

6) UzDRRAP of Chilmari, Kurigram

**Upazila Disaster Risk Reduction
Action Plan (UzDRRAP)**

Chilmari, Kurigram

June 2025

**Upazila Disaster Management Committee
(UzDMC), Chilmari, Kurigram**

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Preface

Bangladesh is one of the most disaster-prone countries in the world due to its geographical location. The frequency and intensity of disasters have increased in recent years due to climate change, as floods and storm surges are likely to become more severe with increases in intense tropical cyclones. Also, geographically, the country is located close to active seismic zones and is susceptible to medium to large earthquakes. These disasters cause not only direct physical damage to lives and assets, but also indirect and consequent losses to various sectors such as the agricultural sector, food security, water, health and sanitation, significantly impacting the economy and livelihood of the local communities. To tackle the situation, the government has achieved breakthroughs in disaster risk management by mentioning this as one of the top priorities, as described in the 8th Five-Year Plan (July 2020- June 2025), “a sustainable development pathway resilient to disaster and climate change” as a core theme.

In order to accelerate the disaster resilience of the country, it is vital to develop and implement local disaster risk reduction strategies and plans, as also indicated in the Sendai Framework for Disaster Risk Reduction 2025-2030. Expectedly, by adopting a local disaster risk reduction plan in every Upazila, it is possible to effectively reduce the damage and loss caused by disaster, and enhance continuous and sustainable development of the country's economy, and therefore achieve Vision 2041 of the government.

In light of this, “The Project for Capacity Enhancement on Formulation and Implementation of Local Disaster Risk Reduction Plan” has been implemented since December 2020, led by MoDMR and DDM, supported by the Japan International Cooperation Agency (JICA). In this Project, Upazila Disaster Risk Reduction Action Plans have been formulated in six pilot Upazilas of three districts, which are Cox's Bazar (Cox's Bazar Sadar and Chakria), Sunamganj (Chhatak and Jagannathpur), and Kurigram (Chilmari and Ulipur). These plans have been developed by unique approaches that are 1) Scientific analysis for local hazards; 2) Setting DRR targets based on risk quantification; 3) Involvement of project implementing agencies including BWDB, LGED, SoB, GSB, BMD, PWD, FSCD, and so on. These approaches have successfully established this effective plan and promote the execution of the projects to reduce disaster risk.

This plan is expected to save lives, livelihoods, and resources of the Upazila, as well as pave the way for enhancing future development through disaster risk reduction in the country.

UzDRRAP Formulated by the Department of Disaster Management (DDM) and Technical Assistance from the JICA Expert Team (JET) of “The Project for Capacity Enhancement on Formulation and Implementation of Local Disaster Risk Reduction Plan”.



Director General
Department Of
Disaster Management



Message

Bangladesh is the 7th most vulnerable country to climate change according to Global Climate Risk Index (CRI) ranks published by German watches. Accordingly, people in Bangladesh are often affected by number of natural disasters like cyclone, storm surges, floods, riverbank erosion, drought, salinity intrusion, cold wave and thunderstorm etc. The Government of Bangladesh (GoB) recognizes these risks as significant detriment to the growth prospects of the country and has taken several measures over the decades.

Bangladesh made its policies and strategies for disaster risk management following principles of the SFDRR (Sendai Framework for Disaster Risk Reduction) since the adoption of the framework in March 2015. Over time, the GoB has shifted its focus from conventional response and relief approach to a more proactive comprehensive risk reduction approach in order to make our common people more resilient. In light of SFDRR, the Ministry of Disaster Management and Relief (MoDMR) has taken a pilot project in a titled "The Project for Capacity Enhancement on Formulation and Implementation of Local Disaster Risk Reduction Plan - LDRRP" with the financial and technical support of JICA. This project is being piloted six Upazilas in three different geographical locations of Cox's Bazar (Cox's Bazar Sadar & Chakaria), Sunamganj (Chhatak & Jagannathpur) and Kurigram (Chilmari & Ulipur) respectively.

I expressed my cordial thanks to JICA Expert Team (JET) including development partners "GPAD" (Geo Planning for Advanced Development) for their diligent efforts to prepare this Upazila Disaster Risk Reduction Action Plan (UzDRRAP) engaging members of UDMC, UzDMC and relevant govt. agencies. I hope that the said plans will play a vital role for reducing disaster risk in the pilot Upazilas and later be expanded across the country.

Razwanur Rahman
(Additional Secretary)



Project Director
LDRR Project
and
Director
Planning & Development
Department Of Disaster Management



Message

Bangladesh is one of the most vulnerable countries to natural disasters due to its geographical location, and socio-economic condition. The geographical location, land characteristics, multiplicity of rivers and the monsoon climate render Bangladesh highly vulnerable to natural hazards. Bangladesh is a riverine country with numerous rivers, and the three major ones flowing over its 147,570 square kilometers of surface area are the Ganges, the Brahmaputra, and the Meghna. Due to climate change, natural disasters are hitting Bangladesh on a massive scale every year, which is regularly holding back Bangladesh's progress. A disaster is a serious disruption of human lives including socio-economic strata and environmental degradation causes long term effects and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

In this consequence in the light of Sendai Framework for Disaster Risk Reduction (SFDRR), the Ministry of Disaster Management and Relief (MoDMR) has taken a pilot project named "The Project for Capacity Enhancement on Formulation and Implementation of Local Disaster Risk Reduction Plan - LDRRP" with the financial and technical support of JICA is being piloting in six Upazilas of three pilot districts namely Cox's Bazar, Sunamganj & Kurigram considering local hazards in different geographical location. The Bangladesh Government has also emphasized on proactive Disaster Risk Management (DRM) instead of Post Disaster Response (PDR). Our belief is that formulation of Upazila Disaster Risk Reduction Action Plan (UzDRRAP) is a fundamental need for the Upazilas in order to reduce the rate of damage and loss through early response. This plan will take us on the path of prosperity by reducing the risk of disasters and will play a significant role in the development of the country.

I expressed my cordial thanks to the members of Union Disaster Management Committee (UDMC), Upazila/District Disaster Management Committee (Uz/DDMC), govt. agencies/departments and other stakeholders for their active participation in respect to invested time & ideas in the whole process during formulation of UzDRRAPs. I also expressed my heartiest thanks to JICA Expert Team (JET) and Sub-Consultant "Geo planning for Advanced Development (GPAD)" for their relentless efforts to prepare this UzDRRAP.

Md. Abdullah Al-Mamun
(Joint Secretary)



Deputy Commissioner
Kurigram District



Message

Kurigram is located in the northern region of Bangladesh along the border with India. The district is bordered by Jamalpur district of Mymensingh division to the south, Gaibandha, Rangpur and Lalmonirhat districts as well as West Bengal state of India to the West, and the Indian states of Assam and Meghalaya to the East. The area of this district is 2245.04 square kilometers where 278.28 kilometers of international border with India. It consists of 09 Upazilas (Ulupur, Chilmari, Rourari, Nageshwari, Bhurungamari and Phulbari, Kurigram Sadar, Nageshwari, Bhurungamari, Rajarhat, Ulupur, Chilmari, Phulbari, Rourari & Rajibpur and 03 Pourashavas (Municipality) & 73 Unions with 1872 villages. Kurigram District Town stands on the Bank of the Dharla River. There are some prominent rivers exists in this district, these are Brhammaputra, Tista, Dharala, Dhudkumar, Fulkumar, Jingiram, Sonavori, Holholla, Kalzani and Sankosh etc.

The district faces annual flooding due to water from upstream areas, as well as riverbank erosion both of which significant hazards. These natural disasters result in the loss of standing crops, valuable property, and even homes, posing a major threat to people's lives and livelihoods. As a result, the progress of development work is often slowed. In light of this, the formulation of Upazila Disaster Risk Reduction Plan (UzDRRP) has become a timely and essential action.

I am pleased to learn that the Upazila Disaster Risk Reduction Action Plan (UzDRRAP) is being implemented on a pilot basis in the Ulupur and Chilmari Upazilas of Kurigram district, through joint collaboration of JICA and the Bangladesh Government. It is expected that this action plan will play a crucial role in reducing the loss and damage caused by natural disasters, while accelerating development efforts in the future.

Nusrat Sultana



Upazila Nirbahi Officer
Chilmari, Kurigram District

Message

Chilmari Upazila is located in the northern part of Bangladesh and consists of six unions under Kurigram district located in the northern part of Bangladesh. The area is 224.97 sq. km, which is vulnerable to natural disasters, resulting in a very high poverty rate. This Upazila is affected by floods and riverbank erosion almost every year, causing extensive damage to standing crops, assets, infrastructures, and settlements, resulting in poverty as a daily companion. Due to these natural calamities, people's normal lives have also suffered a lot. Chilmari Upazila is a river-dwelling area where the road communication system is still not as developed as expected. There are many chars under this Upazila where people are deprived of fundamental/basic civic amenities, and even the communication system is very poor or to, some extent, absent. Henceforth, sustainable infrastructure development is not taking place here, which is a massive waste of the country's resources.

Moreover, every year due to floods and riverbank erosion, the earthen roads are broken and washed out, and even the Brick Flat Soling (BFS), Herring Bone Bond (HBB) and paved roads are also damaged, so sustainable development is far away from expectation. The inhabitants of this Upazila lose their lives and valuable assets, so financial prosperity never comes, resulting in socio-economic development being hampered. On the other hand, migration is one of the major problems of this area as there are no industries and earning sources for the employment generation of the mass people.

In this context, JICA comes forward with "The Project for Capacity Enhancement on Formulation and Implementation of Local Disaster Risk Reduction Plan-LDRRP", and is piloting this project in Chilmari Upazila, which is a timely step. It's my sincere thanks and gratitude to all those who were involved in the process of this Upazila Disaster Risk Reduction Action Plan (UzDRRAP) formulation. It is expected that this UzDRRAP will play a vital role in reducing the loss and damage caused by the natural disasters in the coming days, resulting in the restoration of lives and livelihoods of inhabitants.

Sabuj Kumar Basak

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Attachment 1: Proposed Countermeasures List [Linked with (Chapter 5.2) Action Plan]

Attachment 2: Member lists of UzDMC and UzSC for the development of the Plan with related documents

Attachment 3: Workshop and others activity photos in Chilmari

Acronyms

ADP	Annual Development Program
BBS	Bangladesh Bureau of Statistics
BCC	Building Construction Committee
BMD	Bangladesh Meteorological Department
BNBC	Bangladesh National Building Code
BWDB	Bangladesh Water Development Board
CRA	Community Risk Assessment
DAE	Department of Agricultural Extension
DDM	Department of Disaster Management
DDMC	District Disaster Management Committee
DEM	Digital Elevation Model
DMC	Disaster Management Committee
DPHE	Department of Public Health Engineering
DPP	Development Project Proposal
DRMP	Disaster Risk Management Plan
DRR	Disaster risk reduction
DRRO	District Relief & Rehabilitation Officer
FPOCG	Focal Point Operational Coordination Group
FSCD	Fire Service and Civil Defence
GDP	Gross domestic product
GIS	Geographic Information System
GSB	Geological Survey of Bangladesh
GSD	Ground Sampling Distance
HED	Health Engineering Department
ID	Identity Document
JET	JICA Expert Team
JICA	Japan International Cooperation Agency
LDRRP	Local Disaster Risk Reduction Plan
LGED	Local Government Engineering Department
MoDMR	Ministry of Disaster Management and Relief
MoE	Ministry of Education
NGO	Non-governmental Organization
NPDM	National Plan for Disaster Management
PIO	Project Implementation Officer
PWD	Public Works Department

RRAP	Risk Reduction Action Plan
SFDRR	Sendai Framework for Disaster Risk Reduction
SOB	Survey of Bangladesh
SOD	Standing Orders on Disaster 2019
TSC	Technical Sub-Committee
UNO	Upazila Nirbahi Officer
UPs	Union Parishads
URC	Upazila Resource Center
UzCC	Upazila Construction Committee
UzDMC	Upazila Disaster Management Committee
UzDMP	Upazila Disaster Management Plan
UzDRRAPs	Upazila Disaster Risk Reduction Action Plans
UzSC	Upazila Disaster Risk Reduction Action Plans Sub-Committee
VDP	Village Defense Party

Chapter-1. Introduction

1.1 Purpose and aim of the Plan

The purpose of the Chilmari Upazila Disaster Risk Reduction Action Plan (UzDRRAP) is to identify necessary countermeasures against natural disasters and implement them in cooperation with relevant stakeholders to reduce disaster risks in the Upazila. This Plan contributes to increasing investment in disaster risk reduction by ensuring a mechanism for project implementation of the line ministries' countermeasures and by promoting further funding from agencies.

1.2 Rationale for the formulation of the Plan

This Plan corresponds to the Risk Reduction Action Plan (RRAP) that is required to be developed as a part of the Disaster Risk Management Plan (DRMP) by Disaster Management Committees (DMC) at District, Upazila, and Union DMCs, according to the Standing Orders on Disaster 2019 (SOD). In the SOD, it is recommended to prepare RRAP by local DMCs, as well as the Contingency Plan. While disaster response, which is covered by the Contingency Plan, has been relatively conducted as required in emergencies, risk reduction measures based on the objective hazard and risk assessment had not been sufficiently implemented at the Upazila level. In consideration of this situation and the importance of the DRR investment for the further development of the country, this plan, therefore, emphasises disaster risk reduction and proposes the necessary actions as a master plan corresponding to the RRAP of the Upazila Disaster Management Plan (UzDMP), which directly leads to the preparation of Development Project Proposals (DPPs) and Annual Development Programmes (ADPs).

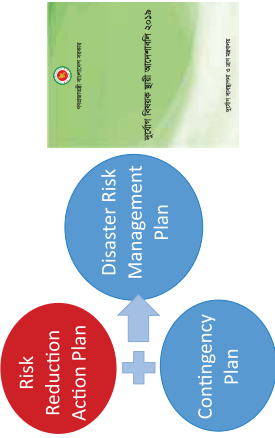


Figure 1-1. Risk Reduction Action Plan in the SOD

The formulation of the UzDRRAP and the implementation of the countermeasure against disasters are in line with the government strategies, policies, and plans of the country, as listed below.

- The Bangladesh Delta Plan 2100 mentions the importance of strengthening the disaster risk management and combating the effects of climate change.
- 8th Five-Year Plan (July 2020-June 2025) emphasizes appropriate policy and institutional capacity building to address their concerns on climate-resilient development and disaster management at all levels of the government, especially at the local government level where most of the programmes are to be implemented.

- The National Plan for Disaster Management (NPDM 2021-2025) focuses on "Making disaster risk reduction a development practice to achieve resilient public investment and the SDGs" and "Building capacity and leadership to implement NPDM 2021-2025 at the national and local level".

In addition, from an international perspective, this plan directly contributes to the Sendai Framework for Disaster Risk Reduction 2015-2030 (SfDRR), specifically the Target (e) "To substantially increase the number of countries with national and local disaster risk reduction strategy".

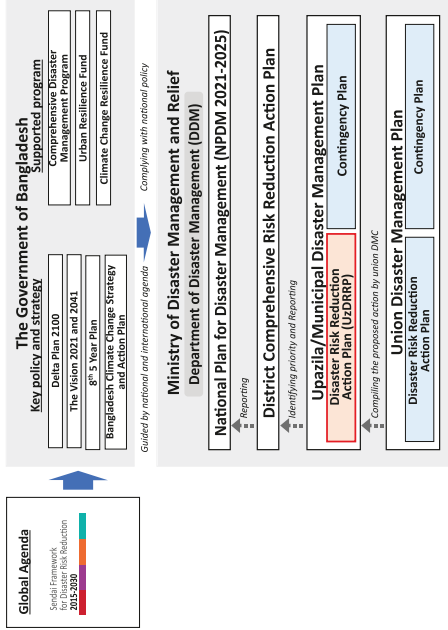


Figure 1-2. Relationship between national key policies and this plan

1.3 Relevance to other Upazila plans

Based on the Local Government (Upazila Parishad and Upazila Administration Reorganization) Act 1998 and the Local Government (Upazila Parishad) Act 2009, each Upazila shall prepare a development plan and land use plan. This plan and the proposed countermeasure against the disasters have been considered to ensure consistency with these plans in this Upazila.

1.4 Features of the Planning

The features of this Planning are 1) Scientific Analysis for Local Hazards, 2) Setting DRR Target based on Risk Quantification, and 3) Involvement of Project Implementing Agencies, which are expected to contribute to the actual execution of the effective countermeasures.

Feature 1: Scientific Analysis for Local Hazards:

The hazard maps were developed by simplified technical analysis, which processes are not adopted in the Community Risk Assessment (CRA), using observed disaster records of rainfall and tidal level, the Digital Elevation Model (DEM), and current hazard maps. The developed hazard maps represent the vulnerable areas of the Upazila and help promote to objective understanding of the hazard potential.

Feature 2: Setting DRR Targets based on Risk Quantification:

Risks in this Upazila were quantified based on risk quantification using hazard maps and various factors such as natural conditions and socio-economic factors, and visualized to share with relevant agencies. A DRR target was set in consideration of the result of identifying which areas are highly affected by potential hazards, by these risk quantifications, as well as the current policies of the line ministries (project implementing agencies).

Feature 3: Involvement of Project Implementing Agencies:

The Upazila Sub-Committee (UzSC), which is composed of the Upazila chairman, UNO, PIO, engineers from LGED, BWDB, and DPHE in the Upazila, Upazila officials, Union Parishad chairman, was established to identify disaster risks and consider priorities of countermeasures against the disasters at the Upazila level. Since the committee at the Upazila level does not have the authority to determine the countermeasures listed in the plan to be implemented, the members from the line ministries at the central level are involved in the planning processes to promote the schemes/projects listed in the UzDRRAP and secure budgets.

1.5 Methodology for the development of the Plan

1.5.1 Institutional Arrangement

For the development of this Plan, an UzSC, that is stipulated in the SOD, was established in this Upazila. The roles and responsibilities of this committee are to::

- 1) Prepare this UzDRRAP by identifying existing DPPs and pipeline projects related to DRR, Union Parishads' (UPs) priority, and some development projects that might affect people or increase disaster risk;
- 2) Summarize DRR projects by examining the needs of UPs and Risk Reduction Action Plans developed by UPs;
- 3) Identify possible DPPs to be able to collaborate among line ministries on structural and non-structural measures to maximize the efficiency and effectiveness of DRR.

In addition to this UzSC at the Upazila level, the Technical Sub Committee (TSC) was established to coordinate projects proposed by other Upazilas in addition to Chilmari Upazila at the central level. Implementation of the projects proposed in the UzDRRAP is determined by the line ministries at the central level. The roles and responsibilities of this TSC are to:

- 1) Summarize and monitor the progress of DRR-related projects based on the plans that UzSCs submitted;
- 2) Request the line ministries on the possibility of doing further investigation on DRR project needs based on the UzDRRAP;
- 3) Make efforts to integrate DRR ideas into DPP, ADP and 5YP in Upazila and line ministries, considering the disaster risk reduction target in the UzDRRAP;
- 4) Discuss among line ministries on development projects which might affect people or cause disasters;
- 5) Establish the guidelines and manuals to prepare UzDRRAPs
- 6) Take the initiative to start up UzSCs for the preparation of UzDRRAPs.

1.5.2 Planning Process and Methodology

This plan was established based on a combination of methods, namely JICA 8 steps and the CRA method which has been broadly utilized as a vulnerability assessment in the country, as shown in the figure below. For developing each chapter of this plan, the following methodology was introduced.

Chapter 2: Geographic, Socio-economic, and Meteorological Conditions

This chapter illustrates the characteristics of the Upazila, that is the conditions to develop the Action plan for DRR. The statistics data including the Census 2022 and meteorological data were collected and analyzed.

Chapter 3: Hazard Characteristics and Disaster Risk

This chapter explains disaster records and experiences, target hazards, as well as hazard and disaster risks of the Upazila. While disaster records and experiences were mostly collected by the DRRO of the district and UzDMC members, hazard and disaster risks were identified through scientific analysis by utilizing data such as elevation data (DEM) probability rainfall data, land use data, and important public facilities. These hazard maps and risk assessment results were then confirmed in workshops where the UzDMC members participated.

Chapter 4: DRR Targets of the Upazila

This chapter describes Vision and Challenges by hazard. This Vision indicates the target that all the stakeholders intend to achieve in carrying out their projects defined in this Plan. Challenges by hazard show the short-to-mid-term and long-term countermeasures to be taken to achieve the Vision, which depends on the target areas, namely inland area, along river, and Char area.

Chapter 5: Action Plan of DRR Countermeasures

This chapter shows the current status of the general DRR countermeasures as well as the action plan in line with the DRR target. The current status of the countermeasures was identified and analyzed by consultation with UzDMC and UzSC members, while the Action Plan was developed in consideration of the risk assessment results, consultation by line ministries, and proposals given by the UzDMC members.

¹ The risk assessment was conducted in accordance with the developed guideline – Guideline on Hazard and Risk Assessment.

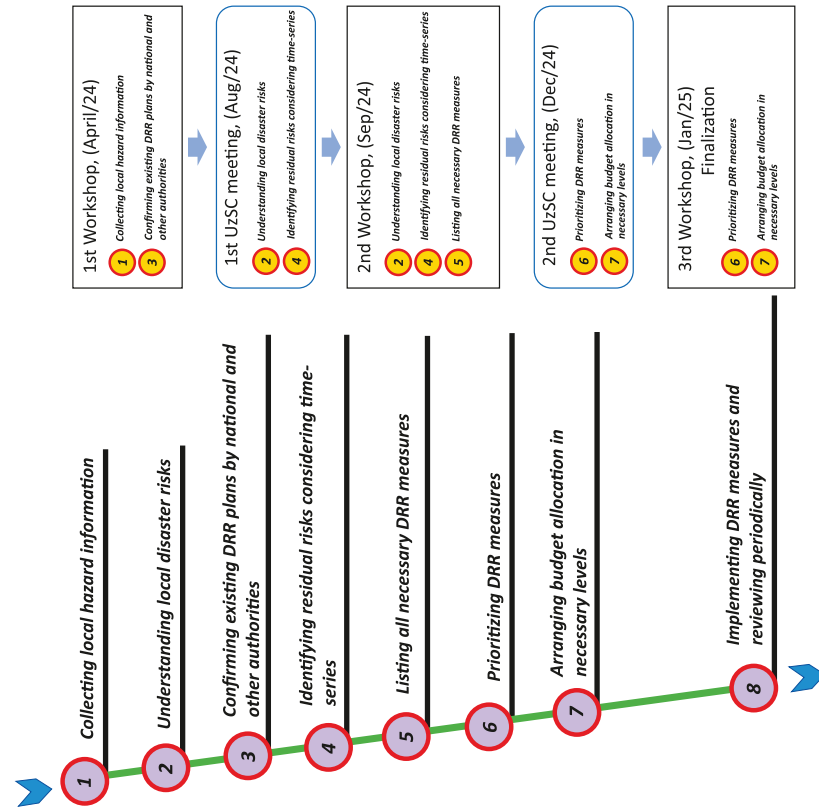


Figure 1-3. "8 Steps" for Upazila DRR Planning in case of this plan

Chapter-2. Geographic, Socio-economic, and Meteorological Conditions

2.1 Location and Geographic Conditions

2.1.1 Location of the Upazila

Chilmari Upazila is an Upazila of Kurigram District under the Rangpur Division of the northern part of Bangladesh. It is located near the Indo-Bangladesh frontier, which is intersected by the mighty Brahmaputra River. It is located 73.3 km south-east of the divisional headquarters city of Rangpur. The is flanked on the north by Ulipur Upazila, on the south by Char Rajibpur and Sundarganj Upazilas, on the east by Raumari and Char Rajibpur Upazilas, and on the west by Sundarban and Ulipur Upazilas (Figure 2-1). The total area of the Upazila is approximately 232.50 km² and is located between 25°26' and 25°40' north latitudes and 89°38' and 89°48' east longitudes.

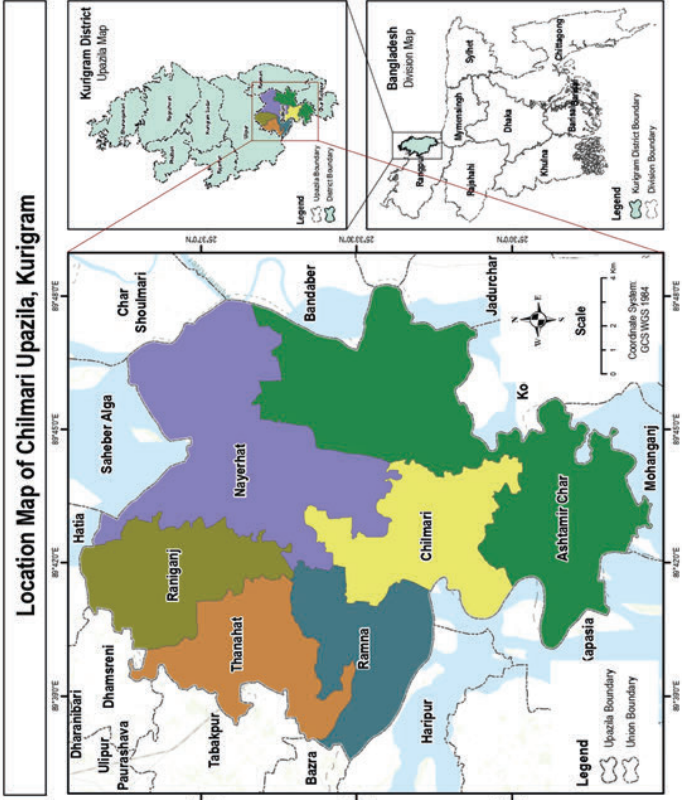


Figure 2-1. Location Map of Chilmari Upazila

2.1.2 Topography of the Upazila

The topography of Chilmari Upazila consists mostly of flatland and riverine itself with an average elevation of 28.78m above mean sea level (Figure 2-2). Therefore, it is often heavily flooded during the rainy seasons. The flat areas are used for agriculture, fishing in open water bodies between Teesta River and Brahmaputra River and settlement.

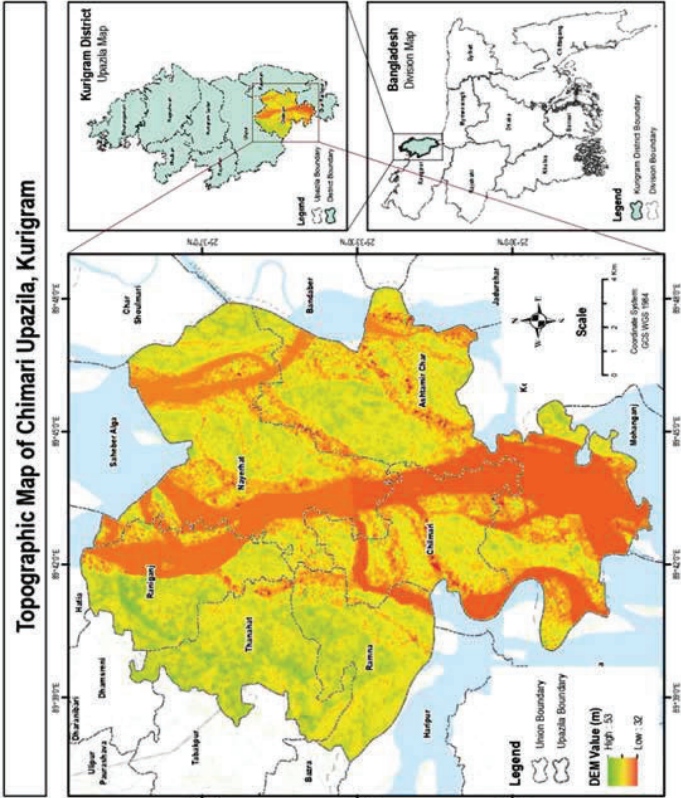


Figure 2-2. Topographic Map of Chilmari Upazila, Kurigram District

2.1.3 River System of the Upazila

Kurigram district is located in the alluvial plain of the Teesta-Brahmaputra basin. The region is prone to flooding during the monsoon season due to the rivers' overflow and the low elevation of the area.

The major rivers are the Brahmaputra River, Dharla River, and Teesta River, and the minor rivers include the Dudhkumar River, Phulkuar River, Gangadhar River, Jinjiram River, and others.

The Dharla River is a transboundary river flowing through India, Bhutan and Bangladesh. The river enters Bangladesh through Lalmonirhat District and flows through Chilmari Upazila, Kurigram District. The Dharla River is a tributary of the Brahmaputra River which is a swift river during the rainy season and a braided

stream in winter. The river is prone to flooding, especially during the rainy season. For example, in June 2024, the Dharla River rose due to heavy rains and river erosion was reported in Chilmari. The length of the river within Bangladesh is about 75 km. One has to cross it to go to Nageshwar, Fulbaria and Bhurungamari upazilas in northern Kurigram.

The Teesta River is a river in Bangladesh that flows through Kurigram District and joins the Brahmaputra River at Haripur Port in Kurigram District. The Teesta River has caused severe erosion and flooding in Kurigram, submerging hundreds of hectares of Aman paddy fields. The Teesta River's water level can rise due to continuous rainfall and also drop due to a decrease in rainfall and upstream water flow.

The Brahmaputra River originates from the Kailash ranges of the Himalayas and enters Bangladesh in the Bhabanipur area of the northeast of Kurigram district.

According to BWDB, in July 2024, the Brahmaputra River was flowing 59 cm above the threshold at Chilmari water gage point, and meanwhile, the water level of Dharla River water gage point rose by 20 cm above the danger level.

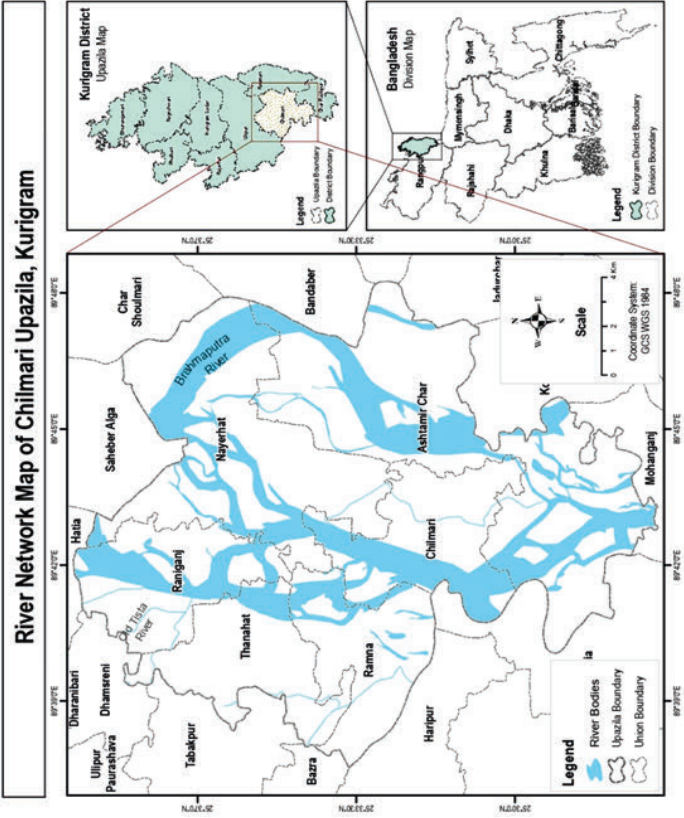


Figure 2-3. River network map of Chilmari Upazila

2.2 Socio-economic Conditions

2.2.1 Demography

Chilmari Upazila is divided into six unions: Ashtamir Char, Chilmari, Nayerhat, Ramna, Raniganj and Thanahat. According to the census 2022, the total population of the Upazila is 131,715. The demography of Chilmari Upazila is shown below.

Table 2-1. Demography of Chilmari Upazila

Union Name	Total Area (km ²)	Total Population	Number of Households
Ashtamir Char	75.10	16,880	4,524
Chilmari	26.76	8,063	2,317
Nayerhat	57.98	10,281	2,557
Ramna	20.95	31,625	8,086
Raniganj	25.80	22,718	6,021
Thanahat	25.92	42,148	11,080
Total	232.50	131,715	34,585

Source: Population and Housing Census 2022. District Report: Kurigram

2.2.2 Economy and Industry

The economy of Chilmari Upazila mainly depends on agriculture and agriculture-based farming. The main crops in this area are paddy, jute, wheat, mustard, vegetables, and fruits like mango, jackfruit, black berry, papaya, banana, guava. The manufacturing of this area are welding factory, saw mill, rice mill, and the industries are goldsmith, potteries, blacksmith, jute industries, weaving, nakshi kantha, wood work, bamboo work, etc.

According to the district statistics (2011), agriculture contributes to the economy 67.85%, non-agricultural sectors 5.17%, industry 0.38%, commerce 9.38%, transport and communication 1.23%, service 6.81%, construction 1.01%, religious service 0.09%, rent and remittance 0.22% and others 7.86%.

The following table (Table 2-2) shows different sectors involved in the economy of Chilmari Upazila.

Table 2-2. Employed by sectors of Chilmari Upazila

Sector Name	Working Population	
	2011	2022
Agriculture	15,534	22,768
Industry	294	3,335
Service	2,625	10,592

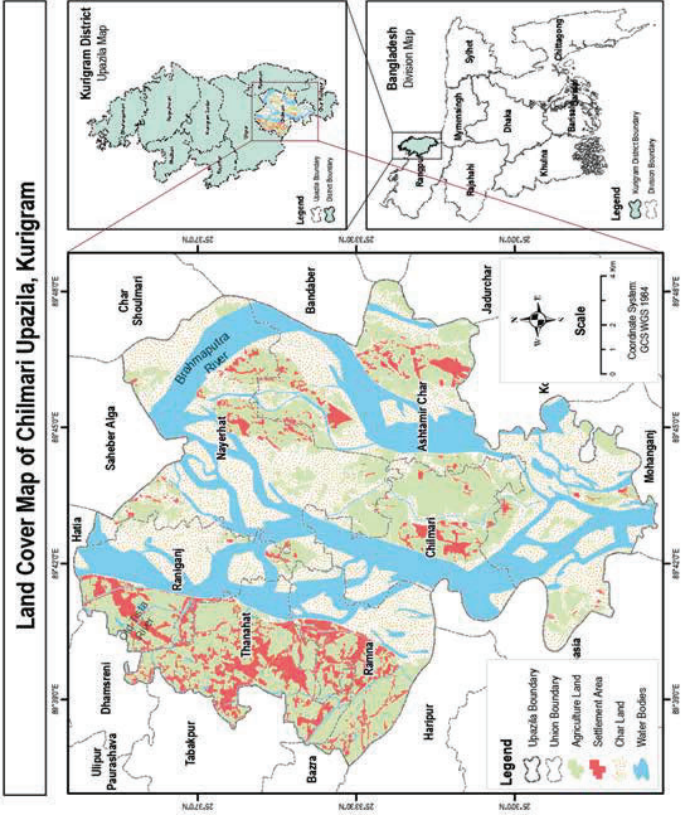


Figure 2-4. Land Cover Map of Chilmari Upazila

2.2.3 Urbanization

The urbanization rate in Kurigram District, expressed as the percentage of the population living in urban or urbanized areas, is relatively low compared to the national average of 31.51% (Population and Housing Census 2022). A comparison between 2011 and 2022 shows that the urbanization rate in Chilmari Upazila only decreased, while those increased in the upazilas of Bhurungamari, Kurigram Sadar, Nageshwari, Phulbari, Rajarhat, Rajibpur, Raumari and Ulipur. According to the 2022 census, only 28.95% of the population of Chilmari Upazila resides in urban areas. The annual population growth rate in Chilmari Upazila from 2011 to 2022 is 0.72%, which is lower than the national average of 1.22% (Population and Housing Census 2022).

The annual population growth rates in the unions of Chilmari, Ramna, Raniganj and Thanahat have experienced annual population growth rates higher than the upazila average. This elevated growth is one of the indicators of ongoing urbanization trends in these unions (Table 2-3).

Table 2-3. Population growth rate of Chilmari Upazila

Union Name	Population		Annual Population Growth Rate (2011 - 2022)
	2011	2022	
Ashtamir Char	17,701	16,880	-0.46%
Chilmari	6,902	8,063	1.68%
Nayerhat	10,519	10,281	-0.23%
Ramna	28,729	31,625	1.01%
Raniganj	20,513	22,718	1.07%
Thanahat	38,477	42,148	0.95%
Total	122,841	131,715	0.72%

Source: Population and Housing Census 2011, Community Report: Kurigram, Population and Housing Census 2022, District Report: Kurigram

2.3 Meteorological Conditions

Chilmari Upazila has a humid subtropical climate, which is warmer in the summer and cooler in the winter than other parts of Bangladesh. The average annual rainfall of Chilmari Upazila is about 3,202.8 mm¹ for the period from January 2009 to December 2024 shown in Figure 2-5, which is higher than the average annual rainfall of Bangladesh (2,200 mm).

As shown in Figure 2-5, most rainfall in the Upazila is concentrated for the months from April to September, which is more than 350 mm, and this heavy rainfall causes flooding in this area. The average annual rainfall days is 177 days.

The Upazila has a little higher temperature in comparison with the national average. The average maximum temperature of 30.0°C reached in April, as indicated that the highest temperature is 37.0°C in April 2024. The average minimum temperature is 12.0°C in January (Figure 2-6).

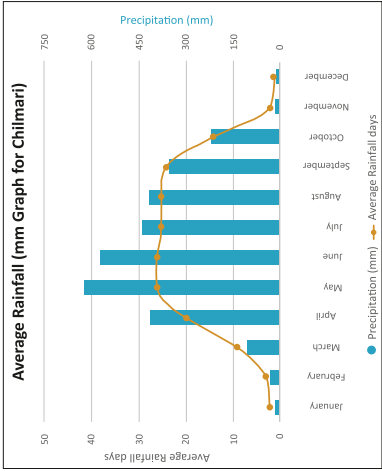
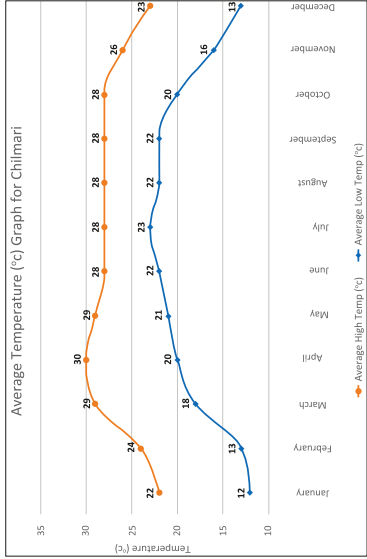


Figure 2-5. Annual average rainfall (mm) and average rainfall days of Chilmari

source: <https://www.worldweatheronline.com/chilmari-weather-averages/bd.aspx>

¹ <https://www.worldweatheronline.com/chilmari-weather-averages/bd.aspx>



source: <https://www.worldweatheronline.com/chilmari-weather-averages/bd.aspx>
Figure 2-6. Average maximum and minimum Temperature (°C) for Chilmari

Chapter-3. Hazard Characteristics and Disaster Risk

3.1 Disaster Record of the Upazila

3.1.1 Disaster Record

Kurigram has a long history of natural disasters, predominantly characterized by floods, riverbank erosion, droughts, and cold waves. Table 3-1 shows some significant historical disasters that impacted the region.

Table 3-1. Recent Disaster Record in Chilmari Upazila

No.	Year	Damage
1. Flood		
(1)	1988	1988 Flood: One of the most devastating floods in the history of Bangladesh, which also affected Kurigram. The Brahmaputra and Teesta rivers overflowed, causing widespread destruction. Thousands of people were displaced, and crops were severely damaged. The water level at Chilmari point was 25.04 mPWD, whereas the danger level is 24 mPWD. The water above the danger level stayed for 15 days.
(2)	1998	1998 Flood: Often referred to as the "flood of the century" in Bangladesh, Kurigram was one of the worst-hit areas. Water remained stagnant for weeks, and approximately 60-70% of the region was submerged. It led to a large-scale humanitarian crisis, with food shortages, loss of property, and diseases. The water level at Chilmari point was 24.77 mPWD, whereas the danger level is 24 mPWD, and the water above the danger level stayed for 22 days.
(3)	2007	2007 Flood: Affected by heavy monsoon rains and water coming from upstream India, Kurigram faced significant damage. The flood submerged large areas of agricultural land, damaging crops and leaving thousands of people displaced.
(4)	2012	2012 Flood: The recorded water level on 30 June was 24.48 m at Chilmari station, which was 48 cm above the danger level for 8 days.
(5)	2014	2014 Flood: Water level: 24.49 mPWD (danger level of 24.0 mPWD) for 13 days
(6)	2015	2015 Flood: Water level: 24.44 mPWD (danger level 24.0 mPWD) for 10 days at Chilmari BWDB point
(7)	2016	2016 Flood: Water level: highest peak water level of 24.99 mPWD, which was 54 cm above its danger level (24.45 mPWD) for 23 days in monsoon
(8)	2017 ²	2017 Flood: A severe flood affected Kurigram, submerging large parts of the district. The disaster impacted hundreds of thousands of people, displacing families, destroying homes, and wiping out significant portions of crops and livestock. The district saw prolonged waterlogging, which exacerbated the crisis. The water level at Chilmari (Brahmaputra) reached a peak of 24.87 mPWD on 15 August (0.87 m above danger level DL 24.0 mPWD) for 14 days above danger level in the 2017 monsoon. At Noonkhawa (Brahmaputra) station, the water level attained the peak at 27.39 mPWD for 3 days; water flowing above the danger level (DL 27.25 mPWD) Affected population in the district: 165,955
(9)	2019	2019 Flood: Water level: highest peak of 25.02 m for 17 days

² FFWC, Annual flood report 2017. 2017, Flood Forecasting and Warning Centre, Bangladesh Water Development Board, Government of Bangladesh Dhaka, Bangladesh. p. 108. <http://www.fwc.gov.bd/images/annual17.pdf>

No.	Year	Damage
(10)	2021 ³	2021 Flood: Water level at Chilmari (Brahmaputra) reached peak 24.21 mPWD on 2 September (0.51 m above danger level DL 23.7 mPWD, revised after 2017 flood) 10 days above danger level in 2021 monsoon. At Noonkhawa (Brahmaputra) station, the water level attained the peak at 26.5 mPWD as same as the danger level (DL 26.5 mPWD, revised after the 2017 flood)
(11)	2022	2022 Flood: Water level reached 32 cm at Chilmari (Brahmaputra) point and 74 cm at Hatia (Brahmaputra) point above the danger level on 21 June and the water above the danger level stayed for 7 days.
(12)	2024	2024 Flood: Water levels rising of the Brahmaputra, Dudhkumar, and Dharla rivers; 72 cm above its danger point at Chilmari; 71 cm above at Hatia union Affected population: Over 70,000 people Damaged croplands: 2300 hectares
2. Riverbank erosion		
(1)	1970s – 1990s	1970s-1990s: Throughout these decades, Kurigram saw steady riverbank erosion, particularly along the Brahmaputra River. Many communities lost their homes and farmland, forcing frequent relocation and deepening poverty.
(2)	2016 - 2019	2016-2019 Erosion Events: Riverbank erosion became more severe, with thousands of people losing their homes annually. This ongoing issue has led to the displacement of entire villages, with some areas disappearing entirely into the river.
3. Drought		
(1)	2019 ⁴	Just after floods, many farmers were hit hard by drought in Kurigram after the water receded. Many farmers could not plant transplanted Aman rice due to the lack of saplings and water, due to flooding. Those who planted Aman tried to protect the field by irrigating which is quite costly as Aman is mainly rainfed crop when farmers are not prepared for irrigation.
(2)	2024 ⁵	Severe droughts, excessive rainfall and flooding had caused an extensive loss (1.05 billion BDT) to agriculture (jute, aman seedbeds, vegetables and aush paddy) in Kurigram in 2024. Due to the drought, only 17,256 hectares were cultivated in 2024, despite the Department of Agricultural Extension (DAE) targeting 17,950 hectares for jute cultivation. Kurigram was hit consecutively by drought during April and May, followed by excessive rainfall in June (1,100 mm recorded), while flooding began in early July. The DAE advised farmers in flood-affected areas to prepare for early Rabi crops if water takes time to recede.
4. Cold wave		
(1)	2021 ⁶	On 15 January 2021, Kurigram faced cold waves of 8.8°C hitting children and elderly people of low-income families and the farmers hard when most day-labourers were unable to go out for work. At least 800-900 people were taking treatment every day for cold-related illnesses at Kurigram General Hospital while thick fog was recorded near the riversides that would damage the crop creating blast and other diseases.

³ FFWC, Annual flood report 2021. 2021. Flood Forecasting and Warning Centre, Bangladesh Water Development Board, Government of Bangladesh Dhaka, Bangladesh. p. 115. <http://www.ffwc.gov.bd/images/annual21.pdf>

⁴ After flood, drought hits Kurigram farmers, United News of Bangladesh, 8 September 2019, <https://unb.com.bd/category/Special/after-flood-drought-hits-kurigram-farmers/27758>

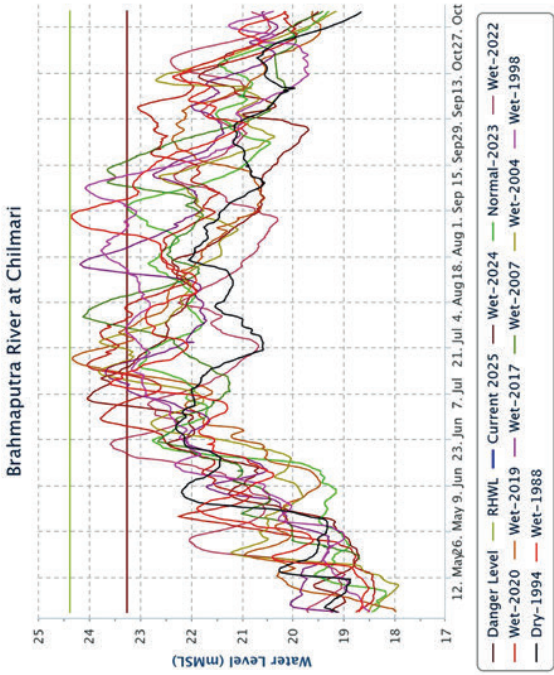
⁵ Natural disasters cause 105C loss in Kurigram's agri sector in 2024,Dhaka Tribune, 16 August 2024, <https://www.dhakatribune.com/bangladesh/354933/natural-disasters-cause-105c-loss-in-kurigram%E2%80%99s>

⁶ Kurigram shivers in cold wave, The Financial Express, 15 January 2021, <https://thefinancialexpress.com.bd/national/country/kurigram-shivers-in-cold-wave-1610710256>

No.	Year	Damage
(2)	2024 ⁷	On 25 January 2024, Kurigram faced cold waves of 9.4°C when around 2,000 schools remained closed and thick fog had enveloped the entire region, while on 26 January morning the district recorded its lowest temperature at 6.8°C. The drop in temperature had led to discomfort in the Brahmaputra, Dharla, Teesta, Dudhkumar and 16 other riverside areas, affecting the lives of local citizens. Hospitals in the district had reported an increase in cases of diarrhea, pneumonia, respiratory distress, colds and coughs and other winter-related illnesses.

Reference:

The hydrograph of monsoon season at Chilmari station, Brahmaputra River has been shown in Figure 3-1 in which the highest water level was 24.37 mMSL recorded in 1988, whereas the danger level at this station is 23.25 mMSL.



source: <http://www.ffwc.gov.bd/index.php/hydrograph/monsoon>
Figure 3-1. The hydrograph of Brahmaputra River at Chilmari station

⁷ Cold wave grips Kurigram, mercury drops to 6.8°C, Dhaka Tribune, 26 January 2024 <https://www.dhakatribune.com/bangladesh/nation/337796/cold-wave-grips-kurigram-mercury-drops-to-6.8%C2%80C>

3.1.2 Disaster Experience

In this section, the issues/challenges faced by each Union Parishad are shown in Figures 3-2 to 3-7. These disaster experiences were compiled based on the opinions of the Union Parishad representatives expressed at the first UzDRRAP formulation workshop held in April 2024, as well as interviews with UDMC members and local residents.

Issues/challenges in Ashtamir Char Union Parishad

The people of Ashtamir Char have experienced floods, water logging, river erosion, drought and lightning almost every year. Because of flooding in this area, crops have been destroyed, and houses, the transport system, the education system, and the medical services have collapsed. Due to waterlogging in the drains, garbage causes diseases with an air pollution. Furthermore, in this area, houses, agricultural land, and educational institutions have been destroyed as a result of river erosion.

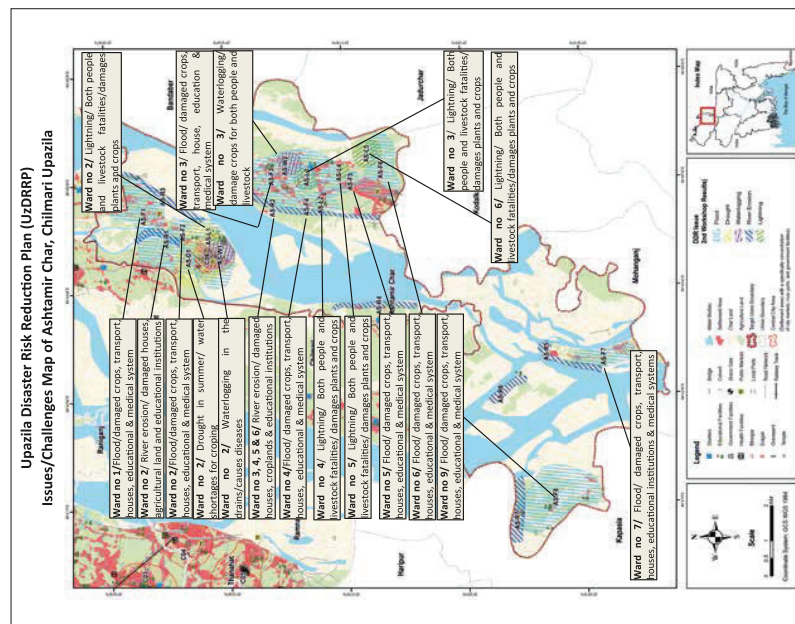


Figure 3-2. Issues/challenges in Ashtamir Char Union Parishad

Issues/challenges in Chilmari Union Parishad

The people of Chilmari have experienced the disaster of flooding, water logging, river erosion, drought and lightning almost every year. As Chilmari is a relatively low-lying area, crops, houses, and the transport system have been destroyed, and there are issues with safe drinking water and sanitation because of floods and waterlogging. In this area, river erosion causes the loss of many houses and croplands every year. In summer, farming becomes difficult due to a lack of water in Chilmari.

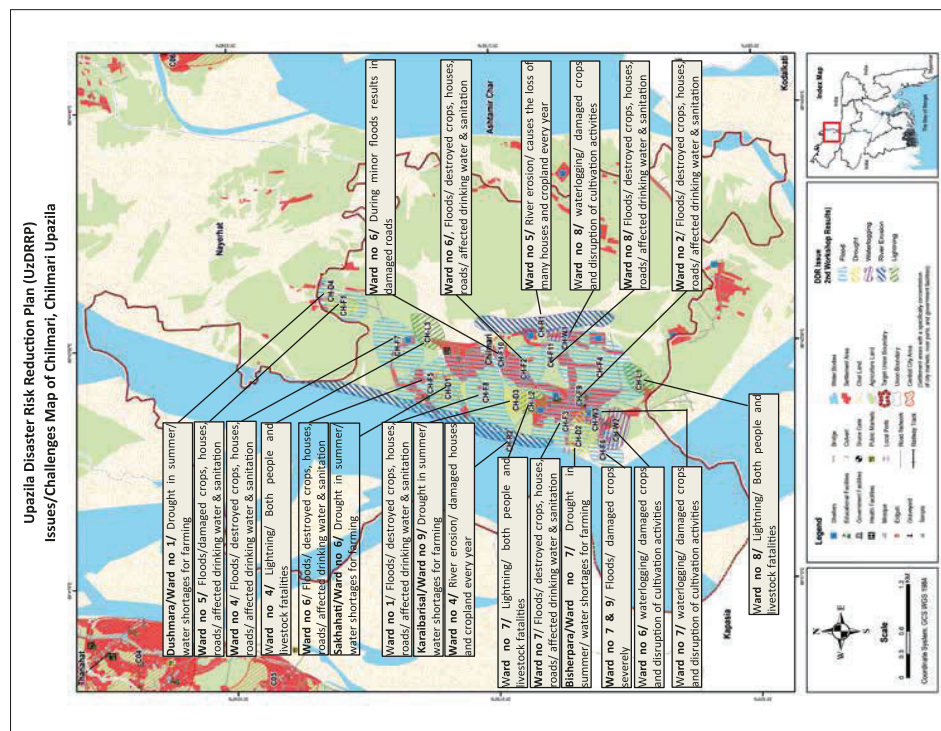


Figure 3-3. Issues/challenges in Chilmari Union Parishad

Issues/challenges in Nayerhat Union Parishad

The people of Nayerhat have experienced the disaster of flooding, river erosion, drought and lightning almost every year. During flooding, most houses and croplands are damaged; cattle die from various diseases and a shortage of adequate food. In this area, houses, agricultural lands, and educational institutions have been destroyed as a result of river erosion. Most of the areas of this union have been affected by river erosion. Due to the prolonged summer, this area has also been affected by drought.

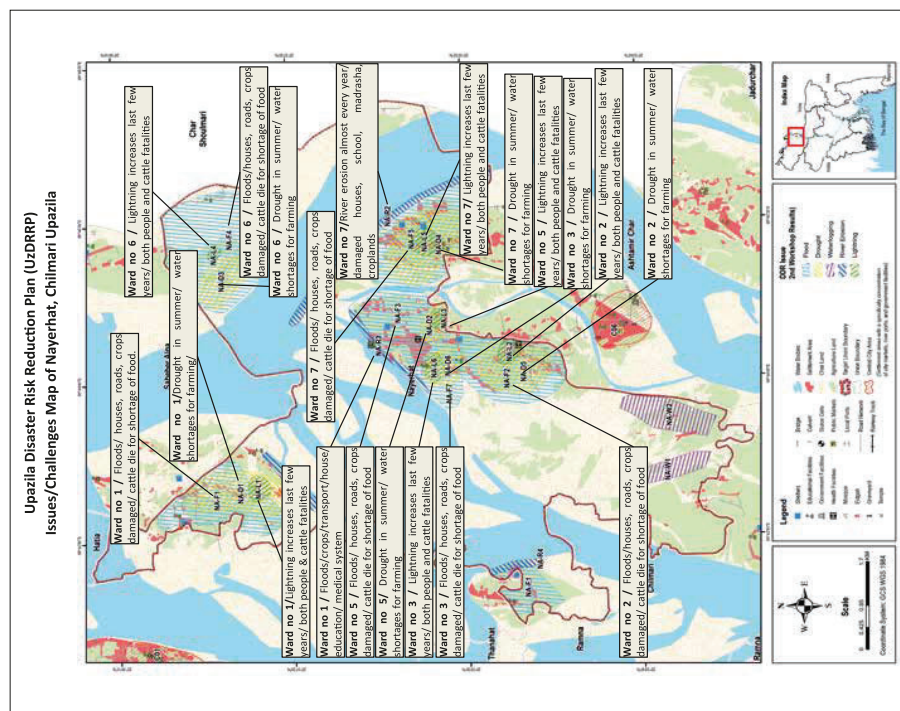


Figure 3-4. Issues/challenges in Nayerhat Union Parishad

Issues/challenges in Ramna Union Parishad

The people of Ramna Union Parishad have experienced the disaster of flood, waterlogging, river erosion, drought and lightning almost every year.

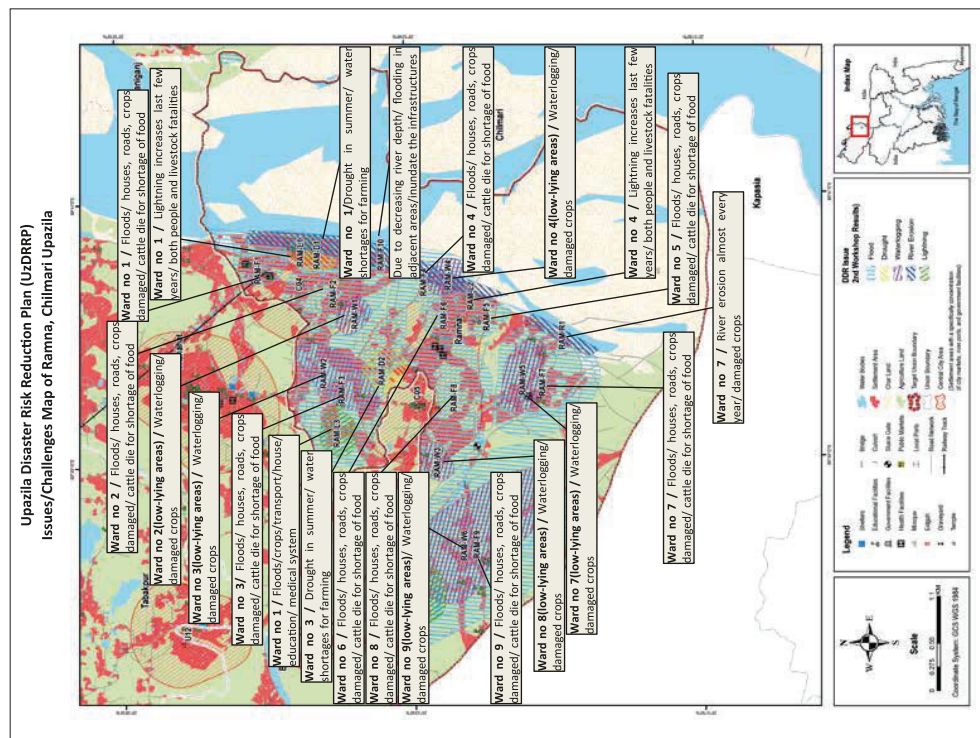


Figure 3-5. Issues/challenges in Ramna Union Parishad

Issues/challenges in Raniganj Union Parishad

The people of Raniganj have experienced the disaster of flood, waterlogging, river erosion and lightning almost every year.

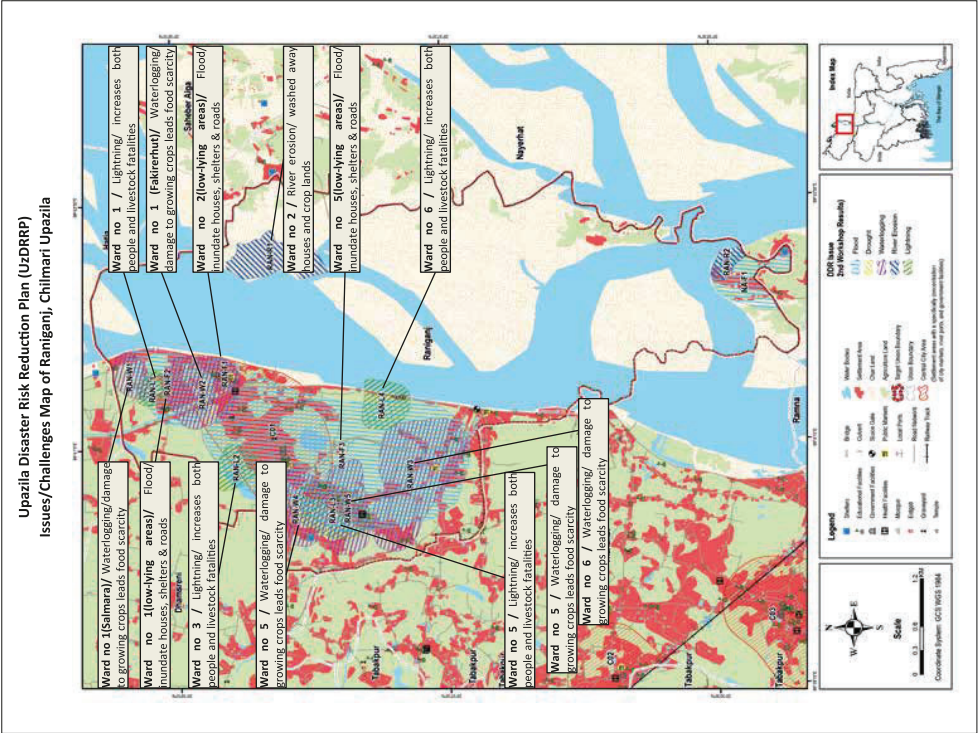


Figure 3-6. Issues/challenges in Raniganj Union Parishad

Issues/challenges in Thanahat Union Parishad

The people of Thanahat have experienced mainly waterlogging as some areas are relatively low-lying and a little rain causes waterlogging almost every year.

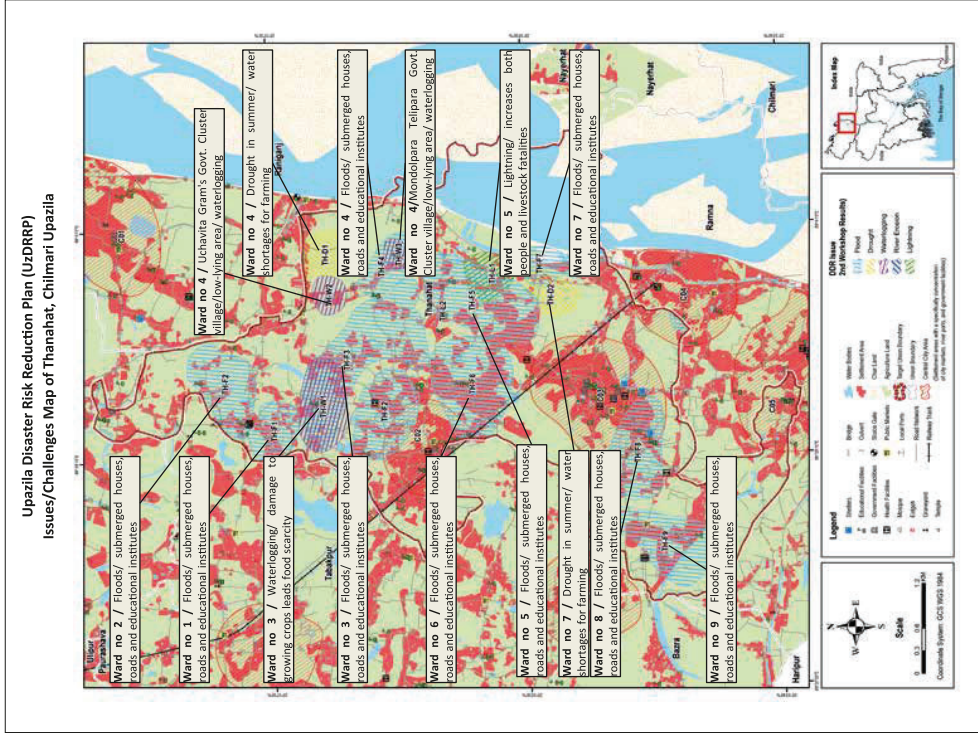


Figure 3-7. Issues/challenges in Thanahat Union Parishad

3.2 Target Hazards of this Plan

As described in the previous section as challenges/issues given by the Union parishad, this Plan targets all the possible disasters in the Upazila, including lightning and drought, whereas it objectively and scientifically analyzes the following disasters with high damage potentials and shows hazard maps to identify the hazard potential in the Upazila.

- Flood/Waterlogging
- River erosion
- Earthquake

Table 3-2. Damage Report on disasters in 2020 (flood, waterlogging and river erosion)

Union Name	Area(km ²)		Agricultural area (ha)		Population		Households	
	Total	Affected	Total	Affected	Total	Affected	Total	Affected
Ashtamir Char	75.01	65	1239	740	16880	16288	4075	4072
Chilmari	26.93	25	810	525	8063	7772	2021	2021
Nayerhat	52	48	953	604	10281	10212	2573	2553
Ramna	20.89	18	666	506	31625	28612	7183	7153
Raniganj	25.83	25	546	408	22718	20510	5404	5384
Thanahat	24.37	20	360	275	42148	38432	9683	9630
Total	225.03	201	4574	3058	131715	121826	30939	30813

Source: D-form from PIO, Chilmari Upazila, Kurigram District; dated 28/07/2020

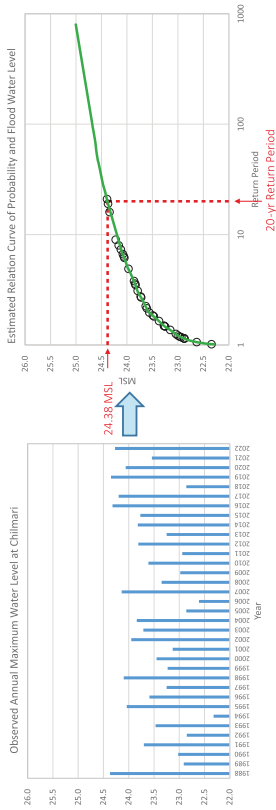
3.3 Hazard and Disaster Risk of the Upazila by Disaster

3.3.1 Flood

(1) Hazard

The flood hazard risk was assessed based on observed historical water level data from the Bangladesh Water Development Board (BWDB) by combining with danger water levels defined by BWDB. The danger water level is the water level above which the flood may cause damages to nearby crops and homesteads. It is generally fixed slightly below the design flood level of the embankment. In terms of the probability of occurrence, the corresponding return period is approximately 2 to 5 years, although it varies depending on the location. Therefore, the difference between the design flood level and the danger water level needs to be calculated.

To obtain the design flood level, which corresponds to a 20-year return period's flood for this plan, the highest water level of each year was plotted against the year after sorting the values against year in ascending order. Then, a trend line was drawn in accordance with standard procedures for hydrological statistical analysis. From this trend line, any return period's water level could be extracted. For the sake of this plan, the 20-year return period's water level of 24.38 m MSL (above mean sea level) was considered (Figure 3-8).



Source: JICA Expert Team, based on data provided by BWDB

Figure 3-8. Observed annual maximum water level at Chilmari (left) and plotting water level against year (right)

Figure 3-9 is the flood hazard map of Chilmari Upazila using the inundation depth of a 20-year return period, which causes tremendous damage to paddy production (cultivation). Among the unions in Chilmari Upazila, all are particularly prone to flooding because the lands of such unions are low-lying. Special attention should be taken at Ashtamir Char, Chilmari, and Nayerhat unions, as most areas (>50%) have a probability of being inundated above 3.6 m of flooding at the 20-year return period (Table 3-3). The paddy fields and the settlement area in such unions are affected severely and widely.

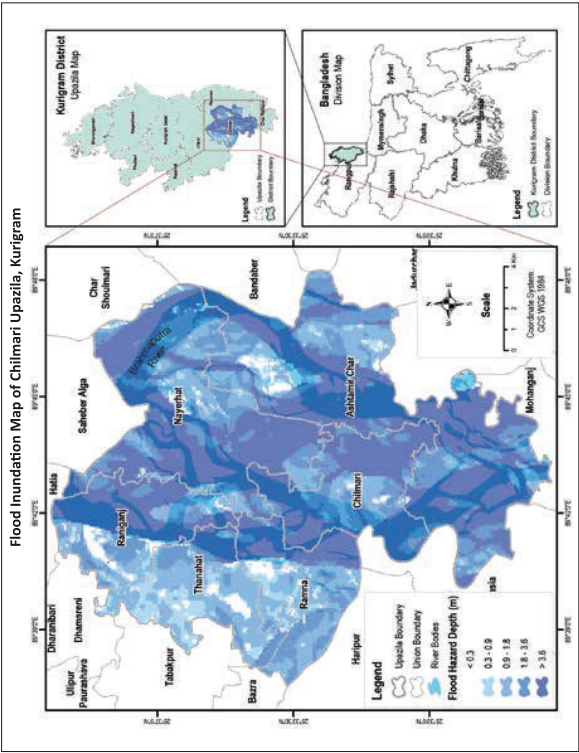


Figure 3-9. Flood Hazard Map at the 20-year return period of Chilmari Upazila

Table 3-3: Union-wise flood inundation area in hectare and percentage of area of Chilmari Upazila

Union/Upazila	Below 0.3 m (%)	0.3 - 0.9 m (%)	0.9 - 1.8 m (%)	1.8 - 3.6 m (%)	Above 3.6 m (%)	Total Area (%)
Ashtamir Char	229.3 (2.9)	185.3 (2.4)	1,101.3 (14)	1,785.3 (22.7)	4,551.3 (58.0)	7,852.5 (100)
Chilmari	19.2 (0.6)	28.6 (1.0)	351.2 (11.8)	757.0 (25.5)	1,817.3 (61.1)	2,973.4 (100)
Nayerhat	103.7 (1.8)	100.5 (1.7)	962.4 (16.5)	1,267.7 (21.8)	3,385.6 (56.2)	5,819.8 (100)
Ramna	124.1 (4.9)	231.1 (9.2)	885.4 (35.2)	547.7 (21.8)	726.4 (28.9)	2,514.7 (100)
Raniganj	166.7 (6.3)	151.9 (5.7)	571.4 (21.6)	507.7 (19.2)	1,246.5 (47.1)	2,644.2 (100)
Thanahat	182.0 (7.0)	608.5 (23.6)	1,173.9 (45.5)	370.3 (14.3)	247.7 (9.6)	2,582.4 (100)
Chilmari Upazila	825.1 (3.4)	1,306.0 (5.4)	5,045.6 (20.7)	5,235.7 (21.5)	11,974.8 (49.1)	24,387.1 (100)

(2) Disaster Risk

The flood disaster risk in the Upazila was estimated focusing on three major assets to be protected: cultivation fields, settlement areas, as well as important infrastructures and public facilities. By overlaying the flood hazard map on these areas, the affected areas were identified.

I. Damage estimation of the paddy field by flood

As shown in Figure 3-10 and Figure 3-11, the most vulnerable unions to flooding are Ashtamir Char, Chilmari and Nayerhat Unions, consisting of large areas of dunes of the Brahmaputra River. The inundation areas are >1,000 ha at each union. Besides, the rest unions, which are Thanahat, Ramna and Raniganj, will also be inundated with flood water that would damage paddy fields, however lesser extent than the other three mostly affected unions (Figure 3-9 and 3-10).

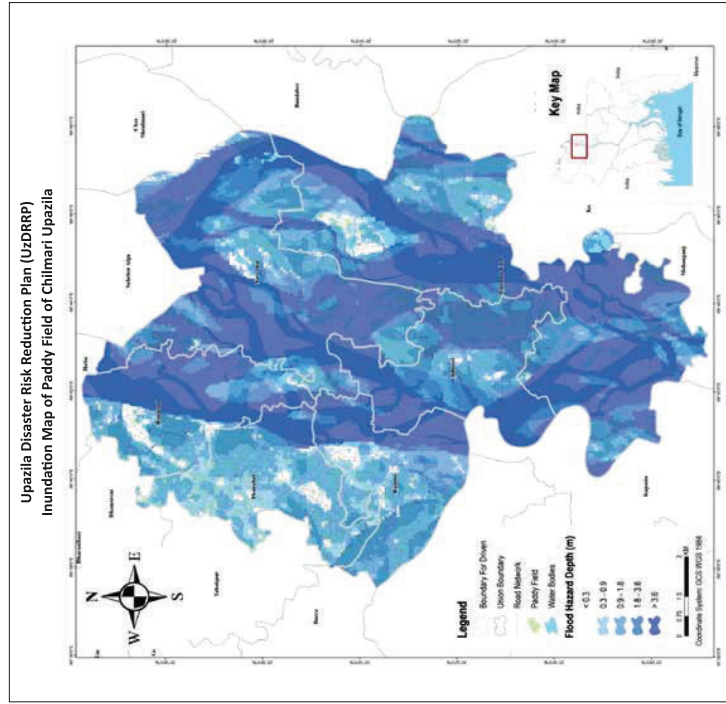


Figure 3-10. Inundated Area of Paddy Field by the flood of Chilmari Upazila

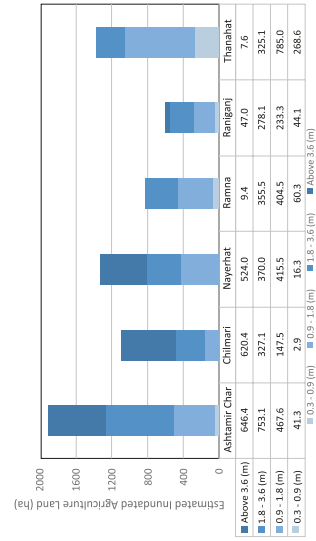


Figure 3-11. Inundated Area of the Paddy field by the flood of Chilmari Upazila