts have high poverty rates but had a comparatively lower range of coverage.

Coverage of GR rice. Figure 2 provides the scatter plots of GR rice coverage of households against upper poverty rate. Overall coverage of GR rice distribution is also consistent with poverty rates. However, low poverty areas had higher coverage (e.g. Nilphamari, Chandpur, Gopalganj) while high poverty areas had low coverage (e.g. Kurigram, Jamalpur).

3.4 Comments on relief distribution and coverage

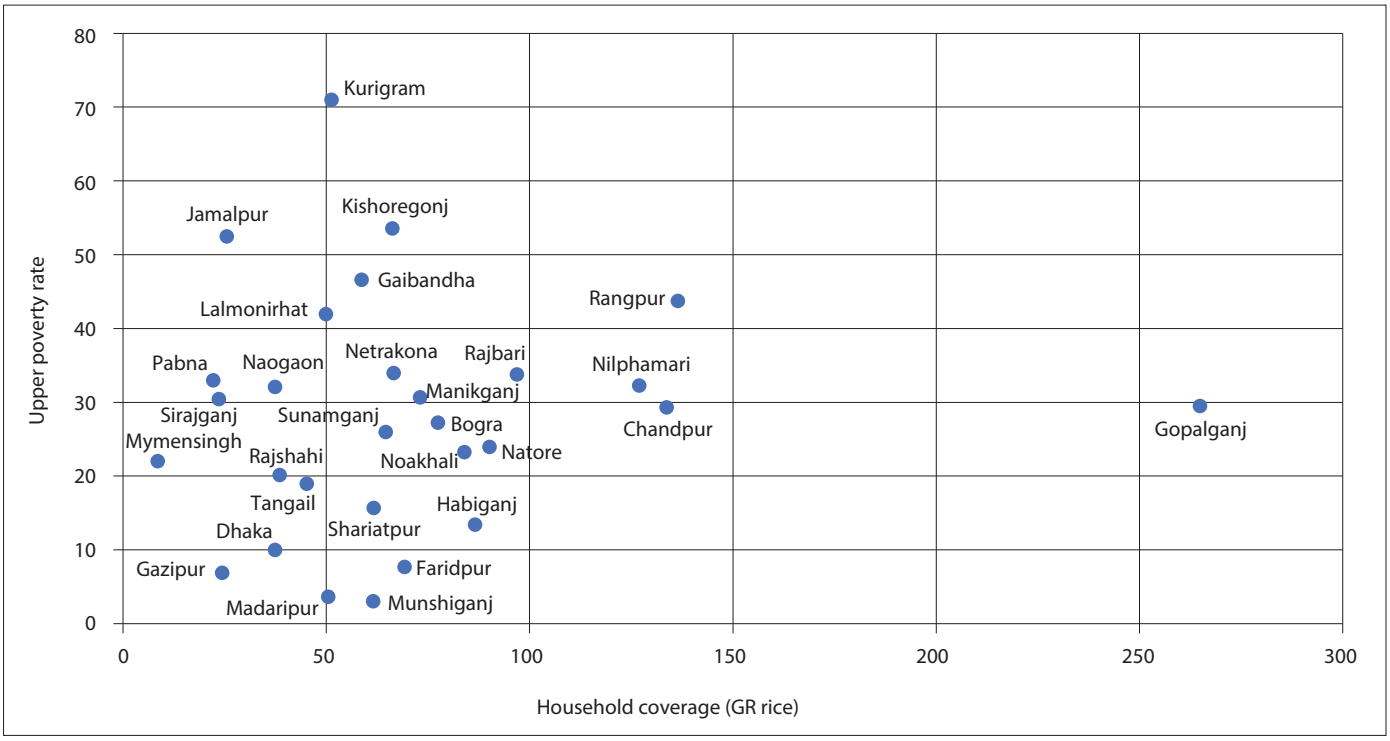
Based on the analysis using data and discussion with relevant stakeholders, capacity constraint in terms of services delivery can be observed. Government relief distribution had been predominantly driven by poverty information. However, the multidimensional nature of adverse impacts which increases the vulnerability of the population was not reflected in the distribution mechanism. Field observations revealed both irregularities and inadequacy in the volume of relief disbursed.

Some marginalised groups, including the COVID-19-induced 'new poor', are also at high risk. The situation is aggravated by the scarcity of both human and animal food. This also increases the risk of malnutrition among the impacted household members. Additionally, there is also the issue of occupational immobility particularly due to the lack of financial capacity. KIIs from the haor region revealed that many farmers are unable to switch to fishing during the flood. During the flood, the farmers already lose a significant portion of their produce before harvesting. This already puts an enormous financial burden on them. While fishing could provide an alternative livelihood for affected farmers, lack of finance to purchase fishing equipment deters them from changing occupation.

3.5 An assessment of two agriculture rehabilitation schemes

Going beyond the relief efforts, authors have reviewed two agricultural rehabilitation schemes which were undertaken by the government during the flood in 2020 from its agricultural rehabilitation assistance budget (Code no. 1200006505) of BDT 300 crore. The total budget for these two schemes is only 3.6 per cent of total budget allocated for FY2020-21. Both the schemes were planned to be executed through zila agricultural rehabilitation implementation committee.

Figure 2: District-wise upper poverty rate by household coverage (GR rice) ***(in per cent)***



*as of 14 August 2020.

Source: Authors' illustrations based on data from the MoDMR (2020) and BBS (2019).

On 27 July 2020, a GO was announced from the Ministry of Agriculture (MoA) to provide seed support for transplantation of Aman seed (Nabi variety) on trays targeting the affected and marginal farmers. The allocated amount for the scheme was BDT 54.1 lakhs while the targeted beneficiaries were only 1,600 farmers from 100 upazilas of 25 affected districts. The farmers will receive replantation seeds to cultivate 1 bigha of land. Both in terms of affected farmers covered and affected Aman crop area supported per farmer, the scheme is not adequate.

The second scheme was announced on 6 August 2020 using the same budget to distribute leafy and other vegetable seeds among affected small and marginal farmers for the next season. The budget for this scheme was BDT 10.27 crore and it was planned to cover over 1.5 lakhs of farmer households from 37 districts. More interestingly, three flood affected districts (Lakshmipur, Maulvibazar

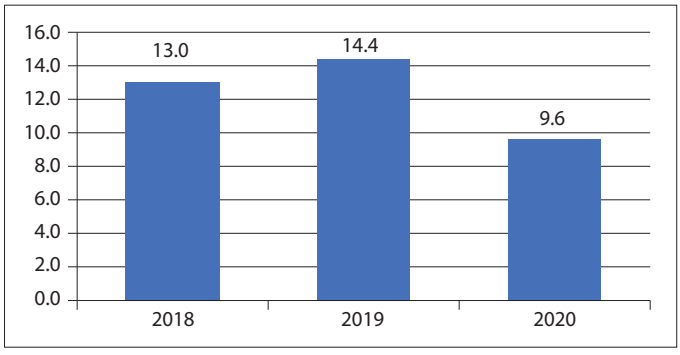
and Noakhali) were not part of the scheme. On the other hand, Chapainawabganj, Cumilla, Dinajpur, Kushtia, Narayanganj, Narsingdi and Sherpur, which were not in DDM's flood affected districts lists, were included in this scheme. However, the GO did not mention the basis of this selection. As many marginal farmers do not have *Krishi Upokoron Shohayota Card* or bank account, they may not receive the benefit. While there are government schemes for flood affected farmers, rehabilitation measures for non-crop sectors (e.g. fisheries and livestock) often receive less attention.

3.6 An assessment of rice stock situation

Boro rice procurement target falls short by a big margin. Following the *boro* rice harvest season in April, every year, the government takes initiative to procure *boro* paddy from farmers and *boro* rice from millers at market prices to keep the balance of public food grain stock secure. The measure aims at keeping the balance between public food stock and public food distribution system, providing fair price to farmers and ensure feeding of the most vulnerable during trying times through open market sales (OMS) drives.

In 2020, the government had targeted to procure 8 lakhs MT of paddy at a rate of BDT 26/kg and 11.5 lakhs MT of parboiled and sunburn rice at a rate between BDT 35-36/kg during this *boro* season.[2] After the end of procurement season on 15 September 2020, Government managed to procure only 27.4 per cent (or 2.19 lakhs MT) of paddy and 66.7 per cent (or 7.7 lakhs MT) of *boro* rice. In comparison, in 2019, 100 per cent of targeted *boro* paddy (or 4 lakhs MT at actual) and 87 per cent of targeted *boro* rice (or 10 lakhs MT at actual) had been procured (FPMU, 2020a). It is evident from observation that government was slow in mobilising procurement drive in a number of areas and many farmers sold their crops by then. On the other hand, government's procurement prices were on the lower side compared to the production price and also the market price (IFPRI, 2020). As a result, rice stock remained lower in 2020 compared to those of the last couple of years (Figure 3).

Figure 3: Public rice stock as of end of September in lakhs MT (after *boro* procurement season)



Source: Based on FMPU (2019) and FPMU (2020b) data.

Rice price has increased in the domestic market. Regular market price data reported from Trading Corporation of Bangladesh reveals that retail price of rice has been on rise in domestic market during and post-flood season. The nominal and real price of rice has increased by 9.85 per cent and 7.97 per cent between July and September 2020 (FPMU, 2020b). Poor and vulnerable groups will face difficulties if the price continues to rise, at a time when their income has suffered erosion due to the pandemic. The government has now resorted to import rice from international market at a time when rice price is high for successive months. Government has announced international tender to procure 1 lakh MT of rice in November 2020 with an aim to procure a total of 3 lakhs MT of rice in turns. However, the government keeps budget to import only 1 lakh MT of rice. In this respect, government may need to relocate its resources to import the additional amount of rice.

4. Challenges of Flood Management

Following national-level consultation with disaster and water management experts, policymakers, government officials, and discussions with relevant field-level stakeholders (local administrative officers, NGO officials and journalists), several policy concerns on related flood management issues were identified. The issues were not assessed quantitatively under this study; however, the identified challenges were no less important than what this particular study could quantitatively analysed. Major arguments of these identified policy concerns were presented below.

Emergence of new marginalised groups. The poorest segment of flood-affected areas are trapped in a vicious cycle of vulnerability as the fund for post-flood management may not suitably reach the hardest hit. They become more vulnerable because of various factors. These include—the loss of property, higher commodity prices in the marketplace due to the disruption of supply chain, and high cost of lending future for initiation of rebuilding process. During COVID-19 crisis, the flood in 2020 pushed many poor to vulnerable situation due to less mobility and loss of work for an indefinite period.

Local people are not well-embedded in the decision-making process. Although Upazila Nirbahi Officer's (UNO) offices have started engaging more people in local consultation meetings, yet the knowledge of local people is not well reflected in the decision-making process. As a result, the local problems are not addressed while undertaking various flood management plans. Mostly, those plans are designed from the centre in a top-down approach and implemented by the local administration without addressing necessary inputs from the local people. Localised approach to tackle local problems are not often considered with adequate attention.

Infrastructure restoration programmes do not receive adequate priority and attention. There are three parts to post-flood management as regards infrastructure restoration programmes. (a) *Emergency*: Building or repairing a minimum structure required for mobility; (b) *Periodic maintenance*: Repair structures or roads that are of a high importance and feasible given annual district budget for maintenance; (c) *Rehabilitation Part*: Reconstruction of roads, bridges and embankments which requires project approval. Field-level observations and government documents reveals emergency and periodic maintenance as part of infrastructure restoration process are often completed within a more time-bound approach. However, taking projects for the later one often gets delayed because of other political priorities and bureaucratic procedures, ignoring the needs of flood-affected people. In fact, rehabilitation part is not ideally a part of post-flood management

[2] A research by IFPRI (2020) recommended that government should procure more paddy than rice to give the maximum benefit to the farmers.

measures, rather a part of governments annual development programme (ADP) through various types of projects. Regular maintenance budget for existing infrastructure is not also a priority for concerned authorities.

NGO efforts are constrained by funding issues and health regulations. It is widely accepted that, in the post-disaster management phase, the role of the NGOs, voluntary organisations and individuals (through philanthropic private transfer) is critical. NGOs mostly provide flood relief and post-flood assistance in the forms of seed support, cash support, health check-ups, community-level medical support, repairing of sanitation, etc., to their respective clients. In view of changing global dynamics during COVID-19 crisis, NGOs are facing multidimensional challenges: (a) access to funds from development partners has shrunk; (b) lack of fund reduces the filed-level capacity of the local NGOs; (c) NGOs' income-generating activities become stalled and their financial space becomes narrow; (d) to ensure social distancing and health restrictions, community-level consultation meetings could not take place; (e) relief efforts have been slowed down with limited capacities as the NGOs' services call for door-to-door approach; and (f) operational costs become high.

Lack of coordination among responsible authorities. In Bangladesh, there are defined disaster management institutions in the national plan of disaster management. However, within the framework, the MoDMR, MoA, the Ministry of Water Resources (MoWR), the Ministry of Fisheries and Livestock (MoFL), the Ministry of Local Government, Rural Development and Co-operatives, the Ministry of Road Transport and Bridges, the Ministry of Planning (MoP), and the Ministry of Finance (MoF) are not directly linked. It reveals that why the study team has repeatedly observed lack of coordination among various departments and division of government. For example, as climate variations are more frequent, planning as regards water resource management—without taking into account the cropping season (that involves MoA)—will not work as it had worked previously. At the same time designing and implementing a new programme may require intensive involvement of MoF and MoP. Also, without an effective integrated flood management approach, and relevant coordination among various government agencies and departments, it would not be possible addressing these cross-cutting issues as regards flood management.

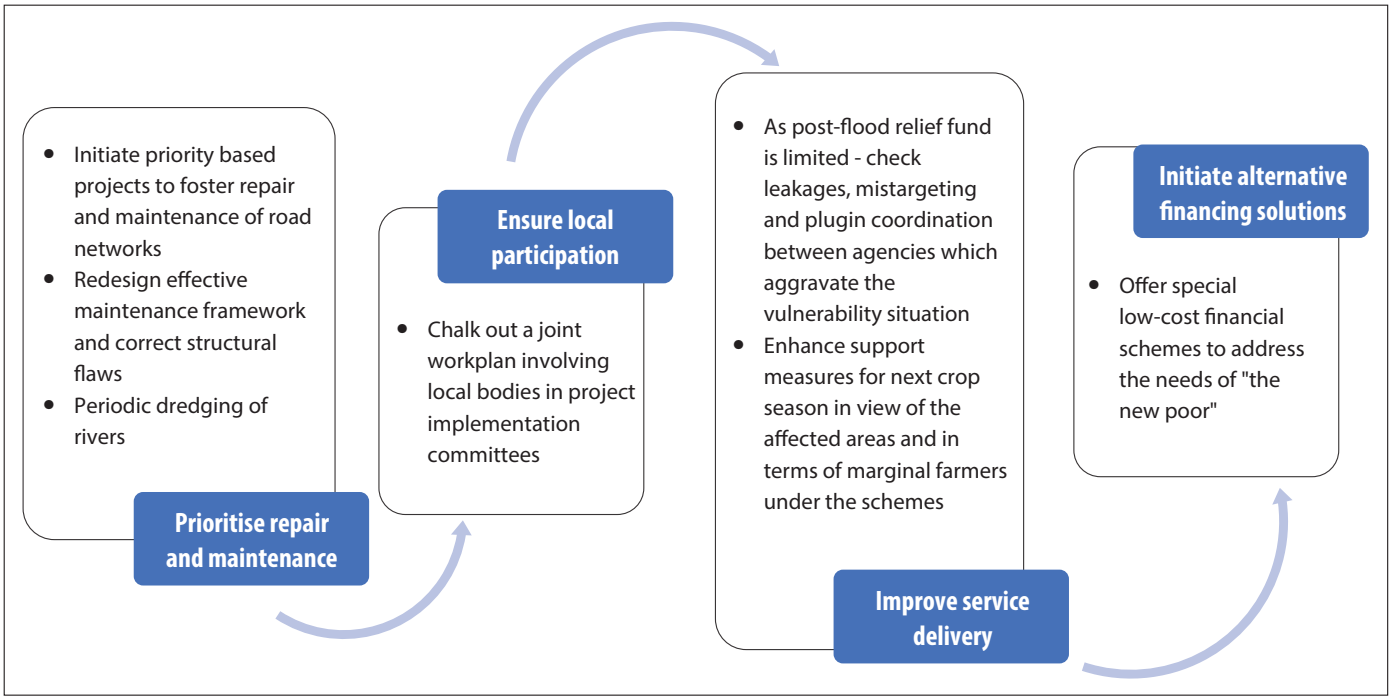
No coordinated approach was followed to generate data on disaster-related indicators. Generation of high quality and relevant disaster related data is important to take appropriate policy measures. In Bangladesh, Institute of Water Modelling (IWM) and Center for Environmental and Geographic Information Services (CEGIS) are responsible agencies to send alert to pertinent agencies regarding the onrush of disaster. On the other hand, post-disaster data are collected by DDM through DC offices. Respective DC offices rely on their UNO offices. The process of data collection is mostly based on manual observation and subject to selection bias. In addition, BBS and DAE, following a more scientific method, separately generate disaster data on agricultural crop loss after the flood. Bangladesh Water Development Board (BWDB), Local Government Engineering Division (LGED) and Roads and Highway Division (RHD) also record damages of their properties separately. Apart from that, MoFL collects some data in a fragmented manner. Although more accurate disaster data were available with various government departments, there is no system to integrate all these fragmented data into one integrated data portal.

5. Policy Recommendations

In view of the above discussions and identified challenges, the following policy initiatives need to be undertaken (Flowchart 1).

Address the vulnerabilities of COVID-19-induced 'new poor'. A significant portion of the total population has gone below the poverty line by

Flowchart 1: Flood risks mitigation framework



Source: Authors' elaborations.

losing work and livelihood due to the double blow that COVID-19 and flood have caused. The lower middle-income group is also at risk of becoming new poor. Their financial inabilities restrict them from occupational mobility (e.g. facilitating farmers in *haor* regions switching to fishing). Their household members are now prone to malnutrition. Even distress selling has gone down as the pandemic has eroded purchasing powers on many. In the light of the abovementioned facts, government should revisit and update poverty map and address their vulnerabilities accordingly —by offering corrective measures, necessary relief items, appropriate rehabilitation programmes, and allowing favourable financing scheme.

Expand relief efforts addressing the capacity constraint in terms of services delivery and attendants needs. Our analysis has clearly shown that in terms of coverage, targeting and allocations, the government's traditional relief efforts fall short of addressing the vulnerabilities and needs. The following is recommended to address the concerns: (a) Allocation of food and resources must be increased in a way which is commensurate with the demand utilising scarce resources; (b) Relief beneficiary listing mechanism should address the changes in poverty clusters and take into account the multidimensional nature of vulnerabilities faced by affected people; and (c) Leakages in the distribution channels of relief and rehabilitation programmes should be addressed. Beneficiary selection and relief disbursement through Union Parishad oftentimes lead to discrepancies. Participation of non-state actors should be encouraged both in relief distribution activities and enforcement of transparency in beneficiary selection. To plug operational leakage and irregularities during relief distribution, government should enhance vigilance by increasing field-level staff and introducing digital listing of relief disbursement (through innovative use of technology); (d) Government's relief efforts should look beyond traditional relief items (e.g. introducing cooked food, cooking fuel, safe drinking water, animal food and other healthcare articles including women's dignity kits); (e) To tackle overlapping, government response must be coordinated with NGOs and other philanthropic private transfers making appropriate use of digital technologies.

Retain NGO supports and address rehabilitation-related challenges. NGOs are last mile partner of government efforts to reach many remote places and affected people during floods. In the current context, fund constraints have severely impeded the capacity of NGOs to undertake such activities. The government may like to deliver the message to development partners for strengthening support to grassroots-level NGOs. The government should make use of the NGO networks to reach the remotest and farthest flood-affected areas. A GO-NGO partnership geared towards flood management will raise the efficiency of the post-flood management and rehabilitation programmes (e.g. to address multiple dimensions of health and other social hazards due to flood). Necessary safety nets need to be strengthened to reduce school drop-out rates caused by the double economic burden of COVID-19 and floods. Participation of the local people at grassroots level has to be encouraged in this regard.

Prioritse infrastructure restoration programmes and redesign flood management plans. Government's flood management and control activities appear to be losing steam. The most urgent demand to the government from the flood-affected people is to ensure effective drainage system and adequate maintenance of embankments that will secure their assets during flood. In line with this, our recommendations are as follows: (a) Urgent restoration of affected and faulty embankment and dams has to be carried out timely (i.e. should have been completed by the end of March); (b) Coordination among Ministries and agencies including LGED, Roads and Highways Department (R&HD), MoWR and MoF, and support from the local institutions is important to execute the task efficiently; (c) An effective framework is required to improve maintenance of existing flood protection infrastructures (newly established Water Committee may take the lead); (d) Projects need to be undertaken as part of integrated flood management framework on a priority basis to repair damaged road networks; (e) Periodic dredging of various cannels and rivers is a must to protect the ecosystem of wetlands; (f) Design flaws of infrastructures including bridge, culvert and road networks that cause waterlogging needs to be corrected and actions must be taken on an urgent basis; and (g) People, permanent residence, and assets should be gradually shifted from low-lying areas to secured areas surrounded by embankments to mitigate the severe damage from floods.

Secure food stock through agricultural resiliency and managing the Public Food Distribution System (PFDS). Flood resiliency needs to be enhanced in the agricultural sector. Agricultural rehabilitation programmes need to be redesigned keeping in mind the chance of incurring longstanding flood like the one of 2020. Farmers should be introduced with new varieties and technologies. Popularising flood resilient crops, use of technology and useful farming methods such as floating seedbeds, gardens, etc., can be explored at the flood-prone areas. Other non-crop sectors should be integrated in the agricultural rehabilitation work plan. Affected fish producers in urgent need should be provided with fingerlings to start fish culture anew. Adequacy and coverage of agricultural rehabilitation programmes can be extended through better use of agriculture subsidy budget.

Public food stocks must be raised in view of rising demand and to keep food market stable. Procurement price may need to be revisited during procurement of *aman* crop in view of low procurement of *boro* this year. The government should buy rice from the domestic market through an open tender in the event the target is not achieved for the next *boro* season. The government may need to go for limited-scale rice import in view of the lower food stock and rising food prices. The amount to be imported will need to be decided after carefully weighing the interests of consumers and farmers.

Address disaster data issue. Although more accurate disaster related data were available from various government departments, there is no system to integrate these fragmented data into one integrated data portal. The integrated data portal should not be a separate government initiative, rather DDM should get the mandate to integrate all disaster related data from relevant government departments and offices. In absence of such integrated data, even policy interventions and the monitoring (post-flood agricultural assistance; health and nutrition related interventions, repairing of infrastructure; new constructions of embankments, etc.) at post-flood stage are hampered.

REFERENCES

BBS. (2019). *Final Report on Household Income and Expenditure Survey 2016*. Dhaka: Bangladesh Bureau of Statistics (BBS), Ministry of Planning, Government of Bangladesh. Retrieved from https://drive.google.com/file/d/1TmUmC-0M3wC5IN6_tUxZUvTW2rmUxMce/view [accessed: 4 August 2020].

BRAC (2020). *Bangladesh flood 2020: Situation update#08 - September 14, 2020*. Retrieved from http://response.brac.net/wp-content/uploads/2020/09/SitRep-08_Bangladesh-Monsoon-Flood-2020_14-September-2020.pdf [accessed: 14 December 2020].

FPMU. (2019). *Bangladesh Food Situation Report 118*. Dhaka: Food Planning and Monitoring Unit (FPMU), Ministry of Food. Retrieved from http://fpmu.gov.bd/agridrupal/sites/default/files/FSR_118.pdf

FPMU. (2020a). *Government domestic boro procurement*. Retrieved from http://fpmu.gov.bd/fpmu-database/0302.htm [accessed: 15 December 2020].

FPMU. (2020b). *Bangladesh Food Situation Report 122*. Dhaka: Food Planning and Monitoring Unit (FPMU), Ministry of Food. Retrieved from http://fpmu.gov.bd/agridrupal/sites/default/files/FSR_122.pdf

IFPRI (2020). *Buy paddy from farmers, not rice from millers*. Retrieved from https://bangladesh.ifpri.info/2020/05/buy-paddy-from-farmers-not-rice-from-millers/

MoDMR. (2020). *Sharbik Bonnya Poristhitir Bishesh Protibedon (Special Flood Situation Report 14 August 2020)*. Dhaka: Ministry of Disaster Management and Relief (MoDMR), Government of Bangladesh.

NAWG. (2020). *Monsoon Floods 2020: Coordinated Preliminary Impact and Needs Assessment*. Dhaka: Needs Assessment Working Group (NAWG). Retrieved from https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/nawg_monsoon_flood_preliminary_impact_and_kin_20200802_final.pdf

Rahman, R., & Salehin, M. (2013). Flood risks and reduction approaches in Bangladesh. In R. Shaw, F. Mallick, & A. Islam (Eds.), *Disaster risk reduction approaches in Bangladesh*. Tokyo: Springer. doi:10.1007/978-4-431-54252-0_4

Southgate, R., Roth, C., Schneider, J., Shi, P., Onishi, T., & Wenger, D. (2013). *Using Science for Disaster Risk Reduction*. Report of the UNISDR Scientific and Technical Advisory Group – 2013. Geneva: United Nations International Strategy for Disaster Reduction (UNISDR). Retrieved from https://www.preventionweb.net/files/ 32609_stagreport2013assembled.pdf

Start Network. (2020). *Northern and Central Bangladesh Second Wave Flood*. Briefing Note. Dhaka: Start Fund Bangladesh. Retrieved from https://reliefweb.int/sites/reliefweb.int/files/resources/B0-34%20BN%20Flood%20Second%20Wave_06082020.pdf

Authors

Md. Zafar Sadique is a Senior Research Associate at the Centre for Policy Dialogue (CPD), Dhaka, Bangladesh. He can be reached at: zafar@cpd.org.bd

Md. Kamruzzaman is a former Senior Research Associate at the Centre for Policy Dialogue (CPD), Dhaka, Bangladesh. He can be reached at: kzaman.md92@gmail.com

Series Editor: *Dr Fahmida Khatun*, Executive Director, CPD

April 2021