


## Article

# Local Officials' Perceptions of Climate Victim Management Challenges on Bangladesh's Southeast Coast

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**Abstract:** In Bangladesh, extreme weather events displace about one million people each year. The national government resettles these climate victims by allocating houses in so-called cluster villages. This paper examines how local disaster management officials manage the resettlement of climate victims in Bangladesh's coastal areas. For this paper, we conducted a preliminary field work, questionnaire survey, and informal phone interviews. The questionnaire survey was conducted from March to July 2020 among 70 central government civil servants who worked as disaster management officials and played a pivotal role in local decision making for climate victim resettlement. This paper first examines how national disaster response policies were implemented in local areas before, during, and after disasters. Our questionnaire survey results show five management challenges local officials faced in managing displaced people: (1) local officials' limited onsite experience, (2) varied impacts of natural disasters on islands and the mainland, (3) arbitrary engagement in disaster response actions, (4) lack of evacuation drills, and (5) weak coordination skills among relevant stakeholders. In particular, these challenges were acute among island officials. Our multiple regression analyses show that the respondents' age and onsite work experience ( $p < 0.05$ ) significantly affected their perceptions. Overall, these findings suggest a need to drastically improve local disaster governance capacity. This study offers insights into how countries with similar challenges may respond to climate-induced displacement in the future.

**Keywords:** displacement; climate victim; disaster management officials; cluster village; southeast coast; Bangladesh



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## 1. Introduction

Climate-induced population displacement is one of the biggest humanitarian challenges of the 21st century [1]; as such, it has received much attention from policymakers and scholars in recent years [2]. The displacement task force of the United Nations Framework Convention on Climate Change (UNFCCC) emphasized the importance of understanding the ramification of displacement due to slow-onset disasters and climate change [3]. The Intergovernmental Panel on Climate Change (IPCC) projected with high confidence in its 2021 report that displacement drivers, such as coastal floods and cyclones, are likely to increase in South Asia [4].

Past studies on climate-induced risk management suggest that effective disaster response strategies require understanding about the interplay between disaster impacts and localized disaster response challenges [5,6]. Some scholars similarly examined localized social vulnerability (e.g., informal sector) and response capacity limitation (e.g., poverty, equity) as important factors to develop effective disaster responses in developing countries [7–9].

Past studies on disaster responses examined risk perceptions of local government officials to understand local institutional capacity [10–12]. Local actors' awareness of disaster responses and displacement challenges play a critical role in preparing for evacuation

and making evacuation decisions for those in vulnerable areas [13]. In particular, local government officials who are dispatched to remote areas in delta and small island regions, significantly impact the way climate victims are resettled and rehabilitated [13–15].

Past case studies on local disaster governance showed that the success and failure of climate victim resettlement depended on how local officials and resettled communities responded by understanding local needs. In Sri Lanka [16], resettlement with shelter/housing enhanced resettled communities' ability to deal with climatic and socioeconomic challenges. In Zimbabwe [17], flood-displaced victims at Tokwe-Mukosi experienced income and livelihood loss at resettlement villages without much prospect for improvement. State-led resettlement schemes in Ghana's Keta area of the Volta Basin failed as the policy did not sufficiently consider cultural and family ties [18]. In southwestern Bangladesh [19,20], resettlement forced victims to change their livelihoods and made it difficult for them to readjust to the new environment. In the southeastern coast of Bangladesh [21], social stigmatization was observed among resettled households. Some studies suggest that designs of cluster houses lacked minimum living standards [22].

Bangladesh is known as a highly vulnerable country to climate change, as much of the country is located within a low-lying river delta of the Ganges–Brahmaputra–Meghna river system. From 2008 to 2019, for example, cyclones and floods displaced approximately 4.3 million people [23]. Article 15 of the Constitution mandates responsible government organizations to ensure social security, including shelter access, for every citizen [24]. Thus, governments in Bangladesh have responded to these displacement problems by placing the victims at so-called cluster villages built on the public land called *khaslands* in Bengali. In 1997, the national government adopted the *khasland* settlement and management policy that allocated cluster village houses among displaced households [25]. A cluster village can accommodate 25 to 100 households. Typically these clustered housing units are made of bricks in coastal areas. In South Asia, dwellings made of bricks, stone, cement or other types of solid structure are commonly known as *pucca* houses [26].

After resettling these victims, the Bangladesh government provided social protection schemes, including cash transfers for children's education, financial support for widows and the aged, and food supplies [27]. The government also provided skill development training, such as handicraft making, livestock rearing skill, and gardening [26]. All these actions were enhanced under its 2009 climate change strategy and action plan that established a legal framework for financial resource mobilization from the national budget and donors [27]. It also funded poverty reduction and disaster management activities [28]. Within a local context, Bangladesh created the subdistrict disaster response committee (SDRC) for immediate response to natural disasters [29] and the *khasland* settlement committee (KSC) for resettling the displaced victims in cluster villages [25]. These committees are responsible for climate victim identification, house allocation, skill development training, and emergency relief for displaced climate victims [27]. Therefore, their judgment ability plays a crucial role in responding to local challenges.

Despite an increasing number of studies on climate victims and their resettlements, we still do not know how local officials implemented displacement policies and what challenges they faced in doing so. Understanding local capacity and challenges among local officials is critical to deal more effectively with natural disasters. Therefore, this paper seeks to understand (1) the capacity of local disaster management officials to respond to climate-induced displacement, (2) how they perceive challenges that climate victim management poses, (3) how they perceive disaster recovery measures for climate victims, and (4) what socio-demographic factors affect their perceptions. Policymakers and NGO workers who support disaster capacity building in Bangladesh and other disaster-prone deltas can have insights into identifying and resolving local climate victim management challenges from the findings of this paper. In the following discussion, we first explain the methodology we used in this study, followed by our investigation results and discussion, and conclusion.

## 2. Materials and Methods

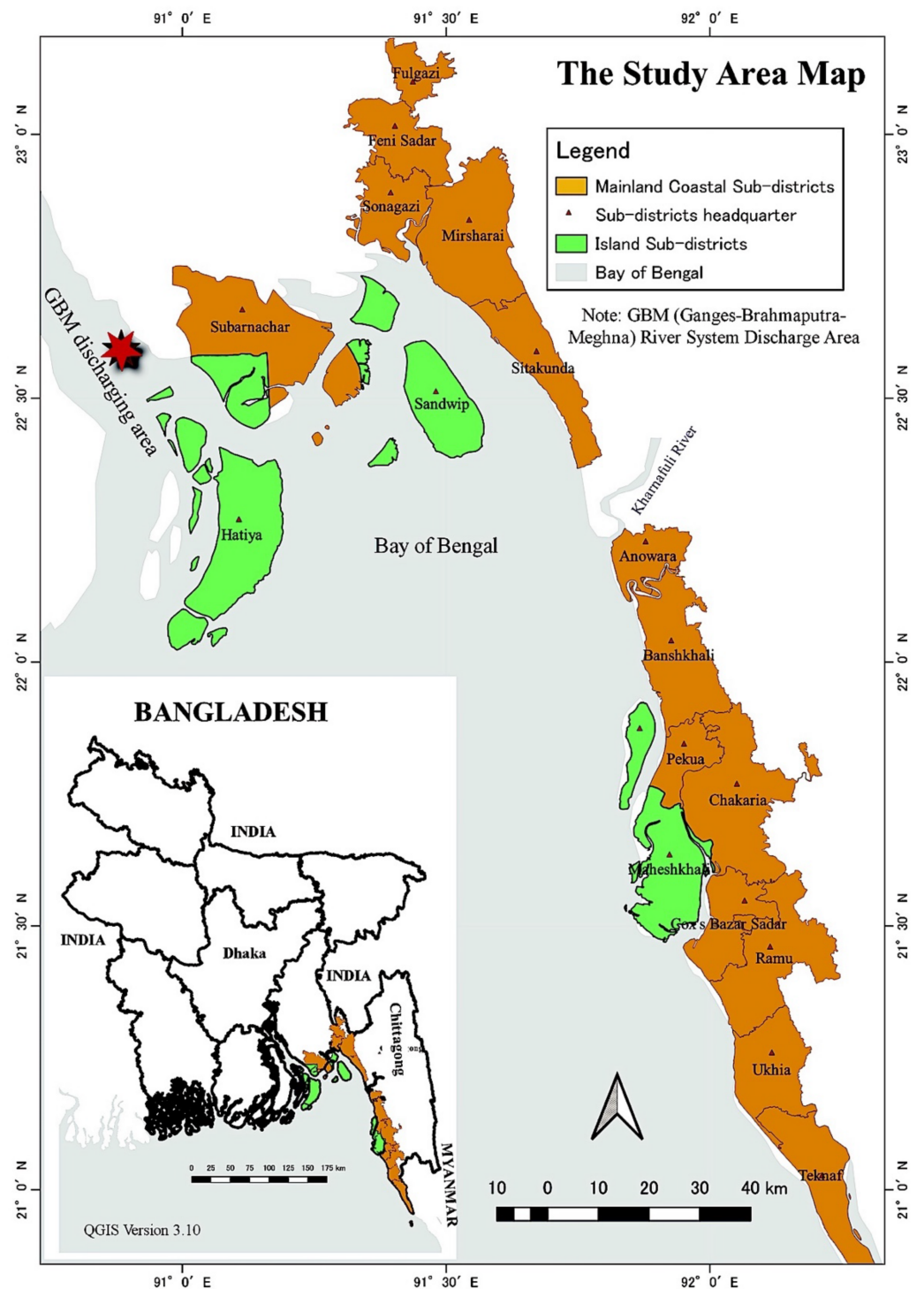
### 2.1. Study Area

For the study area, we selected Bangladesh's southeast coast, which is managed by 18 coastal subdistrict administrative units (Figure 1), as they are highly prone to climate-induced displacement. These subdistricts have experienced about 7.8 mm of mean sea-level rise per year, the highest in Bangladesh [30]. Among these 18 subdistricts, 14 subdistricts are located on the mainland with a total area of 4975 km<sup>2</sup> and about 3.7 million people [31]. The other four subdistricts are islands with a total area of 2849 km<sup>2</sup> and about one million people [31]. The literacy rate in the coastal mainland subdistricts is about 40%, and in the islands, 34% [31]. Tropical cyclones severely affected both island and coastal mainland people, but island people are more remotely located with difficulties of having access to essential post-disaster services from major cities. Additionally, the islands in the study area are more vulnerable to climate change impacts and its associated socioeconomic challenges than the coastal mainland [32]. These islands are particularly prone to sedimentation, land accretion, and land erosion. The coastal mainland areas are also prone to floods and erosion [32]. Local officials who were assigned to island subdistricts tend not to reside on these islands throughout the year, due largely to inconveniences and family reasons. Due to a limited amount of budget at their disposal, what they can do to mitigate local post-disaster responses are limited to short-term job creation, farming and job training.

Each subdistrict has a disaster response committee that is mandated to offer disaster management services, including disaster preparedness training, rescue, and emergency relief activities for disaster-affected people [29]. It also has a *khasland* settlement committee that is responsible for climate victim resettlement actions, including victim identification, resettlement site selection, and rehabilitation need assessment [25]. Both committees consist of government department heads as chairs. Altogether there are 126 central government officials in the study area, representing ministries for public administration, land, police, disaster management, health, agriculture, social welfare, and women affairs [26].

The study area has experienced several displacement drivers. Bangladesh disaster-related statistics in 2015 revealed that approximately 34% of the households in the study area were affected by waterlogging. They also experienced floods (32%), cyclones (31%), tidal surge (14%), drought (11%), coastal erosion (7%), salinity (5%), tornado (2%) and landslides (1%) [33]. These climatic events caused landlessness for approximately 56% of the population in the coastal mainland and approximately 60% on the islands in the study area [31]. As some of these challenges occurred simultaneously, the *khasland* settlement committees in the study area often faced challenges in finding suitable areas that are relatively safer from disaster to establish cluster villages [26].

The southeast coast is particularly vulnerable to direct and indirect impacts from tropical cyclones. Records of the Bay of Bengal cyclone landings in the past 200 years show that the Noakhali–Chittagong coastal belt, which is within the study area, received 40% of nation's devastating cyclone landfalls, and the Chittagong–Cox's Bazar area received 27% of the landfalls [34]. The Bangladesh Meteorological Department reported landfall of 25 severe cyclones out of 33 from 1960 to 2017 at these 18 subdistricts [35]. Among them, the deadliest 1991 cyclone killed 144,000 people in Chattogram (formerly known as Chittagong) and Cox's Bazar districts [36]. After this cyclone, the national government adopted a comprehensive disaster management approach for cyclone victims in the study area. Later this policy was extended to the rest of the country [26]. In 1997, it launched a climate victim resettlement scheme called the *Ashrayan* project in Cox's Bazar [26].



**Figure 1.** Location map of the study area. Orange areas indicate coastal mainland subdistricts, and green areas indicate island subdistricts.

**2.2. Data Collection and Analysis**

In collecting data for this paper, we conducted phone interviews and a structured questionnaire survey from March to July 2020 in English among 70 disaster management officials in 18 above mentioned subdistricts (in total 126 officials worked in the study area at the time of our survey). These executives were central government civil servants, and they were empowered to make decisions regarding climate victim resettlement and disaster management, implying their eligibility to answer the questionnaire for this study.



A subdistrict chief executive officer, known as the Upazila Nirbahi Officer in Bengali, normally acts as the head of both committees. So, we targeted these officials as they should play a crucial role in resettling displaced climate victims.

Before the questionnaire survey, we conducted a number of preliminary field visits and literature review to help design the questionnaire. Our literature review included peer-review journals, research reports, and published government documents. In selecting peer-review journal papers, we used database searches, including JSTOR, Google Scholar and the Tulips search engine of the University of Tsukuba Library system. We used such keywords as climate-induced displacement, displaced victims, resettlement, rehabilitation, coastal area, and Bangladesh. In extracting information from published government documents, we first examined relevant legal/policy frameworks, such as the 1997 *Khasland Settlement and Management Policy*, 2010 National Plan for Disaster Management, and 2019 Standing Orders on Disasters. These documents instructed how local officials deal with disasters. In addition, the first author worked as a cadre officer under the Bangladesh Public Administration for thirteen years and conducted field surveys for many years in the study area. The second author also has several years of experience in discussing with Bangladesh government officials and conducted field surveys in remote areas of Bangladesh. These experiences affected how the survey was designed and questions were customized.

The questionnaire survey was divided into five sections: (1) respondents' socio-demographic information, (2) perceptions of climate change challenges, (3) engagement in disaster preparedness and responses, (4) resilience measures, and (5) gender equity. Each questionnaire had 30 questions. The responses to our questionnaire were coded and analyzed by using Microsoft Excel (version 16.46), and the results are described in tables and graphs in the following discussion. To quantitatively analyze socio-demographic variables, we assigned score 0.5 for less than a year of respondent's working experience, score 1 for one year, score 1.5 for one to two years, and score 2 for two years. For quantifying educational qualification, score 1 was assigned to a bachelor's degree and 2 for graduate degrees. To understand perceptual variation among the respondents in the coastal mainland and island subdistricts, we compared the average rating of each variable on a 5-point Likert scale from 1 (not at all) to 5 (very much). A range of scale intervals was calculated by deducting the lowest scale from the highest one and dividing by the given number of scales. The interpretation was made as "not at all" (scale 1 to 1.8), "disagree" (scale 1.9 to 2.6), "neutral" (scale 2.7 to 3.4), "important" (scale 3.5 to 4.2) and "very much" (scale 4.3 to 5).

A multiple regression analysis was then performed between socio-demographic variables and disaster impacts, management challenges, and disaster recovery measures for cluster villages to identify the factors affecting the respondents' perceptions. Then,  $p$ -value (typically  $< 0.05$ ) was used to determine the statistical significance of the results. The direction and strength of correlation were determined with the coefficients in the regression table. Coefficient 0 to 0.3 was considered 'weak,' 0.3 to 0.7 as 'moderate,' and 0.7 to 1 as a 'strong' relationship between the variables [37].

After the questionnaire survey, we conducted phone interviews partly to follow insights developed by Donahue et al. (2013) [38], who similarly conducted interviews with government officials to reveal the consistency and capacity of their decision making. For our interviews, we contacted 18 chairs of both committees through WhatsApp and Facebook messenger. With regard to those who were not accessible through these media, we contacted them at office by mobile phone from April to August 2020. In this interview, we wanted to know more about their answers to the questionnaire survey. Our questions included (1) the tendency of their short onsite stay in the study area, (2) types of post-disaster support and service they delivered for resettled people, and (3) problems they faced during resettling victims. Each interview ranged from 30 to 40 min. We maintained anonymity of the respondents because of the sensitivity of their opinion.

### 3. Results and Discussion

#### 3.1. Socio-Demographic Characteristics of the Respondents

The first section of the questionnaire attempted to identify respondents' socio-demographic characteristics (Table 1). We found that 70% of the respondents were responsible for the coastal mainland areas. The island and coastal mainland respondents were mostly males (83%) and the mean age value was about 38. No substantial difference was found between island and mainland respondents in terms of gender proportion and age distribution. About 86% belonged to the 30–39 age group. Regarding the highest completed education of the respondents, 70% had a graduate degree, and the rest had a bachelor's degree.

**Table 1.** Socio-demographic characteristics of the respondents.

Socio-Demographic Variables		Coastal Mainland (n = 49)	Islands (n = 21)	Total (n = 70)	Mean
		Frequency	Frequency	Frequency	
Gender	Male	40 (82%)	18 (86%)	58 (83%)	-
	Female	9 (18%)	3 (14%)	12 (17%)	
Age group	0–30	0	0	0	37.8 (Coastal mainland: 37.4, Islands: 38.6)
	31–39	43 (88%)	17 (81%)	60 (86%)	
	40–49	6 (12%)	4 (19%)	10 (14%)	
Education	Postgraduate	34 (69%)	15 (71%)	49 (70%)	-
	Bachelor	15 (31%)	6 (29%)	21 (30%)	
Professional specialization	Administration	14 (29%)	4 (19%)	18 (26%)	-
	Land	14 (29%)	4 (19%)	18 (26%)	
	Agriculture	3 (6%)	4 (19%)	7 (10%)	
	Relief and disaster management	14 (29%)	4 (19%)	18 (26%)	
	Social welfare	0	2 (10%)	2 (3%)	
	Women affairs	4 (8%)	3 (14%)	7 (10%)	
Total service years	0–5 years	15 (31%)	4 (19%)	19 (27%)	7.4 years (Coastal mainland: 7.4, Island: 7.3)
	5–9 years	22 (45%)	13 (62%)	35 (50%)	
	10–15 years	12 (25%)	4 (19%)	16 (23%)	
Onsite experience (Service at current workplace)	0–1 year	17 (35%)	11 (52%)	28 (40%)	1.5 years (Coastal mainland: 1.6, Island: 1.4)
	1–3 years	30 (61%)	8 (38%)	38 (54%)	
	3–5 years	2 (4%)	2 (10%)	4 (6%)	

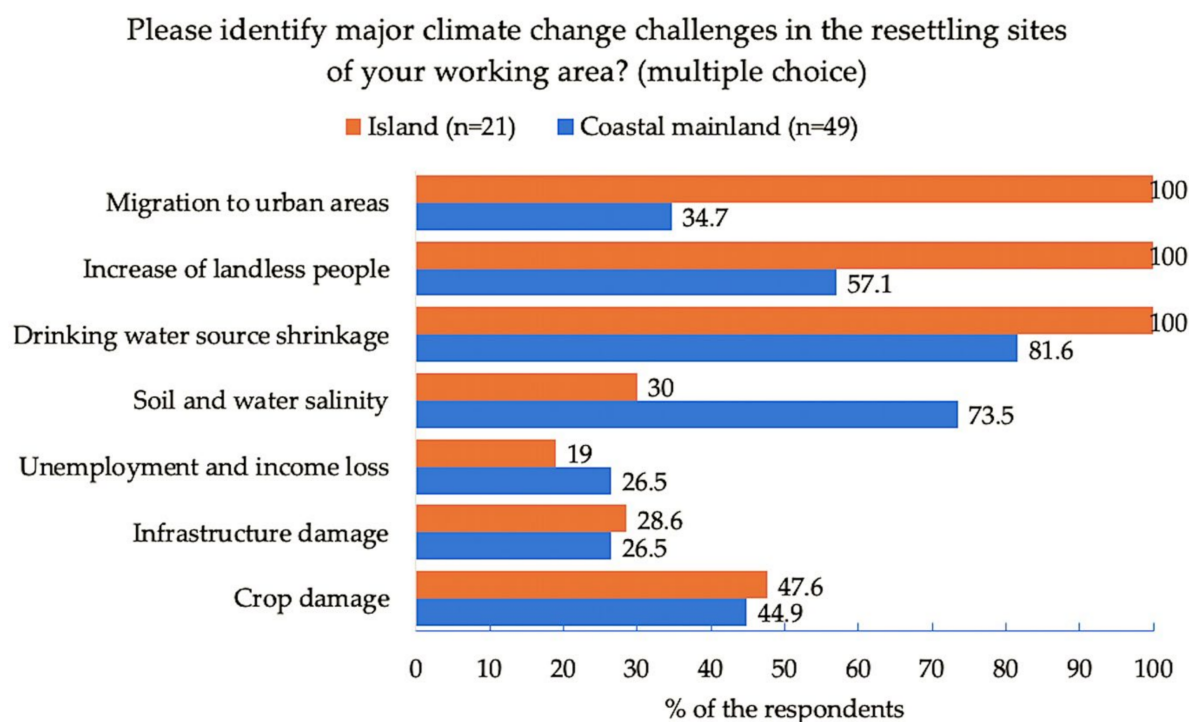
The most notable finding in this section is their onsite work experience in the assigned subdistrict. About 94% had less than three years of experience. In particular, more than 50% of those assigned for island subdistricts had less than one year of experience. On average, those island respondents had 1.4 years of onsite work experience, whereas those in coastal mainland subdistricts had 1.6 years (Table 1). Under Section 6 of the 2015 deployment policy for Bangladesh, civil servants must have at least two years of continuous service in a particular region [39].

In order to better understand this relatively short stay of the respondents, we conducted a phone interview with a 39-year-old island subdistrict head of the subdistrict disaster response committee. He said that these officials tended to be rather transient, as they did not want to stay long on isolated disaster-prone areas away from families. The first author's field experience in the study area also confirms this situation. Family members of these officials remain in Dhaka or other major cities for various reasons, including access to good schools, hospitals, and other social amenities. After being stationed for a few months

on remote islands, they sent requests for a transfer to their controlling departments on the ground of family necessities. Local officials call this practice *tadbir* in Bengali. This practice often creates a disconnect between government officials and local people in terms of disaster responses.

### 3.2. Climate Change Challenges in the Resettling Sites

In the second section of the questionnaire survey, we asked the respondents to identify major climate change challenges at resettling sites in their subdistrict. With multiple choice, the respondents were asked to choose the following options: crop damage, infrastructure damage, unemployment and income loss, soil and water salinity, shrinkage of drinking water sources, increase in landless people, and migration to urban areas. In response, 82% of the respondents identified shrinking drinking water sources as the main challenge in the coastal mainland subdistricts (Figure 2). In connection to this, 74% found soil and water salinity serious in their subdistricts. In fact, an access to safe drinking water in remote areas is an urgent concern in many parts of Bangladesh. The World Economic Forum's *Global Competitiveness* report (2019) identified this issue as one of the most serious challenges for Bangladesh. Other challenges in the coastal mainland subdistrict the respondents identified included increasing landless people (57%), crop damage (45%), urban migration (35%), and unemployment (27%).



**Figure 2.** Major climate-induced disaster challenges in the southeast coast of Bangladesh.

Regarding challenges in island subdistricts, 100% of the island respondents identified three main challenges: an increase in landless people, displaced people's migration to urban areas, and shrinking drinking water sources (Figure 2). These challenges were severe compared to the mainland subdistricts. In fact, salinization of surface and underground water sources is a major concern in the island subdistricts. This situation forces island residents, particularly women, to go a long distance to fetch water [32]. The other challenges on the islands included crop damage (48%), soil and water salinity (30%), infrastructure damage (29%), and unemployment (19%).

In our phone interview with a 38-year-old disaster management committee member in a coastal mainland subdistrict, we learned that when a cyclone landed in his subdistrict, salt water flooded over croplands and devastated rice and vegetable production. This eventually

motivated some of resettled people and locals to migrate into urban areas. De Campos et al. (2020) observed a similar disaster-driven economic insecurity among displacing people in a south-central coastal district, known as Bhola district in Bangladesh [40].

### 3.3. Inconsistent Engagement in Climate-induced Disaster Response Actions

In the third section of our questionnaire, we asked the respondents if they had engaged in disaster preparation (e.g., evacuation drills), disaster responses (e.g., emergency communication) and post-disaster services (e.g., relief distribution) (Table 2). These questions are partly to understand their preparedness for disasters. Evacuation drills and evacuation plans, for example, are essential measures to mitigate or minimize disaster loss and damage. During disasters, government officials are expected to locate survivors by contacting them by phone or finding them in person. After the immediate disaster shock, local officials arrange relief measures and welfare programs for those in resettlement areas. In this process, gender-specific services, such as arranging changing areas and washrooms, can be important for female evacuees to feel safe.

**Table 2.** The respondents' engagement in climatic-induced disaster response actions.

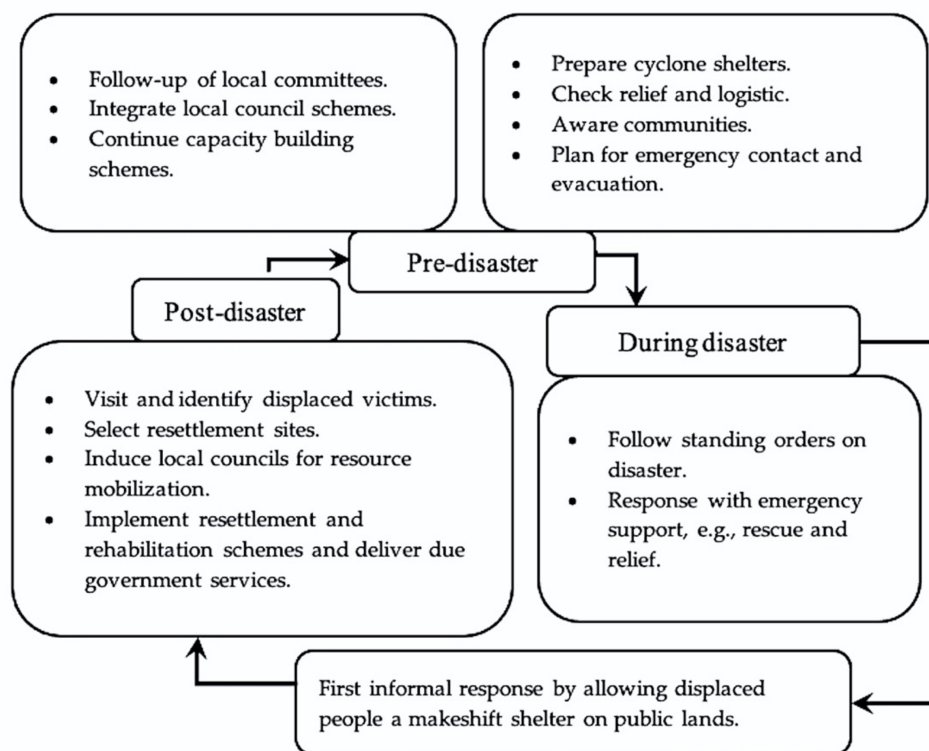
Response Phases	Questions	Response Type	Coastal Mainland (n = 49)	Islands (n = 21)	Total (n = 70)
			Frequency and Percent	Frequency and Percent	Frequency and Percent
Pre-disaster	Have you ever experienced any evacuation drill?	Yes	0	0	0
		No	49 (100%)	21 (100%)	70 (100%)
	Have any evacuation plan for the resettled victims?	Yes	41 (84%)	21 (100%)	62 (89%)
		No	8 (16%)	0	8 (11%)
Do you have emergency contact plan for cluster villages?	Yes	41 (84%)	17 (81%)	58 (83%)	
	No	8 (16%)	4 (19%)	12 (17%)	
During disaster	Have you ever served for a relief program after natural disaster?	Yes	49 (100%)	21 (100%)	70 (100%)
		No	0	0	0
Post-disaster	Do you or your subordinates visit cluster villages?	Yes	45 (92%)	18 (86%)	63 (90%)
		No	4 (8%)	3 (14%)	7 (10%)
	Do you maintain gender-specific data of resettled people for service delivery?	Yes	42 (86%)	15 (71%)	57 (81%)
		No	7 (14%)	6 (29%)	13 (19%)
	Do women of cluster villages visit your office for any service?	Yes	43 (88%)	18 (86%)	61 (87%)
		No	6 (12%)	3 (14%)	9 (13%)
Do you have any particular target group of women, e.g., <i>mohila samiti</i> in cluster villages?	Yes	28 (57%)	17 (81%)	45 (64%)	
	No	21 (43%)	4 (19%)	25 (36%)	

We first asked the respondents if they had disaster evacuation plans and had participated in disaster drills. The results show that about 84% of the respondents in the mainland and 100% on islands had disaster evacuation plans, but none of them had ever experienced disaster evacuation drills in general. We then asked if they had emergency contact information. More than 80% in both mainland and island subdistricts did so.

Regarding post-disaster actions, we asked the respondents if they had relief programs. All respondents had provided a relief program to victims. We then asked them if they had visited cluster villages. Except a small number of them (10%), they had done so. In connection to this action, we asked if they had gender specific data of resettled people for accommodating female needs at resettlement sites. Here, more mainland officials did so (86%) than those on islands (71%). This does not mean that island officials were less concerned about women's needs for post-disaster responses. We found that about 81% of the island respondents had organized microcredit activities for women in cluster villages

(known as *mohila samiti* in Bengali), whereas 57% of the mainland respondents had done so (Table 2).

Given limited field experience, we asked 18 heads of both the subdistrict disaster response and *khasland* settlement committees about their post-disaster rehabilitation actions at cluster villages. In principle, in accordance with subsection D-6 of Section 4.1.4 of the standing orders on disaster, local committees should resettle and rehabilitate displaced people should they fail to return to their pre-displacement residence [29]. We found that these officials were not directly involved in resettling victims. A 39-year-old interviewee said that his people focused on improving rural road connectivity, community-level disaster preparedness training, and income generation for resettled people. He and his local disaster management officials mobilized volunteers to help prepare for cyclone shelters and logistics that were required to issue early disaster warnings (Figure 3). Another 37-year-old interviewee in an island subdistrict said that in responding to the immediate aftermath of cyclone landing, he and his officials made the decision only to give those displaced people temporary shelter on public lands (Figure 3).

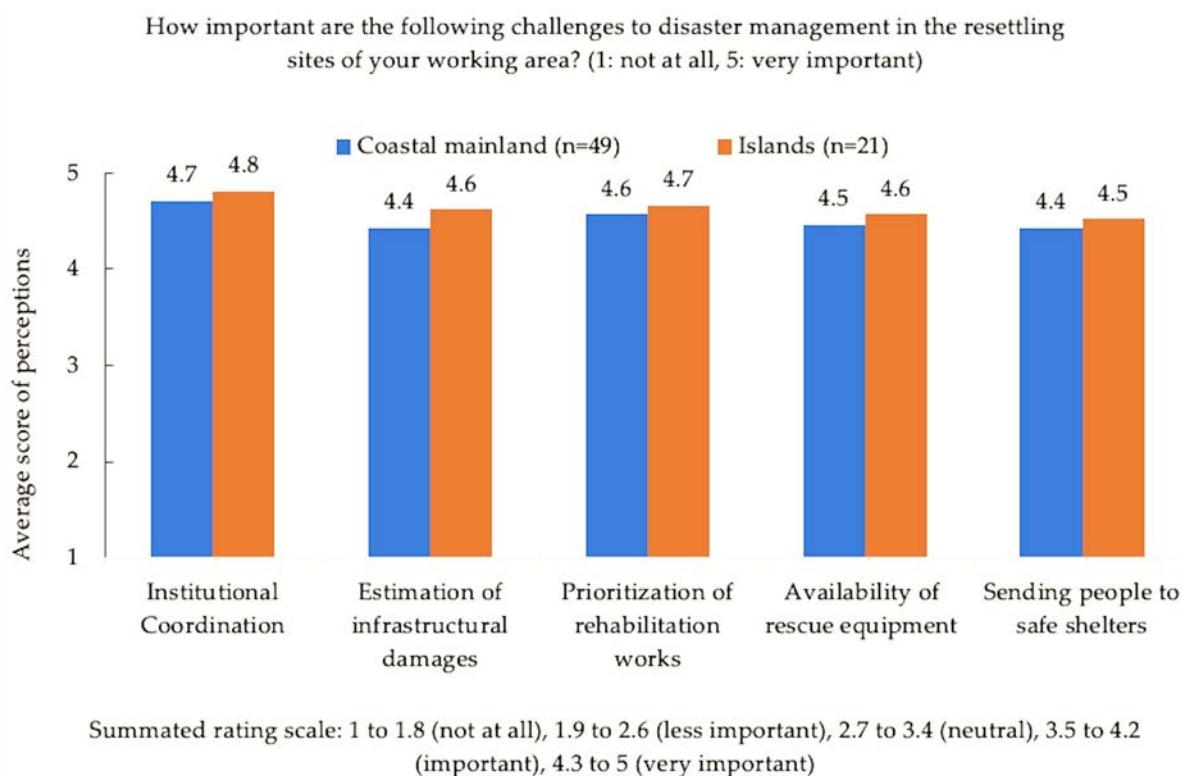


**Figure 3.** Local officials' response flow for handling climate-induced displaced victims.

One common concern among these officials in taking direct responsibility for resettling victims on a more permanent basis was related to Bangladesh's common administrative structure. Our subdistrict chairs felt that they had to obtain instruction and permission from district committees and relevant national administrations before engaging in resettlement actions. For example, 2019 *Ashrayan 2* project implementation guidelines require subdistrict committees to obtain approval from district committees before implementing resettlement schemes [26]. These subdistrict officials are not well-informed about how much budget allocation is expected at their disposal in responding to disasters. A 37-year-old island subdistrict land official said that his *khasland* settlement committee was instructed to send climate victims resettlement proposals to the district committee. It was the instruction from land and disaster management ministries. Another *khasland* settlement committee chair told us that local committees were expected to obtain a budget approval from central government ministries before initiating resettlement actions. This process would normally take about three to six months or even more.



Back to the questionnaire result discussion, in connection to these implementation barriers, we asked the respondents to identify major post-disaster management challenges. On a five-point Likert-scale, the respondents were asked to rate the importance of the following disaster management challenges: institutional coordination, infrastructural damage estimation, prioritizing rehabilitation works, distributing rescue equipment and evacuating people to safe shelters (Figure 4). We calculated an average score from respondents' rating in five-point Likert-scale questions. The respondents found all challenges important (average rating > 3.5), but identified institutional coordination and rehabilitation prioritization particularly important. This result points to our earlier discussion that local officials felt obligated to consult relevant ministries for instruction before taking any decisions about post-disaster relief activities.



**Figure 4.** Perception on climatic disaster management challenges.

In our phone interview, a 38-year-old mainland interviewee pointed out about the complicated nature of coordinating among aid organizations and government relief measures. He noticed that several NGOs came to disaster affected areas with similar mandates such as food distribution and microcredit support. This overlapping aid effort turned out to have benefited some households much more than others especially in remote locations. Another 37-year-old mainland interviewee said that disaster damage estimations sub-district committees submitted to central government ministries were arbitrary due to a lack of expertise. A more accurate damage report often takes for a long time. Haque and Uddin (2013) and Begum and Momen (2019) similarly reported that when cyclone *Sidr* devastated Bangladesh's southwestern coast in 2007, several national and international organizations arrived but many victims could not receive aid due to poor institutional coordination and rehabilitation prioritization [41,42].

### 3.4. Recovery Measures from the Disaster Impacts

Another set of questions asked the respondents to identify long-term recovery options from climate-induced damages. On a five-point Likert-scale, the respondents were asked to rate the importance of the following options: to increase credit coverage, reduce the

credit interest rate, increase social safety net, provide incentives to small businesses, aid agricultural production, expand institutional capacity, and provide life and asset insurance services (Figure 5). The respondents found social safety net (92%) and institutional capacity (90%) very important. Concerning the importance of increasing the social safety net, more mainland respondents (92%) found it very important than those island respondents (86%). A similar gap between island and mainland officials was observed in their responses to institutional capacity, in which about 90% and 86% of the mainland and island respondents found it important, respectively. In our interview, a 38-year-old island respondent said that officials could not efficiently monitor social safety in remote cluster villages due to insufficient skilled staff and logistics.

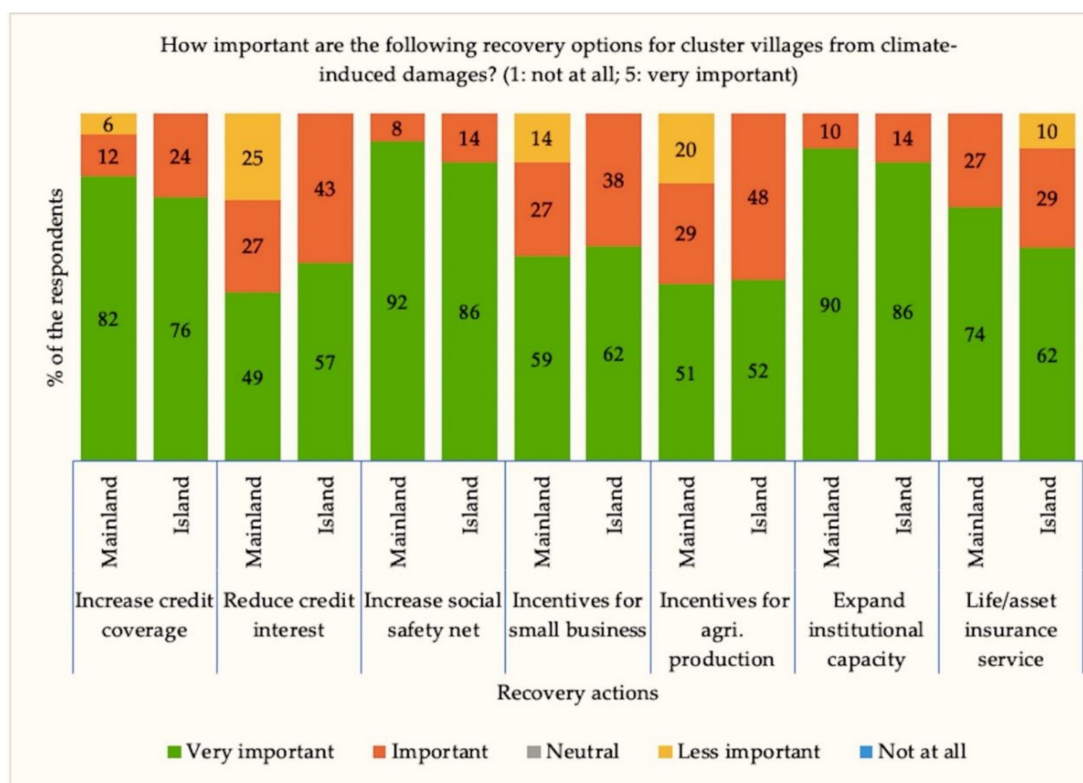


Figure 5. Perceptions about recovery measures from climate-induced damages in cluster villages.

Other than these two options, almost all of the respondents identified increasing credit coverage either important or very important. This means that increasing credit coverage in cluster villages is considered a very viable recovery option. Here, it is also notable that 25% of the mainland respondents found reducing credit interest rate is less important, and about a half of the respondents in both mainland and island subdistricts did not find this option very important. Regarding this point, we had a phone interview with a 38-year-old respondent. He pointed out that public and private banks required collateral, and NGOs charged 10% to 20% interest rates for credit support which many resettled people could not afford.

Regarding a life insurance option, 74% of the mainland respondents and 62% of the island respondents rated it as very important, while 10% on islands found it less important. In our interview, a 37-year-old head of a subdistrict disaster response committee said that insurance services for assets were not available in cluster villages, but it could sustain some community interventions susceptible to floods and cyclones. The disaster response committee head also mentioned that unawareness of asset insurance facilities and high premiums often keep resettled people out of this service on the island. This result shows that island officials with relatively less field experience tend not to see the importance of insurance options for disaster recovery.

### 3.5. Socio-Demographic Factors Affecting the Respondents' Perceptions

After having these results, we conducted multiple regression analyses to see if there are any significant correlations between socio-demographic variables and what the respondents perceived about disaster impacts, management challenges, and disaster damage recovery options. We found that the respondents' age ( $p < 0.05$ ) significantly influenced their perception variables (Table 3). Age positively affected the perceptions of disaster impacts on climate victims, suggesting that the older respondents tended to be more conscious of perceiving disaster impacts in their subdistricts than the younger ones did. This tendency can be explained as an impact of the respondents' personal experience of extreme weather events on their risk judgment ability with aging as Linden (2015) [10] suggested in a similar study. However, the respondents' age was negatively associated with their perceptions of management challenges and disaster damage recovery options. This tendency also can be explained by the respondents' predominantly younger age.

**Table 3.** Factors affecting the perception of the respondents.

Socio-Demographic Variables	The Respondents' Perceptions					
	Climate-induced Disaster Impacts on Cluster Villages		Management Challenges in Cluster Villages		Disaster Damage Recovery Options in Cluster Villages	
	Coeff.	<i>p</i>	Coeff.	<i>p</i>	Coeff.	<i>p</i>
Gender	0.085	0.675	0.016	0.933	−0.103	0.479
Age	0.069	0.033 *	−0.063	0.038 *	−0.048	0.040 *
Education	−0.087	0.641	−0.062	0.725	0.060	0.655
Total service years	−0.057	0.253	−0.029	0.538	−0.023	0.524
Onsite experience (Service at current workplace)	0.020	0.834	0.193	0.034 *	0.069	0.315

\* Significant at  $p < 0.05$  with 95% confidence level.

Somewhat connected to age, we also found that the respondents' onsite experience significantly influenced their perception of management challenges. The  $p$ -value of the variable "onsite experience" was 0.034 ( $p < 0.05$ ), which suggests its statistical significance, and the relationship was positive but weak (coefficient was 0.020). The significance and positive association suggested that the respondents with more onsite experience were more conscious of local disaster management challenges than those with less onsite experience (Table 3). Linden (2017) and Shi et al. (2015) found that officials' onsite experience in the proximity to climate hazards positively affects their understanding of local disaster management challenges [43,44]. This point can provide an insight into our earlier discussion that the respondents had an average onsite experience of 1.5 years, and 40% had experienced less than one year, which affected their understanding of local disaster management challenges. This also means that with the absence of systemic personnel training for disaster management, official's limited onsite experience can affect the local capacity for disaster response and risk management to some extent.

## 4. Conclusions

This paper has discussed how local disaster management officials perceived and responded to climate-induced displacement. It has also attempted to understand factors that might have affected their perceptions. In remote and disaster-prone areas, government officials were expected to be sufficiently trained to secure lives of vulnerable people. However, we found that locally stationed government officials chose to stay there for less than two years, thus having limited onsite experience. This was particularly so for those on remote islands. These officials were mandated to obtain instructions and permissions from their ministries before taking measures and obtaining budget. As a result, their disaster

response actions, especially resettlement arrangement, were delayed and limited. None of the respondents had evacuation drill experience in general. Our regression analysis also identified that the older and more experienced respondents had higher awareness of challenges they faced in helping disaster victims. This finding might draw attention from central government policymakers and high-ranking administrative officials to local needs for appropriate local official deployment criteria as well as infrastructure improvement, including facilities for health care and education, and access roads/ports.

Regarding disaster damage recovery measures for climate victims, we found that local officials emphasized the importance of having social safety-net programs in their subdistricts. As they knew that they would not be able to directly contribute to the establishment of cluster villages soon after the onset of disaster events, they rather focused on having less costly resettlement actions, such as job training, microcredit services, part-time work for infrastructure repair/enhancement, and temporary shelter services. At the same time, they knew that they did not have sufficient expertise to conduct accurate loss/damage assessment before proposing responsible ministries for specific support. Gender specific needs were acknowledged by some of the respondents, but whether or not officials' concerns over gender specific needs and other resettlement needs actually met resettled people's needs remains to be studied in the future.

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