Post-Impact Assessment on the Impact of Early Action for Drought & Heatwave

El Niño Anticipatory Action (AA) to Drought & Heatwave in Bangladesh

Save the Children

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RIMES

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Executive Summary

Regional Integrated Multi-Hazard Information (RIMES) has conducted this post-impact assessment study for selected unions of Ulipur and Chilmari Upazilas in Kurigram District, in collaboration with Save the Children and MJSKS. A total of 401 participants participated in this assessment through individual questionnaires, FGD, and KII. RIMES, in collaboration with the Flood Forecasting and Warning Centre (FFWC) and Bangladesh Meteorological Department (BMD), provided localized weather and flood forecasts. These forecasts, along with early warning information, helped mitigate the impact of hazards at the grassroots level during this period. The findings revealed that the El Niño phenomenon substantially affected the local climate, leading to higher-than-normal temperatures and reduced rainfall across the Rangpur Division, specifically affecting Kurigram District. This shift in climate patterns caused significant deviations in temperature and precipitation from historical averages, exacerbating the impacts of droughts and heatwaves. During the period of the study, recorded temperatures in Kurigram were significantly higher than historical norms, negatively affecting key sectors such as agriculture, livestock, and health.

The study showed that the majority of the population in the surveyed area depends on agriculture and livestock for their livelihood. Most participants, particularly women, reported that their primary occupation was housework, while men typically worked as agricultural day laborers or non-agricultural day laborers. Alarmingly, the majority of participants earned less than 5,000 BDT per month from agricultural work, and reported earning similarly from livestock activities. Overall, most locals were more prone to working in the agriculture sector. This is incredibly concerning as all respondents reported experiencing the adverse effects of the heatwave and drought, with many characterizing the events as highly devastating, particularly due to their multiple crop cultivation. The financial losses varied depending on crop type, with individual losses ranging from 1,000 BDT to 15,000 BDT. The crops grown between January and June were particularly affected, contributing to significant economic strain on farming households.

The extreme weather notably impacted children and increased their susceptibility to heat-related illnesses. All respondents reported increased school absenteeism due to episodes of drought and heatwave. Respondents also reported nutritional imbalances, alongside adverse effects on children's mental health, limited access to education, and a rise in child labor/exploitation. Similarly, the health impacts extended across the entire community, with most respondents citing various health issues related to heat exposure, such as dehydration, heat stroke, and heat exhaustion. Most respondents adopted simple strategies to mitigate these effects, such as resting under trees, staying hydrated, and increasing their bathing frequency. Other measures included the use of hand fans and staying indoors.

In terms of preparedness, all community members reported receiving early warning information on elevated temperatures and extreme weather. The most effective method for disseminating early warning information was through miking, which reached 94% of the population, while 45.4% received information via voice messages. Importantly, 81.8% of

respondents fully understood the warnings, which primarily provided information on timing, advisories, and event duration. A significant 84.79% of participants took immediate action upon receiving early warnings, demonstrating the effectiveness of these alerts in prompting timely decisions. However, indicated the need for improvement in the communication channels for early warnings. Respondents received various forms of support to help mitigate the effects of the heatwave and drought, with advisories, training, and cash support being the most common. Notably, 99.5% of participants took early actions based on the advisories they received, indicating the community's willingness to act on the information provided. However, the financial burden of taking early action was a significant challenge for many across the community.

In the agricultural sector, the most prominent adaptive measure was the increased frequency of irrigation, adopted by 98.3% of respondents. In the livestock sector, 97.5% of participants kept their animals in shaded areas to mitigate the effects of extreme heat. Despite these efforts, the study found that water scarcity was a critical issue, with nearly the entire population facing difficulty accessing water. This lack of water exacerbated the impacts of the heatwave, limiting people's ability to stay hydrated and severely affecting agricultural productivity. Water scarcity hit the agricultural sector hardest, with 92.3% of respondents reporting major impacts, followed by the livestock sector (84.5%) and the health sector (74.1%). However, it must be noted that a vast percentage of participants minimized their monetary loss by around 5,000 BDT.

The interventions implemented during the drought and heatwave were largely successful in alleviating the adverse impacts on vulnerable groups, particularly children. A key achievement of the project was improving access to education, with 97.5% of respondents reporting that educational activities continued despite the extreme conditions. This was a significant improvement from prior years when elevated temperatures and a lack of resources led to high absenteeism rates in schools. However, the study highlighted the continued vulnerability of children and the elderly, signaling the need for further interventions and targeted support. Community members emphasized the need for more training on adaptive practices to better prepare for future heatwaves and droughts. Improvements in early warning systems, especially regarding advisories and message dissemination, were also identified as critical areas for enhancement. Strengthening community awareness of the benefits of early warning information will further enhance resilience, helping the community better respond to climate-related hazards.

Hence, while the implemented interventions effectively reduced many concerns from several sectors, the study underscores the importance of continued capacity building, resource allocation, and community engagement to ensure that the population is better equipped to handle future climate events. By improving early warning systems and providing targeted support, the community's resilience can be significantly strengthened.

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Chapter 1: Introduction

1.1 Background

Hazards such as drought and heatwaves have become increasingly frequent and severe. The adverse effects on productivity, health, and the economy have led many to consider them a disaster. In northern Bangladesh, particularly in the Ulipur and Chilmari Upazilas of Kurigram district, these hazards pose a serious threat. The situation is further aggravated by the El Niño phenomenon, a global climatic event that brings intense heat and drier conditions to these regions. The drought-prone unions in this area suffer from below-average rainfall, while El Niño alters global weather patterns, worsening drought conditions and prolonging dry spells. This makes Ulipur and Chilmari Upazilas especially vulnerable to water crises and prolonged extreme heat.

Since October 2023, Save the Children, in collaboration with RIMES and MJSKS, has executed a project under the Humanitarian Fund titled 'El Niño Anticipatory Actions to Drought and Heatwave in Bangladesh.' Both these upazilas are susceptible to heatwave and drought; while drought adversely impacts food security, heatwaves severely affect the health of community members, particularly those employed in outdoor jobs. This can lead to socio-economic challenges, lower agricultural production, and a heightened demand for resources such as electricity.

Save the Children, in collaboration with RIMES and MJSKS, has executed a project under the Humanitarian Fund titled 'El Niño Anticipatory Actions to Drought and Heatwave in Bangladesh.'

In light of these difficulties, the project aimed to support the local communities by implementing anticipatory measures to protect their well-being and livelihoods and increase resilience to heatwave and drought. Anticipatory actions for hazards primarily depend on the triggers linked to the specific parameters of the hazard. As drought is a slow-occurring hazard, and considering Bangladesh's limited experience with anticipatory strategies for drought and heatwaves, RIMES, in conjunction with Save the Children, has tested the AA initiative by establishing a set of triggers for drought and heatwave after consulting with BMD and other relevant stakeholders. Several research studies have concluded that drought management in Bangladesh should not rely solely on one or two indices, but rather on a comprehensive framework. Hence, evaluating the initiatives taken will offer clearer insights into strategies for reducing the negative impacts of El Niño on the local community.

1.2 Objective of the Assessment

- Assess the existing situation of the local community through the lens of their economic and social well-being.
- Identify the effectiveness of the early warning system and quantify the loss minimized through the initiatives taken.
- Identify the impact on agriculture, livestock, and relevant sectors from the context of the community
- Ensure that people's fatalities, health illnesses, and economic losses are reduced by taking timely and effective early actions against the impacts of heat stress.

1.3 Overview of ENSO Situation and Observed Condition

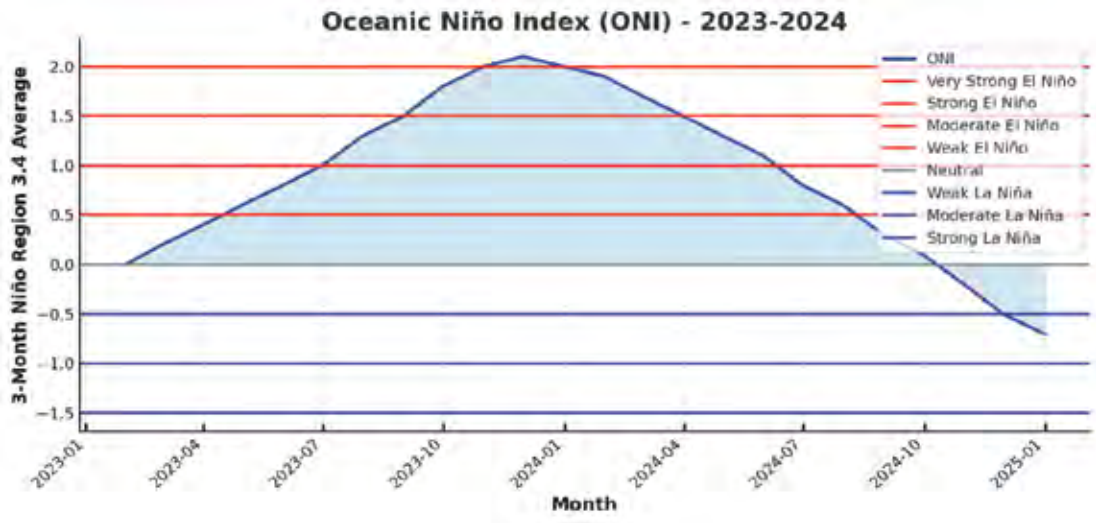


Figure 1: Global ENSO situation (Top: 1990 to Present, Bottom: 2023-2024), Source: WMO

The Oceanic Niño Index (ONI) graph in figure 1 represents the progression of sea surface temperature (SST) anomalies in the Niño 3.4 region during the 2023–2024 period, tracking the evolution of the El Niño and potential transition to La Niña. Starting from early 2023, the graph shows a gradual warming of SSTs, indicating the onset of El Niño conditions. By late 2023, El Niño reaches its peak, with SST anomalies exceeding +2.0°C, categorizing it as a very strong event.

The subsequent months into 2024 illustrate the gradual weakening of the El Niño event, with SSTs declining toward neutral conditions by mid-2024. By the end of the year, the graph shows the potential for a transition to La Niña, as indicated by the SST anomalies dipping below the neutral line into negative territory. The chart also includes horizontal lines to define the thresholds for weak, moderate, and strong El Niño and La Niña conditions, providing context for interpreting the intensity of these events.

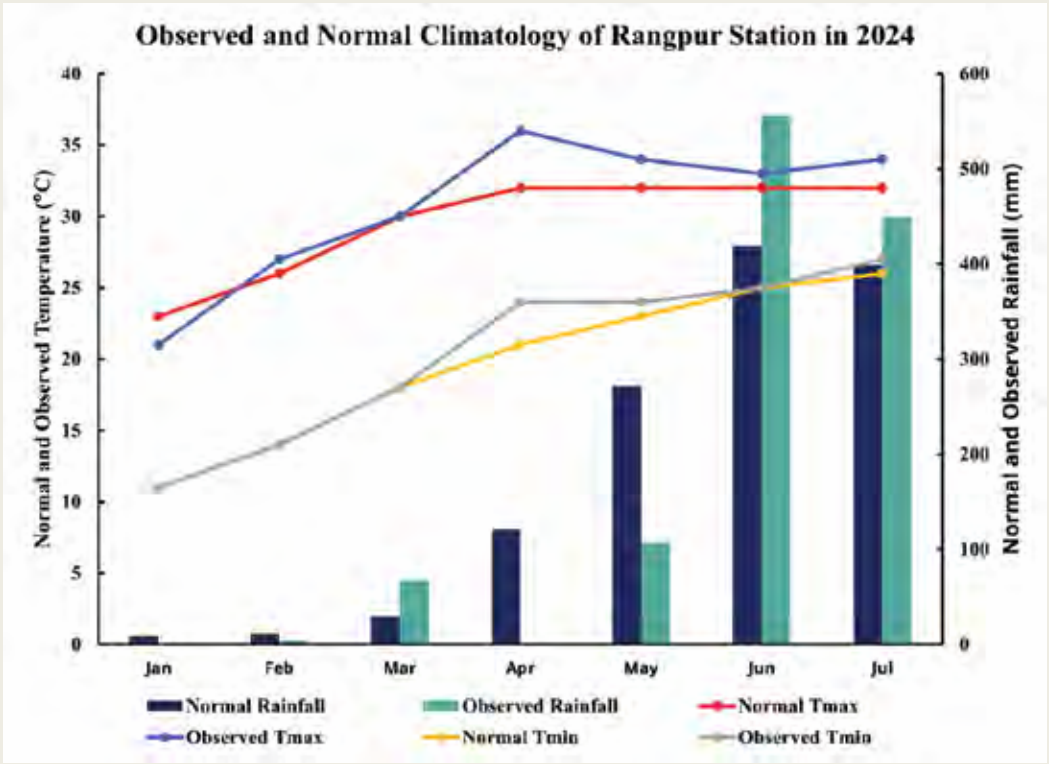


Figure 2: Observed and Normal Climatology of Rangpur station in 2024 (Source: BMD)

Between February and April 2024, the Rangpur region experienced substantial deviations in both temperature and rainfall patterns, heavily influenced by the El Niño event (Figure 2). Observed rainfall was consistently below normal, with a significant reduction in precipitation during all three months. In February, rainfall remained near normal, but from March onward, the region saw a sharp decline in precipitation, falling well below climatological expectations. This dry spell was part of a broader trend linked to the weakening El Niño, which continued to suppress rainfall over the region. Additionally, temperatures in the Rangpur region were consistently above normal during this period. The maximum temperature, in particular, saw a sharp rise in March and April, while the minimum temperature also showed a

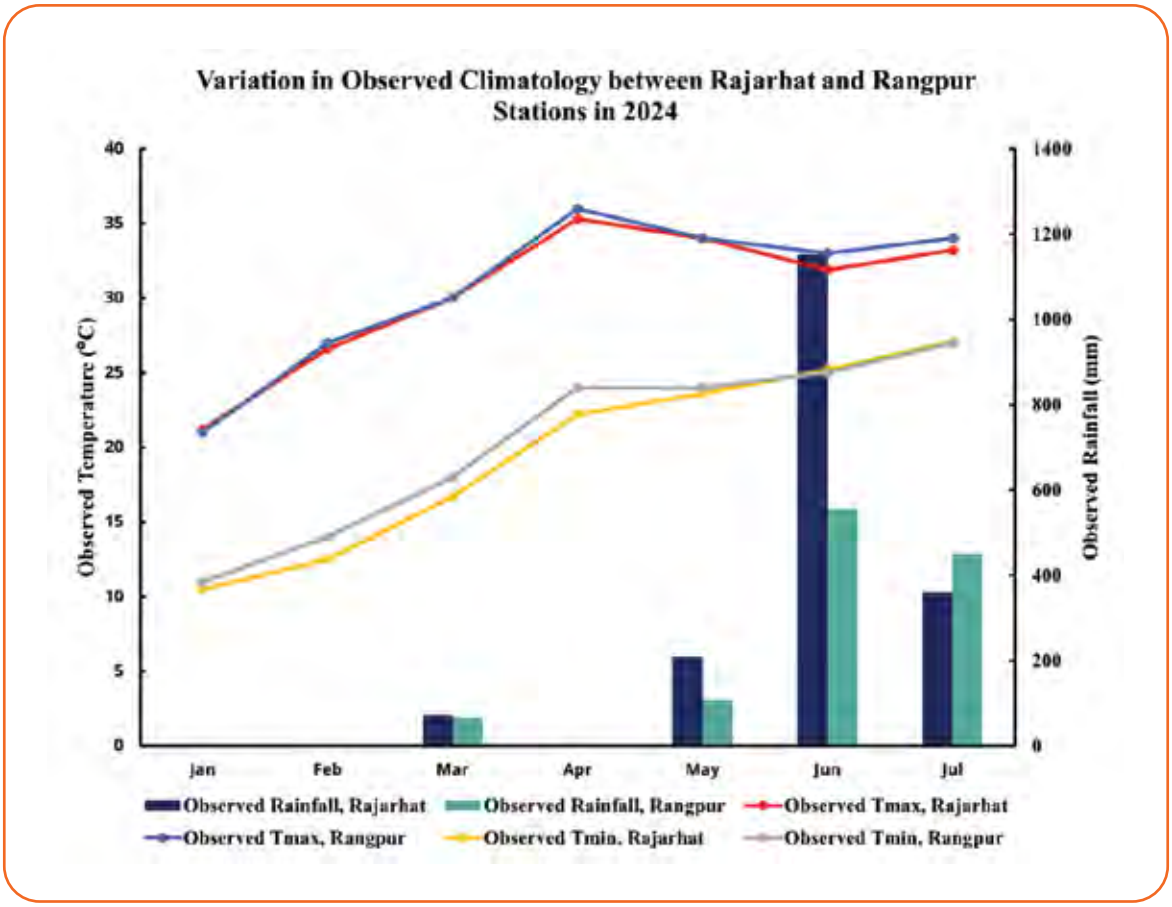
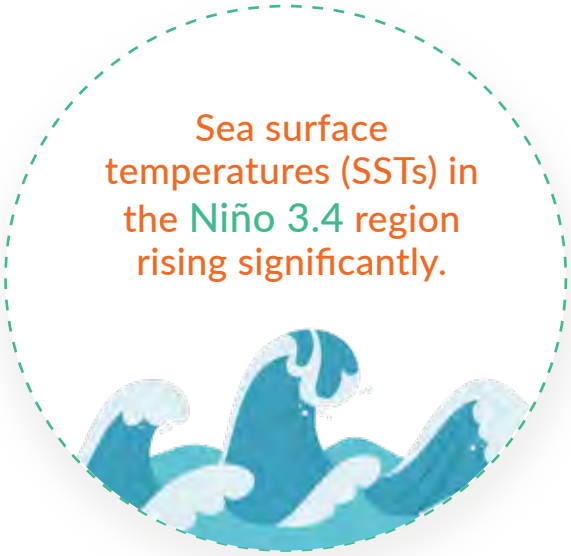


Figure 3: Normal Rainfall and Temperature Variation between Rajarhat and Rangpur Stations in 2024 (Source: BMD)

Moreover, the station in Rajarhat Upazila, being closer to the target area, was analyzed to observe temperature and rainfall variations in comparison with Rangpur. The Rangpur region generally experiences slightly higher maximum temperatures (Tmax), particularly in April, June, and July, with differences of 0.7°C, 1.1°C, and 0.8°C, respectively (Figure 3). However, Rajarhat shows slightly higher minimum temperatures (Tmin) in most months, such as January (-0.5°C) and March (-1.3°C), though the Tmin observed in Rangpur surpasses data from Rajarhat's in June and July by 0.2°C and 0.1°C, respectively. Despite these differences, the variation in temperature data between the two locations remains relatively low. The overall temperature profile shows an upward trend from January to April, with a peak being observed in April. On the other hand, recorded rainfall was notably higher in Rajarhat than in Rangpur, especially in May and June. Yet, in July, the graph witnessed a significant drop in the recorded rainfall in Rajarhat compared to that of Rangpur. Similar to that analyzed in Figure 2, the dry period witnessed between January to April was part of a larger trend associated with the weakening of El Niño, which continued to reduce rainfall and raise temperatures across the region. The elevated rainfall in June and July can also be attributed to the effects of El Niño, as the tropical pacific atmosphere was predicted to transition to neutral conditions after May.

Additionally, the forecast products, including global multi-model ensemble predictions, had accurately predicted the likelihood of above-normal temperatures and dry conditions in Rangpur. As early as February, the ENSO outlook indicated a 60-70% chance of higher-than-normal temperatures, which was confirmed by the observed data. In March and April, this forecast was further refined, with a 50-60% chance of temperatures exceeding the seasonal average. The observed temperatures closely matched these forecasts, with the region experiencing sustained heat anomalies. The rainfall forecasts also aligned with the observed data, predicting the ongoing suppression of rainfall due to El Niño in some regions of Rangpur.



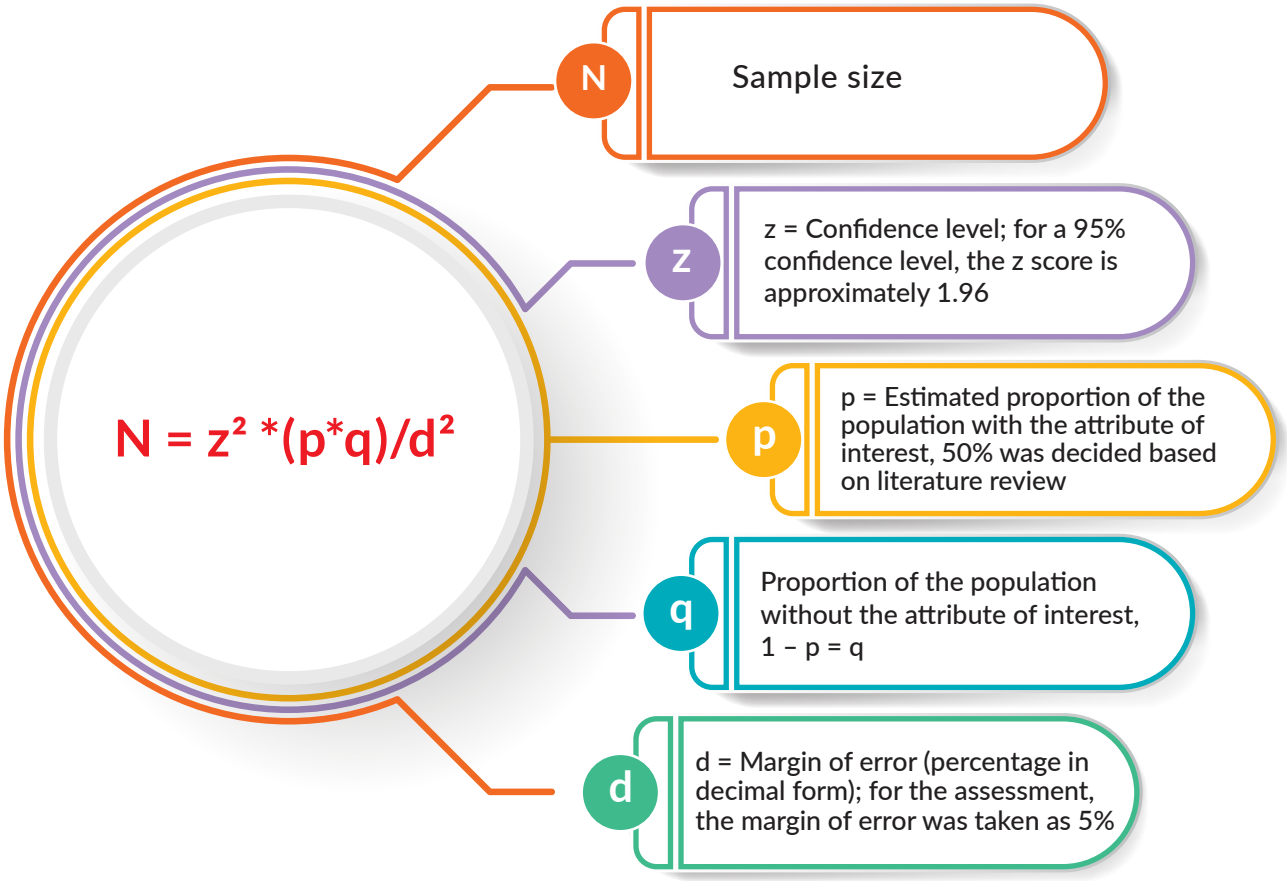
The lag between global ENSO conditions, as represented by the Oceanic Niño Index (ONI), and the warmer and drier conditions in Bangladesh, particularly in the Rangpur region, highlights the delayed regional impacts of global climatic shifts. As the ONI graph indicates, El Niño conditions reached their peak in late 2023, with sea surface temperatures (SSTs) in the Niño 3.4 region rising significantly. However, the warmer and drier conditions in Rangpur region, associated with the El Niño event, were most prominent during February to April 2024. This delay is common, as global ENSO patterns typically take several months to influence localized weather systems. In the case of Rangpur, the forecasted above-normal temperatures and drier conditions began to reveal more strongly after the El Niño peak, when the atmospheric circulation changes influenced rainfall patterns and temperature extremes in South Asia. As El Niño began weakening in early 2024, the region still experienced residual effects, with elevated temperatures and reduced rainfall exacerbating the risk of drought and heatwaves. This lag stresses the complex relationship between global oceanic conditions and localized climatic impacts.

Bangladesh Meteorological Department (BMD) has been consistently offering monthly and seasonal forecasts over the past several years. Through this project, BMD and RIMES has produced special bulletin comprising all these situation and trigger statement for AA. The bulletin (See Annexes) from February, March and April constantly showed Activation trigger which we effectively align with the observed data. Further validation has come from the respondents through this assessment regarding the drought and heatwave condition which has been explained later in the other sections.

Chapter 2: Methodology

2.1 Methods

The assessment included methods for gathering both qualitative and quantitative data to ensure comprehensive data collection. Quantitative survey focused on Individual Questionnaires, on the other hand, qualitative study primarily focused on KII and FGD Questionnaires. The study area focuses on selected unions of Ulipur and Chilmari Upazilas of the Kurigram district. From the given sample population, the sample size was determined using the Cochran's Sample Size Formula as it provides a statistically valid sample size, ensuring results are representative of the target population. The formula can be stated as:

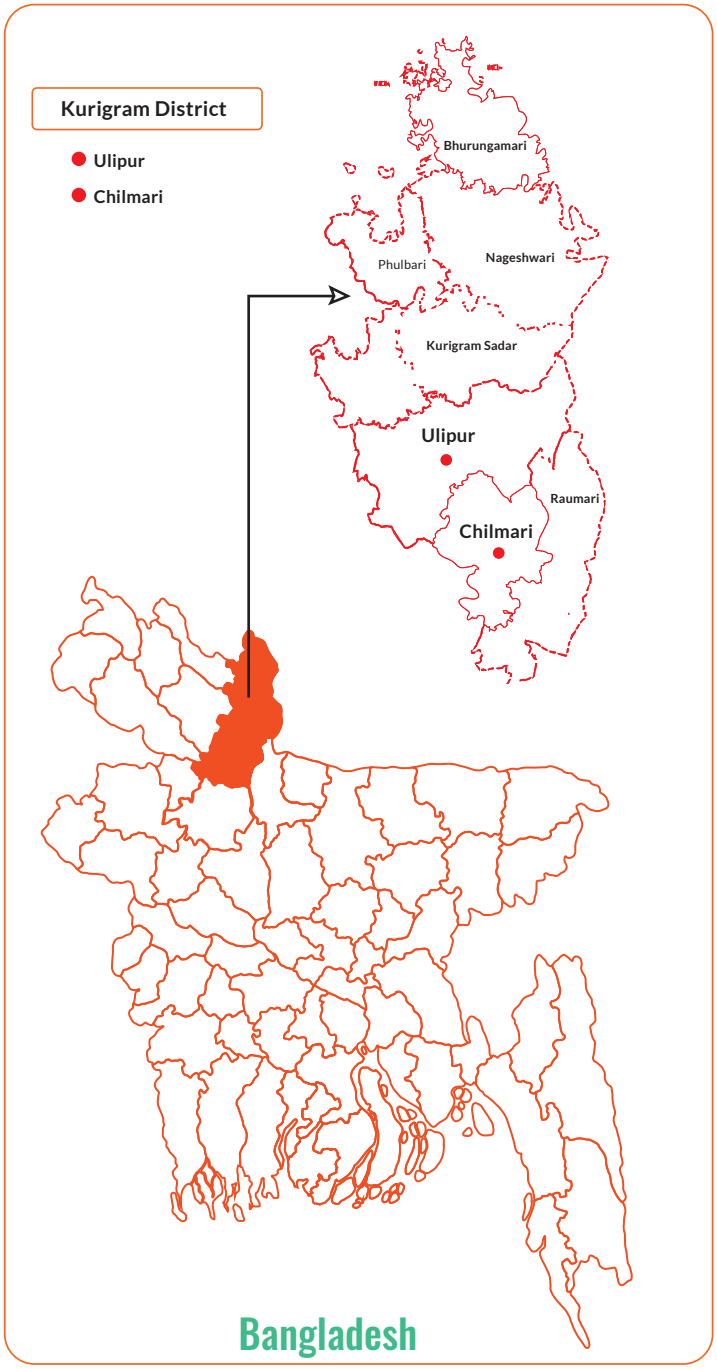


For this study, we have utilized multistage simple random sampling. We have carefully chosen a high confidence level (95%) and small margin of error (5%) to increase precision and reduce uncertainty. In addition, for maximum variability, we have decided upon the default value for p and q; p = 0.5 represents the maximum variability in the population. Overall, all the variables were considered to keep the sample size calculation robust while considering uncertainties amongst variability.

For a large population, the sample size usually represents at least 50% of the population. Therefore, in this study, the total significant sample size for both the upazila combined was found to be around 385. However, to get a representative assessment from each upazila and reduce the chances of error, the sample size was kept above the calculated sample size and rounded up to be approximately 400, thereby 200 per upazila. This was further divided over the selected eight unions, which includes Buraburi, Bajra, Hatia, Gunaigach, Chilmari, Romna, Raniganj, and Thanahat. Therefore, roughly 50 individual questionnaires, 2 FGD and 2 KII questionnaires per union was distributed for the study. The member count for FGD was limited to 10 to 15 members per survey. Additionally, the participating representatives for KII were members of the Union Disaster Management Committee (UDMC) and/or the Upazila Disaster Management Committee. The study has tried to ensure that least 50% of the participants are amongst female and/or youth to ensure gender equality and to promote inclusivity.

2.2 Study Area

Ulipur and Chilmari, located in northern Bangladesh's Kurigram district, typically have a tropical climate consisting of hot summers (up to 35°C), cooler winters (around 10°C), and a monsoon season. Elevated temperatures are common in these regions, particularly during April to May. Chilmari Upazila is prone to river erosion and monsoon flooding. The economy depends on agriculture, particularly rice and jute, and fishing due to its riverine location. As a result, the local population are proficient in adapting to the challenges posed by floods and riverbank erosion. Due to the geographic location, Ulipur Upazila has a similar climate. Most cases of rainfall are witnessed between June to September, leading to seasonal flooding due to its proximity to the Brahmaputra River. The population mainly engages in farming, fishing, and small-scale trade and are used to mitigating impacts of floods. For this study, particular unions were selected due to their elevated temperature and reduced rainfall patterns—Buraburi, Bajra, Hatia, Gunaigach, Chilmari, Romna, Raniganj, and Thanahat.



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সবচেয়ে ঝুঁকিতে যারা

- শিশু ও গর্ভবতী মহিলা
- বয়স্ক ব্যক্তি
- প্রতিবন্ধী ব্যক্তি
- শ্রমজীবী
- যাদের ওজন বেশি
- যারা শারীরিকভাবে অসুস্থ

- দিনের বেলায় যথাসম্ভব বাইরে বের হওয়া থেকে বিরত থাকুন, রোদ এড়িয়ে চলুন।
- বাইরে বের হলে ছাতা, টুপি/ক্যাপ, বা কাপড় দিয়ে মাথা যথাসম্ভব ঢেকে রাখুন।
- প্রচুর পরিমানে বিশুদ্ধ পানি পান করুন।
- সহজে হজম হয় এমন খাবার খাওয়ার চেষ্টা করুন ও বাসি, খোলা খাবার খাওয়া থেকে বিরত থাকুন।
- বেশি অসুস্থ বোধ করলে দ্রুত নিকটস্থ চিকিৎসকের পরামর্শ নিন।
- সম্ভব হলে একাধিকবার পানির ঝাপটা নিন বা গোসল করুন।
- ঘরের পরিবেশ যেন অতিরিক্ত গরম বা ভ্যাপসা না হয় সেদিকে খেয়াল রাখুন।
- দিনের বেলা একটানা শারীরিক পরিশ্রম করা থেকে বিরত থাকুন।
- প্রস্রাবের রঙের দিকে নজর রাখুন, তা হলুদ বা গাঢ় হলে অবশ্যই পানি পানের পরিমাণ বাড়ান।
- হালকা রঙের, ঢিলে ঢালা এবং সম্ভব হলে সুতি জামা পরুন।

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El Niño Anticipatory Action to Drought and Heatwaves in Bangladesh

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Chapter 3: Assessment

3.1 General Information

The study area selected for the on-site survey includes selected unions of Ulipur and Chilmari Upazilas of the Kurigram district. In total, 401 participants took part in the individual questionnaires, while 16 FGDs and 16 KII were conducted. Out of this, 49.9% of participants were from the Ulipur Upazila and 50.1% from the Chilmari Upazila.

Additionally, to ensure inclusivity and gender equality, and to uphold the values of the esteemed organizations affiliated with this project, out of the 401 participants interviewed, 47.1% were female cumulatively. The participants represented all age groups, with the majority being older than 45 years of age (51.13%), followed by those between 36 to 45 (28.4%). (Figure 4). Among these participants, except for the individuals aged 45, the female participants outnumbered male participants in all other age groups.

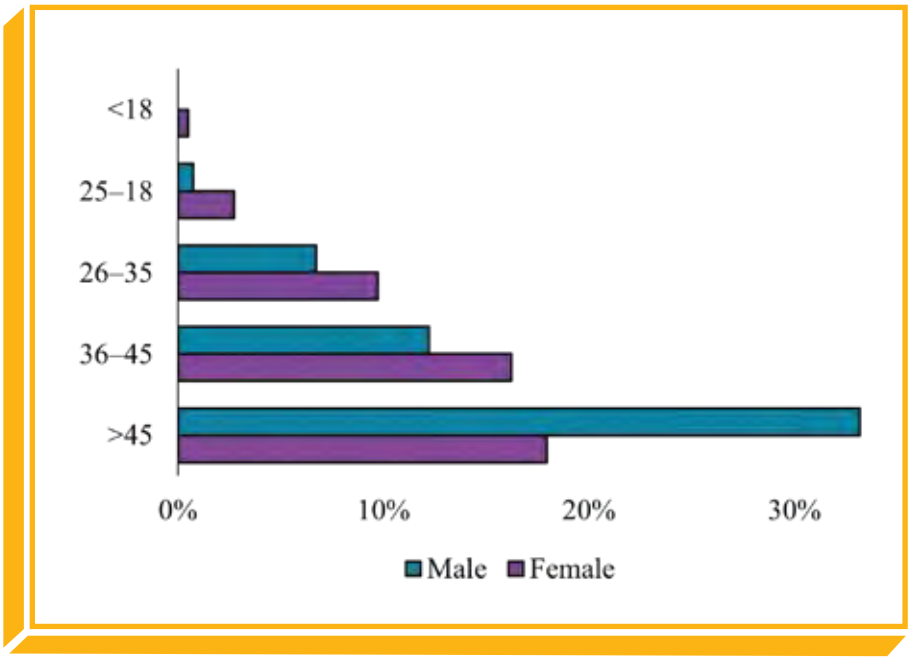


Figure 4: Gender Distribution by Age

According to the questionnaire results, the majority of females in all unions reported their occupation as housewives. They were primarily involved in growing vegetables in their backyard and rearing livestock. A total count of 150 participants belonged in this category with the majority being located in Buraburi, Thanakot, Hatia, Raniganj and Roma Union (Figure 5). A minor portion of the female participants (5.49%) identified their occupation as Agriculture Day laborer, followed by only 2% who were Non-agricultural Day laborer, Farmers (0.75%), and lastly, involved in the Poultry sector (0.5%).

On the other hand, the majority of male participants work as Agricultural Day laborers (Figure 5). In addition to farming and Non-Agriculture Day labor, the male participants earn their living through various occupations such as managing businesses and boats. Only a minor segment of the total participants identified as unemployed, disabled, or dependent on others for their livelihood.

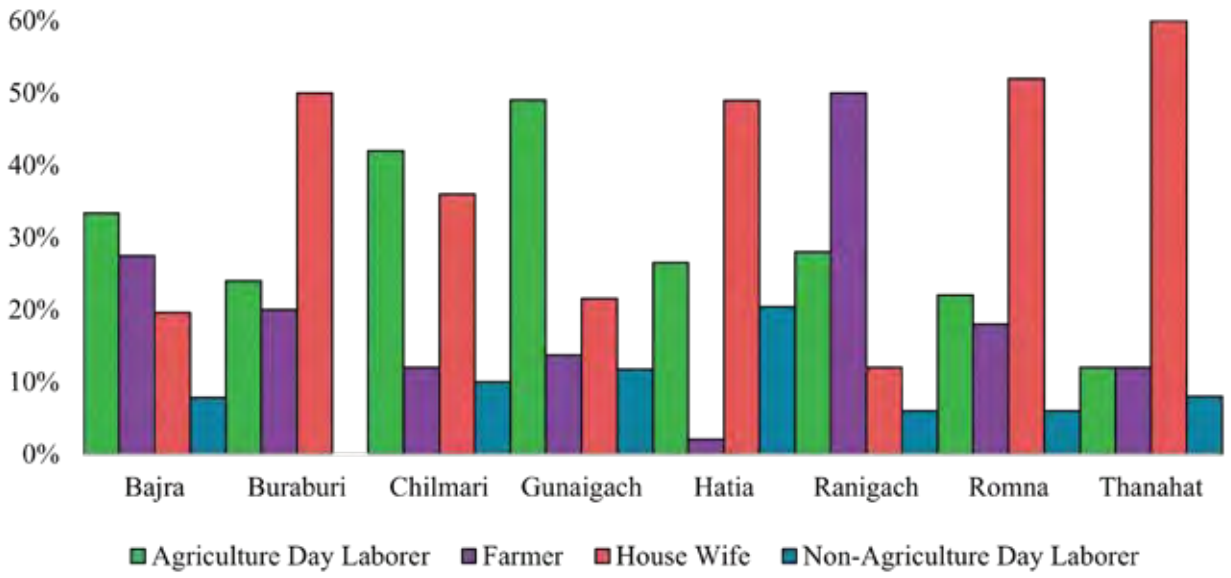


Figure 5: Distribution of major occupation of participants

The majority of people participating in this study depend primarily on agriculture and livestock for their livelihood; as such, their main sources of income come from these sectors, which is reflected in Figure 6. The inner ring of the donut consists of the income generated from the agriculture sector. Similarly, the outer ring is denoted for the livestock sector. It can be stated that a significant majority of participants (84.54%) earn less than 5000 BDT per month through working in the agricultural sector, highlighting that a large portion of individuals in this industry are low-income earners. A smaller percentage (12.47%) declares no income from agriculture, while 2.99% earn between 5000 and 10,000 BDT; with none generating over 20,000 BDT in terms of crop cultivation. On the other hand, a greater proportion of respondents (24.44%) indicate that they have no income from the livestock sector compared to agriculture. The majority of individuals (72.82%) earn less than 5000 BDT from livestock practices. Only 2.49% of respondents earn between 5000 and 10,000 BDT, and a very small fraction (0.25%) earn between 20,000 and 40,000 BDT. Hence, the majority of the participants are dependent on agriculture practices through which they earn quite a low level

of revenue. The increasing temperature and heatwave have only added to the problem. While other sources of income might exist, those are mainly disabled allowance and low-income generation from unreliable sources.

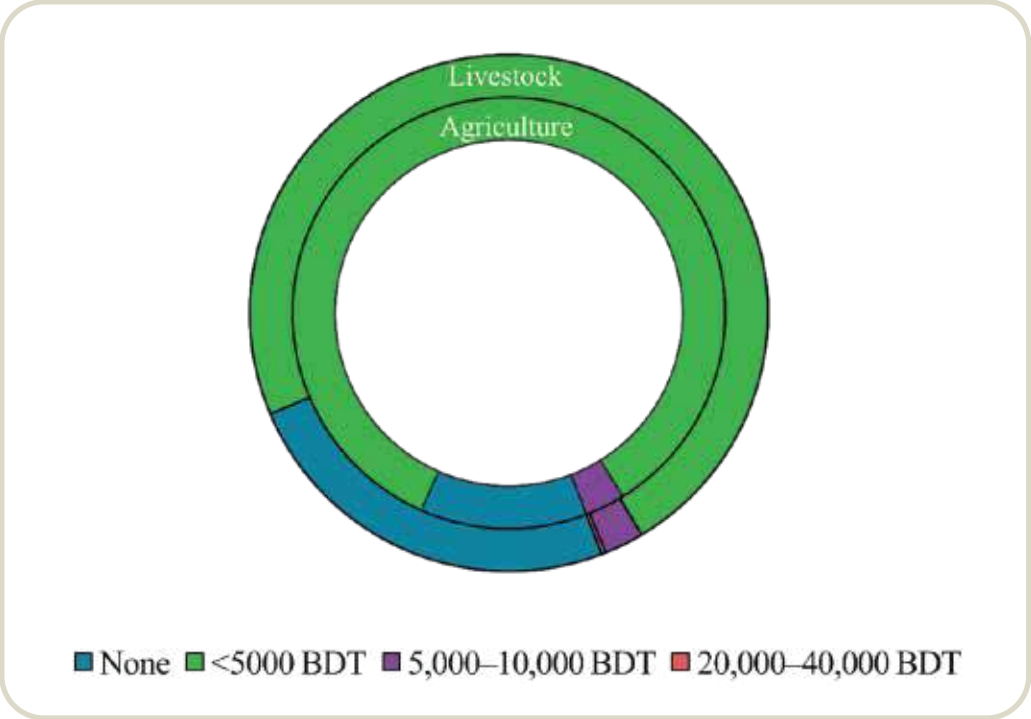


Figure 6: Income generation per sector

3.2 Community Perception of Drought/Heatwave as a Major Hazard

In the community, 100% of respondents regarded drought and heatwaves as major hazards, reflecting the widespread recognition of the destructive consequences of these extreme weather events. Additionally, all individuals reported that they had personally experienced drought and heatwaves this year, signifying that these climatic conditions were not isolated incidents but rather widespread and deeply felt by all community members. A staggering 99.5% of respondents characterized this year's drought as "highly devastating" or "having caused severe damage," underlining the gravity of the situation. The widespread and severe impact highlights the vulnerability of the community to such climate-related hazards and calls for urgent measures to mitigate their effects in the future. In particular, the observed temperature recorded in Kurigram during this period of study was greater than that of the normal temperatures in the past, which in turn negatively impacted several sectors of both the upazila during the heatwave and drought (Figure 7).

The severity of the impact is not only limited to productivity and the economy but has also negatively impacted the health of vulnerable members of the community. In particular, droughts and heatwaves affected children extensively leading to all respondents reporting increased school absenteeism, highlighting how extreme weather disrupted children's education. Additionally, 66.1% mentioned a higher incidence of heat-related illnesses among children, reflecting their heightened vulnerability to health issues during these periods. Other significant impacts on children included nutrition imbalance (69.6%), negative impact on children's mental well-being (52.4%), reduced access to education (60.6%) and increased child labor or exploitation (32.4%). These numbers highlight the multifaceted issues that communities confront during such climatic extremes, from health to employment, demonstrating the long-term dangers posed by repeating droughts and heatwaves, which are exacerbated by the El Niño influence.

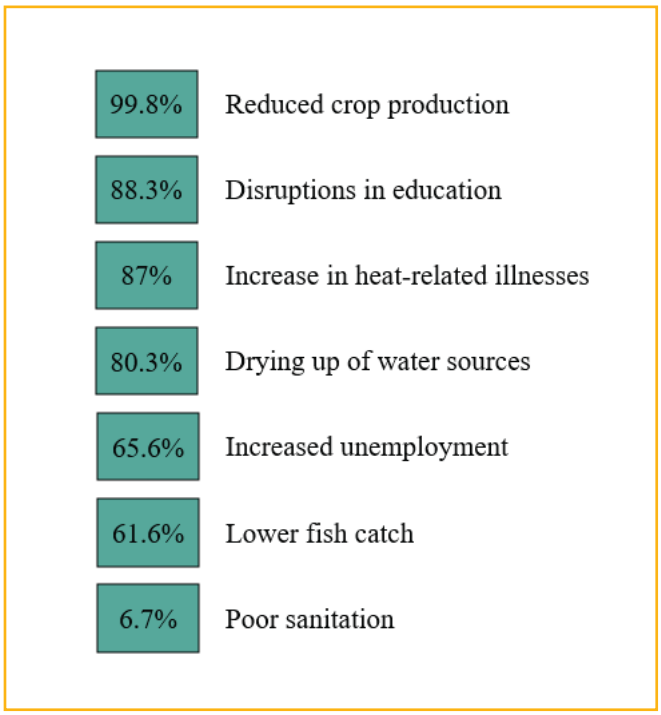


Figure 7: Adverse impacts experience by community members

3.3 Effectiveness of Early Warning Information

All community members reported receiving early warning information on elevated temperatures and extreme weather situations. However, the effectiveness of these warnings varied depending on how the information was delivered and understood. The survey showed that most people (94%) received the warning through miking, making it the most effective method for reaching the community. Other significant channels included voice messages (45.4%) and television (25.2%). People also received information from informal channels like word of mouth from their neighbors and friends (37.2%). Interestingly, more modern platforms, like social media or leaflets, were barely used, withclose to no respondents citing them as their source of information. In case of early warning message dissemination, almost all respondents shared the early warning messages they received with others, demonstrating strong community engagement and communication. Most people passed the information to their neighbors (97.7%) and family members (94.7%). A smaller portion shared the warnings with farmers (24%) and women's groups (9.3%).

3.3.1 Reliability of Early Warning Information

For most people, the warnings did help them reduce losses, showing that early information gave them the chance to act (Figure 8).

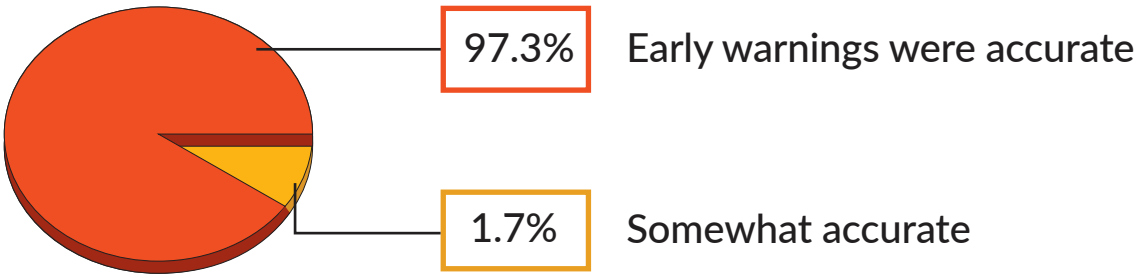


Figure 8: Accuracy of Early warning information according to participants

This shows that the information provided was mostly reliable, which helped in making decisions during the event. Furthermore, when it came to understanding the messages, 81.8% said they fully understood the warnings, while 18.2% stated partially. This suggests that, although most people understood the message, there's still room for improving the clarity of these warnings to ensure everyone is on the same page. The warnings primarily covered timing, which was crucial for preparing in advance. This was followed by advisories, providing guidance on what actions to take, and details on the intensity and duration of the event. The combination of these details helped people take appropriate steps to minimize damage. However, a minor portion (7 respondents) said the warnings did not help. According to 5 of them, the main reason for this was poor communication channels, meaning they either did not receive the message clearly or it was not in a timely manner. Two respondents also felt that the information they received was not specific or accurate enough, and one person mentioned the lack of resources or capacity to take necessary actions hampered their actions. Overall, while the early warning information was a great source of resource for the locals, in the future it will be helpful to improve it even further.

When it came to taking early actions, 84.79% of respondents took immediate action upon receiving the early warnings (Figure 9) This overwhelming response shows that the early warnings were effective in prompting timely decisions, which is crucial in mitigating the adverse effects of heatwaves and droughts. A few respondents delayed taking action (5.74%) as they waited until the drought or heatwave had already started or once the information was

widespread in the community. Others followed the lead of relatives and friends, or waited for advice from the UDMC.

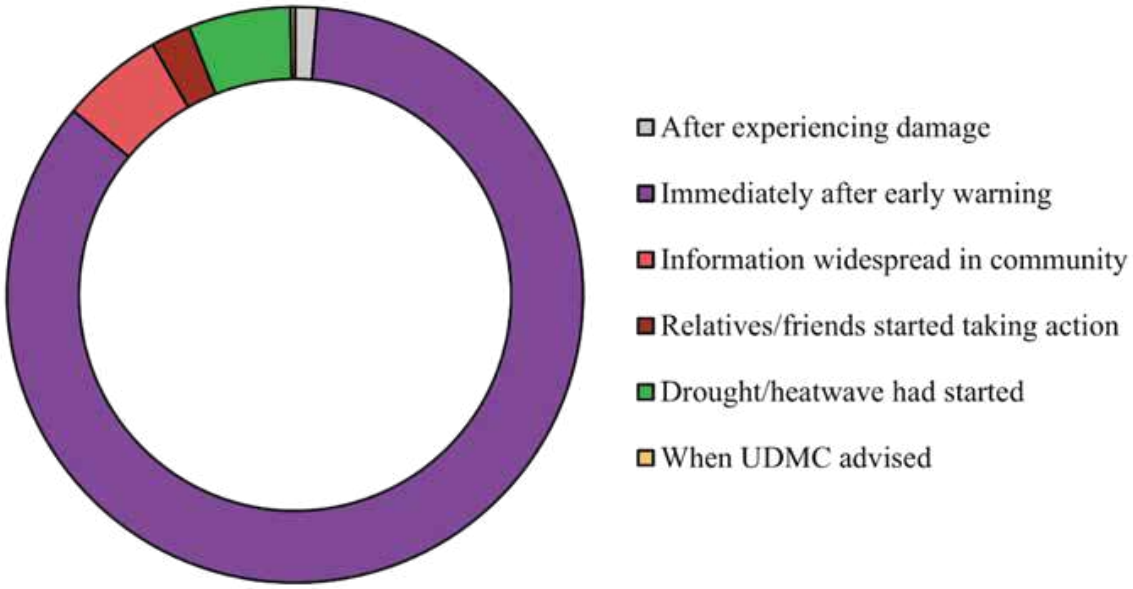


Figure 9: Situation for when Early action was taken

In terms of assistance received to mitigate the effects of the heatwave and drought, respondents mentioned a variety of support options. The most frequently received form of help was advisories (52.9%), followed by training (36.4%) and funding (in the form of cash) (31.2%). This indicates that while financial aid was important, guidance and capacity-building were the main tools provided to help the community cope. Other types of material support, such as equipment (CAP, Feta Pipe, Umbrella, Drought-tolerant seeds, crops, etc.) and resources like spray machines or water-related tools, were minimally distributed, suggesting that these resources were less emphasized or less accessible during the event. Despite the assistance, 18.7% of respondents reported that they received no help at all (Figure 9). When assessing which of these forms of help actually minimized losses, advisories again emerged as the most effective (71.8%), followed by training (40.1%) and then funding (32.2). These results suggest that timely information and knowledge significantly enabled the community to take action and reduce their losses, more so than financial or material assistance. However, 18.2% of respondents stated that none of the available options helped them minimize their losses, indicating that the assistance provided might not have been sufficient or properly tailored to the needs of certain individuals or groups within the community.

3.3.2 Community Insights on Early Action, Cost Management, and Adaptation Effectiveness

The survey further revealed that 99.5% of respondents took early action based on the advisories they received, showing that people valued the information provided and were willing to act on it. However, the financial burden of taking these early actions varied across the community. While 68.6% were able to fully bear the costs, 15.5% could only manage partially, and 16% were unable to afford the actions needed. To cover these costs, respondents mainly relied on cash in hand, followed by personal loans and savings, indicating that many people had to make financial sacrifices or take on debt to protect themselves from the impacts of the drought and heatwave. External financial support, such as government or NGO assistance, was minimal, showing a need for more structured financial aid in future interventions.
In terms of adaptation practices, government or NGO interventions were seen as the most effective in reducing the impact of heatwaves and droughts, with 97.5% of respondents citing these efforts. This highlights the crucial role that organized, large-scale interventions play in supporting communities through climate-related challenges. In contrast, family or household-level practices and community-led initiatives were less frequently recognized, though they still contributed to some level of resilience within smaller groups or households.

Additionally, respondents' lead time for taking early actions and preparedness varied from person to person. The majority (62.8%) had a lead time of 1-3 days, while 27.9% had slightly more time (3-5 days), and only a small percentage had a lead time of 5 days or more. This short lead time highlights these events' urgent nature, especially for heatwave, where communities have very limited time to prepare and respond. Despite this, when asked about their ideal lead time, most respondents preferred 10-15 days, with 57.4% selecting this option. This preference for a longer preparation window reflects the community's desire for more time to adequately prepare, organize resources, and take effective measures to reduce the impact of future droughts and heatwaves.

3.3.3 Challenges and Barriers to Early Warning Information and Adaptive Practices

Despite the adaptive steps, communities in Chilmari and Ulipur Upazilas face significant barriers that limit the effectiveness of the early warning information and thereby their mitigations. The initiatives implemented over the course of the project have had a significant positive effect on the local community. These efforts have enhanced the circumstances of the residents by providing financial support in the form of cash, crop-resistant seeds, and equipment, along with proper guidance on using feeta pipes, spray machines, water storage solutions, and livestock vaccinations, as well as other initiatives like advisory services and consultation workshops. Primarily, barriers still exist that need to be addressed, and more

training and support need to be provided to combat these issues. A critical issue is the lack of awareness or training, leaving almost the entire population unprepared to respond effectively to these climate events. Without proper knowledge and understanding of adaptive strategies, individuals and households struggle to implement measures that could mitigate the impacts of extreme heat and water scarcity. Limited access to resources further exacerbates the situation, as many people lack the tools and financial support needed to safeguard their livelihoods. This shortage of resources affects essential areas such as water management, irrigation, and protective infrastructure for both crops and livestock.

Cultural and social barriers also significantly hinder the effectiveness of adaption practices due to existing traditional norms, societal resistance, or unequal access to information and resources. In addition, while not a major barrier, the inadequate infrastructure in these regions weakens the community's overall capacity to cope with heatwaves and droughts. Without the necessary support systems in place, such as reliable irrigation networks, shelters, or institutional assistance, the population remains vulnerable to the worsening effects of climate change. Overall, the combination of these factors results in a limited adaptive capacity, putting these communities at considerable risk. Addressing these barriers will be crucial to enhancing resilience and reducing vulnerability in the face of future climate challenges.

3.4 Adverse Sectorial Impact

All respondents reported health issues experienced as a result of exposure to drought and heatwave conditions. The most common health consequences experienced were primarily irregular body temperature, felt by a staggering 353 respondents and dehydration (383), followed by loss of conscience, fever, skin disease, cold, and heat stroke. These results highlight the physiological stress caused by prolonged exposure to elevated temperatures and the critical need for anticipatory actions, particularly in areas where locals are not adapted to such conditions. Such hazards are not only detrimental to human health but also can negatively affect crop productivity and yield.

The data indicates that almost all of the respondents reported adverse impacts on their crops due to increased temperature, demonstrating the significant vulnerability of the farming community. This is predominantly devastating as most locals rely on the agriculture sector for their livelihood. Only a negligible 2% were unaffected, and the vast majority of farmers had cultivated crops in the last season and hence were vulnerable. Over 87.5% of respondents grew more than one crop, further increasing their exposure. The severity of

crop damage varied, with moderate impact reported by 87.5% to 79.65% of respondents, while 15.1% to 8.6% experienced severe damage, and 11.8% to 6.4% faced lower levels of impact. The financial losses also varied depending on the crop type, with individual losses ranging from as low as 1,000 BDT to as high as 15,000 BDT. The majority of respondents reported losses between 3,000 BDT and 8,000 BDT, although two respondents from Chilmari and Ulipur Upazila experienced extreme losses of 25,000 BDT due to floods during June and August. For better visualization, the average loss per union has been calculated through expert opinion gathered from SAAO, AO (Union Parishad), UDMC members, and Female Ward members in figure 10. The major crop for this area is rice (C1), which is grown in all unions. Locals in Thanahat suffered the most loss in agriculture, followed by Romna and Burabari; the least damage occurred in Raniganj. In general, both upazilas suffered great economic loss from the agriculture sector.

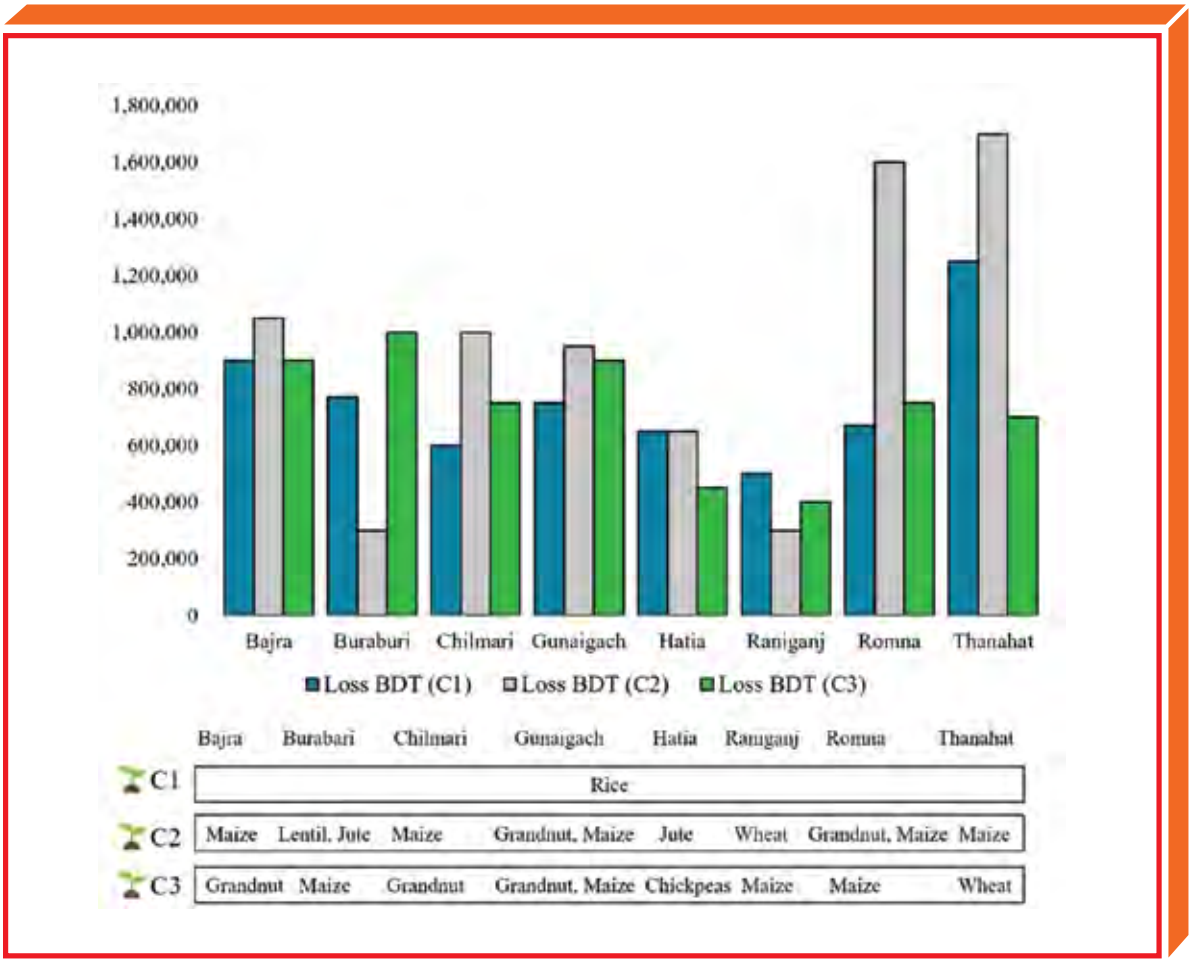


Figure 10: Quantity of loss in agricultural sector per union and the aforementioned crops

In particular, crops grown between January to June suffered the greatest damage. This is due to the elevated temperature and humidity caused by drought and heatwave during that period. Figure 11 visualizes the different hazards faced by the community during the

cultivation period of various crops. Bangladesh has many cascading hazards during this season; as such, those in the agriculture sector are prone to vast amounts of loss. Droughts reduce the availability of irrigation water, while heatwaves can cause spikelet sterility in rice, leading to fewer grains per plant.

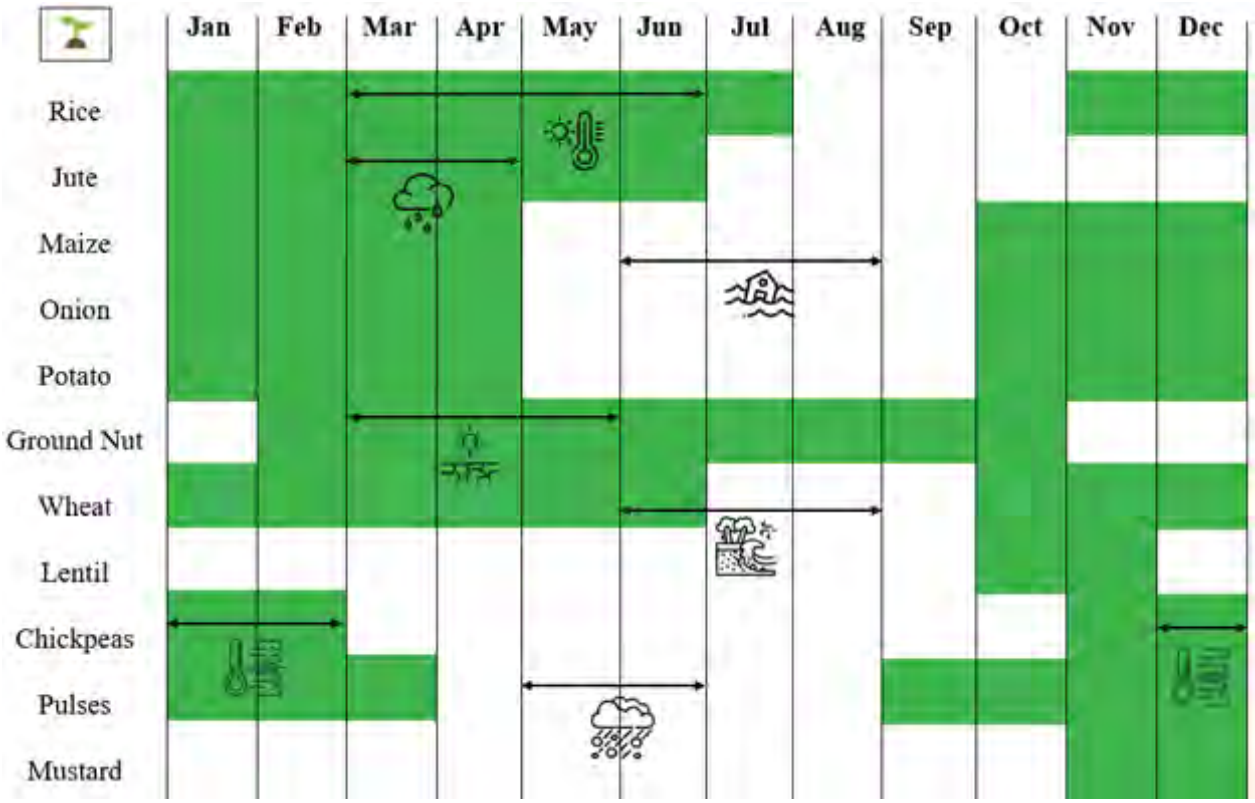


Figure 11: Crop cultivation calendar with the annual associated hazards

For crops like maize, onion, and potato, excessive heat during this period can impair pollination, cause premature leaf senescence (aging), and can lead to poor tuber or bulb formation. Heat stress can also result in wilting, leaf scorch, and a reduction in the photosynthetic capacity of the plants. Moreover, the reduction in soil moisture, makes it harder for crops like groundnut and maize to extract enough water from the soil for optimal growth. This leads to lower yields, poor crop quality, and increased vulnerability to pests and diseases, impacting the livelihoods of farmers dependent on these crops.

During this period of drought and heatwave, 93.3% of the population had access to electricity, a significant improvement compared to the previous report gathered by RIMES on 'Community-Based Heatwave Exposure Survey', where many of the community member representative mentioned that they lacked sufficient coverage of electricity. This access likely enabled people to take better adaptive measures, such as using electric fans to combat

the heat. However, 6.7% of the population still lacked electricity,leaving them more vulnerable to heat-related health issues and less able to mitigate the effects of extreme heat. On the other hand, nearly the entire population experienced water scarcity, a critical issue during a heatwave. The lack of water exacerbated the situation, limiting people's ability to stay hydrated and affecting agricultural and livestock productivity.

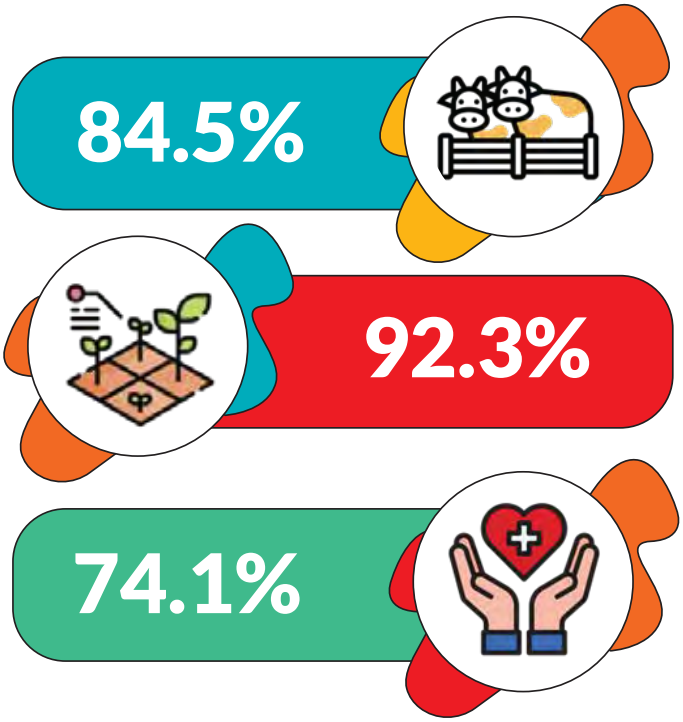


Figure 12: Impact of water scarcity on different sectors

Water scarcity impacted all three major sectors—Agriculture, Health, and Livestock—with the agricultural sector being the hardest hit (92.3%), followed by the livestock sector (84.5%), and then the health sector (74.1%) (Figure 12). This is especially concerning since most of the local population depends on agriculture and livestock for their livelihood. The lack of water threatens crop survival, livestock health, and, ultimately, the community's food security and income. Additionally, all respondents indicated that their own union was the most affected by the drought and heatwave, emphasizing the widespread perception of localized impacts. It must also be noted that the lack of water availability ultimately lowers their capacity to take adaptive actions using water as a cooling agent. In the context of a heatwave, water scarcity is particularly detrimental.

Water is essential for cooling down people and animals, maintaining agricultural resilience, and preventing heat-related illnesses. For farming communities that depend heavily on agriculture and livestock, the combination of extreme heat and limited water availability can have devastating consequences on both food production and economic stability.

3.5 Adaptive Practices and Loss Minimization

Nevertheless, despite the water scarcity and some regions lacking electricity, all participants reported that they took adaptive steps to reduce drought/heatwave impact. The analysis of adaptive measures across the Health, Agricultural, and Livestock sectors reveals essential insights into how communities responded to the heatwave and drought conditions. In the health sector, the majority of respondents (99%) relied on simple strategies like resting under trees, drinking more water (99.3%), and bathing frequently (56.1%) to mitigate the effects of extreme heat (Figure 13). Using hand fans (84%) and staying indoors (75.1%) were also widely adopted to reduce heat exposure. Moreover, some people (43.1%) focused on dietary changes like consumption of panta bhat, and avoided fatty foods (4.5%). Therefore, the majority of adaptation strategies for the health sector were centered around staying cool and hydrated, which was challenging due to limited access to water.

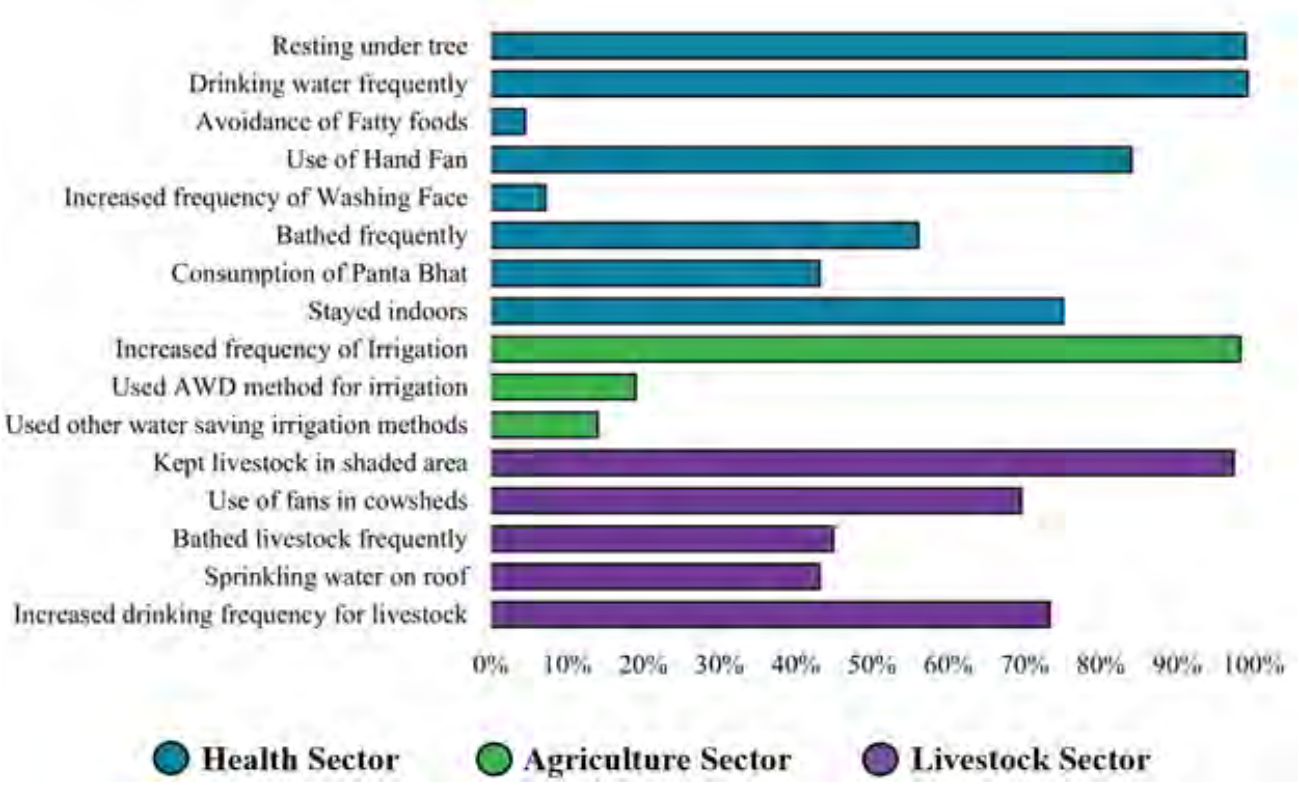


Figure 13: Adaptive measures taken across sectors

In the agricultural sector, increased frequency of irrigation was the most prominent measure, with 98.3% of respondents adopting it to ensure crops received enough water during the drought. Despite the availability of more efficient irrigation methods, only 19% used the AWD method, and 14% employed other water-saving techniques, such as pitch irrigation. This suggests a strong reliance on conventional irrigation, with limited use of advanced techniques that could help conserve water more effectively. The livestock sector saw widespread adoption of measures to protect animals from the heat. Keeping livestock in shaded areas

(97.5%) and increasing drinking frequency (73.3%) were the most common practices, reflecting an understanding of the importance of keeping animals cool and hydrated. Fans in cowsheds were used by 69.6% of respondents, helping to maintain airflow and reduce temperatures indoors. However, less labor-intensive methods like bathing livestock frequently (44.9%) and sprinkling water on roofs (43.1%) were undertaken by fewer people.

As mentioned in the previous section, early warning information was available and received by all participants. In response to that, 79.30% of the participants were able to reduce their loss by <5000BDT (Figure 14). Although this figure seems lower than anticipated, it's important to recognize that the majority of respondents belonged to this income bracket, making it a vital achievement for the local community. Similarly, a smaller percentage (15.96%) was able to save 5000-10,000 BDT, followed by a minor 2.74 percentage of participants who were able to save between 10,000 to 30,000 BDT and 0.5% saved up to 20,000-30,000 BDT. Merely 1.5% of the participants reported that they were unable to reduce their losses and lost around 10,000 BDT. This underscores the significant role and effectiveness of early warning systems in minimizing losses and enhancing the well-being of community members. Moreover, it demonstrates how timely information can be crucial in building community resilience against potential hazards.

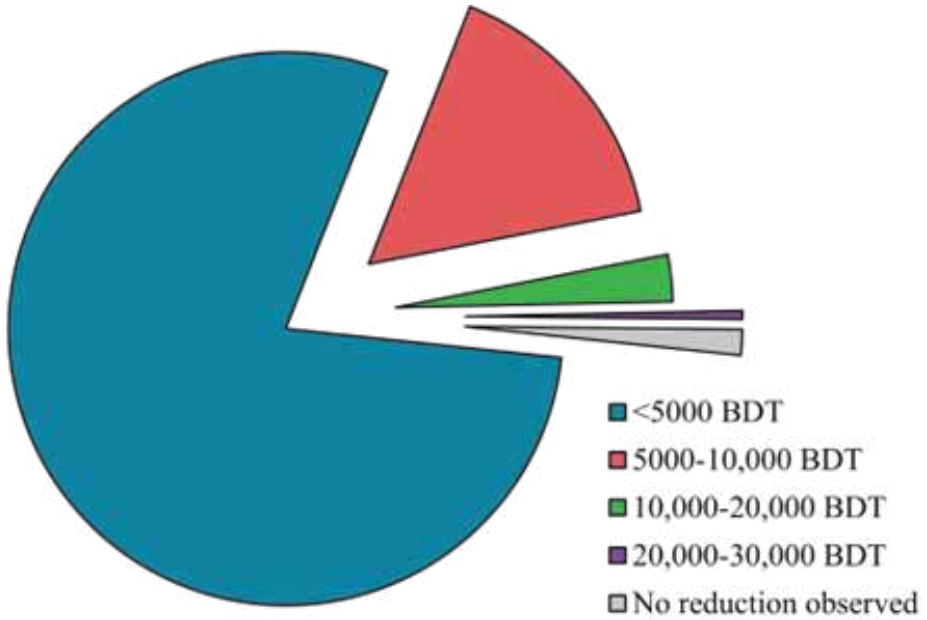


Figure 14: Quantity of loss minimization after receiving early warning information

3.6 Brief Outlook of Interventions

RIMES has been producing localized weather and flood forecasts and alerts in partnership with FFWC and BMD, utilizing long-term flood predictions and upazila-specific weather forecasts, which are delivered directly to the targeted beneficiaries through a voice message broadcasting system. RIMES with collaboration with Disaster Management (DDM), the

Department of Agricultural Extension (DAE), and the Department of Livestock Services (DLS) has created and shared agromet advisories, livestock advisories, and guidance for actions before, during, and after special weather events. From April, 2024 to July 2024, series of early warning messages were disseminated to both Chilmari and Ulipur Upazila before the heatwave spell with a lead time of 2-3 days based on the heatwave alert. These messages were sent almost weekly depending on the trigger and meteorological conditions. The messages were repeated 1 to 2 times daily to increase their dependability and access. These special weather updates were shared concurrently for the pilot project area in Kurigram. The messages allowed for anticipatory actions, particularly for recurring elevated temperature episodes, floods, and unexpected rainfall patterns.

Measures taken during the project aimed to prevent and reduce the impact of hazards at the grass root level. Save the Children implemented a series of initiatives to support the community in response to the drought and heatwave conditions accelerated by El Niño, reaching approximately 22,000 participants, including men, women, children, and youth. The project facilitated community-based drought risk assessments and conducted workshops on disaster-resilient livelihood preparedness and rehabilitation for government officials and DMC members. Additionally, the project supported capacitated Local Service Providers (LSPs), who provided primary treatment, vaccination, and technical support for poultry, livestock rearing, beef fattening, milk production, and artificial insemination in eight unions of Ulipur and Chilmari Upazilas.

Figure 15: Intervention through this project (Sprayer distribution in the left and Umbrella distribution among school children)

Critical agricultural interventions included consultations with the Department of Agricultural Extension (DAE) to identify the locally suitable crop seeds for the Kharif-1 season, including BRRI Dhan-98 and BARI Teel-4, along with the distribution of fertilizers. The project promoted the use of mulching (rice straw or mulching sheets) in homestead gardens and provided canvas-coated Feeta pipes (Ribbon pipes) for irrigation. Many farmers in the char areas also benefited from access to shallow machines and Low Lift Pumps (LLPs). Further initiatives included the distribution of agro-inputs and equipment such as the Spray machine,

along with arranging mass awareness campaign (Figure 15). Workshops focused on developing early action plans were also held in each union and upazila to draft a local early action protocol. For schools, a list of vulnerable institutions was identified for WASH (Water, Sanitation, and Hygiene) interventions, which included the reinstallation of tube wells and the construction of platforms at the school level to improve access to clean water.

3.6.1 Timeline of the AA Interventions

The anticipatory actions for managing drought and heatwave events in the study area were implemented in a phased manner, guided by specific meteorological triggers and forecast information (Annex-3). These timelines aimed to ensure that communities were prepared and equipped to mitigate the adverse effects of these climatic hazards.

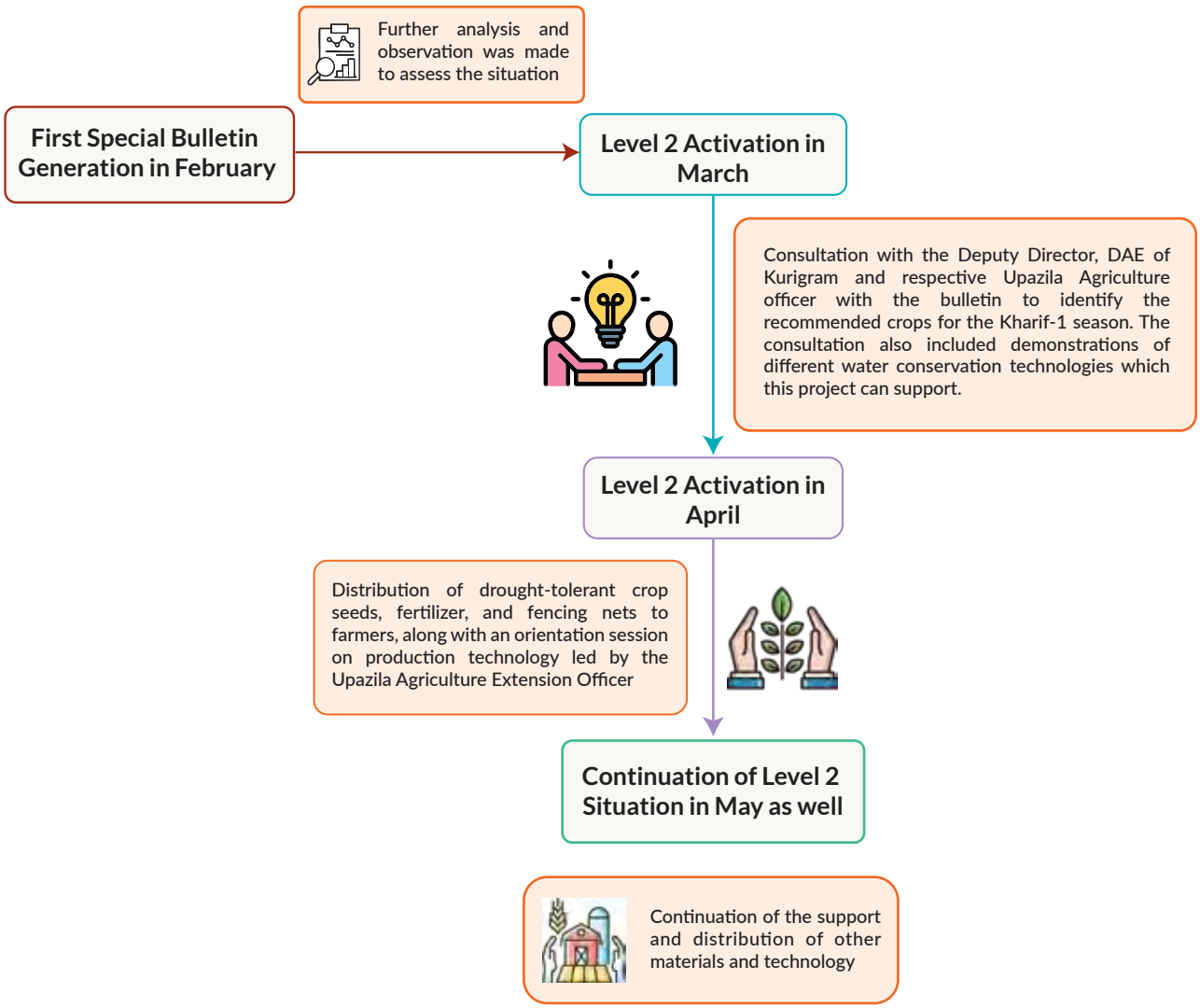


Figure 16: Drought trigger Activation Timeline

The drought AA intervention began in February 2024 with the generation of a specialized bulletin aimed at informing stakeholders of the potential drought risks, allowing for early preparatory measures to be taken. By March 2024, Level 2 Activation was triggered as the severity of the drought became evident. During this phase, specific drought-resilient practices were encouraged, such as promoting drought-tolerant crop varieties,implementing water conservation techniques, and encouraging early irrigation measures to protect agricultural production. In April 2024, the drought conditions persisted, and Level 2 Activation continued. The focus during this period was on providing further support for agricultural resilience, including distributing essential agricultural inputs and promoting efficient irrigation practices to help sustain crop health. As the drought situation remained critical in May 2024, Level 2 interventions were extended. This included sustained support to affected farmers, additional input distribution, and ongoing advisories to ensure that communities were well-informed on mitigating the impact of the prolonged drought.

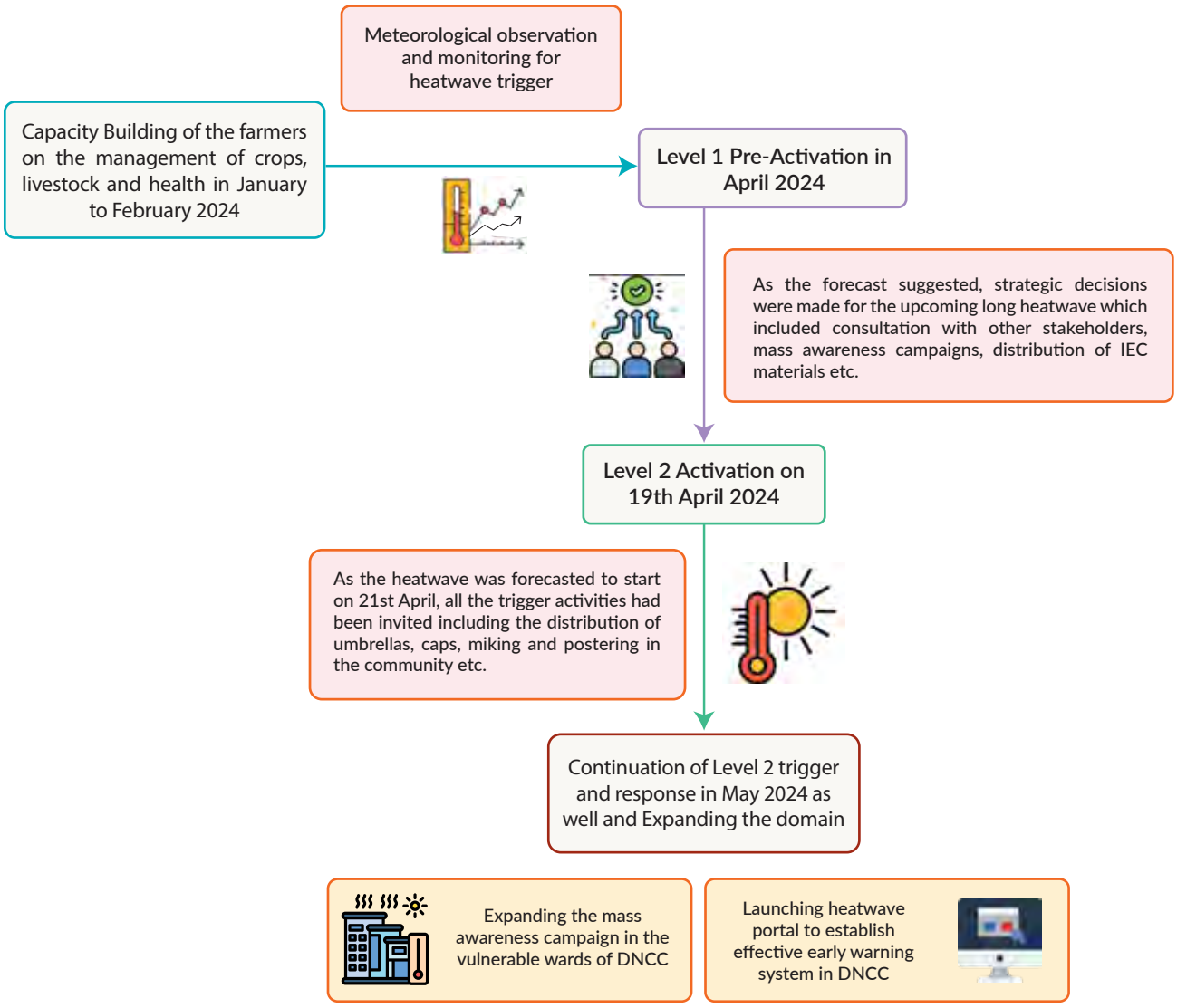


Figure17: Heatwave trigger Activation Timeline

The heatwave intervention timeline followed a similar phased approach, starting with capacity building for farmers in January and February 2024. These training sessions focused on crop, livestock, and health management, equipping farmers with adaptive skills to mitigate the expected impacts of the upcoming heatwave. In April 2024, as forecast indicated a potential risk of heatwave conditions, Level 1 Pre-Activation was initiated. This phase involved early dissemination of advisories to prepare communities for potential worsening conditions. On April 19th, Level 2 Activation was triggered in response to more accurate heatwave forecast. This activation included broader dissemination of early warning information, advisories tailored to vulnerable groups, and the implementation of measures such as providing shade, distributing cooling aids, and ensuring hydration support. The heatwave intervention efforts continued into May 2024, extending the response domain to additional regions. Measures included sustained advisories, expanded access to cooling resources, and enhanced community outreach to help mitigate the ongoing heatwave impacts.

The heatwave trigger mechanism was followed at a small scale focusing the vulnerable wards in the Dhaka North City Corporation (DNCC). Mass awareness campaigns, postering, resting booths, water booth were installed in this area during the Heatwave based on the forecast. Additionally, in collaboration with BMD and DNCC, a dedicated heatwave portal for DNCC was inaugurated to aid DNCC to properly rollout their heatwave related interventions.

3.6.2 Protection, Gender and Inclusion

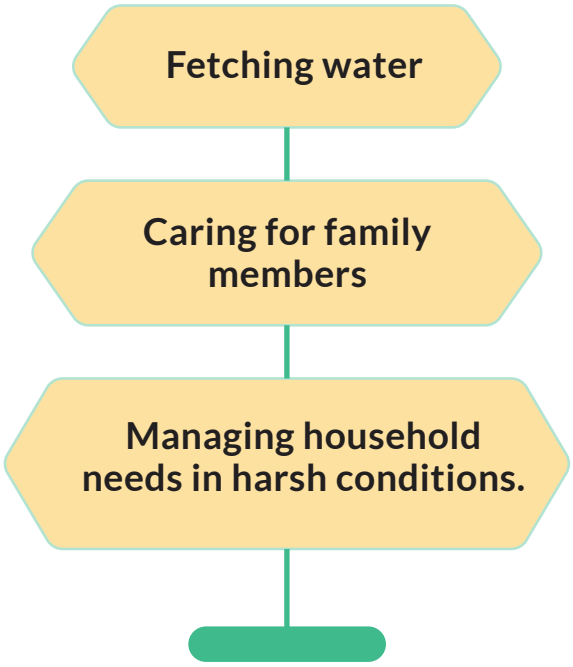
El Nino Anticipatory Action project adopted a robust, inclusive approach to ensure equitable access to resources and protection measures, prioritizing the most vulnerable groups, including children, women, and persons with disabilities. Tailored interventions addressed specific vulnerabilities, with women empowered through active participation in decision-making and community-led initiatives to mitigate heatwave impacts. Safe spaces and child-centred activities, complemented by safeguarding awareness campaigns and the Feedback Response Mechanism, fostered a culture of protection and accountability. Emphasis was placed on reducing risks of exploitation, violence, and neglect, creating safer environments for children and families. These gender-responsive and inclusive measures aligned with global standards, ensuring no one was left behind in building resilience to drought and heatwave impacts.

3.6.3 Improvement in Quality of Life

The interventions implemented during the drought and heatwave have played a crucial role in alleviating the adverse impacts on children in the community. During these extreme weather events, which severely disrupted daily life, access to essential services became a lifeline for vulnerable groups like children. Yet, as a result of the interventions, 97.5% of respondents observed improved access to education. In the face of heatwaves and droughts—when schools often shut down or attendance drops due to extreme conditions—continued schooling and the distribution of learning materials ensured that children could maintain their education without significant disruption. This marks an exceptional improvement compared to the drought risk assessment study, which noted that Chilmari and Ulipur Upazilas used to experience high absentee rates in schools due to elevated temperatures and the lack of vital resources. The effectiveness of these interventions suggests a notable improvement in the quality of life within the community.

Other interventions have also improved the life of the community members. The enhanced healthcare and emergency services, benefiting 65.8% of the population, provided vital medical support during the drought and heatwave, helping to manage heat-related illnesses, dehydration, and other health issues exacerbated by the harsh conditions. Additionally, special support measures like counseling and nutritional support were critical in maintaining children's well-being, especially when drought caused food shortages and increased malnutrition risks. With extreme heat often making outdoor activities dangerous, the increased availability of child-friendly spaces and recreational activities (56.6%) offered safe alternatives where children could continue to play, learn, and socialize in protected environments. However, while interventions aimed to reduce child labor and exploitation, only 23.4% of respondents saw improvements in this area, suggesting that economic pressures during droughts and heatwaves might still push children into labor. Strengthened family and community support systems (28.2%) helped provide a safety net for children, ensuring they had access to resources and protection, though more efforts are needed in this regard. Interestingly, only a small percentage (0.4%) of respondents mentioned staying indoors as a common protective measure, which suggests that other interventions were prioritized to maintain a sense of normalcy and activity for children.

The drought and heatwave have also exacerbated gender inequalities in the community. Women's workloads surged, with 99.3% of respondents indicating that women bore a significant share of additional responsibilities, such as :



These weather events also heightened the vulnerability of children and the elderly, with 94.5% of respondents noting increased risks for these groups due to factors like heat exposure and reduced access to essential resources. Although gender-based responsibilities shifted slightly during these crises, with 12.5% reporting changes in traditional roles, these shifts were not widespread.

Overall, while the interventions helped to mitigate the impact of the heatwave and drought on children, particularly in education, healthcare, and safe spaces, the increasing burden on women and the continued vulnerability of children and the elderly highlight areas that require further intervention and support. The community's adaptive capacity still needs bolstering to better withstand future climate events, particularly in addressing gender inequalities and child labor.

Chapter 4: Observations & Learnings

4.1 Recommendation

While the interventions have positively impacted the lives of community members, there always remains room for improvement. Locals have emphasized the need for more training on adaptation practices to ensure quick and effective responses during future heatwaves and droughts. Additionally, improving advisories and disseminating early warning information is vital, as timely and accurate forecasts can help people prepare better and reduce damage. Fund allocation must also be optimized to ensure resources reach those most affected, especially in vulnerable sectors like agriculture and livestock. Furthermore, considering the changing climate, supporting shifts in occupation for community members whose livelihoods are directly impacted by extreme weather could be a vital strategy for long-term resilience. Enhanced focus on these areas will help reduce potential loss and damage from future droughts and heatwaves, making the community more resilient to ongoing climate threats.

Moreover, several limiting factors need to be addressed to enhance the effectiveness of adaptative strategies, and some ways to mitigate this is to:

Increase trust and experience of locals in using early warning information

Even though DAE and DLS have enough drought/heatwave-tolerant technologies, breeds, and varieties, the lack of connection with seasonal and sub-seasonal forecasts hinders the effective application of these technologies. So, enhancing their capacity in this regard will ensure more seasonal-scale early action, which can definitely reduce losses.

Enhancement of forecast interpretation capacity

This assessment has revealed that communities prefer more capacity-building programs. They want to learn more about forecast interpretation and real-time forecast use. So, capacity building should be the top priority for any future projects.

Enhancement of the forecast products

Even though the forecast and bulletin were available with at least 1 month lead-time, this can be improved with more technological advancement. More high-resolution and multi-model ensemble forecasts with data assimilation will ensure a more reliable and precise forecast.

Mainstreaming Seasonal to Sub-seasonal Forecast Application

The demand of longer lead-time confirms the necessity of seasonal to sub-seasonal forecast with sector specific application. So seasonal to sub-seasonal forecasts should be promoted with sectoral engagement to ensure resilience through strategic sectoral (e.g., selection of crop variety) decisions.

Adaption of multi-timescale and multi-hazard forecast

While the longer lead time forecast sounds ideal, in reality, the longer lead time comes with the caveat of uncertainty and lower spatial resolution. Similarly, from the hazard table, it is clear that, a single crop can be exposed to multiple hazards. So, it would be wise to address multi-hazard scenarios with multi-timescale forecast products for both strategic and tactical decision-making.

Capacity building of sectoral departments

Even though DAE and DLS have enough drought/heatwave-tolerant technologies, breeds, and varieties, the lack of connection with seasonal and sub-seasonal forecasts hinders the effective application of these technologies. So, enhancing their capacity in this regard will ensure more seasonal-scale early action, which can definitely reduce losses.

Mainstreaming local and National level Early Action Protocol

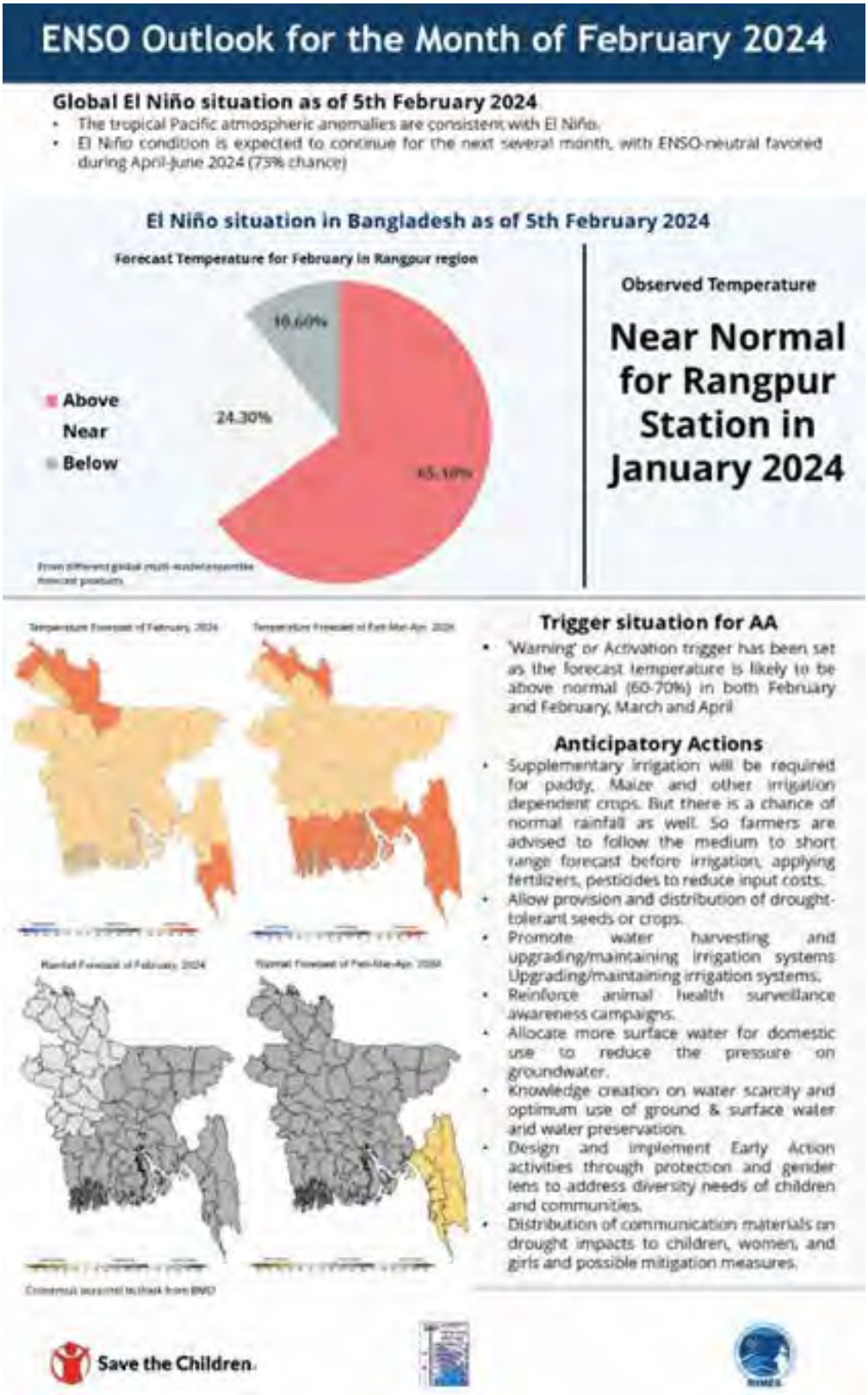
All developments should be integrated under a national protocol to ensure reliable early actions with forecast products. Similarly, localized early action protocol should be developed and maintained along with the national one to ensure the seamless integration of AA. This will connect the policy gap to the extension of the EAP to the communities and reduce the damage.

Providing targeted support for vulnerable groups, such as women, children, those who are disabled, and the elderly, will help tailor interventions to their specific needs. Additionally, fostering greater community involvement in planning and response will ensure that local knowledge and concerns are integrated into solutions. Offering gender-sensitive and culturally appropriate strategies is essential to address the unique challenges different groups face during droughts and heatwaves. For children, interventions must place more emphasis on educational continuity and enhanced health services to safeguard their well-being during extreme weather events. Finally, by strengthening community awareness about the benefits and effectiveness of early warning information, this initiative will foster a more resilient and sustainable approach, ensuring that the project's goals are met in the long term and the community is better equipped to respond to future challenge


Save th

Annexes

Annex – 1 ENSO Bulletins



ENSO Outlook for the Month of March 2024

Global El Niño situation as of 13th March 2024

- The tropical Pacific atmospheric anomalies are consistent with El Niño.
- El Niño condition is expected to continue for the next several month, with ENSO-neutral favored during April-June 2024 (79% chance)

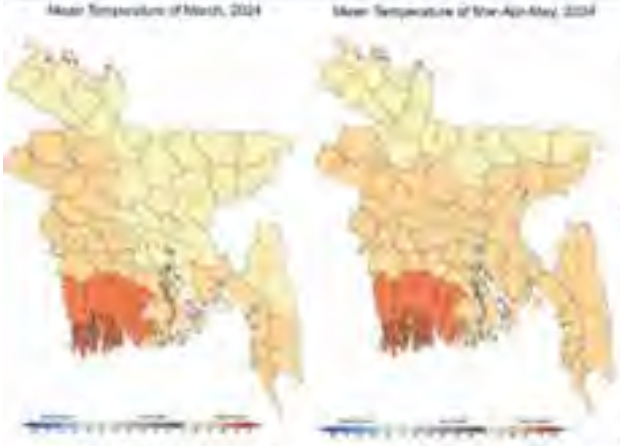
El Niño situation in Bangladesh as of 13th March 2024

Forecast Temperature for March in Rangpur region

Seven different global multi-model ensemble driven set products

Observed Temperature

Above Normal for Rangpur Station in February 2024



Consensus seasonal outlook from BMD

Trigger situation for AA

- 'Warning' or Activation trigger has been set as the forecast temperature is likely to be above normal (50-60%) in both March and March, April and May

Anticipatory Actions

- Supplementary irrigation will be required for paddy, Maize and other irrigation dependent crops. But there is a chance of normal rainfall as well. So farmers are advised to follow the medium to short range forecast before irrigation, applying fertilizers, pesticides to reduce input costs.
- Allow provision and distribution of drought-tolerant seeds or crops.
- Promote water harvesting and upgrading/maintaining irrigation systems Upgrading/maintaining irrigation systems.
- Reinforce animal health surveillance awareness campaigns.
- Allocate more surface water for domestic use to reduce the pressure on groundwater.
- Knowledge creation on water scarcity and optimum use of ground & surface water and water preservation.
- Design and implement Early Action activities through protection and gender lens to address diversity needs of children and communities.
- Distribution of communication materials on drought impacts to children, women, and girls and possible mitigation measures.

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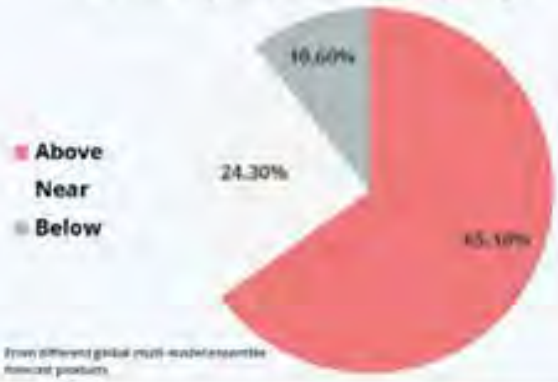
ENSO Outlook for the Month of February 2024

Global El Niño situation as of 5th February 2024

- The tropical Pacific atmospheric anomalies are consistent with El Niño.
- El Niño condition is expected to continue for the next several month, with ENSO-neutral favored during April-June 2024 (75% chance)

El Niño situation in Bangladesh as of 5th February 2024

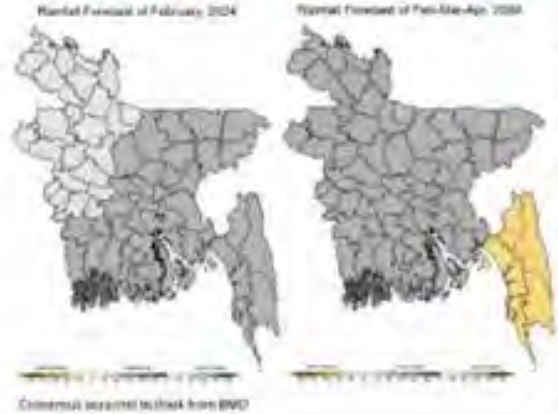
Forecast Temperature for February in Rangpur region



From different global multi-model ensemble forecast products

Observed Temperature

Near Normal for Rangpur Station in January 2024



Consensus forecast outlook from BMD

Trigger situation for AA

- 'Warning' or Activation trigger has been set as the forecast temperature is likely to be above normal (60-70%) in both February and February, March and April

Anticipatory Actions

- Supplementary irrigation will be required for paddy, Maize and other irrigation dependent crops. But there is a chance of normal rainfall as well. So farmers are advised to follow the medium to short range forecast before irrigation, applying fertilizers, pesticides to reduce input costs.
- Allow provision and distribution of drought-tolerant seeds or crops.
- Promote water harvesting and upgrading/maintaining irrigation systems Upgrading/maintaining irrigation systems.
- Reinforce animal health surveillance awareness campaigns.
- Allocate more surface water for domestic use to reduce the pressure on groundwater.
- Knowledge creation on water scarcity and optimum use of ground & surface water and water preservation.
- Design and implement Early Action activities through protection and gender lens to address diversity needs of children and communities.
- Distribution of communication materials on drought impacts to children, women, and girls and possible mitigation measures.

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Annex – 2 ENSO Bulletin Summary and performance

Month	Forecast and Warning	Actual Observed Situation
Feb-24	Above normal temperatures (60-70%) with drought likelihood.	Near normal temperatures for January, warning activated due to potential above normal temps
	Trigger issued: Warning' or Activation trigger based on temperature forecast	
Mar-24	Above normal temperatures (50-60%), potential drought, normal rainfall	Observed higher-than-normal temperatures, forecast was mostly accurate
	Trigger issued: Warning' or Activation trigger based on temperature forecast	
Apr-24	Above normal temperatures (40-50%), El Niño weakening, neutral conditions expected by April-June	Observed conditions confirmed transition towards ENSO-neutral with normal rainfall and cooler temps
	Trigger issued: Warning' or Activation trigger based on temperature forecast	

Annex – 3 Proposed triggers for Drought and Heatwave

Drought Triggers

Level	Trigger Scenario	Trigger points for Action
Monitoring or Pre-Activation	Drier environment, high evapotranspiration, increase in the use of supplementary irrigation systems and groundwater level at a lower level, farmers complaining about water scarcity, in the riverine areas, the river water level is also at a lower level.	Observed below normal (equal or above 30 percentile) rainfall for three months Or a forecast rainfall (3-month) of below normal (equal or above 30 percentile) for that same region and forecast temperature of above normal (equal or above 30 percentile) Or both
Warning or Activation	The probability of drought occurring in the next month is high, and rainfall is significantly below average for the last three months	Observed below normal (equal or above 30 percentile) rainfall for last month Or a forecast rainfall (1-month) of below normal (equal or above 30 percentile) for that same region and forecast temperature of above normal (equal or above 30 percentile) Or both. Forecast SPI (Standardized Precipitation Index) and SPEI (Standardized Precipitation Evapotranspiration Index) value 0 to -1 (ECMWF extended range daily forecast) for at least consecutive 10 Days. At least 50% of crops are dependent of on irrigation for this month to next month (Based on the reports from DAE).
Monitoring and warning	Dry spell/drought has been on set based on the previous trigger values, the probability of continuation of the same scenario for next month is high.	Observed below normal (equal or above 50 percentile) rainfall for last month Or a forecast rainfall (1-month) of below normal (equal or above 30 percentile) for that same region and forecast temperature of above normal (equal or above 30 percentile) Or both Forecast SPI and SPEI value 0 to -2 (ECMWF extended range daily forecast) for at least 10 Days At least 50% of crops are dependent of on irrigation for this month to next month (Based on the reports from DAE)

Heatwave Triggers

Level	Trigger Scenario	Trigger points for Action
Monitoring or Pre-Activation	Drier environment, minimum chance of rainfall for at least 14 days, low soil moisture.	Strong low-level westerly winds and weak southerlies with at least 15 days lead time. (Monthly outlook of these wind patterns can also guide this.)
Warning' or Activation	More drier environment, minimum chance of rainfall for at least 14 days, low soil moisture and strong westerly in neighboring Indian region	BMD defined thresholds of heatwave for at least consecutive three (03) days based on 10-day forecast And Forecast Temperature humidity index (THI) of Mild stress to severe stress for ruminant and poultry for consecutive 3 days at least based 10-day forecast

Case Study

Nazir Hossain's Path to Sustainable Farming Practices

Nazir Hossain, who is 72, and his spouse, Mst. Maleka Begum, 67 years old, live on their own in Chilmari Upazila and depend primarily on old-age pensions and farming for their livelihood.

As a small-scale farmer, Nazir faces challenges from droughts and heatwaves that negatively impact both crop production and livestock output. Last year, the drought led to a 40% decrease in his maize harvest, which hindered his ability to access medical care and improve Water, Sanitation, and Hygiene (WASH) facilities, ultimately forcing him to take out a loan. Additionally, he found it difficult to care for his livestock during the heatwave due to a lack of knowledge. Nazir became a member of a farmers' group established by the El Niño Project in November 2023. He gained knowledge about crops that can withstand drought, effective irrigation practices utilizing ribbon pipes, and managing livestock during periods of extreme heat. Thanks to the ribbon pipe, his maize production rose by 15% this year, and his jute crop is flourishing. He expresses appreciation for the support he has received and plans to keep using these adaptive strategies.

For more information or to provide your feedback on this report, please contact

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