

IMPROVING EARLY WARNINGS OF CASCADING RISKS TO FOOD SECURITY IN BANGLADESH

SUMMARY

Food security in climate-vulnerable districts like Satkhira, Rangpur, and Faridpur in Bangladesh is increasingly threatened by disasters that disrupt crop production, markets, water quality, and diets. Current early warning systems (EWS) focus on single hazards, lacking integration of cascading risks and food security indicators. Institutional silos limit cross-sectoral data sharing, and exclusion of women, elderly, and marginalized people weaken early action implementation. Opportunities to improve include developing digital platforms, a Common Alerting Protocol, and multi-hazard frameworks. People-centred, multi-hazard EWS aligned with food security dimensions (availability, access, utilization, and stability) plus inter-agency collaboration and community empowerment can strengthen resilience and reduce long-term humanitarian impacts in Bangladesh.

RECOMMENDATIONS

- **Conduct cross-sectoral risk mapping** of cascading hazards, develop localized risk profiles connecting hazards to crop cycles, markets, and nutrition, and integrate non-natural threats like pandemics. Document and validate traditional community knowledge to enhance EWS to better address interconnected risks to food security.
- **Strengthen EWS** by investing in localized monitoring of relevant indicators, including weather, crop health, prices, and water salinity. Coordinate and align the Integrated Food Security Phase Classification's -IPC's Food Security Cluster forecasts with existing hydrometeorological forecasting and dissemination agencies such as the Bangladesh Meteorological Department (BMD), the Flood Forecasting and Warning Centre (FFWC), the Department of Disaster Management (DDM), and the Department of Agricultural Extension (DAE) to enable impact-based forecasting. Define multi-level triggers, linking hazard forecasts and market shifts to enable timely anticipatory action.
- **Synthesize Food Security Cluster forecasts** across key ministries and departments to strengthen coordinated, people-centred early warning dissemination. Adopt a Common Alerting Protocol for timely, consistent warnings and issue impact-based advisories in local languages via trusted channels. Train agricultural extension officers as communicators, ensuring inclusive access for vulnerable groups.
- **Update contingency plans** for cascading disaster scenarios and allocate funds for anticipatory actions, including pre-positioned resources and shock-responsive social protection. Strengthen Food Security Cluster coordination for multi-agency responses and ensure inclusive preparedness measures, such as accessible shelters, to protect vulnerable groups during complex food security crises.

INTRODUCTION

Bangladesh, being one of the world's most climate-vulnerable countries, faces frequent natural and non-natural hazards that threaten food security. Floods, cyclones, droughts, erosion, and emerging hazards like heatwaves, salinity intrusion, and flash floods increasingly create cascading risks –

damaging crops, disrupting markets, and driving food price surges (Moon, 2023). These hazards disrupt food systems and undermine food security, particularly for smallholder farmers and marginalized communities. With climate change amplifying these threats, shifting from relief to proactive disaster risk reduction is critical. Strengthening EWS is central to protecting livelihoods and ensuring sustainable food security.

Approach and methodology

This study used mixed methods to assess EWS and cascading food security risks in Faridpur and Satkhira. Data included 23 community focus group discussions, 15 subnational key informant interviews, 21 national key informant interviews, and 732 household surveys across the study sites (Satkhira, Faridpur) and additional major food hubs (Rangpur, Sunamganj, Bandarban, and Dhaka; see Figure 1). An additional 17 'Missing Voices' interviews captured perspectives from marginalized groups (Practical Action, 2023).

FINDINGS

Food insecurity in Bangladesh

Overall, **35 per cent** of communities across all the study areas are classified as mildly food insecure, with **22 per cent** experiencing low food security and **26 per cent** experiencing very low food security.

According to this study, food shortages peak in July, often stemming from cascading impacts of April–June cyclones and flash floods, which damage crops, contaminate water, and disrupt supply chains (See Figure 2). Flooding

depletes household stocks, raises prices, and limits market access, driving a seasonal peak in food insecurity.

Satkhira faces moderate food insecurity due to salinity intrusion, monsoon-dependent aman rice losses from flooding, limited crop diversity, waterlogging, and cyclone impacts – factors compounded by socio-economic vulnerabilities (see Figure 3 and 5). Sunamganj's mild insecurity stems from flash floods disrupting boro rice harvests, though timely harvesting reduces risks. In Rangpur, the agricultural economy of the region heavily relies on cash crops, particularly jute, which, while economically valuable, do not directly contribute to local food availability, driving moderate insecurity.

Cascading risks to food systems and food security

Seventy-one per cent of study participants faced disruption to producing food due to hazardous events each year, and **74 per cent** reported that the food supply chain collapsed after a hazardous event. Natural hazards like cyclones, flash floods, and salinity intrusion directly impacted crop and aquaculture production, leading to significant crop loss and fish mortality. Study participants reported crop losses (**63 per cent** reported that crops washed away, and **70 per cent** reported damage) and aquaculture breaches (**34 per cent**). Coastal regions face limited arable land due to salinity, restricting crop diversity.

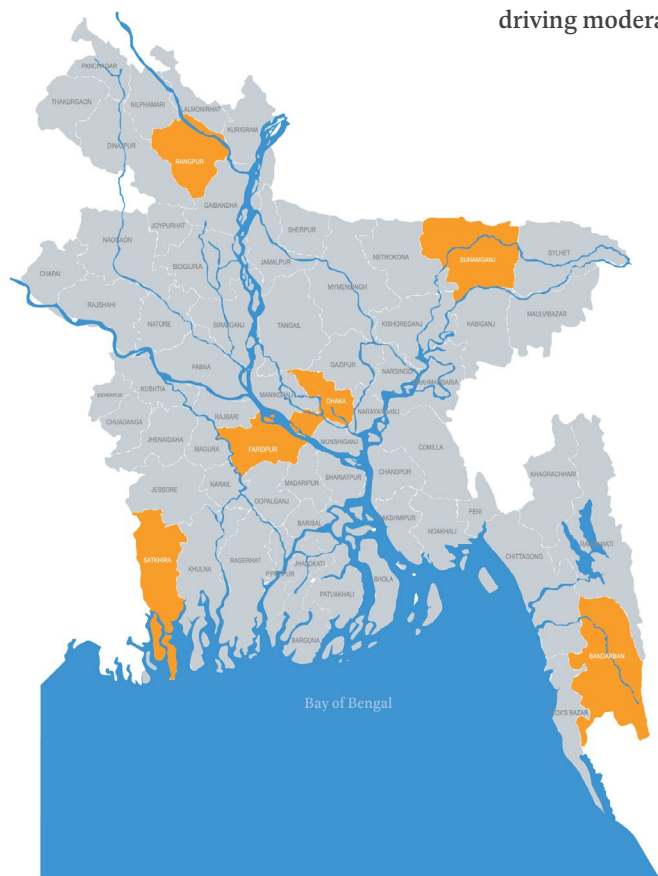


Figure 1: Study Area. Credit: Practical Action, 2024

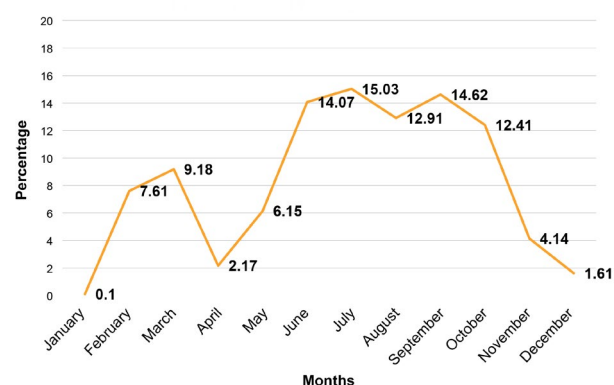


Figure 2: Monthly average food availability. Credit: Practical Action, 2025

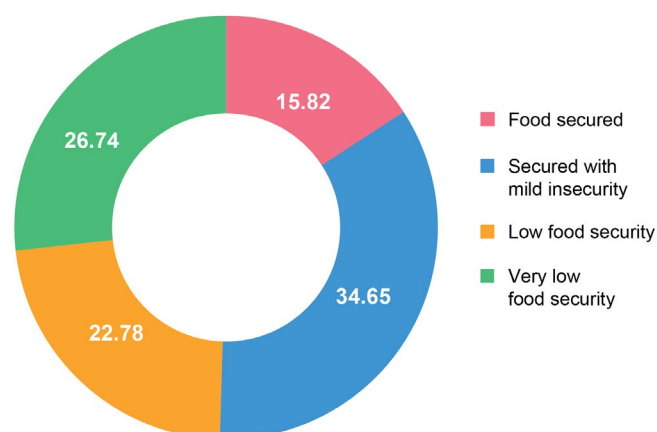


Figure 3: Overall food insecurity status (%), n = 632. Credit: Practical Action, 2025

Disasters also disrupt planting and harvesting cycles, impacting seasonal yield and reducing the overall availability of staple foods.

Access to food is hindered by disruptions in transportation and supply chains following hazard events, such as cyclones and floods, which cut off remote communities. These disruptions lead to price surges, making food less affordable for households with limited incomes. Rural and coastal populations, reliant on local markets, face challenges when roads are damaged, increasing the distance and difficulty of reaching food supplies. Additionally, economic constraints from recurring disasters leave households with less purchasing power, further limiting access to essential foods.

‘During floods, it becomes even harder to get food. We rely on whatever help our neighbours and local members can provide, but it’s never enough. Sometimes, we go days without proper meals. I worry about my wife because she is also weak and can’t see well.’
Elderly man, Sadarpur, Faridpur

Food utilization, especially in rural coastal areas, is compromised by potable water scarcity and deteriorating food quality during disaster periods. Lack of potable water affects hygiene and increases the prevalence of waterborne diseases. Nutritional needs are also impacted, as households often cope by reducing food variety and quality. Gendered coping mechanisms further exacerbate these issues, as women reduce their food intake during shortages, leading

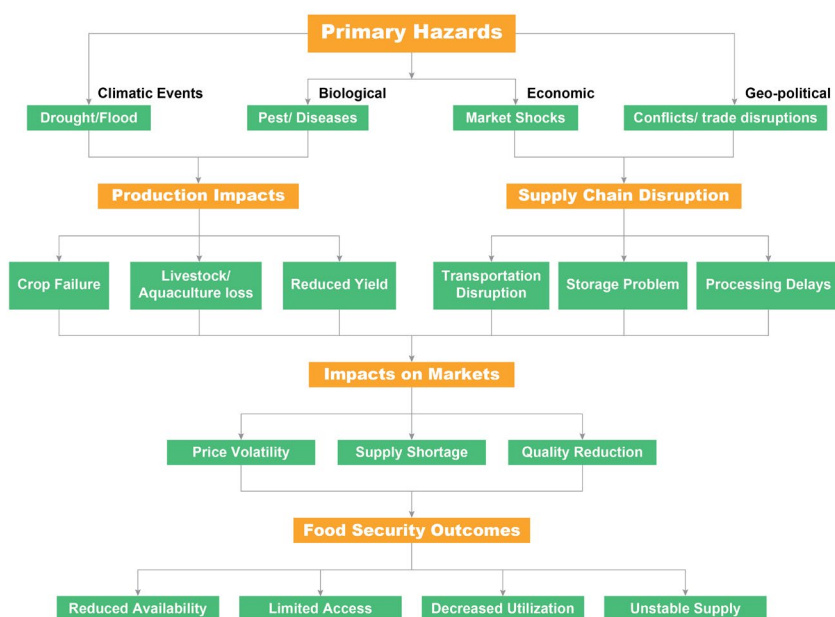


Figure 4: Cascading risk triggers to food system and food security. Credit: Practical Action, 2025

to nutritional deficits and long-term health impacts within families.

The stability of food security is highly vulnerable to recurrent and unpredictable disasters. Frequent climate shocks, like floods and droughts, cause fluctuations in food production and disrupt the stability of market prices, leading to seasonal food scarcity. Dependency on a single crop season in saline-prone areas further destabilizes food supply, as one failed harvest can create food shortages for months. Additionally, economic setbacks from these disasters diminish a household’s ability to invest in future planting or resilient practices, weakening their ability to recover and maintain stability over time.

‘As Indigenous people living in remote areas, cyclones often leave us isolated from aid. Our homes aren’t built to survive such storms, and we lose both our crops and our primary means of earning a living. Women bear the heaviest burden – they’re responsible for feeding their families, and when food runs low, they are the ones who often go without.’

Member of an Indigenous group,
Shyamnagar, Satkhira

Early warning systems

Whilst **92 per cent** of study participants had experienced multi-hazards in the past five years, **53 per cent** could not take early action to reduce food loss. Participants reported receiving early warning alerts before hazardous events from radio, TV, newspapers, social media, social gatherings, local government, and telecom operators, but only **9 per cent** reported that they understand the early warning messages all the time and take actions based on that.

‘I want to be able to act on warnings myself, instead of waiting for someone to tell me. I also hope there is better food support, so my mother does not have to starve for me.’

Youth partially blind from birth,
Shyamnagar, Satkhira

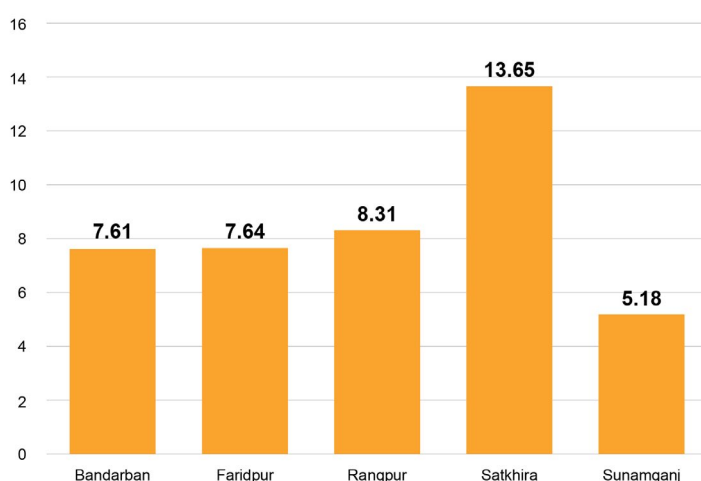


Figure 5: Intensity of food insecurity status based on a 0–27 scale (linear measure), $n = 632$. Credit: Practical Action, 2025

Challenges

Challenges to consider in the current EWS regarding cascading risks to food security include:

- **Siloed hazard-monitoring systems.** Current EWS primarily focus on individual hazards like cyclones and riverine floods. New and emerging threats, such as flash floods, heatwaves, salinity intrusion, and biological risks (e.g. pests and fish mortality) remain under-monitored and unintegrated.
- **Absence of food security-specific early warnings.** No dedicated government agency issues alerts for food insecurity risks (e.g. crop failure, price hikes, or supply chain breakdowns), despite their critical relevance during and after climate shocks.
- **Limited use of impact-based forecasting.** Current forecasts are often technical and lack actionable content, especially for farmers, fishers, and market-dependent households. Only a small percentage of people consistently understand or act on warnings.
- **Weak monitoring of cascading effects.** There is no systematic assessment of interlinked impacts such as crop loss leading to income loss, which then affects food access and dietary diversity.
- **Data gaps and technical constraints.** Outdated digital elevation models, poor maintenance of weather stations, and lack of localized climate data hinder hazard prediction and risk mapping.
- **Communication gaps and gender inequities.** Early warnings often don't reach or aren't understood by women, the elderly, and marginalized groups. Messages are not always tailored for diverse local contexts.
- **Lack of multi-hazard early warning protocols.** Bangladesh lacks an operational Common Alerting Protocol and has no standardized mechanism for issuing alerts based on compound risk scenarios.

- **Inadequate preparedness and response systems.** Existing plans and resources are focused on post-disaster relief, with insufficient investment in anticipatory actions or food system resilience.

CONCLUSION

Bangladesh's EWS remain fragmented, hazard specific, and poorly linked to food security, limiting proactive action on cascading risks. Communities face interconnected shocks without clear, inclusive guidance. Strengthening cross-sectoral coordination, improving warning communication, and tailoring early action to local needs are vital to protect food security in vulnerable regions.

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Project information

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About Practical Action

We are an international development organization putting ingenious ideas to work so people in poverty can change their world. Our vision is for a world that works better for everyone.

We help people find solutions to some of the world's toughest problems, including challenges made worse by catastrophic climate change and persistent gender inequality.

We believe in the power of small to change the big picture. And that together we can take practical action to build futures free from poverty.

Big change starts small.

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