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Climate Change and Social Protection: Threats for Contemporary Human Security Issues in Bangladesh

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ABSTRACT

Bangladesh is a climate-vulnerable country that is highly vulnerable to the effects of climate change. The country faces various climate-induced threats, including cyclones, floods, salinity intrusion, storm surges, erosion, and drought. Satkhira and Khulna districts are southwest coastal districts situated nearby Sundarban. Because of the topography and geographical position, Khulna and Satkhira districts are highly climate-vulnerable in Bangladesh. The study was conducted in four sub-districts of Khulna and Satkhira districts (Dacope, Koura, Assasuni, and Shyamnagar) to explore the social security and climate vulnerability nexus. The study was conducted through mixed methods (Qualitative and Quantitative), where 400 households survey was conducted for quantitative data collection, and regarding qualitative data collection 32 FGDs and 20 KIIs were conducted in the study area. The study reveals that all four sub-districts are highly vulnerable due to climate change and gender-based violence, human trafficking, polygamy, and early marriage also increasing.

Keywords: Climate change, social protection, human security, Bangladesh.

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1. INTRODUCTION

Bangladesh is a nation particularly susceptible to the effects of climate change (Rahaman et al., 2020). The nation has experienced numerous hydro-meteorological hazards, including cyclones, floods, saline intrusion, storm surges, erosion, and drought (ADB, 2021). The results of climate change, such as cyclones, storm surges, sea waves, tidal surges, tidal floods, sea level rise, and increased storminess, pose growing dangers to biodiversity and nature (Zappa et al., 2013; Rahaman et al., 2020). South Asia's climate is changing, and its effects can already be seen, according to the IPCC's Sixth Assessment Report (IPCC, 2022). Climate change in Bangladesh resulted in 11,450 fatalities, $3.72 billion in economic losses, and 185 extreme weather events between 2000 and 2019, according to statistics compiled by the Climate Risk Index (GCRI) (GCRI, 2021). According to a long-term catastrophe trend in Bangladesh based on data from EM-DAT (https://www.emdat.be/) over 120 years (1900-2020), cyclones and floods are the two most frequently occurring disasters that generate massive economic loss and are linked to some of Bangladesh's most devastating events, such as the 1970 Bhola Cyclone, which caused a casualty of around 500,000 people's loss of life (NIRAPAD, 2021). In the seven-year trend study from 2014 to 2020, the 15 critical catastrophes (Cyclone and storm surge, flood, salinity, and riverbank erosion) affected 42 million people, drove 9.4 million people from their homes, badly damaged 4.6 million homes, resulted in 1,053 fatalities, and resulted in an economic loss of $4.1 billion (NIRAPAD, 2021). Climate change is not only a problem for the environment but also has enormous social repercussions for women and children (The Daily Star, 2020). Riverbank erosion is another element causing a surge in the number of abandoned women in Bangladesh (Rahaman et al., 2022). When husbands abandon their spouses, the women are forced to go to cities, mainly Dhaka and Chittagong, in search of employment (The Daily Star, 2020). In addition due to climate change, 3.45 million Bangladeshi children are expected to work as enslaved people (AFP, 2019). The effects of harsh weather, floods, river erosion, sea level rise, and other environmental shocks brought on by climate change affect one in three children in Bangladesh, or nearly 20 million (Dhaka Tribune, 2022). Child labor and physical violence are frequently made worse by large extended families, and cyclones, floods, storms, droughts, and river erosion are frequent causes of these issues (Norpoth et al., 2014). Due to the threat of natural disasters by climate change pose to the lives and futures of over 19 million children in Bangladesh, many families are pressuring their daughters into underage marriages (AFP, 2019). Children who frequently experience natural disasters and often lose

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their homes need to work to support their families. As a result, children are more likely to encounter many forms of abuse, such as the likelihood of missing children, sexual abuse victims, child labor, human trafficking, and dangerous migration during natural disasters (Dhaka Tribune, 2021). As a result, threats brought on by the climate jeopardized the lives and way of life of human beings.

2. METHODOLOGY

2.1 Study area

The study was conducted in Shyamnagar and Assasuni upazilas (Satkhria district) and Dacope and Koyra upazilas (Khulna district) (**Map 1**). Southwestern Bangladesh's Satkhira and Khulna district is part of the Khulna Division (BBS, 2013a, 2013b). Satkhira district is bordered by Jessore district to the north, Khulna district to the east, the Bay of Bengal to the south, and India to the west. It lies between latitudes 21°36' and 22°54' north and longitudes 88°54' and 89°20' east. The entire area of the district is 3817.29 square kilometers, of which 1534.88 square kilometers are reserved forests (BBS, 2013b). In addition, the Khulna division is located between 22°12' and 23°59' north latitude and between 89°14' and 89°45' east longitude. The district is bordered by Jessore and Narail districts to the north, Bagerhat district to the east, the Bay of Bengal to the south, and Satkhira district to the west. The district's total area is 4389.11 square kilometers, of which 607.80 square kilometers are riverine and 2028.22 square kilometers are forested (BBS, 2013a). The agricultural sector encompasses Satkhira and Khulna's rural economies (BBS, 2013a, 2013b). However, the economy of Khulna district is also dependent on the Sundarbans and Mongla ports (BBS, 2013a). Out of the total 436,178 holdings in the district of Satkhira, 252,036 are agricultural holdings that produce a variety of commodities, including local and HYV rice, vegetables, spices, and pulses, among others. Bananas, jack fruits, papaya, guava, olives, and other fruits are available in the district (BBS, 2013b). The total number of holdings in the district of Khulna is 503000, 41.31% of which are farms producing a variety of commodities, including local and HYV paddy, wheat, jute, vegetables, spices, pulses, oilseeds, and others (BBS, 2013a). Fishing and forestry are additional sources of domestic income. Shrimp is one of the principal exports of Bangladesh and is abundant in the districts. In coastal areas, the most significant economic activity for households is prawn farming. In addition to crops, livestock, and fishing are the primary sources of domestic income (BBS, 2013a, 2013b). Shyamnagar Upazila has a total area of 1968.23 square kilometers with 72279 households and a total population of 318254 people, while Assasuni Upazila has a total area of 374.81 square

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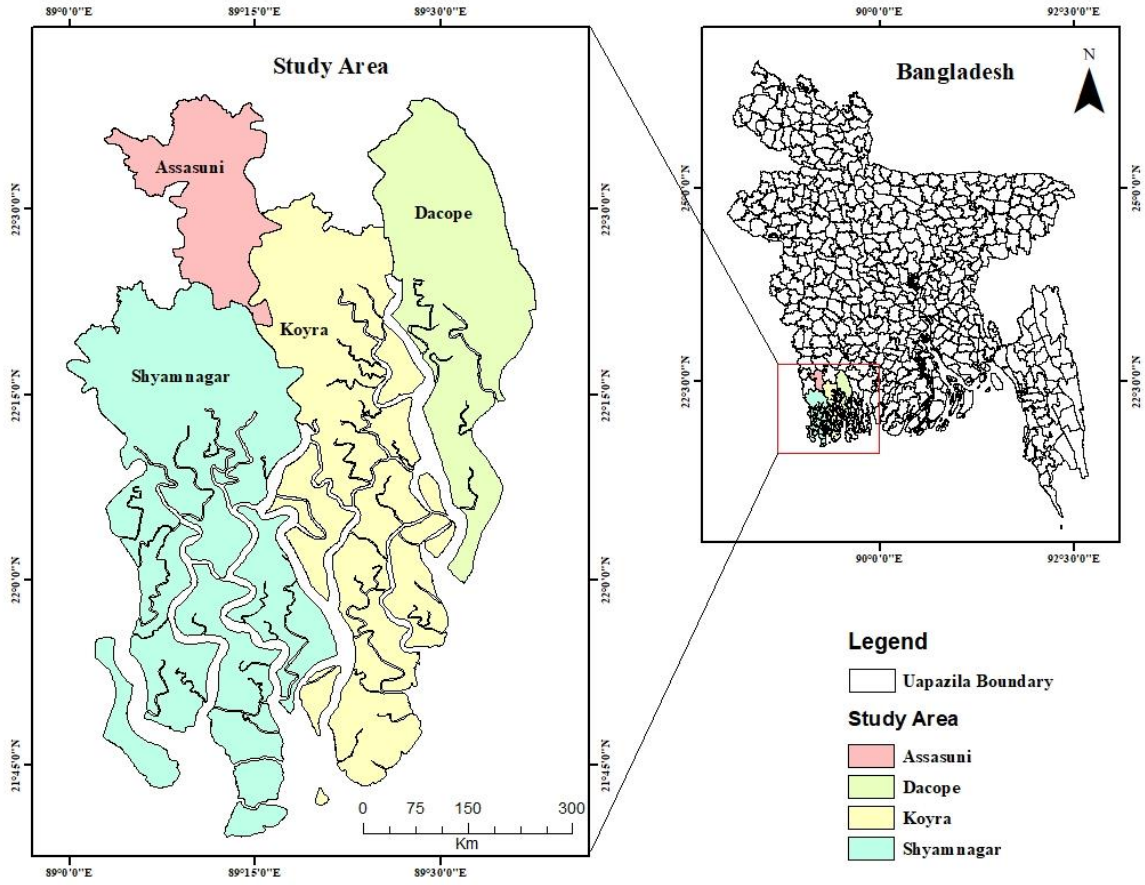
kilometers with 62037 households and a total population of 268754 people (BBS, 2013b). Koyra Upazila has a total area of 1775.40 square kilometers with 45750 households and a total population of 192000, while Dacope Upazila has a total area of 991.56 square kilometers with 36597 households and a total population of 152,000. (BBS, 2013a).

Map 1: Study area



2.2. Methods used

The study adopted a participatory and multi-disciplinary approach to data collection and analysis to deeply understand the multi-dimensionality of climate risks, social vulnerability, and human security in the study area and to develop appropriate strategies and actions for local-level climate adaptation and resilience to ensure social protection. The study would make for the triangulation of qualitative information and perspectives with quantitative data for understanding the climate change trends and vulnerability in the study areas; its impacts

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on social and human security and adopted primary and secondary data collection and analysis tools.

2.2.1 Secondary review

Collection, review, and analysis of long-term climate and weather data of key climate parameters and disaster data to show the trends of change and review of documents, strategy, policies, etc.

2.2.2 Primary information collection

Primary information (qualitative and quantitative) were collected using:

- **Participatory research to get actual data, perspectives, and experiential knowledge** of the vulnerable households and communities on climate change, hazards, and human security issues through Household Survey (HHS)
- **Participatory capacity analysis of individual, household, community, and institutional levels** to understand knowledge, practice, and resource to adapt to changing climate and human protection through Focus Group Discussion (FGD) and Key Informant Interview (KII).

2.2. Data sources

Long-term observational data on climatic parameters and hazards were collected from the Bangladesh Meteorological Department (BMD), Bangladesh Water Development Board (BWDB), and the Department of Disaster Management (DDM). Examples of indices are included in the following table 1.

Table 1: Examples of indices of climatic parameters

Indices	Definition
Monthly maximum rainfall	maximum 1-month rainfall
Monthly minimum rainfall	Minimum 1-month rainfall
Monthly maximum temperature	Maximum 1-month temperature
Monthly minimum temperature	Minimum 1-month temperature
Monthly average rainfall	Average 1-month rainfall
Monthly average temperature	Average 1-month temperature
Cold wave	Maximum number of consecutive days of $<10^0$

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Cyclone, storm surge, tidal inundation frequencies	Number of the cyclone, storm surges, and tidal inundations in a season

The study collected quantitative data from 400 households (200 male and 200 female respondents) across the four subdistricts. In addition, a total of 32 FGDs (eight in each upazila) with men, women, youth, adolescents, persons with disability, farmers, fisher folk, boatmen, small traders, and livestock rearers were held with 160 community people. Twenty Key Informant Interviews (KIIs) were performed representing local to the national level with the Department of Agriculture Extension (DAE), Department of Public Health Engineering (DPHE), District Relief and Rehabilitation Officer (DRRO)), Project Implementation Officer (PIO), Department of Social Service (DSS), Department of Women and Children Affairs (DWCA), Police Station to capture existing scenarios of climate vulnerability and key issues regarding social protection and human security issues living in the studied area.

2.3. Data collection techniques

The primary (qualitative and quantitative) data collection techniques included Household Surveys (HHS), Focus Group Discussions (FGD), and Key Informants Interviews (KII).

2.4. Interview techniques

In the Household Survey, the survey respondents were interviewed through a semi-structured questionnaire survey. In qualitative data collection, Focus Group Discussion (FGD) and Key Informant Interview (KII) checklists were used.

2.5. Informant/respondent criteria

In Household Survey, randomly selected men, women, adolescents, and youths were interviewed who are permanent residents of the study area. In Focus Group Discussion (FGD), persons with disability, farmers, fisher folk, boatmen, small traders, and livestock rearers were covered. In each FGD, 8 participants (homogeneous) were selected randomly. Key Informant Interviews (KIIs) were conducted with government, local government, and non-government stakeholders who are responsible for climate-resilient development and the protection of social security in the study areas.

2.6. Data analysis techniques

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Climate parameters (precipitation and temperature) for 30 years (1990-2020) were analyzed at Satkhira and Khulna stations collected by Bangladesh Meteorological Department (BMD). **A Climate Vulnerability Index** and a **Multi-Disaster Vulnerability Index** were developed, normalizing respondents' perception values with high, medium, and low vulnerability categories validating with the national disaster vulnerability database. The quantitative data were analyzed through Statistical Analysis. The quantitative data were processed through SPSS Programme. Tools for data entry and research, as well as the dummy tables, were prepared based on the indicators. Statistical Tools including Frequency, Percentile, and Regression Analysis were performed to analyze quantitative data. In qualitative data analysis, the narrative analysis was followed to analyze FGD and KII to illustrate the perspectives of people and key stakeholders on the specific issue.

3. RESULTS AND DISCUSSION

3.1.1. Climate change scenario

Like the rest of Bangladesh, Satkhira's average maximum and minimum temperatures are rising, while the average annual rainfall trend is falling **(Figures 1,2, and 3).** At the same time, a similar pattern for maximum and minimum temperature for Khulna was also seen to rise. The annual rainfall trend of Khulna differs from that of Satkhira, where Khulna shows a slight rise in the yearly rainfall trend **(Figures 4, 5, and 6)**.

Figure 1: Yearly average maximum temperature of Satkhira (1990-2020) (BMD, 2022)

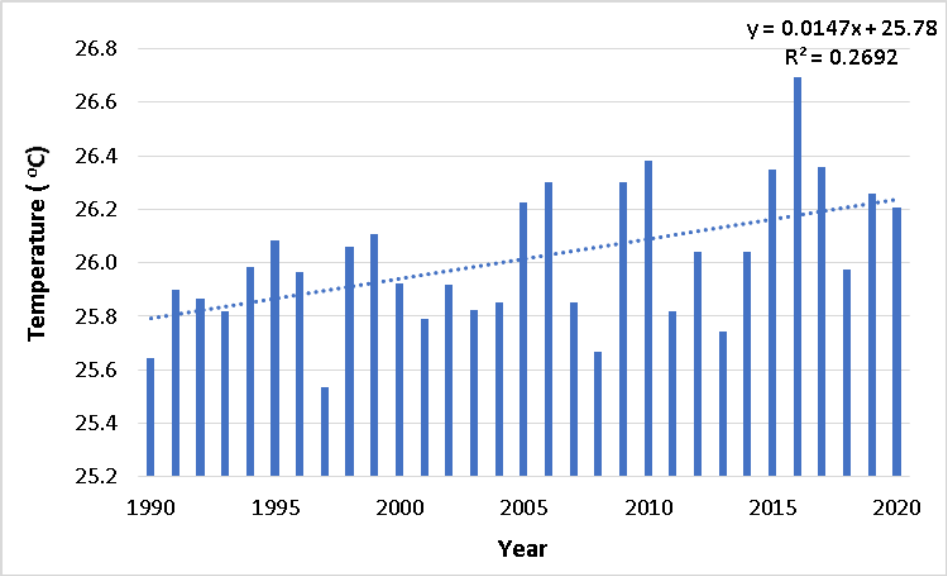

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Figure 2: Yearly Average Minimum Temperature of Satkhira (BMD, 2022)

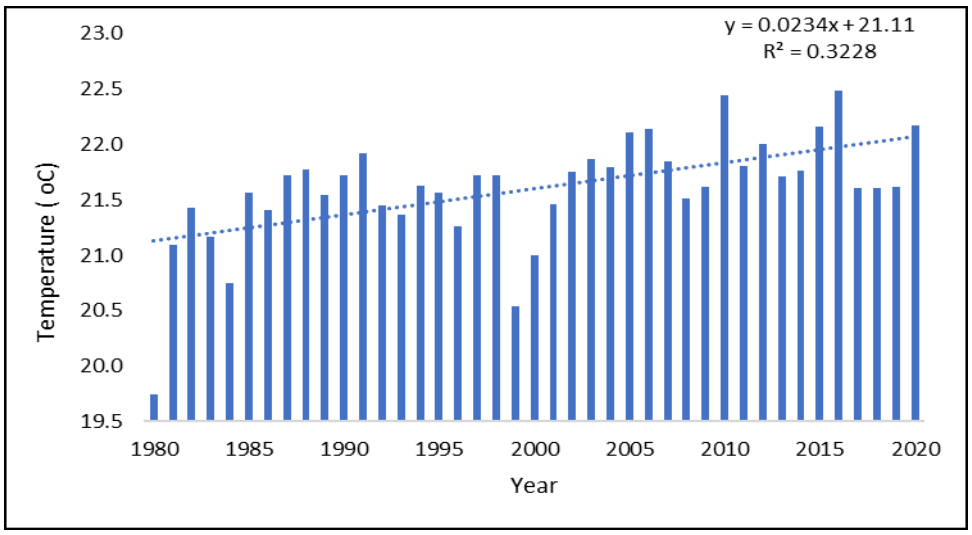

Figure 3: Yearly Average Rainfall of Satkhira (1990-2020) (BMD, 2022)

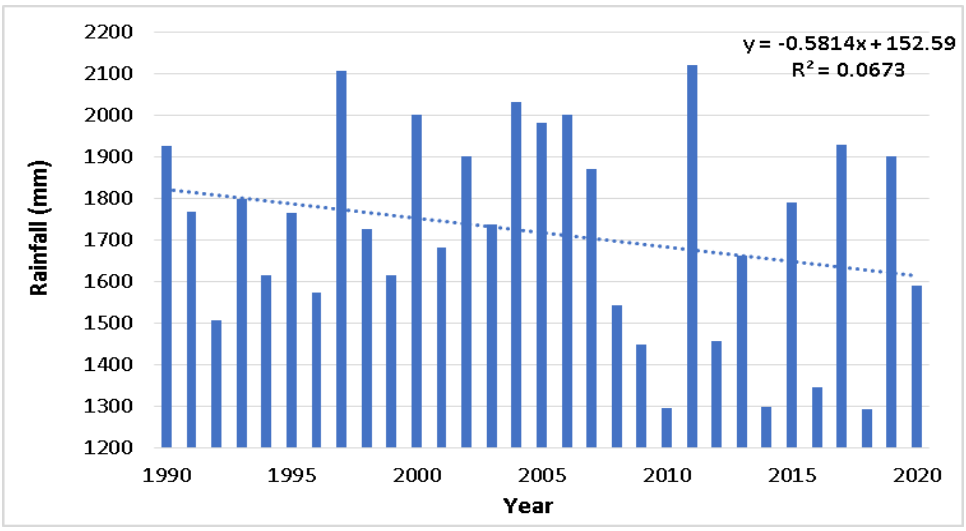

Figure 4: Yearly Average Maximum Temperature of Khulna (BMD, 2022)

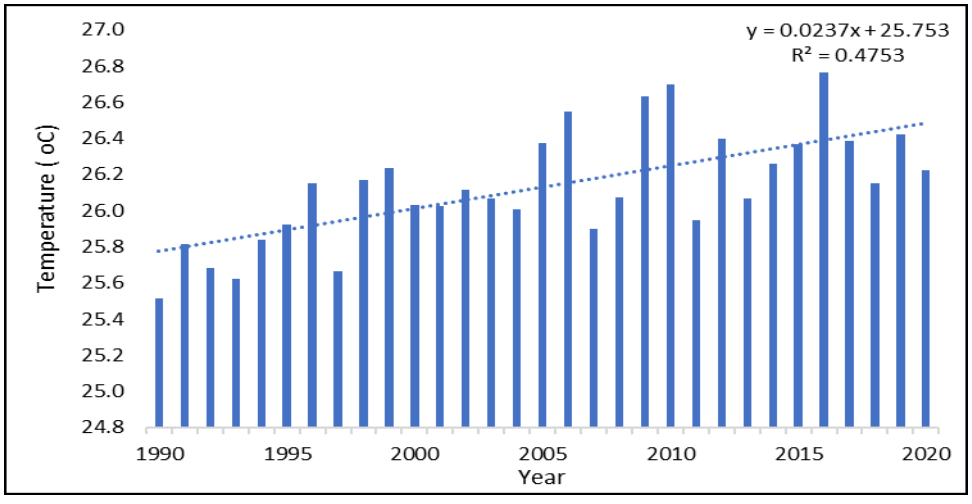

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Figure 5: Yearly Average Minimum Temperature of Khulna (1990-2020) (BMD, 2022)

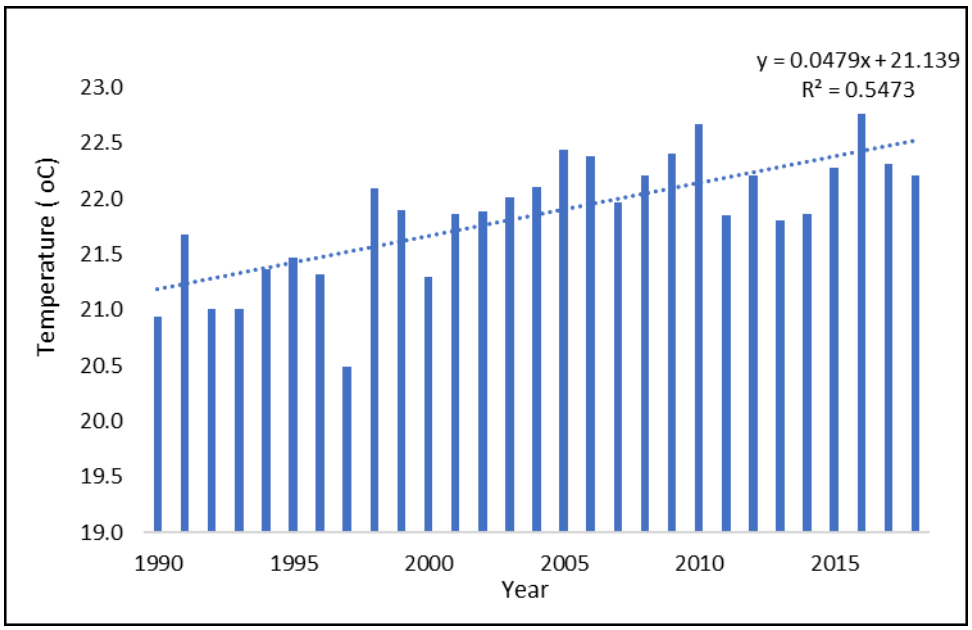
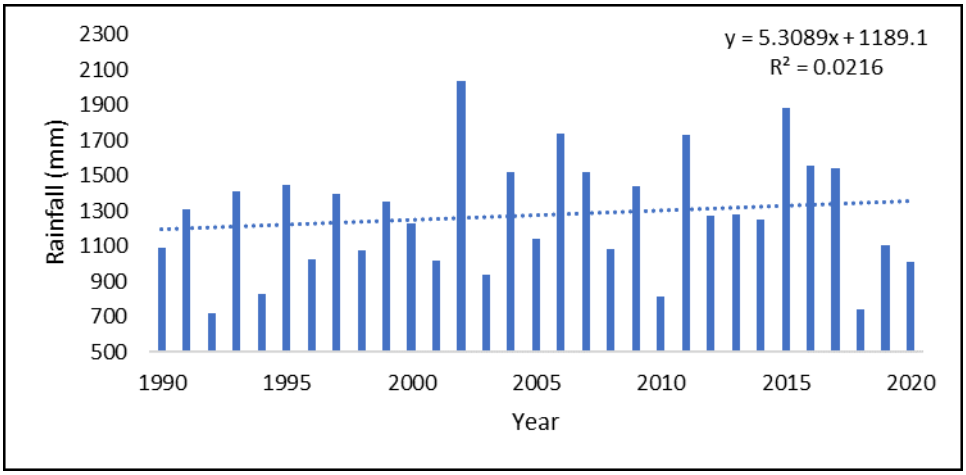


Figure 6: Yearly Average Rainfall of Khulna (1990-2020) (BMD, 2022)



3.1.2. Climate-induced risks and vulnerability in the study area

On normalizing the participants' responses to climatic parameters (observations of temperature, and rainfall) in the study area, the data indicates that, over the past five years (2012–2021), temperatures have increasing trend while rainfall has decreasing trend in Satkhira and Khulna **(Table 1).** Though information from the weather station shows a slightly increasing trend of rainfall in Satkhira the people's observation is different. In this regard, the Director of the Bangladesh Meteorological Department of Khulna noted that rainy days have reduced in the Khulna district so people cannot understand the increasing trend of rainfall.

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Table 1: Trend of climatic parameters in the Study area (2012-2021)

Disaster	The trend in 2012-2021	
	Satkhira	Khulna
Temperature	+	+
Rainfall	-	-

Increased	+
Decreased	-

According to the respondent, the study also found that waterlogging, drought, riverbank erosion, wave erosion, and hailstorm have all decreased over the past ten years (2012–2021) in the study area, in contrast to an increase in floods, flash floods, heatwaves, and thunderstorms **(Table 2).** According to the DRROs of both districts (Satkhira and Khulna), thunderstorms are becoming a dangerous hazard for the coastal regions, including Satkhira and Khulna.

Table 5: Disaster Trends in the study area

Disaster	The trend in 2012-2021
Flood	+
Waterlogging	~
Heavy Rainfall	~
Drought	~
Riverbank erosion	~
Heatwave	+
Cold wave	~
Thunderstorm	+
Hailstorm	~
Salinity	+

Increased	+
Not changed	~

Based on the **Multi-Disaster Vulnerability Index** Shyamnagar and Assasuni Upazilas are highly vulnerable due to climate-induced disasters, Koyra Upazila is medium vulnerable, and Dacope is low vulnerable **(Map 2)**. Shymnagar upazila should be given priority because of its

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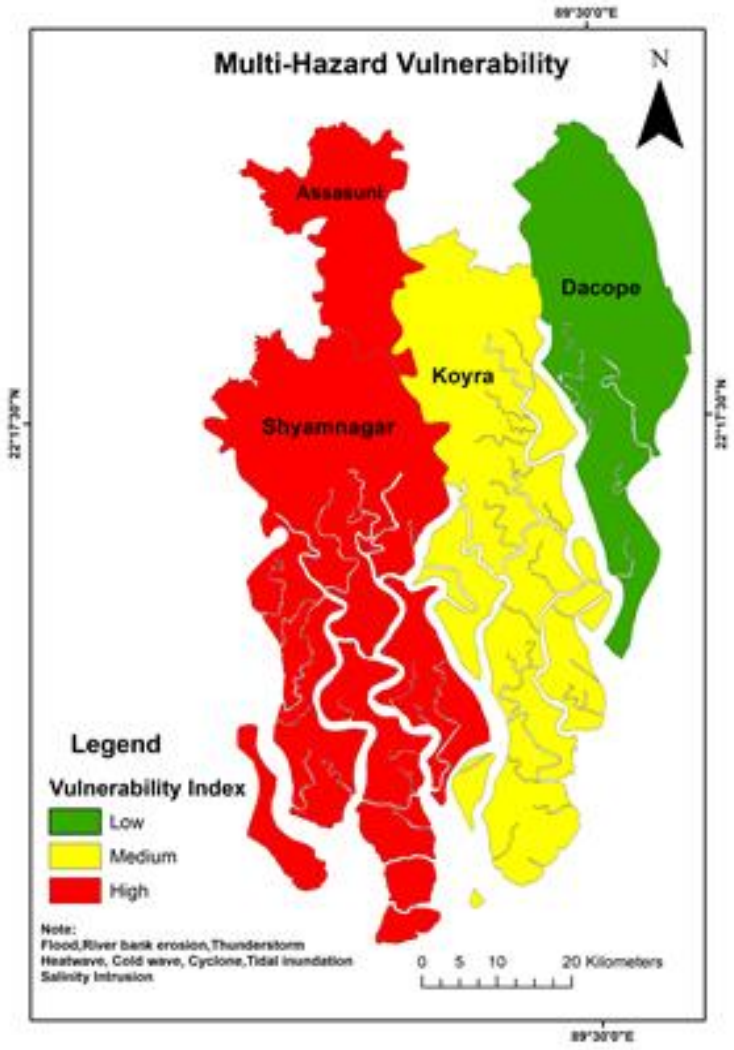
multihazard vulnerability, exclusionary communities (such as the Munda ethnic minority), and poor income. **(Table 4).**

Map 2: Multihazard vulnerability in the study area



Both districts are most vulnerable to climate change and disaster. Agricultural droughts, heat waves, cold waves, cyclones, tidal inundations, waterlogging, riverbank erosion, and other contemporary trends of climate-induced extremes are frequent calamities in Satkhira and Khulna. Saline intrusion affected the most individuals (410020), while cyclones harmed the second-highest number of residents (21202) in Satkhira whereas, for Khulna, more saline intrusion (51192) was seen. But Cyclone kept a significant impact on 174206 households in Khulna (**Table 2**).

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Table 2: Disaster-affected households in Satkhira (2015-2020) (BDRS, 2021)

Name of disaster	Number of the affected household	
	Satkhira	Khulna
Drought	240	4073
Flood	5650	9764
Water Logging	35442	15580
Cyclone	212024	174206
Tornado	425	58
Storm and tidal Surge	2181	3814
Thunderstorm and Lightening	3896	19392
River and coastal Erosion	11231	7990
Salinity	410020	51192
Hailstorm	6239	1375

Participants in the FGD from four Upazilas remarked that during summer and winter, salinity and drought restrict access to water and cultivation. In addition, they also claimed during monsoons, tidal inundations, and storm surges restrict income-generating activities. The fishermen FGD participants from these upazilas reported that in recent years, cyclone intensity has increased for which the number of income-generating (fishing) days have reduced which made them food insecure. Department of Agriculture Extension (DAE) reported that in all four upazilas, the production of crops on cropland and homesteads is seriously threatened by soil and water salinity. The soil salinity in homesteads and croplands is higher than the tolerance limit for crop production in all four upazilas. The FGD participants from all four upazila also noted that the drinking water crisis is one of the major threats in their locality. During winter and summer, their drinking water crisis reaches a hazardous level.

3.1.3. Climate change and social protection

Social protection issues are precarious in the study area. Early girl marriages, divorces, polygamy, women trafficking, etc., are rising in all four upazilas. Women respondents in Shymanagar reported experiencing domestic violence in the highest percentage (23.40%).

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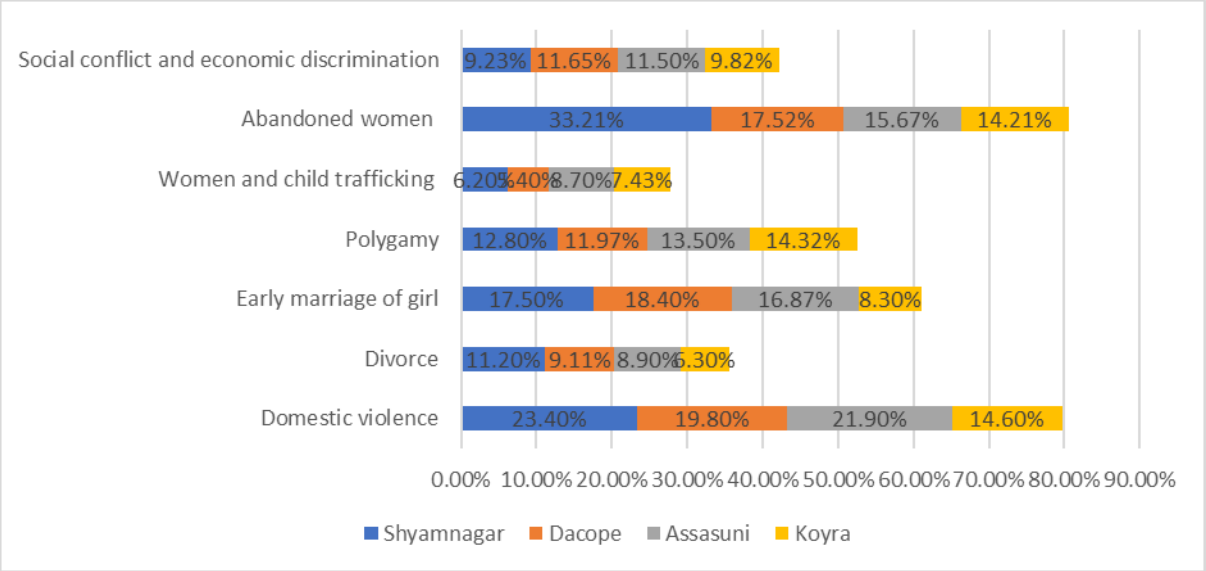
The most significant percentage (33.21%) of abandoned women are in the same upazila (**Figure 1**). The women FGD participants from all four upazila stated that it takes them one to 2.5 hours per day to gather drinking water from a location that is typically more than 1.3 kilometers distant. They encounter gender-based violence on their route to the water and fuel collection. Every time women are late responding to requests for food or other household tasks due to fuel and water collection delays, they occasionally experience domestic violence from their spouses or in-laws. Human trafficking has become more prevalent recently. The District Women Affairs Officer of Satkhira district stated that although most human trafficking incidents are not reported to the police station, the number of women and young girls trafficked is increasing. He also mentioned the rising scenario of early girl marriage. Most parents wish to marry off their teenage daughters to shift their financial load and risk associated with the changing climate. They also include their boys in earning activities for extra income to cover household expenditures. As a result, child labor is increasing.

Figure 1: Social protection threats in the study area



Rape was also observed to be increasing in the study area. Four rape cases were reported in Shyamnagar Police Station in 2020, but rape cases increased to sixteen in 2021 and twenty in 2022 **(Table 3)**. In Assasuni, nine rape case was reported at the police station in 2020, which decreased to six in 2021 but again rose was seen in 2022 to eight reported cases **(Table 4).** Gender-based Violence (GBV) or domestic violence in Shyamnagar upazila of Satkhira district was seen to have a major increase as four cases were reported in 2020, which rose to sixteen reported cases in 2021, and a major difference was seen when it stood to sixty-six reported cases in 2022. While in the Assasuni upazila of Satkhira district, Gender Based

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Violence or domestic violence shows consistency over the three years, twenty-five, twenty-two, and twenty-eight reported causes in 2020, 2021, and 2022 respectively.

Table 3: Reported cases in Shyamnagar upazila of the rape case, GBV, and human trafficking (2020-2022)

Month	Rape case			GBV			Trafficking		
	2020	**2021**	**2022**	**2020**	**2021**	**2022**	**2020**	**2021**	**2022**
Jan	0	0	0	0	0	3	1	0	0
Feb	0	1	2	0	1	3	0	0	0
Mar	0	0	1	0	0	5	0	0	0
April	1	0	1	1	0	8	0	0	3
May	0	0	3	0	0	6	0	0	0
June	0	2	3	0	2	10	0	0	0
July	0	8	1	0	8	0	1	0	0
Aug	1	1	1	1	1	5	0	0	0
Sep	1	2	3	1	2	6	0	0	0
Oct	1	0	2	1	0	11	2	0	5
Nov	0	1	2	0	1	6	0	0	0
Dec	0	1	1	0	1	3	0	0	0
Total	4	16	20	4	16	66	4	0	8
NB: GBV= Rape attempt, beating wives for bribes, abduction, and eve-teasing									

Shyamnagar Thana and Nari Nirjaton Protirodh Cell, 2022

Table 4: Reported cases in Assasuni upazila of the rape case, GBV, and human trafficking (2020-2022)

Month	Rape case			GBV			Trafficking		
	2020	**2021**	**2022**	**2020**	**2021**	**2022**	**2020**	**2021**	**2022**
Jan	1	0	1	2	3	0	1	1	0
Feb	1	1	1	1	0	1	5	2	0
Mar	1	0	0	1	0	0	5	2	0
April	0	0	0	0	0	1	0	4	0
May	2	0	2	3	0	4	0	4	0

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June	0	0	1	2	0	1	0	2	0
July	0	0	0	2	3	4	3	1	0
Aug	1	3	0	4	3	4	0	0	0
Sep	1	0	1	2	4	0	1	0	2
Oct	1	1	2	5	4	6	0	0	0
Nov	1	1	0	2	4	5	1	0	0
Dec	0	0	0	1	1	2	2	0	0
Total	9	6	8	25	22	28	18	16	2
NB: GBV= Rape attempt, beating wives for bribes, abduction, and eve-teasing									

Assasuni Thana and Nari Nirjaton Protirodh Cell, 2022

In Dacope, the maximum number of gender-based violence (GBV), or domestic violence reported in 2021, was 12 **(Table 5).** And for Koyra, the GBV was raised from 2021 to 2022, from 1 to 12 cases **(Table 6).**

Table 5: Reported cases in Dacope upazila of the prevention of child marriage, GBV (2020-2022)

Month	**GBV**		
	2020	**2021**	**2022**
Jan	0	0	0
Feb	0	0	0
Mar	0	1	0
April	0	0	1
May	0	2	0
June	0	2	1
July	0	0	2
Aug	0	1	0
Sep	2	0	0
Oct	1	3	0
Nov	0	1	0
Dec	2	2	0
Total	5	12	4

Department of Women Affairs, Khulna, 2022

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Table 6: Reported cases in Koyra upazila of the GBV (2020-2022)

Month	GBV	
	2021	**2022**
Jan	0	1
Feb	0	0
Mar	0	0
April	0	0
May	0	0
June	0	0
July	0	1
Aug	0	8
Sep	0	0
Oct	0	1
Nov	1	1
Dec	0	0
Total	1	12

Department of Women Affairs, Khulna, 2022

Women experience several injustices and deprived conditions. Due to their precarious position in society, low or nonexistent earning potential, physical and biological barriers, religious barriers, lack of control over resources, and lack of property rights, women were found to be disproportionately affected by climate change, making them more vulnerable to food insecurity, water shortages, and health issues as well as injury and death from natural disasters. Because it is unacceptable from a cultural and religious perspective for women to leave their homes during disasters, they don't. Because of this, more women die during cyclones than males do. When homestead vegetable production beds and animal shelters are washed away, poor women who manage homestead-based livelihoods lose income and experience chronic undernourishment. Participants in the FGD also stated that girls and women frequently experience gender-based violence (sexual harassment, eve teasing) outside and inside the shelter. Gender-based violence, human trafficking, polygamy, and early marriage are on the rise along with climate change, making all four sub-districts extremely vulnerable.

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3.2. DISCUSSION

The study shows that the overall average maximum and minimum temperatures of both Satkhira and Khulna districts are rising but though the average annual rainfall of Khulna shows a raising trend for Satkhira the average annual rainfall is on the decrease. The study conducted in the Khulna division shows a similar result that the annual average temperature of Satkhira is increasing by 0.006-degree Celsius per year and for the Khulna district the annual average temperature is increasing by 0.008-degree Celsius per year (Mondal et al., 2017). Similar to this study the annual total rainfall in Khulna was also found to be increasing by 4.960 mm/year (Mondal et al., 2017). Several studies also show that the pre-monsoon rainfall in the Satkhira district is decreasing (Bhowmick et al., 2013; Mondal et al., 2017; Rabbani et al., 2021). The study found that several disasters like floods, flash floods, heatwaves, and thunderstorms in Khulna and Satkhira districts are increasing, similarity was seen in several other studies (Fenton et al., 2017; Karmakar & Das, 2020; Mohiuddin, 2022; Rabbani et al., 2021; Zannat & Islam, 2016). while another study mentioned drought, cyclones, river flooding, and flash flooding increasing in the studied districts (Ahmed et al., 2017). The study found that Shyamnagar and Assasuni Upazilas are highly vulnerable due to climate-induced disasters, Koyra Upazila is medium vulnerable, and Dacope is low vulnerable. Several other studies over time mentioned Shyamnagar Upazila as being highly vulnerable due to climate-induced extremities (Islam et al., 2015; Mudasser et al., 2020; Sarker et al., 2021). The study found that all four studied Upazilas are experiencing early girl marriages, divorces, polygamy, and women trafficking while due to financial burden, most parents prefer early marriage to their child. Several reports also found climate change is a prior reason for early child marriage and domestic violence (Akter, 2022; Alston et al., 2014; Mcleod et al., 2019; The Daily Star, 2022). Shyamnagar Upazila reported experiencing the highest percentage of domestic violence and the most abandoned women found in this study. Where similar vulnerability was also mentioned in a research study mentioning two villages of Shyamnagar Upazila (Rahaman, 2018). The study also mentioned women suffering from domestic violence due to the collection of drinking water in climate-vulnerable areas, often having to walk long distances to get drinking water. Such cases were reported by several research studies along with newspaper articles (Khan, 2016; Rahaman, 2018; The Daily Star, 2022). The study also found that child labor is increasing in climate-vulnerable areas. Other studies found that due to climate change and a lack of social security, families are reliant on their children for additional income, in addition to the direct and indirect costs of education,

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poor educational quality is a major contributor to the rise in child labor (AFP, 2019; Norpoth et al., 2014). A report also found Bangladesh ranked 15th out of 163 countries in terms of the number of children exposed to climate and environmental shocks (Dhaka Tribune, 2022). The study also found along with domestic violence and other Gender Based Violence (GBV), rape case is also a major concern. Research studies found the climatic impact resulting in poverty ends up in girls encountering violence such as rape or other physical harassment and failing to receive social recognition or legal support in protecting their rights, also rape cases and harassment in shelters are seen due to the lack of safe women corner and breastfeeding corner in the shelters (Hossen et al., 2021; Rezwana & Pain, 2021). The study also found that cultural and religious perspective on women leaving their homes during disasters restricts them from leaving houses more women die during cyclones than males do, as also mentioned in several studies (Alam & Rahman, 2014; Ayeb-Karlsson, 2020; Juran & Trivedi, 2015).

4. CONCLUSION

Climate change and climate-induced disasters trend and severity are increasing in the study area. As a result, livelihood opportunities are shrinking which causes food insecurity and malnutrition among the community people in the study area. The ultimate consequences of climate-induced extremes are fragile social and human security. Gender-based violence, human trafficking, early marriage, child labor, and forced migrations are in increasing trend. To overcome this worsening situation, climate-resilient interventions need for the poor, women, and vulnerable community in the contexts of current and emerging climate change impacts. They are more exposed and sensitive to multiple climate hazards, including temperature, flood, drought and heat stress, erratic rainfall, cold waves, and fog. The non-structural interventions, led by community members, will be influential in enhancing community resilience, including awareness raising, household and community level preparedness and response actions, and creating community adaptation plans. Disaster risk reduction and climate change adaptation training will be helpful in disaster preparedness and improving life savings capacity at the household level, primarily through climate-resilient livelihoods and employment and health education. Organizing and activating the community-led and managed mechanisms such as Ward Disaster Management Committee (WDMC), Union Disaster Management Committee (UDMC), Climate Justice Community Mechanism, mother group, youth group, and WASH committee will be an effective and sustainable solution to prevent social and human security. The financial window for risk recovery and reducing loss and damage will be effective for climate-induced risk prevention. Through this

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initiative, the skills of the women and youth participants will be improved so that their participation in the decision-making process, disaster risk reduction, and climate change adaptation, and also in social and human security protection could also be increased by sustainable management of climate justice communities. There is also a need to climate justice mechanisms for poor women, adolescents, and marginalized people.

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