Community Led Climate Adaptation: A Case Study of Whykong Union, Teknaf UpazilaUnder Coxsbazar Districtin Bangladesh

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ABSTRACT

The study was conducted in Whykong union, Teknaf upazila under coxsbazar district, an area prone to climate-related vulnerabilities. The primary aims and objectives of the case study to assess the impact of climate change, economic condition and community led adaptation initiatives to the selected study location. Data was collected through self-selected sampling from the total amount of community by using KOBO data collection tools. The study reveals successful community-led adaptation practices, innovative approaches, and the impact of local empowerment on resilience. Females account for 55%, while males account for 45%. According to the data, the most common occupation among the participants was housewife, with a frequency of accounting for 54.84% of the total. 54.84% had an income level of less than 5000 BDT. The most prevalent challenge reported by the respondents is the Rohingya Crisis, with a frequency of 93.55%. Poverty is another major challenge, with a frequency of 70.97%. Water scarcity is also a significant challenge, reported by 67.74%. Respondent perception showed that the government which accounts for 74.19% of the total initiatives. The need for climate education and awareness is also recognized, accounting for 70.97% of the total initiatives. This highlights the importance of educating and creating awareness about climate change among the public. CBOs/NGOs/INGOs activities have also contributed significantly, with accounting for 70.97% of the total. Domestic rainwater harvesting accounts for 45% of the community-led initiatives. This initiative involves capturing and storing rainwater for domestic use. It helps to minimize water scarcity during dry periods and reduces reliance on groundwater sources. Pond Sand Filter (PSF) accounts for 30% of the community-led initiatives. It aims to protect the community from climate-related hazards. Diversification of livelihoods accounts for 65% of the community-led initiatives. It helps reduce dependence on climate-sensitive sectors and promotes sustainable livelihood practices. Community participation and decision-making account for 49% of the community-led initiatives. The insights derived from the case study have implications for policymakers, practitioners, and researchers involved in climate resilience efforts. Community-led adaptation in building climate resilience and fostering collaboration and integrating local knowledge into broader climate change mitigation and adaptation.

Keywords: Climate change, mitigation, Adaptation, community, sustainable.

BACKGROUND OF THE STUDY

Climate change has become one of the main challenges of the 21st century. It is both an enduring and complex hazard which has different effects, from drought to floods, and is multidimensional, from local to global. Moreover, climate change is a hazard that has short- and long-term effects with unknown outcomes (O'Brien et al. 2006). Observable negative effectsimpact of global climate change on the environment, water availability and quality, energy consumption, crop productivity, the magnitude and frequency of natural disasters, and the spread of disease are well documented (Adamowski et al. 2009). These climate

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change effects mostly occur in the developing countries, which create an injustice, because less developed countries are least responsible for climate change, and thus most vulnerable to its effects (Adger et al. 2003). Many communities and regions that are vulnerable to climate change are also under pressure from forces such as population growth, resource depletion, and poverty. Policies that lessen pressures on resources, improve management of environmental risks, and increase the welfare of the poorest members of society can simultaneously advance sustainable development and equity, enhance adaptive capacity, and reduce vulnerability to climate and other stresses. Inclusion of climatic risks in the design and implementation of national and international development initiatives can promote equity and development that is more sustainable and that reduces vulnerability to climate change. (IPCC 2001, pp. 08).

In the coastal areas, Bangladesh scarcity of potable water is very acute (Islam et al., 2011; Kamruzzaman and Ahmed, 2006), as suitable aquifers at shallow depths are rarely available and surface water especially the river water is highly saline and turbid (Islam et al., 2015). The groundwater table in Chittagong City, Bangladesh is at present in a position from where it is difficult to pump groundwater by shallow tube well. Profound tube well is required practically in each place to locate the fresh water from the ground. For the most part, the area, profundity, size, and piece of aquifers are dictated by seasonal rainfall intensity. Some areas in Chittagong experience a great depletion of groundwater level which is shown in (Mirdad & palit, 2017).

Whykong union under Teknaf sub district upazila of Cox's Bazar District in Bangladesh are vulnerable to climate change impacts, including sea-level rise, extreme weather events, and changing rainfall patterns. Several adaptation approaches and techniques are being implemented in this region to address these challenges. Engaging local communities in adaptation efforts is crucial. This includes capacity building, training in sustainable agriculture and aquaculture practices, and supporting community-led initiatives to build resilience. Promoting climate-smart agricultural practices such as drought-tolerant crop varieties, improved irrigation techniques, and crop diversification can help farmers adapt to changing climate conditions. These approaches and techniques are part of a comprehensive strategy to address the specific climate challenges faced by Teknaf and Cox's Bazar District. It's important that adaptation efforts in this region are tailored to the local context and involve the active participation of the communities most affected by climate change. Collaboration between government agencies, NGOs, and international organizations is also critical to successfully implement these adaptation measures.

The groundwater table in Chittagong City is at present in a position from where it is difficult to pump groundwater by shallow tube well. Profound tube well is required practically in each place to locate the fresh water from the ground. For the most part, the area, profundity, size, and piece of aquifers are dictated by seasonal rainfall intensity. Some areas in Chittagong experience a great depletion of groundwater level which is shown in (Mirdad & Palit, 2017). The United Nations Development Program (UNDP) released the study on the groundwater depletion around Cox’s Bazar in 2019, stating that the water table around the Rohingya camps close to Cox’s Bazar has depleted by 5 to 9 meters.

Climate change is posing a serious and growing threat to the vulnerable communities of the host community, Whykong Union. Rising temperatures, irregular rainfall patterns, an increase in the frequency of extreme weather events, and sea-level rise are just a few of the serious climate-related concerns that the host community faces. Different types of climate change adaptation and community-based climate adaptation research were conducted throughout the country, particularly in the greater Chattogram division and the Coxsbazar district, and the research mentioned above was not conducted in the most climate vulnerable location of Whykong union under Teknaf upazila in the Coxsbazar district. Due to the effects of climate change, the eastern half of Bangladesh's coastal area and hilly area both face major problems, such as water scarcity and livelihoods. Water scarcity is a major issue in Teknaf upazila, Coxsbazar district, affecting people's everyday lives, livelihoods, and health.

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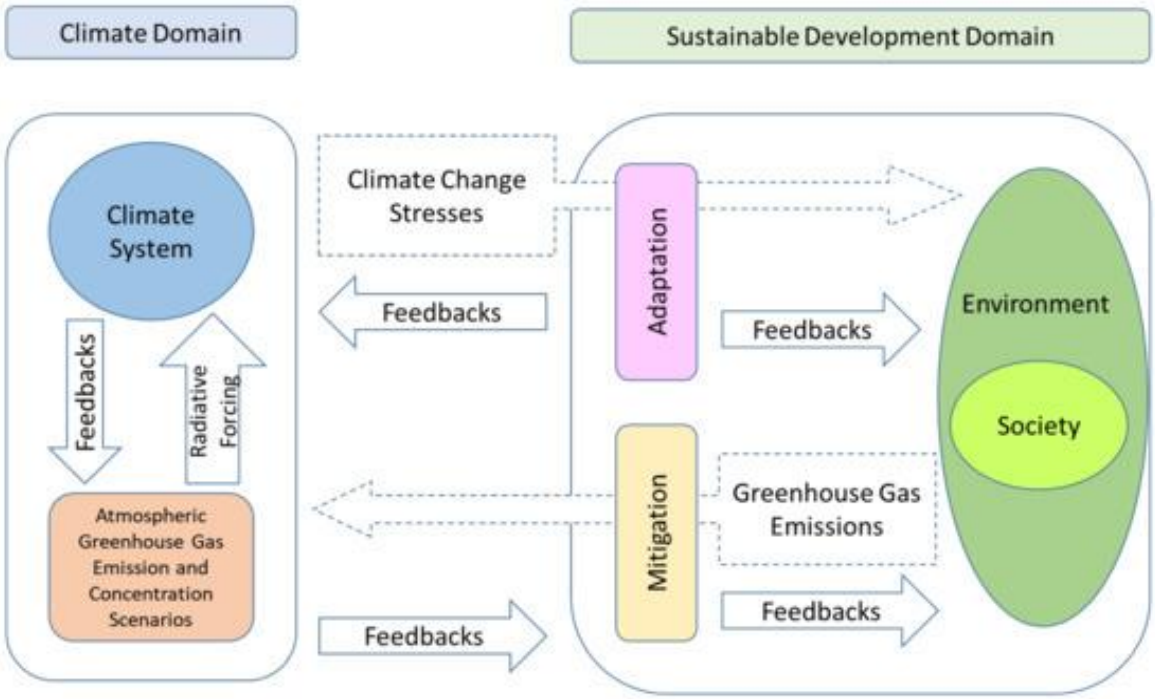

Fig-1:Conceptual framework of mitigation and adaptation (Ting and Yuh,2021).

Statement of the problem:

Coastal communities in Cox's Bazar, Bangladesh, face increasing vulnerabilities and risks due to the adverse impacts of climate change and Rohingya influx. Rising sea levels, more frequent and severe storms, shifting weather patterns, and saltwater intrusion are threatening the livelihoods, food security, and overall well-being of these communities. Despite efforts to implement community-led climate adaptation initiatives, significant challenges persist, creating a pressing problem that requires attention and action.

Key Issues and Challenges:

- Limited Access to Resources
- Inadequate Infrastructure
- Erosion of Livelihoods
- Lack of Institutional Support
- Gender and Social Inequities

The above statement of the problem outlines the specific issues and obstacles faced by coastal communities in Cox's Bazar regarding climate adaptation. It provides a clear context for the proposed project and emphasizes the urgency of finding sustainable solutions to safeguard the livelihoods and well-being of these climate vulnerable communities in the face of climate change.

EXISTING LITERATURE REVIEW

Climate change refers to short, medium, and long-term changes in weather patterns and temperature that are predicted to happen or are already happening because of anthropogenic emissions of greenhouse gases such as carbon dioxide. These changes include a higher frequency of extreme weather events such as drought and floods, as well as greater unpredictability and variability in the seasons and in rainfall. Overlaying this increased variability are expected longer-term changes, such as temperature and sea-level rises, and lower (or in some cases higher) rainfall (Christian Aid,2009based on the IPCC 4th assessment report,2007).

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Vulnerability to climate change is not just a function of geography, or dependence on natural resources; it also has social economic, and political dimensions which influence how climate change affects different groups (Action Aid, 2005). Poor countries and communities are more vulnerable to climate change because they tend to be in geographically vulnerable areas, such as flood-prone Mozambique, drought-prone Sudan, or cyclone-prone Bangladesh, and in more vulnerable location. Many poor communities are heavily dependent on natural resources for their livelihoods. Smallholder farmers have much experience of adapting to their complex, diverse, and risk-prone environments. However, farming is now becoming even more difficult and risky because of greater unpredictability in the timing of rainy seasons, making it more difficult to decide when to cultivate, sow, and harvest and needing more resources to seize the right time for planting. Heat stress, lack of water at crucial times, and pest and diseases are serious problems that climate change appears to be exacerbating. These all interact with ongoing pressures on land, soils, and water resources that would exist regardless of climate change (Jennings and McGrath, 2009).

As defined by Reid et al. 2009 "Community-Based Adaptation (CBA) to climate change" is "a community-led process, based on communities' priorities, needs, knowledge, and capacities, which should empower people to plan for and cope with the impacts of climate change." Climate change is a complex issue and subject to collective efforts. Community-based adaptation takes climate-related issues "back to the local." With local communities as the mainstay, not only cultural structures or lifestyles could be consciously rebuilt, but also more stakeholders' inputs could be acquired. Stakeholders' inputs may include ecosystem services for community beneficiaries and consumer groups. The more stakeholders can be engaged, the more "empowerment" can be achieved.

Huq and Reid,2004 argue that community adaptation is community-based and propose the most effective way to manage risks with climate change adaptation as it encourages the community to achieve the goal of sustainable development.

Verner, 2012 further concludes that all CBA to climate change literature stresses the need for adequate financing. Simple financial services play a critical role and can have a great impact, especially for poor people, allowing them to increase their asset base, widen their economic possibilities, and reduce their vulnerability to climate change. Local governments and municipalities have developed a very low capacity to adapt to climate change.

Forsyth, 2013 points out that community adaptation is a formal adaptation that aims to reduce the risks of climate change for the world's poorest people.

Dodman and Mitlin, 2013 argue that community adaptation is based on the premise that local communities have the skills, experience, knowledge, and networks to adapt to local activities, increase environmental tolerance, and reduce the impact of climate change vulnerability.

Magee,2013 argues that community-based adaptation to community-based climate change can lead communities to progress based on their strengths, needs, knowledge, and skills. These are sufficient to enable residents to adapt and plan for the effects of climate change. It must make local residents the core of its planning and make plans within the capabilities of the residents.

Ensor et al., 2014 point out that a "community" refers to a group of people who have common goals and is generally used to describe those who live in the same village or region. This particular group of people faces challenges together at specific locations and will therefore work together to address these challenges. In the future, in community planning against a changing climate, we must think together about ecosystem services and governance, economy, society, culture, land and resources, health, and infrastructure construction.

Uitto et al., 2107 point out that adaptation and mitigation are two different but linked dimensions of social, economic, and environmental sustainability. Adaptation concerns how the social and economic domains are

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"ready" for change in the environmental domain and includes the resulting actions. Mitigation focuses on the ways society and the economy use natural resources and aims to make these more environmentally sustainable. Morgan, 2017 points out that "Community-based adaptation" is receiving growing attention from NGOs, climate change initiatives, and researchers worldwide.

Due to these unknown outcomes, we are uncertain about the future of our climate. The International Panel on Climate Change (IPCC) aims to reduce this uncertainty by creating a scientific overview of climate change research. The IPCC report of 2014 concludes that the cumulative emissions of CO2 largely determine global surface warming by the late 21st century and beyond. Observable negative effects of global climate change on the environment (e.g., ecosystems and biodiversity), water availability and quality, energy consumption, crop productivity, the magnitude and frequency of natural disasters, and the spread of disease are well documented (Adamowski et al. 2009).

These climate change effects mostly occur in the developing countries, which create an injustice, because less developed countries are least responsible for climate change, and thus most vulnerable to its effects (Adger et al. 2003).

Community resilience is a holistic approach to reduce a community's vulnerability to climate change. Resilience is "The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions" (IPCC 2012, pp.3).

The groundwater table in Chittagong City is at present in a position from where it is difficult to pump groundwater by shallow tube well. Profound tube well is required practically in each place to locate the fresh water from the ground. For the most part, the area, profundity, size, and piece of aquifers are dictated by seasonal rainfall intensity. Some areas in Chittagong experience a great depletion of groundwater level which is shown in (Mirdad & Palit, 2017). The United Nations Development Program (UNDP) released the study on the groundwater depletion around Cox's Bazar in 2019, stating that the water table around the Rohingya camps close to Cox's Bazar has depleted by 5 to 9 meters. The main reason for groundwater depletion is the installation of around 5,731 tube-wells between August and December 2017 to supply drinking water to the Rohingya refugee camps. Due to the sudden rise in groundwater extraction, the water table is depleting faster than it can replenish (UNDP, 2019).

Cox's Bazar gets abundant rainfall during the monsoon season and has a lot of potential to collect and use rainwater in the wet season and store for the drier months. In Cox's Bazar, the average annual rainfall is 3770 mm / 148.4 inch (BMO, 2018) which is much higher (1,334 mm) than the average annual rainfall of Bangladesh varies from 2200 mm to 2800 mm (World Bank, 2019).

Pond sand filter (PSF) systems were introduced in Bangladesh in the early 1990s (Hoque, 2009). They are considered a low-tech, easy-to-operate drinking water infrastructure that can provide reasonably priced,1 safe drinking water, reliably. PSF consists of a hand pump to pump water from a pond into a raised filter bed containing gravel and sand. After passing through the filter, drinking water is stored in a filter chamber from which it can be collected via a tap. Not only the technology is relatively simple, but also the governance arrangements seem straightforward enough: The number of actors and actor interactions is (Harun & Kabir 2013) estimate that installing a PSF system in Bangladesh costs between $500–750. A PSF can serve up to 100 families, so installation costs could be as little as $5/household. Annual maintenance costs are estimated by them to amount to $50, or, $0.50 per household/year. Hasan et al: A Community Management Plus Model for the Governance of Rural Drinking Water Systems 663 limited, and roles and responsibilities are clearly defined and not very complex: According to the National Policy for Safe Water and Sanitation (1998) local governments (i.e., Union Parishad and Upazila Parishad) select PSF sites, based

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on two criteria: the scarcity of drinking water in a community and the availability of a suitable pond. Subsequently, the Department of Public Health and Engineering (DPHE) is responsible for the installation of the infrastructure and can also be called upon in case of a need for big repairs, later. PSF users are responsible for operating and maintaining their drinking water system. To this end, they select a designated caretaker who is to be paid through user contributions. A committee comprising of five PSF users should take responsibility for organizing overall PSF management. A maintenance committee is usually selected in a general community meeting (Ansari & Roy, 2010).

The scarcity of drinking water is acute as the freshwater aquifers at reasonable depths are not available. Households are mainly dependent on PSF, rainwater harvesting and rain-fed pond water for drinking purposes. In coastal area of Bangladesh, numerous PSFs have been constructed. About 90 PSFs, each serving about 50 to 60 households on the average, have been constructed in Dacope upazila of Khulna district since the start of the PSF programme in 1984. In Kaliganj upazila at Satkhira district, there are about 24 PSFs, all constructed during 1993-94. The average lifetime of a PSF is a minimum of 10 years. The use of PSFs has the potentiality to revolutionize the drinking water systems in the saline areas in the southern belt of the country, covering the greater Khulna, Patuakhali, Barisal and Noakhali districts (Sarwar, 2005). There are two types of PSF, one of which is Model - 1 (PSF-300) that is feasible for 300 users and another Model - 2 (PSF-500) is generally constructed for 500 users (Setu et al., 2014) and (Moniruzzaman et al., 2017)

Research Gap

Different author mention community-based climate adaptation internationally and nationally but they have limitation on the aspect of scarcity of ground water problem, climate resilient livelihood and socio-economic condition at world largest sea beach of coxsbazar district till to date in Bangladesh.

Limited research on the specific community: There might be limited existing research on the Whykong union community in Teknaf upazila, making it necessary to conduct an in-depth study to understand the community's vulnerabilities, livelihood opportunities, climate change risk, adaptive capacities, and their existing efforts in climate adaptation.

Lack of focus on community-led approaches: The research gap could be the inadequate exploration of community-led climate adaptation strategies and their effectiveness in the specific context of Whykong union. This may include initiatives taken by the community, such as indigenous knowledge, traditional practices, and local institutions in response to climate change impacts.

Aim and Objectives:

This study aims to identify the impact of climate change, economic condition and effectiveness of community led climate adaptation initiatives at Whykong Union, Teknaf Upazila.

Objectives:

- To assess the economic condition of the local community.
- To identify the impact of climate change of coastal area.
- To enlist of community-led climate adaptation initiatives in enhancing resilience in study area.

Sub district

Study Area:

The study area for community-led climate adaptation at whykong union of teknaf upazila sub-district in Cox's Bazar district, Bangladesh. About 112.74 square km make up the entire area. There are 60,478 people

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in total, with 34,445 men and 26,033 women. A 21.14 percent literacy rate is reported and most climatic vulnerable location. Cox's Bazar is in the southeastern part of Bangladesh, near the border with Myanmar, and is known for its long sandy beach along the Bay of Bengal. This district is particularly vulnerable to climate change impacts due to its coastal location. weather and climate in the study area is Summer (March to May) is hot and humid. During this period, temperatures can rise significantly, with daytime highs often exceeding 30°C (86°F). Humidity levels are relatively high, making it feel even hotter. The winter season in Teknaf is characterized by mild temperatures and relatively low humidity. It is a popular time for tourists, as the weather is pleasant, with daytime temperatures ranging from 15°C to 25°C (59°F to 77°F). The monsoon season, from June to September, receives the majority of the annual rainfall in Teknaf. During this time, heavy downpours and occasional storms are common. The total annual rainfall in Teknaf typically ranges from 3,000 to 4,000 millimeters (approximately 118 to 157 inches), making it one of the wettest regions in Bangladesh. Teknaf Upazila is susceptible to tropical cyclones and storms originating in the Bay of Bengal, especially during the pre-monsoon and post-monsoon periods. These weather events can bring strong winds, heavy rainfall, and storm surges, causing significant damage to the coastal areas. Like many coastal areas worldwide, Teknaf is vulnerable to the effects of climate change, including sea-level rise and increased cyclone intensity. These factors pose long-term challenges to the region's resilience and adaptation efforts.

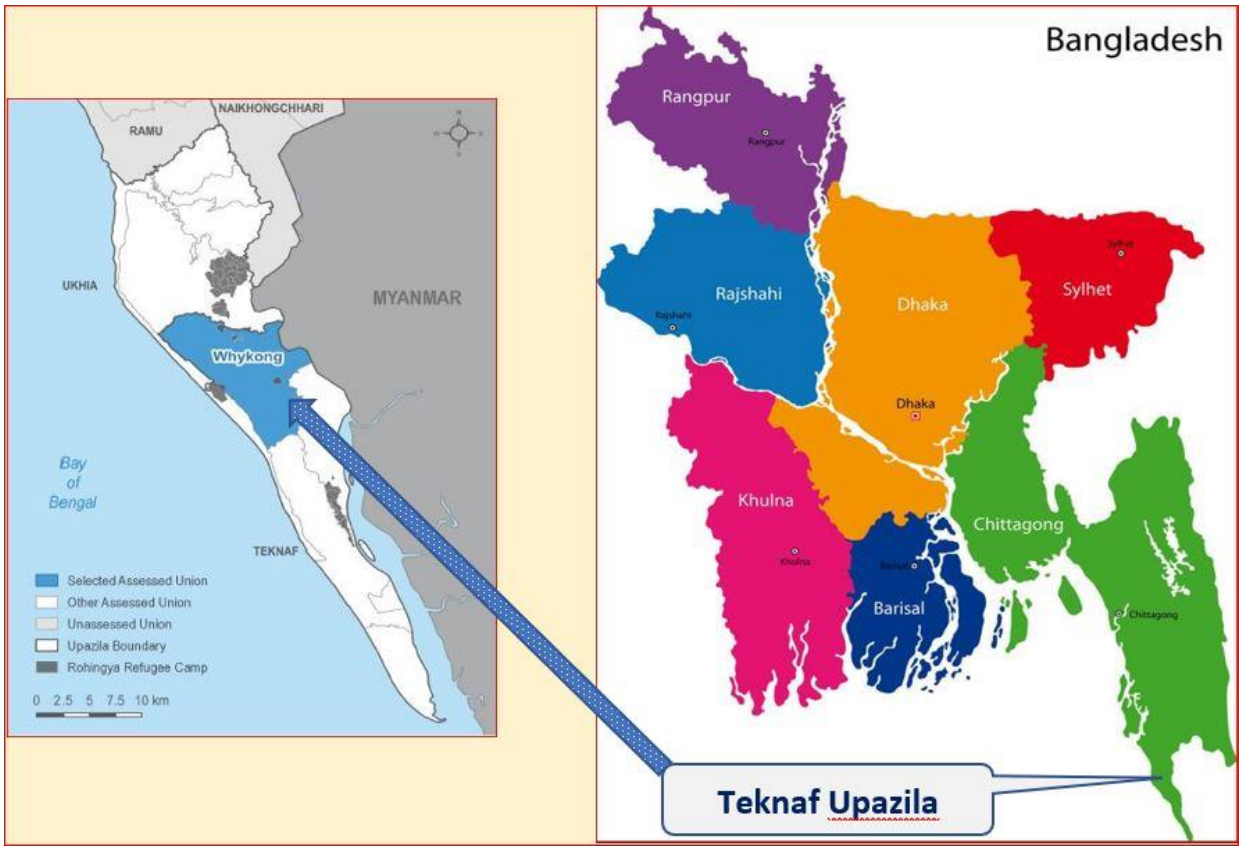

Fig-2: Study location map

Climate change is a global challenge, impacting communities in diverse ways. This chapter focuses on the specific context of Whykong Union, situated in Teknaf Upazila, Cox's Bazar District, and elucidates the factors that make this area a critical subject for the study of community-led climate adaptation.

Geographic Context

The geographic context of Whykong Union, situated within Teknaf Upazila in Cox's Bazar District, Bangladesh, is marked by distinctive features that influence the community's dynamics and vulnerability.

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Whykong Union is positioned in the southernmost part of Bangladesh, specifically within the Teknaf Upazila of Cox's Bazar District.

Latitude and longitude coordinates: 21.4411313 and 91.9922662, The union is characterized by its proximity to the Bay of Bengal, placing it within the coastal zone. The coastal setting exposes Whykong Union to the impacts of sea-level rise, saline intrusion, and tropical cyclones, all of which are associated with climate change. The topography of Whykong Union features a combination of coastal plains and river deltas. Low-lying areas are prevalent, influencing the susceptibility of the region to flooding and other climate-related hazards. The region experiences a tropical monsoon climate, characterized by distinct wet and dry seasons. High temperatures, heavy rainfall during the monsoon, and occasional cyclonic activities contribute to the climate challenges faced by the community. The union is endowed with diverse ecosystems, including mangrove forests, wetlands, and coastal vegetation. Rich biodiversity supports various flora and fauna, contributing to the local economy and traditional practices. Rivers and water bodies, possibly including estuaries or tributaries, are integral to the landscape. The interaction between freshwater and saltwater in these water bodies may influence agricultural practices and community livelihoods. Accessibility to Whykong Union may be facilitated by road networks, potentially linking it to the broader Teknaf Upazila and neighboring regions. Understanding the geographic context of Whykong Union is pivotal for comprehending the environmental exposures and opportunities that shape the community's responses to climate change. The coastal positioning, topography, and climatic conditions collectively form the canvas upon which the community's adaptive strategies unfold.

Demographic Profile

The community of Whykong Union is estimated to have a population of [insert approximate number], according to the latest available census or survey data. The population exhibits a diverse age distribution, with significant representation across various age groups.[Provide specific percentages or numbers for different age categories, such as children, adults, and elderly]. Whykong Union is characterized by a rich tapestry of ethnicities and cultural backgrounds.[Specify the major ethnic groups or communities residing in the area].Income Levels: The community's income levels vary, reflecting a range of economic activities. Occupation: Primary livelihood activities include [mention predominant occupations such as agriculture, fishing, trade, etc.].Educational attainment within the community spans [provide information on literacy rates, educational levels]. Family structures in Whykong Union vary, with households typically consisting of [average family size].[Mention any specific household arrangements or cultural aspects related to family structures].Health indicators, including access to healthcare services and prevalent health conditions, contribute to the overall well-being of the community.

[Include relevant health statistics if available].Explore patterns of migration within and outside the community, considering factors such as seasonal migration for work or other demographic trends. The primary language spoken in Whykong Union is [mention the predominant language].

[Include any multilingual aspects or language variations within the community].Discuss the gender distribution within the community, highlighting the roles and contributions of both men and women.[Include gender-specific data on education, employment, etc.].

Environmental Setting:

The environmental setting of Whykong Union, located within Teknaf Upazila in Cox's Bazar District, Bangladesh, plays a crucial role in shaping the community's livelihoods, vulnerabilities, and resilience. While specific details may vary based on local conditions. Whykong Union is endowed with diverse flora and fauna, contributing to the region's ecological richness. The community likely engages in agriculture, utilizing fertile lands for cultivation. The types of crops grown may be influenced by the soil composition and climate conditions. Housing and infrastructure are dispersed throughout the union, reflecting the

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community's settlement patterns. The presence of rivers, estuaries, or tributaries may be a defining feature of Whykong Union. These water bodies contribute to the community's water supply and may be vital for agriculture and fisheries. The community's access to freshwater for drinking, agriculture, and other domestic purposes is essential for its sustenance. Whykong Union experiences a tropical monsoon climate characterized by distinct wet and dry seasons. Monsoon rains contribute significantly to the local water cycle. The region may be susceptible to tropical cyclones, influencing weather patterns and posing risks to the community. Sea-Level Rise and Saline Intrusion: The coastal location exposes Whykong Union to the threat of sea-level rise and saline intrusion, impacting agricultural lands and freshwater resources. The community may face challenges associated with extreme weather events such as cyclones, storm surges, and heavy rainfall. Proximity to coastal areas may make the community susceptible to soil erosion, affecting agricultural productivity. Local initiatives or government programs aimed at environmental conservation and sustainable resource management may be in place.The environmental setting influences the vulnerability of community infrastructure to climate-related impacts such as erosion, flooding, or damage from extreme weather events. The community may have implemented adaptation measures to safeguard infrastructure against environmental challenges.

Community Infrastructure and Resources

The community infrastructure and resources of Whykong Union, situated in Teknaf Upazila, Cox's Bazar District, Bangladesh, play a crucial role in shaping the daily lives and resilience of its residents. While specific details may vary, here is a general exploration of community infrastructure and resources: The community likely features a mix of traditional and modern housing structures. Traditional homes may be designed to withstand local weather conditions. The availability of adequate housing and its accessibility to essential services contribute to the community's overall well-being. The union may be connected by a network of roads, facilitating transportation within the community and connecting it to neighboring areas. Local transportation modes, such as bicycles, rickshaws, or community vehicles, may be prevalent. Access to clean and safe water is essential. The community may rely on wells, boreholes, or piped water systems for their water supply. The availability of reliable electricity supports various aspects of community life, including household activities and economic endeavors. The presence of schools and educational facilities is vital for the community's access to formal education. The accessibility of educational resources and opportunities may influence literacy rates and the community's overall educational attainment. Local healthcare facilities contribute to the community's well-being. The availability of medical services and access to healthcare professionals are crucial. Initiatives focused on health education and awareness may be in place to address community health concerns. The presence of local markets and economic centers is significant for trade and commerce within the community. Economic activities such as trade, agriculture, or small businesses contribute to the community's livelihoods. Whykong Union has a history marked by climate-related events, including cyclones and storm surges. Past occurrences have shaped community resilience and adaptation strategies. The community has a legacy of self-organized adaptation efforts, including communal shelters during cyclones and traditional agricultural practices resilient to environmental changes.

Local Institutions and Governance:

The local institutions and governance structures within Whykong Union, under Teknaf Upazila, Cox's Bazar District, Bangladesh, play a crucial role in decision-making, resource allocation, and community development. While specific details may vary, here is a general exploration of local institutions and governance in this context: The Union Parishad serves as the local government body for Whykong Union, responsible for administrative and developmental functions. It plays a key role in decision-making processes related to local governance, development projects, and community welfare. Elected representatives, including the Union Chairman and members, form the core of local leadership. These representatives engage with the community to understand needs, address concerns, and advocate for local interests. Local

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administrative officers appointed by the government play a role in implementing policies and managing day-to-day affairs. They contribute to service delivery, including healthcare, education, and infrastructure development. These organizations operate at the grassroots level, focusing on community development initiatives. CBOs may engage in activities such as environmental conservation, healthcare awareness, and disaster preparedness.

METHODOLOGY

This study encompasses primary and secondary data and information. Primary data sources are basically physical observation and field measurement. The study location and community people will be selected using purposeful sampling to collect data. This study will be conducted october and november'2023 at whykong union under teknaf upazila. In the whykong union, the research covered the selected wards number. Random sampling data was collected from the total number of community people. Data will be collected by using KOBO data collection software to ensure data accuracy and reduce the use of Paper and time. A survey questionnaire will be design considering the research objectives. Women are given priority to have an interview. After collect the data will be analysis and visualize the data and results.

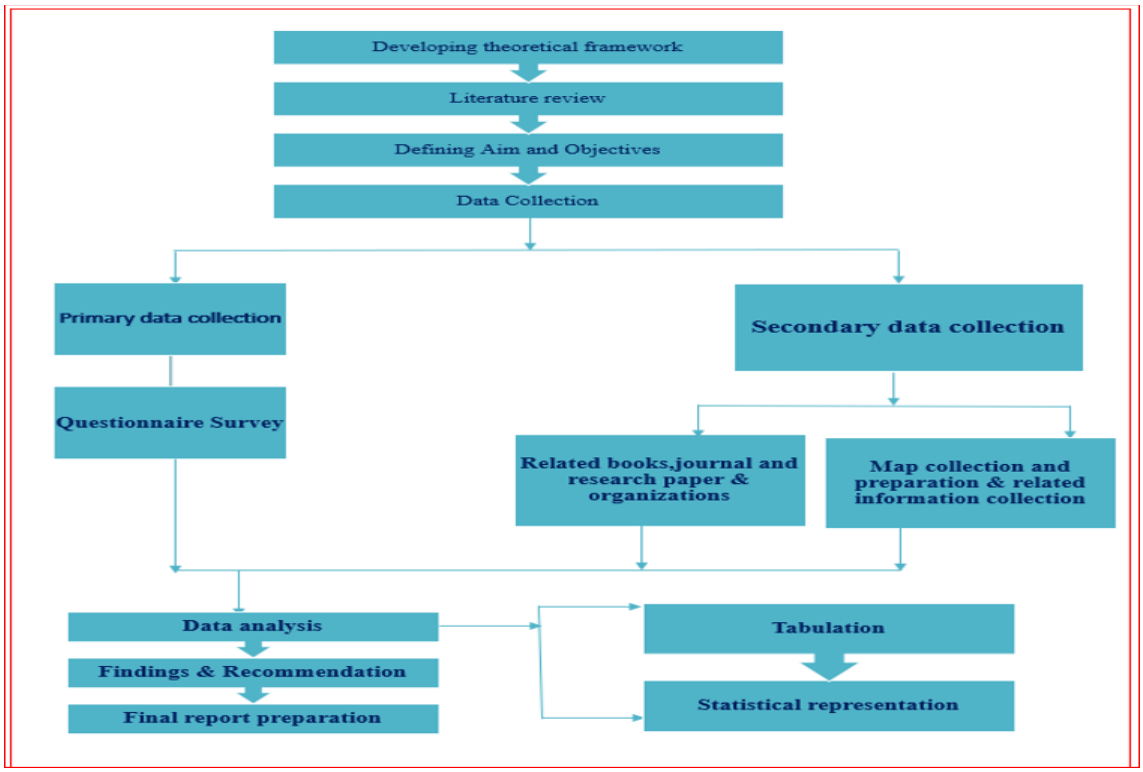

Fig-3: Flow chart of materials and methods

This study is the result of brief fieldwork that was carried out in 1 & 5 number ward of whykong union under Teknaf Upazila of Coxsbazar District. Community members were selected through purposeful sampling to gather data. Data was collected through self-selected sampling from the total amount of community. Data collection was conducted using KOBO data collection software to ensure data accuracy and minimize the use of paper. Prior to designing study questionnaires based on indicators, women were given preference for interviews.

Primary Data Sources:

Individual Interviews: Conducted individual interviews with community individuals actively involved in community-led climate adaptation initiatives within Whykong Union.

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Focus Group Discussions (FGDs): Organized informal FGDs with community members to gather collective insights on climate challenges, adaptation strategies, and the perceived effectiveness of these strategies.

Secondary Data Sources:

Review of Local Documents: Examined relevant documents, reports, and records from local authorities, NGOs, and community organizations that provided information on past and ongoing climate adaptation initiatives.

Climate Data: Utilized historical climate data from local meteorological agencies to understand the region's climatic patterns and trends.

Sampling:

Purposeful Sampling: Selected Whykong Union in Teknaf Upazila due to its vulnerability to climate impacts and the presence of active community-led adaptation efforts.

For this Data Collection targeted population is 50 households who have had access to the assistance. The sample size has been determined using the following equation:

The sample size has been determined using the following equation:

$$n_0 = \frac{Z^2 \times p \times (1-p)}{e^2}$$

$$n = \frac{n_0}{1 + \frac{n_0}{N}}$$

After calculation Sample size was 51 household

Here-

Z = Z value (e.g., 1.96 for 95% confidence level).

p = percentage picking a choice; expressed as a decimal (0.5 used for sample size needed).

e = Specified margin error (0.05)

N= Population size (N=40)

n= Sampling size

DATA COLLECTION

Conducted semi-structured interviews with key informants to explore their perspectives on climate challenges, community-led initiatives, and the impact of these efforts. Organized FGDs with diverse community members to capture a range of opinions and experiences related to climate adaptation. Reviewed and analyzed relevant documents to complement primary data and provide a historical context of climate adaptation efforts.

Data Analysis:

Categorized qualitative data into themes related to climate challenges, adaptation strategies, community dynamics, and the perceived effectiveness of initiatives. Applied descriptive statistics to quantify responses from structured survey questions, where applicable. Obtained informed consent from all participants before

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data collection. Ensured the confidentiality of participants by anonymizing data and protecting sensitive information. Respected local customs and traditions and sought permission from community leaders before engaging with the community. Utilized a triangulation approach by comparing information from different sources (interviews, FGDs, documents) to enhance the reliability and validity of the findings.

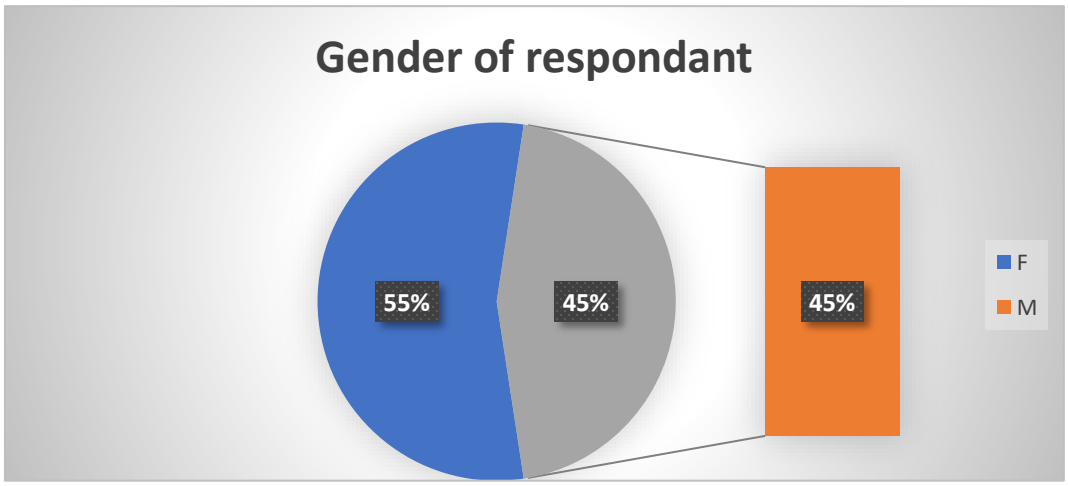
Limitations:

Acknowledged potential limitations due to political disruptions, which may have impacted access to participants and introduced biases.By detailing your data sources, methodology, and addressing potential limitations.

RESULT AND DISCUSSION

1. Demography information
2. Gender of respondent
3. Livelihoods
4. Occupation of the respondent
5. Income the respondent
6. Barrier of Income
7. Disaster and climate impact in Community
8. Climate impact Challenges
9. Way to reduce climate change challenges.
10. climate and Eco-System
11. Some of community led climate change initiatives of the study location

Demography information



Gender of respondent

Based on the data, females account for 55% of the participants in the community-led climate adaptation initiatives, while males account for 45%. This gender distribution indicates a slight majority of female participants in the initiatives. Analyzing the gender percentages can help identify potential gender imbalances or disparities in participation and engagement.

Fig-4: Gender respondent

It also highlights the importance of considering gender dynamics and promoting gender equality in climate adaptation efforts. Promoting gender equality and inclusivity in community-led climate adaptation

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initiatives is crucial for fostering resilience and ensuring that diverse perspectives and experiences are considered in decision-making.

Table-1: Education Levels in the Study Population

The following table represents the distribution of education levels among the study population:

Education Level	Frequency
No Education	18
Primary Education	13

The data indicates that 18 individuals in the study population have no formal education, while 13 individuals have completed primary education.

This information provides insights into the educational background of the participants, which can be crucial for understanding the context and potential implications for the study.

Livelihoods

Occupation of the respondent

The data collection and analysis focused on the occupations of individuals involved in the community-led climate adaptation initiatives. The table provides the values, frequencies, and percentages of different occupations within the dataset. According to the data, the most common occupation among the participants was housewife, with a frequency of accounting for 54.84% of the total. Day laborers and farmers were also significant, with frequencies of 38.71% and 35.48% respectively. Businessmen and unemployed individuals had lower frequencies, each accounting for 3.23% of the dataset. This analysis provides insights into the occupational diversitof individuals engaged in community-led climate adaptation initiatives. It highlights the significant participation of housewives, day laborers, and farmers in these efforts. Understanding the occupations of participants can aid in tailoring adaptation strategies and interventions to specific occupational groups, ensuring inclusivity and addressing the unique needs and challenges faced by different occupations.

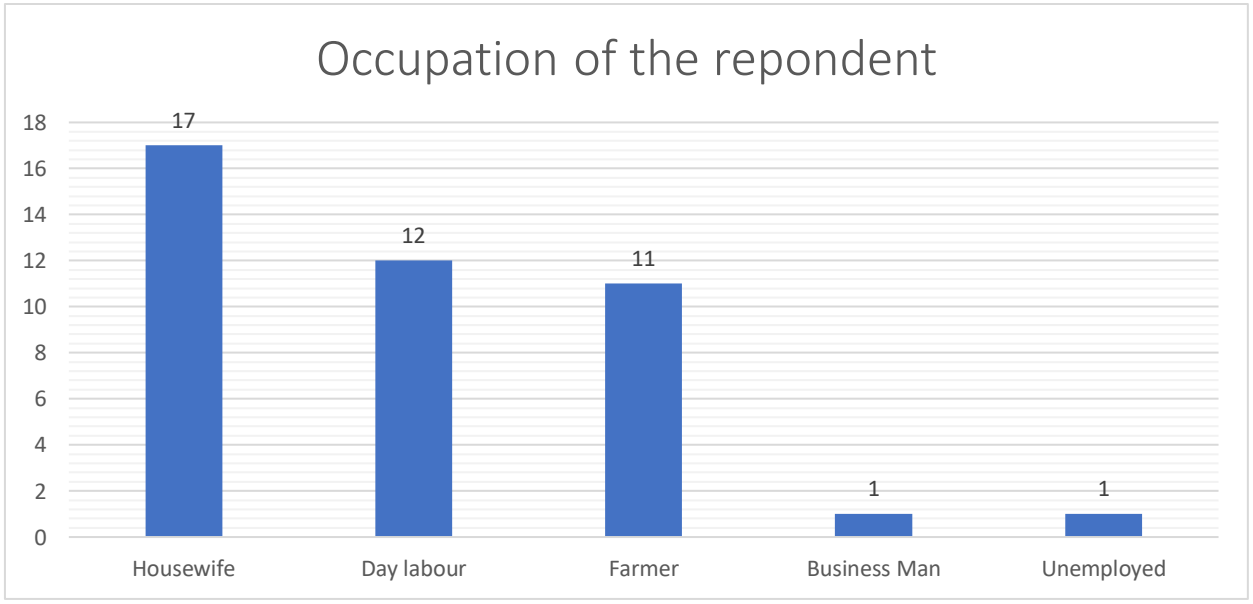

Fig: -5: Occupation of the respondent

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Income the respondent

According to the data, 54.84% had an income level of less than 5000 BDT. The income bracket of 15000-25000 BDT had a 25.81%, while the income bracket of 5000-15000 BDT had a 19.35%. This analysis allows for an understanding of the income distribution within the community and its implications for climate adaptation initiatives. It highlights a significant proportion of individuals with lower incomes involved in the initiatives.

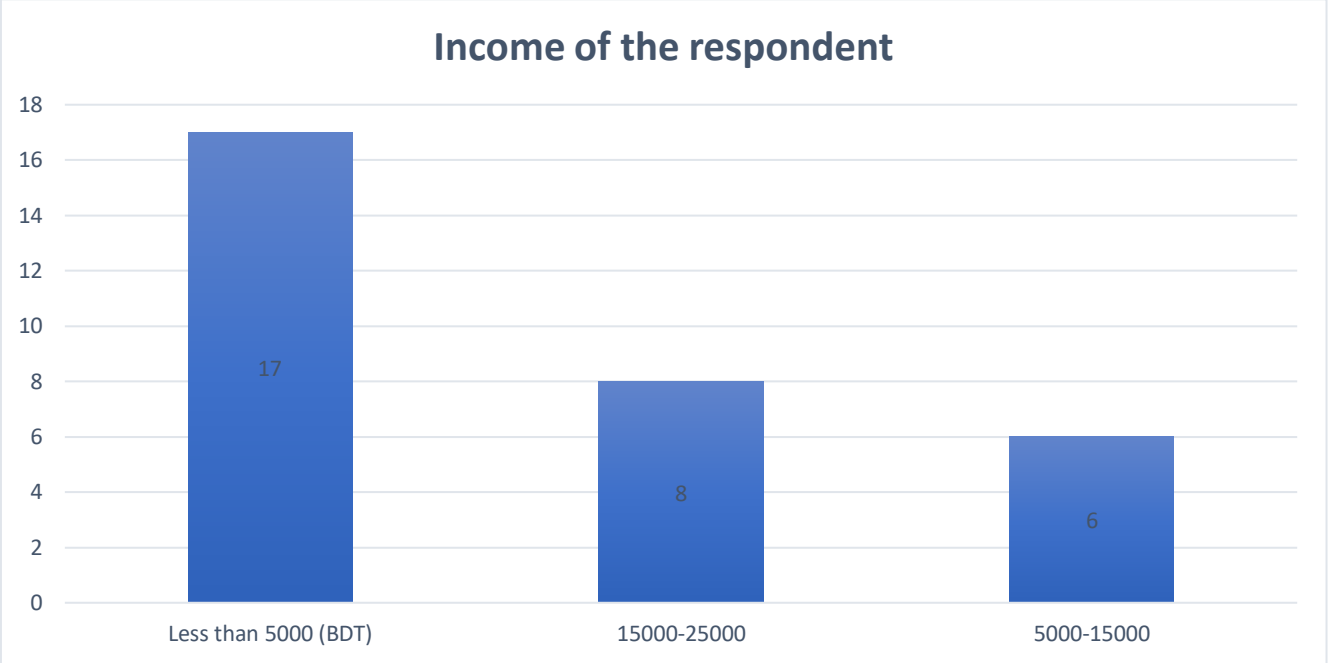

Fig-6: Income of the respondent

Table-2: Community Development Priorities

The table below illustrates the community's priorities as indicated by the respondents, along with the respective frequencies:

Development priorities	**Frequency**
Job Creation and Entrepreneurship	22
Education and Skill Development	20
Improved Healthcare Facilities	15
Infrastructure Development	9
WASH Facilities	4

The data highlights the preferences of the community, with a significant emphasis on job creation and entrepreneurship. Education and skill development, improved healthcare facilities, and infrastructure development are also identified as key priorities. WASH facilities, while less frequently mentioned, still represent an aspect of concern for a subset of the respondents.

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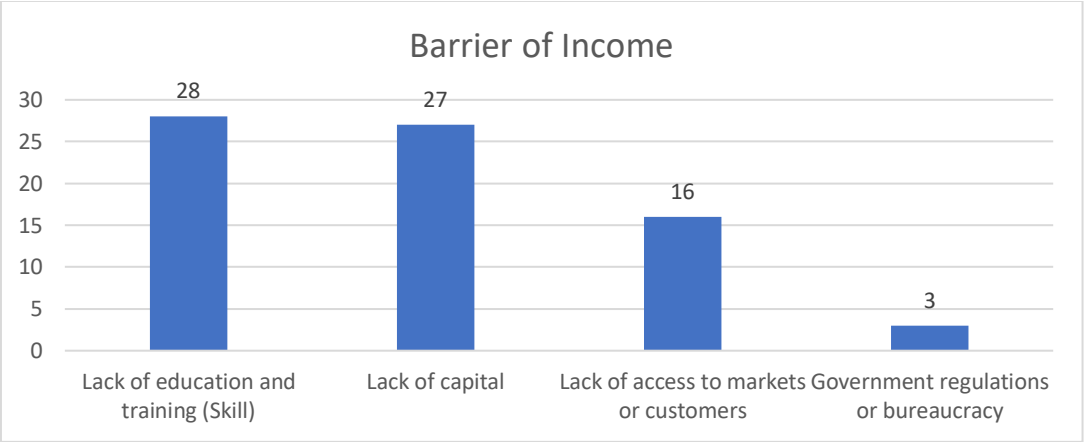
Understanding these priorities is crucial for formulating effective community development strategies that align with the needs and aspirations of the local population.

Barrier of Income



The data shows the different barriers related to income in the context of community-led climate adaptation initiatives. The barrier categories and their respective frequencies and percentages are as follows, Lack of education and training (Skill), this barrier had accounting for 90.32% of the respondents. Lack of capital, this barrier had accounting for 87.1% of the respondents.

Fig-7: Barrier of income

Lack of access to markets or customers, this barrier had accounting for 51.61% of the respondents. Government regulations or bureaucracy, this barrier had accounting for 9.68% of the respondents. These findings suggest that the lack of education and training, as well as the lack of capital, are the most significant barriers faced by individuals with respect to income in the context of community-led climate adaptation initiatives. These barriers hinder their ability to engage effectively in adaptation activities and limit their access to resources and opportunities. The lack of access to markets or customers was also identified as a barrier, indicating challenges in generating income from climate adaptation initiatives due to limited market access or customer base.

Disaster and climate impact in Community

Climate impact Challenges

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The challenges faced by the community-led climate adaptation initiatives are diverse, but the most prevalent challenge reported by the respondents is the Rohingya Crisis, with a frequency of 93.55%. This indicates the significant impact of the Rohingya Crisis on the community and its ability to focus on climate adaptation efforts. Poverty is another major challenge, with a frequency of 70.97%. This highlights the economic vulnerability of the community and the need to address poverty as a key factor in climate adaptation. Water scarcity is also a

Fig-8: climate impact challenges

significant challenge, reported by 67.74%. This underscores the importance of water management and access to ensure the resilience of the community in the face of climate change. Unemployment is a challenge for 51.61%, indicating the need for livelihood opportunities and job creation in the context of climate adaptation. Lack of education, although reported by a smaller percentage 16.13%, should not be overlooked, as it can hinder the community's capacity to understand and implement climate adaptation measures effectively. Health issues were reported as a challenge by respondent 3.23%, but it is still important to consider the health impacts of climate change and how they intersect with other challenges. Understanding these challenges is crucial for developing targeted strategies and interventions that address the specific needs of the community. It requires a multi-faceted approach that considers not only climate adaptation but also social, economic, and political factors to foster resilience and sustainable development.

Table-3: Community Preferences for Emergency Preparedness

The following table outlines the community's preferences for enhancing emergency preparedness, along with the corresponding frequencies:

Community preference	**Frequency**
More Training for Emergency Responders	24
More Emergency Supplies and Equipment	19
More Public Awareness Campaigns	18
More Efficient Communication Systems	3
Other	1

Way to reduce climate change challenges

The data indicates that the majority of respondents express a need for more training for emergency responders, followed by a desire for additional emergency supplies and equipment. Public awareness campaigns are also deemed essential. However, there is a lower frequency of respondents suggesting the need for more efficient communication systems. Additionally, one respondent mentioned other considerations not specified in the given categories.

Respondant perception showed that the government which accounts for 74.19% of the total initiatives. This indicates that the government plays a significant role in addressing climate change. The need for climate education and awareness is also recognized, accounting for 70.97% of the total initiatives. This highlights the importance of educating and creating awareness about climate

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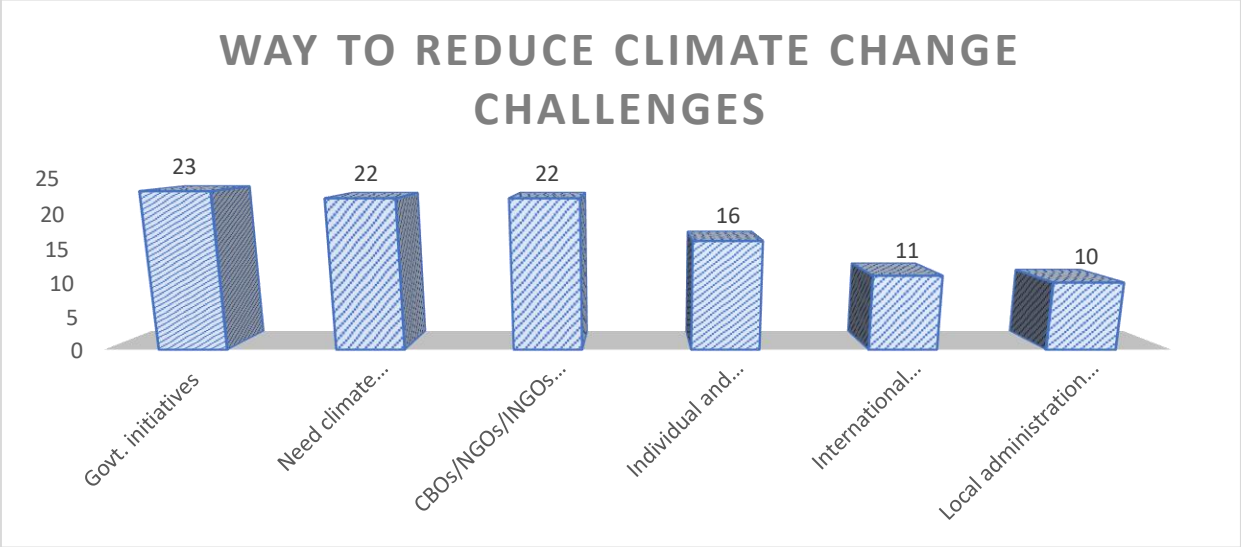

change among the general public.CBOs/NGOs/INGOs activities

Fig-9: Way to reduce climate change challenges.

have also contributed significantly, with accounting for 70.97% of the total. These organizations play a crucial role in implementing climate change initiatives at the grassroots level. Individual and community-led action is also recognized as important,accounting for 51.61% of the total. This highlights the role of individuals and communities in taking action to mitigate and adapt to climate change. International initiatives have been taken as well, with accounting for 35.48% of the total. This indicates the global effort to address climate change and the need for collaborative action. Local administration initiatives have also been taken, accounting for 32.26% of the total. This shows the importance of local governments in implementing climate change policies and actions. Overall, these initiatives represent a multi-faceted approach to address climate change, involving government, education, organizations, communities, international cooperation, and local administration.

climate and Eco-System

Table-4: Promoting Natural Ecosystems

The table below outlines the community's preferences for promoting the importance of natural ecosystems, along with the corresponding frequencies:

Particular of promoting natural ecosystem	**Frequency**
More Education on the Importance of Natural Ecosystems	25
More Conservation Efforts by Governments and Organizations	22
More Public Awareness Campaigns	11
More Sustainable Practices by Individuals and Businesses	3

The data highlights that the majority of respondents emphasize the need for more education on the importance of natural ecosystems. Additionally, there is a substantial interest in increased conservation efforts by governments and organizations. Public awareness campaigns are also deemed important, although

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with a lower frequency of respondents expressing this preference. A smaller number of respondents indicate a desire for more sustainable practices by both individuals and businesses.

Some of community led climate change initiatives of the study location:

Respondent accounts for 60% of the community-led climate smart agricultural initiatives. This initiative focuses on implementing sustainable agricultural practices that are resilient to climate change. Knowledge sharing and capacity building account for 70% of the community led initiatives. This initiative emphasizes educating and training community members on climate change impacts, adaptation strategies, and sustainable practices. Domestic rainwater harvesting accounts for 45% of the community-led initiatives. This initiative involves capturing and storing rainwater for domestic use. It helps to minimize water scarcity during dry periods and reduces reliance on groundwater sources. Pond Sand Filter (PSF) accounts for 30% of the community-led initiatives. This initiative focuses on constructing sand filters in ponds to improve water quality. PSFs remove impurities and contaminants, ensuring access to clean and safe water for the community. Infrastructure development accounts for 55% of the community-led initiatives.

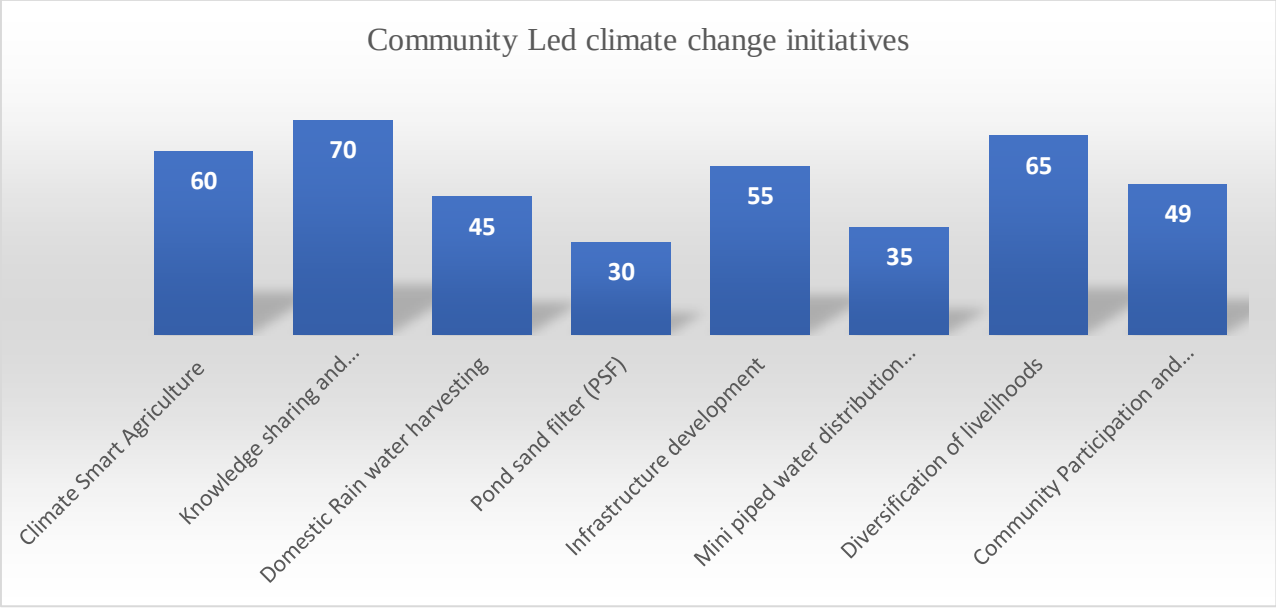

Fig-10: Some of community led climate change initiatives of the study location

This initiative involves the construction of climate-resilient infrastructure, drainage systems, and coastal defenses. It aims to protect the community from climate-related hazards. The mini piped water distribution network accounts for 35% of the community-led initiatives. This initiative aims to provide access to clean and safe water through the establishment of mini piped water systems. It ensures the availability of reliable water sources within the community. Diversification of livelihoods accounts for 65% of the community-led initiatives. This initiative focuses on creating alternative income-generating opportunities for community members. It helps reduce dependence on climate-sensitive sectors and promotes sustainable livelihood practices. Community participation and decision-making account for 49% of the community-led initiatives. This initiative emphasizes the active involvement of community members in decision-making processes related to climate change adaptation. It ensures that community voices are heard and considered in shaping adaptation strategies. These community-led climate change initiatives highlight the importance of empowering communities to take action and build resilience in the face of climate change challenges. By actively engaging in these initiatives, communities can effectively adapt to the changing climate and contribute to a more sustainable and resilient future.

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CONCLUSION

The study emphasized the importance of community-led initiatives, approaches, economic condition, and the impact of climate change in the local community and in addressing climate change challenges. It highlighted the significance of indigenous knowledge, traditional practices, and local institutions in promoting adaptation strategies. The active involvement of community members in decision-making and implementation processes was found to be crucial for the success and sustainability of climate adaptation initiatives.

However, the research also identified several challenges and barriers faced by the Whykong union community. Limited resources, institutional support, and external pressures were found to hinder their adaptation efforts. These factors need to be addressed to enhance the community's adaptive capacities and resilience.

The case study emphasized the need for continued research and evaluation of community-led climate adaptation initiatives. Assessing the outcomes, impacts, and scalability of these initiatives is essential for understanding their effectiveness and potential for replication in similar contexts. Additionally, future research should adopt participatory methodologies to ensure the active involvement of the community in the research process.

Overall, the case study of Whykong union contributes to the body of knowledge on community-led climate adaptation. It provides valuable insights that can inform policymakers, practitioners, and the community itself in developing effective strategies to cope with the challenges posed by climate change. By recognizing and strengthening community resilience, the study paves the way for sustainable and locally appropriate climate adaptation practices.

RECOMMENDATIONS:

Here are some suggestions to fortify and improve the efficacy of community-led initiatives, building on the climate adaptation programme that the people of Whykong union, Teknaf upazila, Cox's Bazar district, have initiated:

Community Empowerment and Inclusion:

- Foster inclusive decision-making processes that involve all segments of the community, including women, youth, and vulnerable groups.
- Conduct capacity-building programs to empower community members with the knowledge and skills needed for active participation in climate adaptation initiatives.

Education and Awareness Programs:

- Conduct educational programs to raise awareness about climate change impacts, adaptation measures, and the importance of community resilience.
- Promote community-based training on sustainable practices and disaster preparedness.

Financial Support and Resource Mobilization:

- Advocate for increased financial support from local authorities, governmental agencies, non-governmental organizations (NGOs), and international donors.

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- Explore innovative funding mechanisms and partnerships to ensure a sustainable flow of resources for community-led projects.

Sustainable Technology Transfer and Innovation:

- Facilitate the transfer of climate-resilient technologies to enhance the community's adaptive capacity.
- Encourage the adoption of innovative solutions such as climate-smart agriculture practices, renewable energy options, and sustainable water management techniques.

Ecosystem Conservation and Sustainable Land Use:

- Promote sustainable land-use practices and conservation of local ecosystems to enhance the community's resilience.
- Implement reforestation programs and biodiversity conservation initiatives to protect natural resources.

Climate Information and Early Warning Systems:

- Improve access to timely and accurate climate information for the community.
- Strengthen early warning systems to enable the community to prepare for and respond to climate-related events effectively.

Community-Based Infrastructure Development:

- Invest in climate-resilient infrastructure, including flood-resistant buildings, stormwater drainage systems, and resilient housing, to protect against extreme weather events.

Collaboration and Networking:

- Facilitate collaboration with neighboring communities, NGOs, and governmental agencies to share knowledge, resources, and best practices.
- Establish community networks that can provide mutual support during climate-related challenges.

Policy Advocacy:

- Advocate for supportive policies at the local, regional, and national levels that recognize and integrate community-led climate adaptation efforts.
- Engage with policymakers to ensure that community perspectives are considered in broader climate action plans.

Crisis Response and Preparedness:

- Develop and regularly update community-based emergency response plans to ensure swift and effective action during climate-related crises.
- Conduct drills and training sessions to enhance the community's preparedness for various climate-related scenarios.

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Consider the unique needs, circumstances, and difficulties mentioned in the Whykong Union case study when tailoring these suggestions. A more resilient and adaptable community will be developed through the application of a holistic strategy that considers social, economic, and environmental factors.

Limitation:

Identifying and acknowledging the limitations of community-led climate adaptation is crucial for understanding the challenges faced by the Whykong union in Teknaf upazila, Cox's Bazar district. Here are some potential limitations that might have been observed in the case study:

- Access to Participants: Political disruptions may lead to restricted access to study participants, making it difficult to collect data and limiting the comprehensiveness of the study.
- Safety Concerns: The safety of researchers and participants may be compromised in politically unstable environments, impacting the ability to conduct fieldwork or interviews.
- Limited Generalizability: Findings from a single case study may not be broadly applicable to other regions or communities due to unique contextual factors.
- Small Sample Size: The study is based on a small sample size within study location, the generalizability of the findings may be constrained.
- Temporal Constraints: The study might be limited to a specific time frame, potentially overlooking longer-term trends or variations in climate patterns.
- Data Quality and Availability: There are limitations in the quality or availability of historical climate and community data, it could impact the robustness of the analysis.
- Social and Cultural Dynamics: The study may not capture the full spectrum of social and cultural dynamics within the community, leading to a potentially oversimplified understanding of community-led climate adaptation.
- Selection Bias: The study area was chosen as the case study without accounting for the diversity of challenges in other parts of Teknaf upazila, selection bias may be present.
- Short-Term Focus: The study primarily focuses on short-term outcomes; it may not capture the long-term effectiveness and sustainability of community-led adaptation measures.

REFERENCES

1. Abdulla F.A., Eshtawi T., Assaf H. 2009. Assessment of the impact of potential climate change on the water balance of semi-arid watershed. Water Resources Management. Vol. 23. Iss. 10 p. 2051–2068. DOI: 10.1007/ s11269-008-9369-y.
2. Adger, NW, Huq, S, Brown, K, Conway, D & M Hulme 2003, ‘Adaptation to climate change in the developing world’, Progress in Development Studies, vol. 3, no. 3, pp. 179-195.
3. Ansari, M. S., & Roy, K. (2010). Community perception on potentiality of pond sand filter technology in the Southwest coast of Bangladesh. Bangladesh J, 19, 57–62.
4. Dodman, D.; Mitlin, D. Challenges for Community-Based Adaptation: Discovering the Potential for Transformation. J. Int. Develop. 2013, 25, 640–659.
5. Ensor, J. Emerging Lessons for Community-based Adaptation. In Community-based Adaptation to Climate Change: Emerging Lessons; Ensor, J., Berger, R., Huq, S., Eds.; Practical Action Publishing: Rugby, UK, 2014.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XI Issue IV April 2024

6. Forsyth, T. Community-based Adaptation: A Review of Past and Future Challenges. Wiley Interdiscip. Rev. Clim. Change 2013, 45, 439–446.
7. Hoque, M. R. (2009). Access to Safe Drinking Water in Rural Bangladesh: Water Governance by DPHE. Dhaka, Bangladesh: BRAC University.
8. Huq, S.; Reid, H. Mainstreaming Adaptation in Development. Inst. Develop. Stud. Bull. 2004, 35, 15–21.
9. IPCC 2001, Climate Change 2001: Impacts, Adaptation and Vulnerability. In: Synthesis Report: IPCC Third Assessment Report - Climate Change 2001.
10. Islam, M.M., Adrin, S., Redwan, A.M. and Rahman, M.M., 2015. Impact of Climate Change on Reliability of Rainwater Harvesting System: A case Study in Mongla, Bangladesh. Journal of Modern Science and Technology, 3(1): 220 – 230.
11. Islam, M., Sakakibara, H., Karim, M.R., Sakine, M., and Mahmud, Z.H., 2011.Bacterial assessment of alternative water supply options in Coastal Areas of Bangladesh. Journal of Water and Health, 9(2):415-428.
12. Magee, T. A Field Guide to Community Based Adaptation; Earthscan-Routledge: New York, NY, USA, 2013.
13. Mirdad MA and Palit SK (2017). Investigation of ground water table in the South-East (Chittagong) part of Bangladesh. Chittagong: American Journal of Civil Engineering, 1: 06-07.
14. Morgan, E.A. The Challenges and Opportunities for Higher Education Institutions at the Science—Policy Interface. In Climate Change Research at Universities—Addressing the Mitigation and Adaptation Challenges; Leal Filho, W., Ed.; Springer: Cham, Switzerland, 2017.
15. O'Brien, G, O'Keefe, P, Rose, J & B Wisner 2006, 'Climate change and disaster management', Disasters, vol. 30, no.1.
16. Rainwater harvesting for recharging shallow groundwater in Patan, Nepal.www.nepal.wateraid.org.
17. Reid, H.; Canon, T.; Berger, R.; Alam, M.; Milligan, A. Community-based Adaptation to Climate Change: An Overview. In Community-based Adaptation to Climate Change; Participatory Learning and Action (PLA) Series, 60; International Institute for Environment and Development (IIED); Russell Press: Nottingham, UK, 2009.
18. Uitto, J.I.; Puri, J.; van den Berg, R.D. Introduction. In Evaluating Climate Change Action for Sustainable Development; Springer: Cham, Switzerland, 2017.
19. United Nation Development Program (UNDP). A study: Groundwater levels fall drastically around Rohingya camps: Dhaka, Bangladesh 2019.
20. Verner, D. Adaptation to a Changing Climate in the Arab Countries: A Case for Adaptation Governance and Leadership in Building Climate Resilience; MENA Development Report; World Bank: Washington, DC, USA, 2012.
21. World Bank (2019). Weather data of Bangladesh.

APPENDIX

A. Questionnaire

Salutation! My name (interviewer's) is …… I am a Student of Jagannath University, Dhaka, for my study purpose I want to know the climate impact and your livelihood condition of your community through some question and discussion. I can assure you that your answer will be kept confidential.

Do I have your consent to start?

Yes

No

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Section- 01: Demography information

1. Please proceed with the survey only if the household gives its consent to do so.

   Yes

   No

2. Name of Upazila:

   Text

3. Name of Union?

   Text

4. Ward no?

   Number

5. Name of respondent?

   Text

6. NID/BRC

   Number

7. Mobile number

   Number

8. Sex of the household head

   Male

   Female

9. Age of the household head

   Male

   Female

10. Total family household member?

11. Number of male household members

    Numeric

12. Number of female household members

    Numeric

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13. Number of children in the household

    Numeric

14. What is your gender?

    a) Male

    b) Female

    c) Prefer not to say

    d) Non-binary

    e) Other

15. What is your marital status?

    a) Single

    b) Married

    c) Divorced

    d) Separated

    e) Widowed

16. What is your highest level of education?

    a) No education

    b) Primary education

    c) Secondary education

    d) Vocational training

    e) University education

17. What is your religious affiliation?

    a) Muslim

    b) Christian

    c) Hindu

    d) Buddhist

    e) Other

Section 02: Livelihood

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18. What is your primary source of income?

a) Full-time employment

b) Part-time employment

c) Self-employment

d) Agriculture

e) Other

19. What is your current occupation?

a) Farmer

b) Businessman

c) Day labour

d) Teacher

e) NGO worker

f) Unemployed

g) Housewife

h) Other

20. What is your annual household income?

a) Less than BDT 5,000

b) BDT 5,000 - BDT 15,000

c) BDT 15,000 - BDT 25,000

d) More than 25,000

21. How satisfied are you with your current income?

a) Very satisfied

b) Somewhat satisfied

c) Neutral

d) Somewhat dissatisfied

e) Very dissatisfied

22. What barriers do you think exist for people who want to start their own businesses or pursue self-employment?

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a) Lack of funding

b) Lack of education or training

c) Lack of access to markets or customers

d) Government regulations or bureaucracy

e) Other

23. How important do you think it is for governments to support small businesses and entrepreneurship?

a) Very important

b) Somewhat important

c) Not very important

d) Not at all important

24. Have you or anyone you know ever received support or training from a government or non-governmental organization to improve your livelihood?

a) Yes

b) No

25. How important do you think it is for individuals to have access to affordable healthcare as a means of improving their livelihoods?

a) Very important

b) Somewhat important

c) Not very important

d) Not at all important

26. What suggestions do you have for improving livelihood opportunities in your community?

a) More job training programs

b) More support for small businesses and entrepreneurship

c) More access to funding for education and training

d) More access to affordable healthcare

e) Other

27. What do you think are the biggest challenges faced by your community?

a. Water scarcity

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b. Lack of education

c. Unemployment

d. Poverty

e. Health issues

f. Lack of infrastructure

28. What kind of support would you like to receive from the government or NGOs?

a. Educational support

b. Employment opportunities

c. Health care support

d. Infrastructure development

e. Other

29. What are your suggestions for improving the living standards of the community?

a. Education and skill development

b. Job creation and entrepreneurship

c. Improved health care facilities

d. Infrastructure development

e. Other

Section -03: Disaster and climate impact in Community

30. Do you know or any idea about climate change (climate and weather)?

a. Yes

b. No

31. How can you/your community affect by the climate change?

32. What type of challenges you are faced due to the climate change?

a. Rising Temperatures

b. Extreme Weather Events

c. Sea-Level Rise

d. Ocean Acidification

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e. Altered Precipitation Patterns

f. Disruption of Ecosystems

g. Health Impacts

h. Food Security

i. Water Scarcity

j. Economic Impacts

k. Migration and Displacement

l. Others

33. How can reduce/way forward the challenges by you and the community?

a. Need climate education and awareness.

b. Individual and Community led action.

c. Govt. initiatives

d. Local administration initiatives

e. CBOs/NGOs/INGOs activities

f. International initiatives

g. Others

34. Have you or your community ever experienced a disaster and climate?

a. Yes

b. No

35. What type of disasters have you or your community experienced?

a. Natural disasters (e.g., flood, earthquake, land slide etc.)

b. Man-made disasters (e.g., fire, explosion, terrorism, etc.)

c. Other

36. How prepared do you feel your community is for a disaster?

a. Very prepared

b. Somewhat prepared

c. Not very prepared

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d. Not at all prepared

37. What steps has your community taken to prepare for a disaster?

a. Emergency response plans

b. Evacuation plans

c. Disaster drills

d. Stocking emergency supplies

e. Other

38. How confident are you in your ability to respond to a disaster?

a. Very confident

b. Somewhat confident

c. Not very confident

d. Not at all confident

39. What resources do you think are essential in responding to a disaster?

a. Food and water

b. Medical supplies

c. Communication equipment

d. Shelter

e. Other

40. Have you or anyone you know ever received training in disaster response and preparedness?

a. Yes

b. No

41. What suggestions do you have for improving your community's disaster preparedness and response?

a. More public awareness campaigns

b. More training for emergency responders

c. More emergency supplies and equipment

d. More efficient communication systems

e. Other

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42. How important do you think it is for your community to be prepared for a disaster?
    a. Very important
    b. Somewhat important
    c. Not very important
    d. Not at all important

Section- 04: Water, sanitation, and hygiene

43. How often do you have access to clean water?
    a. Always
    b. Sometimes
    c. Rarely
    d. Never
44. How often do you have access to basic sanitation facilities (e.g. toilets)?
    a. Always
    b. Sometimes
    c. Rarely
    d. Never
45. Have you or anyone in your community ever experienced a waterborne disease (e.g. diarrhea, cholera)?
    a. Yes
    b. No
46. How do you obtain your drinking water?
    a. Tap water.
    b. SPF
    c. tube well water
    d. pond
    e. Other
47. Do you treat your drinking water before consumption?
    a. Yes

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b. No

48. What methods do you use to treat your drinking water?

    a. Boiling

    b. Chlorination

    c. Filtration

    d. Other

49. Have you ever received information or education on proper hand washing techniques?

    a. Yes

    b. No

50. Have you or your community ever received support from organizations or government agencies to improve WASH conditions?

    a. Yes

    b. No

51. What suggestions do you have for improving WASH conditions in your community?

    a. More public awareness campaigns

    b. More access to clean water sources

    c. More access to basic sanitation facilities

    d. More education on proper hygiene practices

    e. Other

Section- 05: climate and Eco-System

52. What do you think is the most important function of natural ecosystems?

    a. Providing habitats for wildlife

    b. Purifying air and water

    c. Regulating the climate

    d. Providing food and other resources for human use

    e. Other

53. How concerned are you about the loss of biodiversity in natural ecosystems?

    a. Very concerned

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b. Somewhat concerned.

c. Not very concerned

d. Not at all concerned.

54. What human activities do you think have the greatest negative impact on natural ecosystems?

a. Deforestation

b. Pollution

c. Overfishing

d. Climate change

e. Other

55. How important do you think it is for individuals/ community to take action to protect natural ecosystems?

a. Very important

b. Somewhat important

c. Not very important

d. Not at all important

56. Have you ever received education or information about the importance of natural ecosystems?

a. Yes

b. No

57. How important do you think it is for governments to take action to protect natural ecosystems?

a. Very important

b. Somewhat important

c. Not very important

d. Not at all important

58. What suggestions do you have for protecting natural ecosystems?

a. More public awareness campaigns

b. More conservation efforts by governments and organizations

c. More education on the importance of natural ecosystems

d. More sustainable practices by individuals and businesses

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e. Other

59. How important do you think it is to preserve natural ecosystems for future generations?

    a. Very important

    b. Somewhat important

    c. Not very important

    d. Not at all important

60. Any weather changes observed (the changes on highest temperature, the heaviest rainfall over the past 10-30 years)?

61. Any climate changes over the past 10-30 years? (e.g. destructive cyclone occur more often even it's not in the monsoon season, etc.)

62. What are the common natural disasters faced by the community? (Landslide, flooding, drought, heat wave, etc.)

63. What types of Community Led climate change initiatives have taken in this community?

63. Thank you for your kind support