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Assessing Vulnerability in Rohingya Relocation: A Comparative Study of Households in Cox's Bazar and Bhasan Char, Bangladesh

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ABSTRACT

This study assesses the multidimensional vulnerabilities of Rohingya refugees and compares livelihood conditions between settlements in Cox's Bazar and Bhasan Char. A survey of 154 purposively selected respondents was conducted using a structured questionnaire. The Multidimensional Vulnerability Index (MVI) was calculated to measure overall vulnerability, and Chi-square tests examined associations between vulnerability factors across the two locations. The findings show that households in Bhasan Char experience higher MVI due to intensified economic hardship, weaker healthcare services, and greater social isolation, although residents benefit from permanent housing and closer neighborly support. Conversely, households in Cox's Bazar exhibit lower overall vulnerability because of better access to income opportunities and healthcare services. However, the Cox's Bazar camps are more prone to environmental hazards, which elevates certain dimensions of risk. The study emphasizes the urgent need for the international community to facilitate the safe and immediate repatriation of Rohingya refugees to ensure long-term security and dignity.

Keywords: *Bhasan Char,* Cox's Bazar, Exclusion, Minority, Relocation, Rohingya.

INTRODUCTION

The Rohingya, a stateless Muslim minority group from Myanmar, have been subjected to persecution, discrimination, and violence in their home country for decades (Sarmin, 2020). The persecution of Rohingyas in Myanmar's Rakhine state has created an ongoing humanitarian and human rights issues (Mahdawi & Smith, 2022). Bangladesh is highly vulnerable to this ethnic conflict due to a huge influx of Rohingya refugees to the country (Islam, 2020). The exodus of Rohingyas to Bangladesh has placed a significant strain on Cox's Bazar refugee camps. Most of the Rohingyas are now concentrated in Ukhiya and Teknaf Upazilas of Cox's Bazar along the Naf River, the porous border between Bangladesh and Myanmar (Kudrat-E-Khuda, 2020).

The camps in Cox's Bazar are in the face of various challenges and problems. The camps are densely populated, with limited space and inadequate infrastructure, leading to poor living conditions and health risks (Akhter et al., 2020; Khan et al., 2020). Their diverse vulnerabilities increase, because the population density has put a significant strain on resources such as food, water, and sanitation facilities resulting in nutritional deficiencies, poor health status, mortality, and morbidity risks (Ahmed et al., 2020; Alam et al., 2020; Jubayer et al., 2023; Khan et al., 2020; Shohel, 2022; Akhter et al., 2020). Besides, the provision of education for Rohingya children is also a significant challenge (Shohel, 2022). Rohingya refugees, particularly women and children, face significant protection risks, including gender-based violence, human trafficking, and child exploitation (Yousuf et al., 2020). A survey conducted by the Ministry of Social Welfare of Bangladesh shows that 36,373 orphaned children are at risk of abuse and trafficking ("Report on Rapid", n.d.). However, these numbers may underestimate the actual scope of the problem, as their security risks stem from a lack of earning opportunities, social isolation, and identity-related challenges.

Moreover, Rohingyas are restricted from seeking formal employment in Bangladesh due to a lack of formal recognition as a refugee. Labeled instead as Forcibly Displaced Myanmar Nationals (FDMNs), they are considered a temporarily displaced population, who are expected to return to their place of origin once a repatriation process is successfully concluded (International Crisis Group, 2019). This status limits their

access to regular and decent-paying jobs which further hinders their ability to engage in formal employment sectors (Habib, 2023; Ansar & Khaled, 2021). Consequently, many Rohingya are engaged in informal and low-paid jobs within the camps, such as casual labor, small-scale trading, or wage laborers. These jobs often provide limited income and security, making them vulnerable to exploitation and poverty (Islam et al., 2022). For economic insecurity and tension of survival, many Rohingya became engaged in crimes such as human trafficking, drug business etc. (Naim, 2022) as highlighted in many well renowned national print media. Cox's Bazar police headquarters statistics showed that between August 2017 and August 20, 2020, a total of 725 criminal cases involving Rohingyas have been filed against 1,664 individuals (Rashid, 2020).

In this dire situation, local law and order are highly challenged in the camp areas raising serious security concerns for Bangladesh. Considering the complexities such as population density within the camp, conflictual relation between camp people and host community, security concern for the host community, rising poverty in the camp, and lack of hope for an immediate solution, the government of Bangladesh has decided to relocate, in phases, 100,000 Rohingyas to Bhasan Char ("Dhaka to UNHCR", 2020) until settling a permanent solution through repatriation. Despite government's sincere approach and commitment to offer Rohingyas a better livelihood at Bhasan Char, many Rohingyas still have the fear of being shifted to this island while some prefer to be shifted to Bhasan Char from crowded Cox's Bazar camp.

This relocation program requires scientific studies to determine whether it improves or worsens the social and material conditions of the Rohingya, yet only a few such studies exist. In these circumstances, the study aims to assess the vulnerabilities of the Rohingya people in economic, social, health, and environmental aspects, exploring the problems and challenges they face in Bhasan Char and Cox's Bazar. It also seeks to make a comparative analysis of the living conditions of Rohingyas in the two camps. The findings of this study can help policymakers formulate or reformulate development policies for this vulnerable community while safeguarding local and national interests. The study expects that this will contribute to effective policy formation regarding Rohingya crisis management and their repatriation issues. The study finally offers scopes

of further research for greater practical outcomes in the process of sustainable development of the nation.

LITERATURE REVIEW

History of Rohingya Influx in Bangladesh

The Rohingya exodus to Bangladesh has a long history that stretches back several decades. The Rohingya are an ethnic, cultural, linguistic, and religious minority group mainly from the Northwestern Arakan State in Myanmar (Sahana et al., 2019). The first major wave of Rohingya migration to Bangladesh occurred in 1978 when an estimated 200,000 to 250,000 Rohingya sought refuge in Bangladesh. Subsequently, they have experienced brutal persecution, and denial of basic rights in Myanmar under Myanmar's Citizenship Law in 1982 (D'Silva & Basu, 2022; Faisal, 2020). The Rohingya community was called in Myanmar as an Arakani minority. The Arakani minorities were subjected to rape, torture, summary killings, confiscation and destruction of their homes and property, physical abuse, religious persecution, and forced unpaid labor, resulting in extreme psychological trauma inflicted by the NaSaKa (Shwe, 1989; Ullah, 2011). More adversely, the Rohingya civilians were murdered by the armed forces of Myanmar, girls and women were raped, and entire villages were razed to the ground; consequently, the army was accused of committing crimes against humanity and genocide (Ebbighausen, 2022). The scenario of atrocities in Arakan between 1978 and 1983 indicates significant regional variations, with Pomnakyam and Maungdaw recording the highest numbers of rapes (930 and 1,121 respectively). While Pomnakyam also experienced the most villages destroyed (105), Maungdaw had only 5 villages destroyed despite having the highest number of rapes (Shwe, 1989, as cited in Ullah, 2011) (see Figure 1 in Appendix).

Under such circumstances, about 700,000 Rohingya fled to neighboring Bangladesh, where most remain to this day in refugee camps. As a reaction to the alleged persecution by Myanmar authorities on the basis of religious and ethnic discrimination, the community took Cox's Bazar, the southern part of Bangladesh, as their place for shelter (Amnesty International, 1997; Ullah, 2011). It was triggered by the "Dragon King" operation by the Myanmar military that directly targeted civilians, and

resulted in widespread killings, raping and destruction of mosques, widespread human rights abuses and further religious persecution (Ahmed, 2012)

A second significant wave of Rohingya migration occurred in the early 1990s when over a quarter of a million Rohingyas fled to Bangladesh. The most significant and recent wave of Rohingya migration to Bangladesh occurred in 2017 when hundreds of thousands of Rohingya, estimated to be around 700,000, fled to Bangladesh to seek safety and refuge (Tareque, 2021). In August of that year, a violent crackdown by the Myanmar military in response to attacks by Rohingya insurgents led to this mass exodus (Lee, 2021). These major influxes of Rohingya refugees has placed a significant strain on Bangladesh, particularly in Cox's Bazar refugee camps. During this influx, the Rohingyas were primarily concerned about their personal safety and did not consider other potential vulnerabilities they might face while living in the host country. Upon arriving in Bangladesh, they began to experience multidimensional challenges such as limited income opportunities, poor health conditions, and difficult social circumstances. Over time, some groups became involved in crime and illegal activities, which created security concerns for the host communities. Due to growing tensions and complexities with the host community, the relocation of some Rohingyas to Bhasan Char became inevitable.

Rohingya Relocation: National and International Context

The Rohingya relocation initiative, led by the Bangladeshi government, aims to shift displaced individuals from overcrowded camps in Cox's Bazar to Bhasan Char, a more manageable temporary settlement. This effort is supported by both national and international organizations to enhance living conditions and provide essential services. Key considerations in this relocation process include the state of current camps, settlement and resettlement strategies, integration with host communities, voluntary repatriation, and long-term local integration ("Relocation," n.d.).

One of the studies delineates that the Rohingya camp in Cox's Bazar is facing adverse risk situations with the evidence that about 3 million native people and their assets are at varying degrees of cyclone risk in the Cox's Bazar district (Alam, 2019). Considering the remaining crises

and problems in Cox's Bazar, the Bangladesh government adopted multiple initiatives to convince other countries for having assistance with resettlement support from them. Bangladesh witnessed that huge pressure on the South Asian nation has been increasing, as the host country has to spend $1.2 billion a year, which requires international support (Sumon, 2022). Unfortunately, the result is not satisfactory, though the resettlement has been another part of the relocation program as per international UN policies.

Several countries have launched resettlement initiatives to relocate Rohingya refugees from overcrowded camps to third countries. On December 13, 2022, the United States expressed its commitment to this effort in partnership with Bangladesh and UNHCR (US Embassy in Bangladesh, 2022). As part of this initiative, the first group of Rohingya refugees departed for the U.S. at the end of 2022, with plans to resettle 300 to 800 refugees annually (Sumon, 2022). The number is so small that a large proportion of the Rohingya population must live in the Cox's Bazar camps, which has worsened their livelihood conditions and deteriorated their relationship with the host community.

Additionally, the U.S. has contributed over $1.9 billion in humanitarian aid to support Rohingya refugees in Bangladesh, aiming to enhance their resilience, education, livelihoods, and the well-being of host communities (US Embassy in Bangladesh, 2022). The government of Bangladesh found Cox's Bazar as a complicated zone for the Rohingya community since the conflict between the local inhabitants and the Rohingya interests always remains, and various forms of crimes and social insecurities are increasing day by day. In this situation, government made a plan to relocate the community from Cox's Bazar to Bhasan Char in Bangladesh.

However, the country is always facing various challenges including economic shortages for this relocation program. In this regard, the Dhaka Tribune reports that the government demanded foreign funds to relocate 70,000 Rohingyas to Bhasan Char, also, the government wanted assistance from international agencies to construct more infrastructures for the newly replaced Rohingya people, although Bangladesh spent Tk3,100 crores only to prepare Bhasan Char ("Dhaka wants," 2023). As an international response, Bangladesh received some $586 million, which is

62% of the committed amount of $876 million in 2022 ("Dhaka wants", 2023). Unfortunately, the funding trends over the years from 2018 to 2019 show that financial assistance from the international community has been declining (Banerjee, 2020) (see Figure 2 in Appendix). As a result of declining funds, the relocation program may increase economic, physical, and environmental vulnerabilities, even though its objective is to reduce them. Despite the challenges, Bangladesh took a relocation program of 100,000 Rohingyas to Bhasan Char (Islam & Siddika, 2022) and spent more than $300.

Subhuman Theory and Multidimensional Vulnerability Index (MVI)

The Rohingya influx creates pressure on food, jobs, health services, population balance, and other basic needs; and the more concerning point is that the many Rohingyas involve in human trafficking, forced prostitution, and drug business, also creates deforestation in the camp areas (ACAPS, 2025; Nasar et al., 2022; Kudrat-E-Khuda, 2020). In these unfavorable conditions, the Rohingya community has to depend on the government, local agencies, and international organizations for their daily food, monetary support, and essential services (Khaled, 2021).

In this respect, this research applies the subhuman life theory to understand the conditions of the Rohingya people, highlighting their extreme vulnerability and marginalization. According to Uddin (2020), Rohingya existence is reduced to 'subhuman' through five conditions: atrocious living environments, being treated as illegal objects within legal frameworks, homelessness both at home and abroad, exposure to unchecked violence (killing, rape, and arson), and a life deemed worthy of extinction. He argues that these experiences cannot be fully explained by existing theories such as 'bare life' or 'statelessness.' Instead, the subhuman life framework emphasizes how Rohingya lives are devalued to less than human—even 'poorer than those of animals'—as a result of exclusion from citizenship, rights, legal recognition, and the constant uncertainties of their existence (Uddin, 2020; Roy, 2024).

Rohingya people find the material supports so insufficient that they cannot adapt to the high commodity prices existing in the market, and if they involve in a temporary-based informal economic sector they get lower-grade wages affecting economic, physical, and health-related

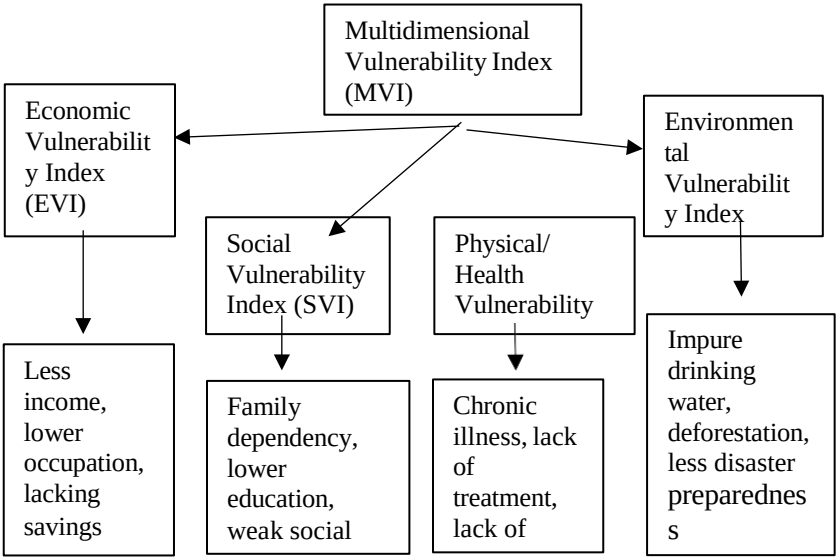
vulnerabilities (Khaled, 2021; Nasar et al., 2022). Alongside, the geographical location of the Rohingya camps in Cox's Bazar is so unfavorable that they have to face environmental degradation resulting in the risk of security for weak infrastructural support, and the resource distribution to the Rohingyas causes disputes for livelihood tensions between the Rohingyas and the host community (Hosen & Shahria, 2020). The conflict between the Rohingya and the host community has pressured the government to adopt a relocation program to an island separated from the host community. However, this relocation may create new complexities in the lives and livelihoods of the Rohingyas.

Therefore, it is evidentially proved that the vulnerabilities of the temporary settlers are contingent on the factors such as economic opportunities, environmental situations, physical support, and sociocultural realities (Nasar et al., 2022). That means different levels of vulnerability, linked to limited control over social, physical, and environmental resources (Guragain & Doneys, 2022), result in differentiated physical, social, economic, and socio-demographic impacts on society (Lindell & Prater, 2003). In this context, Guragain and Doneys (2022) developed the Multidimensional Vulnerability Index (MVI) comprising of the Social Vulnerability Index (SVI), Physical Vulnerability Index (PVI), Economic Vulnerability Index (EVI), and Environmental Vulnerability Index (EnVI) (Figure 1).

Social vulnerability is perceived by the socio-demographic and social factors including age, household size, Households with Dependent family members, gender, level of education, spouse togetherness, household participation in awareness training, and having trust in a government program; and, physical vulnerability includes household's use of materials to construct the house, households (HH) having the opportunity to cultivate, having any transportation support, having alternative water sources, having reliable means of communication, and having family members with chronic illness (Guragain & Doneys, 2022).

Figure1

Conceptual Model of the Assessment of Vulnerabilities with Relevant Variables



Source. Adapted from Guragain and Doneys (2022).

The economic vulnerabilities are also understood by the level of monthly household income, the status of income sources, having multiple sources of income or not, the amount of household savings, and having any kind of insurance. The environmental vulnerabilities are also measured by the variables such as households having drinking water, using open places for defecation, having a sewage disposal system, having open disposal of animal waste, and using chemical fertilizer to increase productivity (Guragain & Doneys, 2022). The above-mentioned factors of vulnerabilities associated with various variables are required to investigate how much vulnerability the Rohingya people experienced in the Cox's Bazar camps and how much vulnerability increases or decreases for the Rohingya families living in the relocated Bhasan Char .This model, therefore, can be useful for drawing comparisons between two areas in Bangladesh.

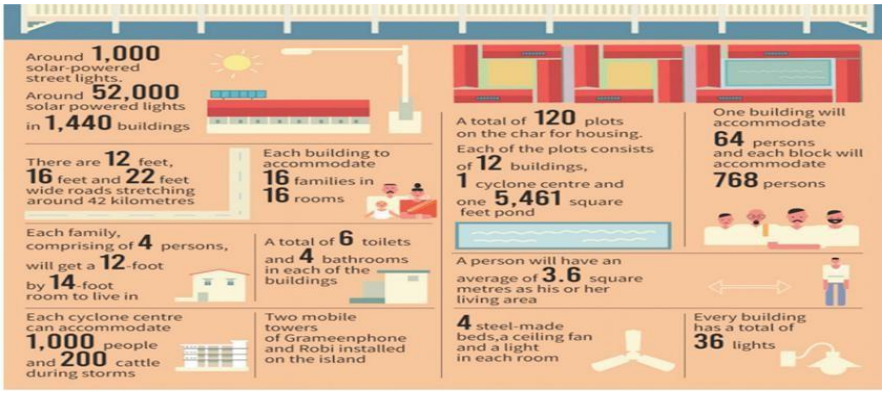
METHODS AND DATA

Research Area and Approach

The research area of the study is Bhasan Char which is homogenous in terms of not only the characteristics of the Rohingya community but also their living standard that is shaped by the housing and livelihood facilities provided by the Ashrayan-3 project (see Figure 2) (Dhaka Television, 2019). Under the project, 120 clusters have been built including 12 barracks in each cluster, and each barrack has 16 airy rooms, and also, each block is accomplished with a community kitchen, six toilets, and four bathrooms (Figure 2). The research is based on quantitative data to fulfill the objectives of the research. Since our research field is homogenous, it is assumed that the quantitative survey method would be able to provide adequate ideas about their livelihoods and living standards.

Figure 2

Simple Housing Structure at Bhasan Char Constructed with Homogenous Facilities



Source. The Business Standard (30 December 2019) cited in Banerjee (2020).

Sampling, Field Setting and Respondents

From a total of 30,079 Rohingya people settled in Bhasan Char ("963 more Rohingyas", 2022), a total of 180 Rohingyas were identified as respondents for the survey. The sample size from quantitative data has

generally been identified with the standardized formula of 'small sample techniques', formulated by Krejcie and Morgan (1970), that denotes a required sample size of 384 against a total population of 10, 00000 and above. Krejcie and Morgan (1970) used a formula for sample size published by the research division of the National Education Association which is mentioned below with the calculation of the formula and format of the table (Techniques, 2015). Since the Rohingya community in Bangladesh holds a minority position and the community is living on a separate island 'Bhasan Char' with simplified structural support, the community has lost the characteristics of heterogeneity, rather it is so homogenous that the data variability seems very low. Besides the issue of homogeneity, visiting Bhasan Char and Cox's Bazar was very challenging, as these areas are highly politically restricted and socially sensitive for data collection. Therefore, the sample size of 384 for the heterogenous population was not adopted, and a minimum sample size '180' was selected.

The more important thing was that data collection from such a remote area was so difficult and challenging since the Bhasan Char is always kept under surveillance for security concerns. The research team was bounded by the limited time schedule from the legitimate authority of the Bhasan Char, because the research team was guided by the formal security and the team must maintain the schedule of the special ship, however, the arrival and departure of the shipment were depended on the condition of the weather of the sea. In this situation, we collected data from 180 respondents of which 154 were finalized after scrutinizing for analysis. The majority of respondents were aged between 26–35 years (42%), indicating a youthful population. Males made up 58% of the sample, slightly higher than females at 42%. Professionally, most respondents were unemployed, with some working as rickshaw pullers or relying on charity. Previously, more Rohingya were informal workers at Cox's Bazar. Over 94% of the respondents had lived in Bhasan Char for more than a year and had similar long-term experience in Cox's Bazar; therefore, individuals without prior experience in Cox's Bazar were excluded. All of the respondents were selected by their consent and interests of willingness to provide information. While the research area was selected purposively on the condition that respondents of Bhasan Char would be able to give

answers about their experience of Cox' Bazar and also Bhasan Char from which we could draw a comparison of their conditions between the two areas, the respondents were selected purposively based on their consent, capacity to provide answers, and previous experience in Cox's Bazar.

Data Collection: Tools and Techniques

We collected survey data from 14 February to 20 February 2023. Separate guidelines were developed for data collection. For conducting survey data collection, a structured questionnaire was formulated. The structured questionnaire was comprised of several sections: i) Part A: Socio-demographic information ii) Part B: Economic vulnerabilities (with 3 indicators such as household income, income changes, and vulnerability sources) iii) Part C: Social vulnerabilities (with 6 indicators such as Family relation, kinship, neighboring relation, causes of dispute, psycho-social status, social integration) iv) Part D: Health vulnerabilities (with 3 indicators such as types of disease, sources of treatment, and maternal health related treatment) v) Part E: Environmental vulnerabilities (with 2 indicators such as disaster effects, impact on living). The questionnaire was first written in English, and then the questionnaire was translated into Bengali using such languages that the research team for data collection would feel easy to communicate with that questionnaire.

All of the questions had specific variables and some questions had more than five options including 'any other', thereby, respondents could feel easy to provide answers instantly. During data collection, the questionnaires were not provided to the respondents, instead, the research team of 6 members separately collected data through face-to-face interviews. Respondents were given the opportunity to give answers according to the questions, and if they replied something out of the options of the questions---that was written in a separate notebook.

Data Analysis Techniques

The study identified the household, rather than the individual, as the unit of analysis. Data analysis followed several steps such as data reduction, data display, data transformation (from quantity to quality), data consolidation (quantitative data with literature support), and data comparison (between Bhasan Char and Cox's Bazar) (Onwuegbuzie

&Teddlie, 2003). For the completion of those steps, we reduced quantitative data into generalized form with the use of statistical software SPSS 21. The software helped us to measure statistical data according to the input coding system. We calculated the demographic variables with the use of descriptive statistics such as frequency and percentage. This research uses cross-tabulation and applies the Chi-square (χ^2) test to examine the association between the variables and different living experiences, and to compare Bhasan Char and Cox's Bazar to determine whether there is a significant difference based on location.

Table 1

List of Selected Indicators of Multidimensional Vulnerability Index (MVI) with Scores as Scale, Normalized Value and Interpretation of NV for Data Analysis

Economic Vulnerability				
Indicators	**Variables**	**Scale**	**Normalized value**	**Interpretations**
Household income	No income	6	1.0	No income households are at maximum vulnerability (1.0), while 10,000+ income households are at minimum vulnerability (0.0).
	Less than 4000	5	0.8	
	4000-6000	4	0.6	
	6000-8000	3	0.4	
	8000-10000	2	0.2	
	10,000+	1	0.0	
Income changes after shifting	More	1	0.0	3= declined; 1= increased (Income increases mean a better situation compared to Cox's Bazar)
	As it is	2	0.5	
	Less	3	1.0	
	No vocational training	5	1.0	

	No skill-building training	4	0.75	Highest vulnerability (1.0) = No vocational training
Sources of Economic Vulnerabilities	Very limited market orientation	3	0.5	
	No connection with big bazar/market	2	0.25	Lowest vulnerability (0.0) = Competition with the locals
	Competition with the locals	1	0.0	
Social Vulnerability				
Family relation	Living cooperatively	1	0.00	Lowest vulnerability (0.0) = Living cooperatively
	Part of family left at Cox's Bazar	2	0.33	
	Poverty weakens good relation	3	0.67	Highest vulnerability (1.0) = Part of family left in Myanmar
	Part of family left in Myanmar	4	1.00	
Kinship relation	Part of relatives left in Myanmar	5	1.0	0 = least vulnerable (Normal relation) 1 = most vulnerable (Relatives left in Myanmar)
	Part of the relatives left in the camps	4	0.75	
	Conflicting relation	3	0.5	
	Distant relation	2	0.25	
	Normal relation	1	0.0	
Neighboring relation	Well-relation	1	0.00	0 = least vulnerable (well-relation) and 1 = most vulnerable (frequent disputes).
	Normal relation	2	0.33	
	Occasional dispute	3	0.67	
	Frequent dispute	4	1.0	
	Crime	4	1.0	

Causes of dispute among community members	Lack of resources	3	0.75	1= dispute for a silly matter; 4= offensive matter A more score means the more vulnerability
	Aid distribution	2	0.5	
	Silly matter	1	0.25	
	Unidentified	0	0.0	
Phyco-social status	Feeling detached	3	1.0	1= communication problem; 3= feeling isolated More feeling of isolated/ detached, more suffering for them
	Feeling isolated	2	0.5	
	Communication problems with the mainland	1	0.0	
Nature of social integration	Problems related to marriage	4	1.0	1= Congested; 6= (The more conflictual relation the more vulnerability)
	Scarcity of resources	3	.67	
	No formal schooling for kids	2	.33	
	Congested areas	1	.00	
Health Vulnerability				
Types of diseases	Infectious (diarrhea, cholera, skin disease).	1	.00	1= infectious, 3= Chronic (The more chronic the more vulnerability)
	Respiratory (Asthma, TB, Covid)	2	.50	
	Chronic (Diabetes, stroke, heart disease)	3	1.00	

Sources of treatment	Govt hospital	1	0.00	0 = least vulnerable (Govt hospital access)
	NGO health care	2	0.25	
	Pharmacy	3	0.50	
	Quack doctor	4	0.75	1 = most vulnerable (No treatment at all)
	No treatment when necessary	5	1.000	
Maternal health related treatment	Govt hospital	1	0.00	0 = least vulnerable (Govt hospital access)
	NGO health care	2	0.25	
	Pharmacy	3	0.50	
	Quack doctor	4	0.75	1 = most vulnerable (No checkup at all)
	No check-up when necessary	5	1.000	
Environmental Vulnerability				
Support during disaster	No signal before disaster	4	0.00	0 = least vulnerable (sufficient support), 1 = most vulnerable (no signal before disaster).
	No support during disaster	3	0.33	
	Having insufficient support	2	0.67	
	Sufficient support	1	1.0	
Source of support during disaster	No support	4	1	0= least vulnerability (Govt. support)
	Local support	3	0.67	
	NGO support	2	0.33	
	Govt. support	1	0.0	1= Most vulnerability (No support)
Environmental impact	Loss of bio-diversity	3	1.0	1= soil erosion, 3= loss of bio-diversity (The more diversified impact the more vulnerability)
	Deforestation	2	.50	
	Soil erosion	1	.00	
Living impact	Strong wind and Loss of shelter	4	1.00	0= less severe, 1= most severe

	Damage to infrastructure	3	.67	(The more severity of
	Poor living conditions	2	.33	living condition, the more
	Only clean water access	1	.00	vulnerability)

The data analysis follows the model of Multidimensional Vulnerability Index (MVI) developed by Guragain and Doneys (2022) which includes Economic Vulnerability Index (EVI), Physical Vulnerability Index (PVI), Social Vulnerability Index (SVI), and Environmental Vulnerability Index (EnVI). To understand the present living conditions in Bhasan Char, four levels of vulnerability such as economic vulnerability, social vulnerability, health vulnerability, and environmental vulnerability were analyzed. For measuring economic vulnerability, different variables of household income, changes of income, sources of vulnerabilities; for measuring social vulnerability, variables of family relations, kinship relations, neighboring relations, causes of dispute, psycho-social status and social integration were analyzed (Table 1). As such different themes and indicators of health vulnerability (types of disease, sources of treatment, and maternal health related treatment) and environmental vulnerability (disaster effect and impact on living) were measured (Table 1).

To measure the Multidimensional Vulnerability Index (MVI), we first developed a coding system and calculated the Normalized Value (NV), where 0 represents the least vulnerability and 1 represents the highest vulnerability. The formula for NV is: NV = (Xi – Xmin) / (Xmax – Xmin), where Xi = actual score, Xmin = minimum score observed, and Xmax = maximum score observed. Next, we calculated the Weighted Score (WS) using the formula: WS = (fi × NV) / Total frequency, where fi = frequency, NV = normalized value (between 0–1), and Total frequency = total number of responses (Table 1). After that, we computed the average scores for each dimension—Economic Vulnerability Index (EVI), Social Vulnerability Index (SVI), Health Vulnerability Index (HVI), and Environmental Vulnerability Index (EnVI)—using specific formulas. For example, the HVI was calculated as: HVI = (Weighted Types of Diseases + Weighted Sources of Treatment + Weighted Maternal Health Treatment)

/ 3. Finally, the overall MVI for each location was obtained using the formula: MVI = (EVI + SVI + HVI + EnVI) / 4 (see Tables in result section). The multiple responses were analyzed within the coding structure. The comparison with different levels of vulnerability gave a clear idea of the nature of livelihood and its problems associated with the present conditions and the previous living experience in Cox's Bazar.

Ethical Issues

The ethical issues of the study mainly focus on the reliability, validity, and credibility of data. The sample size for survey research was 154 which remains credible and acceptable because of the homogeneity of the Rohingya community and the uniform physical structure of their living place at Bhasan Char. To manage credibility in data collection, we constructed trust-building among the respondents by taking face-to-face consent and allowing the respondents to respond until they wish. The authenticity of data collection was protected by confirming permission letter for data collection by the 6 members of the research team including a community guide in the field of Bhasan Char authorized by the commissioner of the Refugee Relief and Repatriation Commission, Cox's Bazar.

RESULT AND DISCUSSION

This section represents data under four themes including economic, social, health and environmental vulnerabilities. The status of the vulnerabilities of Rohingya in both Bhasan Char and Cox's Bazar are explained and compared.

Economic Vulnerabilities

This section shows data on the economic vulnerabilities of Rohingyas both at Cox's Bazar and at Bhasan Char. The coping strategies that Rohingyas used to employ to survive the situation have also been included in this section. This section also represents a comparative analysis of the income and savings of Rohingyas both at Cox's Bazar camps and Bhasan Char camp.

Table 2

Economic Status of Rohingya both at Bhasan Char and at Cox's Bazar

Household income	**S**	**NV**	***Bhasan Char***			**Cox's Bazar**		
			f	**%**	**WS**	**f**	**%**	**WS**
No income	6	1.0	68	44.2	68.0	29	18.8	29.0
Less than 4000	5	0.8	81	52.6	64.8	14	9.1	11.2
4000-6000	4	0.6	5	3.2	3.0	8	5.2	4.8
6000-8000	3	0.4	0	0	0	12	7.8	4.8
8000-10000	2	0.2	0	0	0	91	59.1	18.2
10,000+	1	0.0	0	0	0	0	0	0
Total			154	100	135.8	154	100	68
Weighted Score (avg)				**0.881**			**0.442**	
Income changes after shifting								
More	1	0.0	0	0	0	141	91.6	0
As it is	2	0.5	13	8.4	6.5	13	8.4	6.5
Less	3	1.0	141	91.6	141	0	0	0
Total			154	100.0	147.5	154	100	6.5
Weighted Score (avg)				**0.96**			**0.04**	

Note. i) f means frequency, % means percentage ii) NV = Normalized Value, WS = Weighted Score (NV*f). Weighted Score (avg) = WS/ sum of

Source. Field Survey (2023).

Table 2 shows that in Cox's Bazar, most of the Rohingya people (59%) earn between 8,000 and 10,000 taka per month, whereas in Bhasan Char the majority (53%) earn less than 4,000 taka monthly. The economic hardship in Bhasan Char is further reflected in the fact that 44% of the Rohingya there have no income at all, compared to only 19% in Cox's

Bazar, highlighting a much deeper economic crisis in Bhasan Char. It is evident that involvement in temporary-informal economic activities can increase economic, physical, and health-related vulnerabilities, particularly in Bhasan Char (Khaled, 2021). Thus, the weighted average score also supports this finding, as Bhasan Char scored 0.881, very close to 1, which indicates the highest level of vulnerability. In contrast, Cox's Bazar scored 0.442, representing a moderate level of vulnerability on the 0–1 scale, suggesting a relatively lower degree of economic crisis there.

Table 2 also shows the amount of income and its change after Rohingyas' voluntary relocation at Bhasan Char. According to the scale, 'income increases' means a better situation compared to Cox's Bazar. The Table shows that around 92% of respondents mentioned that their income was more in Cox's Bazar compared to Bhasan Char. This similar number mentioned that income significantly dropped at Bhasan Char. Also, based on the weighted average score, Bhasan Char shows very high economic vulnerability (WS = 0.96) as most households lost income, while Cox's Bazar shows very low economic vulnerability (WS = 0.04) as income seems stable.

Table 3

Sources of Economic Vulnerabilities and Coping Strategies of Rohingya

Sources of Vulnerabilities	**S**	**NV**	***Bhasan Char***			**Cox's Bazar**			**p**
			f	**%**	**WS**	**f**	**%**	**WS**	
Less vocational training	5	1.0	96	62.3	96	141	91.6	141	.436 (.509)
Very limited market orientation	4	0.75	76	49.4	57	5	3.2	3.75	5.04* (.025)
Limited connection with big bazar/market	3	0.5	114	74.0	57	30	19.5	15.0	5.89* (.016)

Limited skill-building training	2	0.25	120	77.9	30	7	4.5	1.75	25.88*** (.000)
Competition with the locals	1	0.0	6	3.9	0	135	87.7	0	
Total			412		240	318		161.5	
Weighted Score (avg)			**0.583**			**0.508**			

Note. i) It's a multiple response Table ii) f means frequency, % means percentage iii) NV = Normalized Value, WS = Weighted Score (NV*f). Weighted Score (avg) = WS/ sum of; and sum of frequency = 412 and 318 because of multiple responses.

Source. Field Survey (2023).

Table 3 highlights the key sources of economic vulnerability among the Rohingya in Cox's Bazar and Bhasan Char. A vast majority in Cox's Bazar (92%) and a large proportion in Bhasan Char (62%) reported not having any vocational training to support their livelihood, making it difficult for them to enter the job market. The situation is worse in Bhasan Char, where 78% mentioned having no opportunity for skill-building training, although some programs have recently begun. Findings also show that people in Cox's Bazar receive more skill development opportunities compared to those in Bhasan Char. The difference is statistically significant ($\chi^2 = 25.88$, $p < .001$). Almost half of the Rohingya in Bhasan Char (49%) reported a lack of market orientation ($\chi^2 = 5.04$, $p = .02$), which can be attributed to the island's weak market infrastructure and geographical isolation. Additionally, around 74% stated that they had limited access to large markets ($\chi^2 = 5.89$, $p = .02$), leaving them with few opportunities to engage in the exchange of goods. Further restrictions on trade and commerce were also reported due to limited transportation beyond the island.

Though income sources were still less at Bhasan Char compared to Cox's Bazar as 71% of respondents mentioned, the positive side is the Rohingyas at Bhasan Char had less conflict and competition with the locals regarding scarce resources. Rohingyas are restricted from seeking formal

employment in Bangladesh due to a lack of formal recognition as refugees. This has limited their access to any kind of formal jobs. They are deprived of work permits and legal recognition. This hinders their ability to engage in formal employment sectors (Habib, 2023; Ansar and Khaled, 2021). These findings align with independent analyses showing Bhasan Char households earn far less: for example, a World Bank study found monthly wages on Bhasan Char about 45% lower than in Cox's Bazar. Due to this situation, Rohingyas often are in the face of acute economic crisis and extreme economic insecurity.

Thus, considering the relative advantages and disadvantages in both areas, the weighted average scores (0.58 for Bhasan Char and 0.51 for Cox's Bazar) indicate nearly similar levels of economic vulnerability. Both scores fall within the mid-range of the 0–1 vulnerability scale, suggesting that the economic conditions in the two areas are moderately vulnerable, though the difference between them is relatively small. The Economic Vulnerability Index (EVI) is derived from the average of all weighted scores related to economic indicators. The EVI for Bhasan Char is 0.81, indicating a high level of economic vulnerability since they are excluded from citizenship rights, legal recognition, and the constant uncertainties of their existence (Uddin, 2020; Roy, 2024). This reflects that households experience severe economic challenges, with limited skill-building opportunities and poor communication beyond the island. In contrast, the EVI for Cox's Bazar is 0.33, which is much lower than that of Bhasan Char. This suggests that Cox's Bazar has a relatively lower level of economic vulnerability, largely due to better economic security and greater access to income-generating opportunities.

Social Vulnerability

Table 4 presents critical insights into the core social relationships among the Rohingya community by focusing on family, kinship, and neighboring relations, particularly in the context of relocation from Cox's Bazar to Bhasan Char.

Table 4

Social Relations in Connection to Social Vulnerability

Family relation	S	NV	*Bhasan Char*			Cox's Bazar			Chi squire (P value)
			f	%	WS	f	%	WS	
Living cooperatively	1	0.00	133	86.4	0.0	102	66.2	0.0	2.08 (0.14)
Part of family left at Cox's Bazar/distant camps	2	0.33	77	50.0	25.41	68	44.2	22.44	6.46 (0.02)*
Poverty weakens good relation	3	0.67	144	93.5	96.48	58	37.7	38.86	4.77 (0.02) *
Part of family left in Myanmar	4	1.00	84	54.5	84.0	83	53.9	83.0	0.105 (0.74)
Total			438		205.89	311		144.3	
Weighted Score (avg)			**0.47**			**0.46**			
Kinship relation									
Part of relatives left in Myanmar	5	1.0	135	87.7	135.0	149	96.8	149.0	36.7*** (.000)
Part of the relatives left in the Cox's Bazar/distant camps	4	0.75	59	38.3	44.25	10	6.44	7.5	17.2*** (.000)
Conflicting relation	3	0.5	64	41.6	32.0	105	68.2	52.5	8.62*** (0.00)
Distant relation	2	0.25	28	18.2	7.0	21	13.6	5.25	38.4*** (.000)
Normal relation	1	0.0	19	12.3	0.0	64	41.4	0.0	9.21** (.002)
Total			305		218.3	349		214.3	
Weighted Score (avg)			**0.72**			**0.61**			

Neighboring relation									
Well-relation	1	0.00	118	76.6	0.0	39	25.3	0.0	1.88 (.16)
Normal relation	2	0.33	125	81.2	41.25	139	90.3	45.87	.61 (.43)
Occasional dispute	3	0.67	118	76.6	79.06	22	14.3	14.74	3.25 (.07)
Frequent dispute	4	1.0	58	37.7	58.0	30	19.5	30.0	1.02 (.31)
Total			419		178.31	230		90.61	
Weighted Score (avg)			**0.43**			**0.39**			

Note. i) It's a multiple response Table ii) f means frequency, % means percentage iii) NV = Normalized Value, WS = Weighted Score (NV*f). Weighted Score (avg) = WS/ sum of and sum of frequency is calculated considering multiple responses.

Source. Field Survey (2023).

Field data reveal that families in Bhasan Char generally live more cooperatively, with 86% reporting close and supportive family ties, compared to 66% in Cox's Bazar. However, poverty remains a major challenge. In Bhasan Char, 93% of families said they live in poverty, whereas in Cox's Bazar, the rate is considerably lower at 38%. About half of the respondents also mentioned that part of their family members remained behind—either in Myanmar or Cox's Bazar—creating emotional and social strain in both areas. Statistically, family relations were found to be significantly affected by relocation from Cox's Bazar ($\chi^2 = 6.46$, $p = .02$), although the difference in poverty levels was not statistically significant ($\chi^2 = 4.77$, $p = .36$). Human Rights Watch (HRW) and other reports document the social toll of relocation. Many families were split. HRW recounts a Cox's Bazar mother whose 13-year-old son was sent to Bhasan Char. She said officials told her the only way to see him was to move to the island (UNHCR & World Bank, 2023).

Even though family relations appeared more affected in Bhasan Char, similar levels of poverty across both areas seem to have weakened family cohesion equally. The weighted average scores, 0.47 for Bhasan Char and 0.46 for Cox's Bazar, support this result and show that both places have nearly the same level of social vulnerability. This means that the strain on family relationships in Bhasan Char is likely caused more by social and emotional reasons, such as being far from their previous homes and being separated from family members who stayed behind.

Kinship ties are also an important part of social stability, especially in a controlled and distant environment like Bhasan Char. Even with the challenges of relocation and limited communication, 66 percent of respondents in Bhasan Char said they still keep good relationships with their relatives, which is slightly higher than the 62 percent reported in Cox's Bazar. However, 38 percent mentioned having to leave some relatives behind during the move, compared to only 6 percent earlier, which has made these relationships more complicated. In contrast, conflicting kinship relations were found to be more frequent in Cox's Bazar, 68 percent, than in Bhasan Char, 42 percent.

The data indicate significant differences in kinship quality between the two locations: good relations ($\chi^2 = 5.09$, $p = .02$), conflicting relations ($\chi^2 = 8.62$, $p = .00$), and distant relations ($\chi^2 = 38.4$, $p = .00$). Furthermore, having relatives left behind in Cox's Bazar ($\chi^2 = 17.2$, $p = .000$) and Myanmar ($\chi^2 = 36.7$, $p = .000$) had a strong impact on kinship ties. The weighted average scores—0.72 for Bhasan Char and 0.61 for Cox's Bazar—also suggest that kinship is more vulnerable in Bhasan Char.This higher score indicates greater social distance and disconnection, mostly caused by displacement, geographical isolation, and separation from loved ones who remain in other places.

Neighborly relation seems stronger in Bhasan Char. Around 77 percent of respondents stated, they maintain good relationships with their neighbors, compared to only 25 percent in Cox's Bazar. On the other hand 38 percent mentioned about having little disputes occasionally. This is often caused due to their stressful living in confined spaces. The island's organized settlement pattern and shared dependence among residents help to keep such conflicts manageable, and no major variation was found based on how long people have lived there. The weighted average scores, 0.43

for Bhasan Char and 0.39 for Cox's Bazar, are on the lower side of the zero to one scale. This suggests that neighborly relations are relatively stable and moderately strong in both areas, while only small differences are found in case of conflict.

Table 5

Social Disputes in Relation to Social Vulnerability

Causes of dispute among community members	**S**	**NV**	**Bhasan Char**			**Cox's Bazar**			**Chi squire (p)**
			f	**%**	**WS**	**f**	**%**	**WS**	
Crime	4	1.0	23	14.9	23.0	131	85.1	131.0	4.74 (0.02)
Lack of resources	3	0.75	139	90.3	104.3	76	49.4	57.0	17.1 (< .001)
Aid distribution	2	0.5	39	25.3	19.5	131	85.1	65.5	38.4 (< .001)
Silly matter	1	0.25	139	90.3	34.8	146	94.8	36.5	.91 (.33)
Unidentified	0	0.0	131	85.1	0.0	91	59.1	0.0	18.7 (< .001)
Total			471		181.5	575		290.0	
Weighted Score (avg)			0.39			0.50			
Phyco-social status									
Feeling detached	3	1.0	154	100	154.0	66	42.9	66.0	--
Feeling isolated	2	0.5	125	81.2	62.5	116	75.3	58.0	14.1 (< .001)
Communication problems	1	0.0	132	85.7	0.0	146	94.8	0.0	50.6 (< .001)
Total			411		216.5	328		124.0	
Weighted Score (avg)			0.53			0.38			

Nature of social integration									
Problems related to marriage	4	1.0	23	14.9	23.0	0	0	0.0	24.8 (< 0.001)
Scarcity of resources	3	.67	154	100.0	103.18	15	9.7	10.05	253.3 (<0.001)
Limited formal schooling for kids	2	.33	31	20.1	10.23	32	22.8	10.56	0.02 (0.88)
Congested areas	1	.00	62	40.3	0.0	84	54.5	0.0	.6.30 (0.012)
Total			270		136.4	131		20.61	
Weighted Score (avg)			0.51			0.16			

Note. i) It's a multiple response Table; ii) f means frequency, % means percentage iii) NV = Normalized Value, WS = Weighted Score (NV*f). Weighted Score (avg) = WS/ sum of and sum of frequency is calculated considering multiple responses.

Source. Field Survey (2023).

Table 5 shows that in Bhasan Char, disputes mainly arise from lack of resources (90%), trivial issues (90%), and aid distribution (85%), while in Cox's Bazar, criminal activities are the leading cause (85%) and aid distribution is much lower (25%). The controlled setting in Bhasan Char limits crime but increases competition over scarce resources. Statistically significant differences were found in disputes over aid distribution (χ^2 = 38.4, $p < .001$), lack of resources ($\chi^2 = 17.1$, $p < .001$), and trivial issues (χ^2 = 4.74, $p = .02$). Weighted score (avg) for Bhasan Char (0.39) and for Cox's Bazar (0.50) also shows the difference between two areas in terms of the extent of disputes. The lower score for Bhasan Char indicates relatively fewer social disputes, whereas the mid-level score for Cox's Bazar suggests a moderately high level of social conflicts that residents encounter in their daily lives.

The study found strong psycho-social impacts of geographic isolation in Bhasan Char, where all respondents (100%) felt detached compared to 43% in Cox's Bazar. Feelings of isolation were also higher in Bhasan Char

(81%) than in Cox's Bazar (75%). Communication problems showed slight variation but remained difficult due to restricted access. Significant differences were observed in feelings of isolation ($\chi^2 = 14.1$, $p < .001$) and communication problems with the mainland ($\chi^2 = 50.6$, $p < .001$).

Based on four indicators, Table shows weighted score (avg) for Bhasan Char (0.53) indicating more feeling of isolation compared to the score of Cox's Bazar (0.38). Rohingyas in Bhasan Char feel more isolated because the island is geographically far from the mainland, and they cannot move or meet others freely. In contrast, Rohingyas in Cox's Bazar live geographically closer to Myanmar and can see the border, which helps them feel more connected to their homeland and less lonely.

According to respondents, relational and economic issues were more severe than physical constraints like congestion. It is a fact that living in congested areas leads to poor living conditions and increased health risks (Akhter et al., 2020). In terms of physical living conditions, congestion was more prominent in Cox's Bazar (55%) than in Bhasan Char (40%). This difference is also statistically significant ($\chi^2 = 6.30$, $p = 0.012$). Formal schooling access for children remained uniformly limited in both locations. While Cox's Bazar experienced more local conflicts, Bhasan Char residents faced more economic vulnerability due to a lack of resources ($\chi^2 = 253.32$, $p < 0.001$). Problems related to marriage is also more in Bhasan Char compared to Cox's Bazar ($\chi^2 = 24.80$, $p < 0.001$). Based on the statistical data, respondents of Bhasan Char highlighted the challenges of living in government-allocated plots with no mobility and full dependence on aid. These issues have led to reduced livelihood opportunities and limited access to basic necessities. As Khuda (2020) and Ahmed (2020) noted, such conditions result in poor housing, inadequate sanitation, food shortages, and widespread nutritional deficiencies among the Rohingya.

Considering four indicators of social integration, the weighted average scores for Bhasan Char (0.51) and Cox's Bazar (0.16) reveal a substantial difference in social integration between the two areas. The higher score for Bhasan Char indicates relatively weaker social integration, as the community lives on a geographically distant island. In contrast, the much lower score for Cox's Bazar reflects a higher level of social connectedness among its residents. Finally, Social Vulnerability Index (SVI) has been calculated by averaging the weighted scores of all selected

indicators. The SVI for Bhasan Char is 0.51, indicating a moderate to high level of social vulnerability, reflecting weaker social conditions and challenges such as limited integration and resource access. In contrast, Cox's Bazar has an SVI of 0.42, which is relatively lower and indicates moderate vulnerability, meaning the community there enjoys somewhat better social conditions compared to Bhasan Char. Overall, the results highlight that Bhasan Char faces greater social vulnerability than Cox's Bazar.

Health Vulnerability

Healthcare data show clear disparities between Rohingya in Bhasan Char and Cox's Bazar. Infectious diseases like diarrhea, cholera, and skin infections are most common, affecting 92% in Bhasan Char and 77% in Cox's Bazar. By contrast, chronic and respiratory illnesses are more prevalent in Cox's Bazar, affecting 57% and 60% of the population, compared to 50% in Bhasan Char. Though these differences are not statistically significant by the Chi-square test, the weighted score for Bhasan Char (0.32) indicates a moderately low level of health vulnerability in terms of diseases, while Cox's Bazar (0.45) indicates a moderately high level of health vulnerability, showing a clear difference between the two areas.

Table 6

Status of Health Vulnerability

Types of diseases	**S**	**NV**	***Bhasan Char***			**Cox's Bazar**			**Chi squire (p)**
			F	**%**	**WS**	**f**	**%**	**WS**	
Infectious (diarrhea, cholera, skin disease).	1	.00	141	91.6	0.0	119	77.3	0.0	.52 (0.46)
Respiratory (Asthma, TB, Covid)	2	.50	59	38.3	29.5	92	59.7	46.0	1.76 (0.41)

Chronic (Diabetes, stroke, heart disease)	3	1.00	51	33.1	51.0	88	57.1	88.0	2.05 (0.15)
Total			251		80.5	299		134.0	
Weighted Score (avg)			**0.32**			**0.45**			
Sources of treatment									
Govt hospital	1	0.00	154	100.0	0.0	154	100	0.0	
NGO health care	2	0.25	21	13.6	5.25	154	100	38.5	234.2 (< 0.001) ***
Pharmacy	3	0.50	147	95.5	73.5	141	91.6	70.5	1.92 (0.17)
Quack doctor	4	0.75	33	21.4	24.7	34	22.1	25.5	0.02 (0.88)
Lack of treatment when necessary	5	1.00	154	100.0	154	0	0	0.0	230.9 (< 0.001)
Total			509		258	483		134.5	
Weighted Score (avg)			**0.51**			**0.28**			
Maternal health related treatment									
Govt hospital	1	0.00	154	100.0	0.0	154	100.0	0.0	
NGO health care	2	0.25	32	20.8	8.0	154	100.0	38.5	234.2 (< 0.001) ***
Pharmacy	3	0.50	16	10.4	8.0	39	25.3	19.5	5.75 (0.02) *
Quack doctor	4	0.75	115	74.7	86.25	76	49.4	57.0	2.48 (0.11)

No check-up when necessary	5	1.000	54	35.1	54.0	99	64.3	99.0	1.34 (.24)
Total			371		156.3	522		214	
Weighted Score (avg)			**0.42**			**0.41**			

Note. i) It's a multiple response Table; ii) f means frequency, % means percentage iii) NV = Normalized Value, WS = Weighted Score (NV*f). Weighted Score (avg) = WS/ sum of and sum of frequency is calculated considering multiple responses.

Source. Field Survey (2023).

Bhasan Char shows higher infectious disease rates due to limited health awareness and basic living conditions, while its simpler lifestyle may reduce chronic disease risk. Since the camps in both Cox's Bazar and Bhasan Char were constructed with proper planning, government and NGO services provided opportunities for treatment; however, access to care was significantly limited in emergencies and other critical situations at Bhasan Char ($\chi^2 = 230.9$, $p < 0.001$). Similarly, though NGO clinics exist in both areas, care is limited ($\chi^2 = 234.2$, $p< 0.001$). Despite better health care services at Cox's Bazar, reliance on quack doctors is high in both areas. Considering all indicators related to the sources of treatment, the weighted score shows that Bhasan Char (0.51) has a higher health vulnerability in terms of access to treatment sources compared to Cox's Bazar (0.28). This means people in Bhasan Char face greater difficulties in getting proper healthcare, mainly because the island is geographically distant and separated from the mainland, which limits availability of medical facilities and emergency services. In contrast, Cox's Bazar has relatively better access to treatment options, resulting in lower vulnerability.Bangladesh invested over $300 million in relocating Rohingyas to Bhasan Char, but limited international support has impacted healthcare service delivery, contributing to community health insecurity (Ahasan, 2020).

Maternal health vulnerability was assessed similarly across locations. While government hospitals offered some pregnancy care, 35% of women in Bhasan Char missed check-ups, compared to full coverage in

Cox's Bazar through NGOs. This difference is statistically significant (χ^2 = 234.3, p < 0.001). Emergency services at Bhasan Char are provided by Gonoshastho Kendro, yet 74% of women still rely on quack doctors and 75% on informal "Dais" for deliveries, versus 49% and 39% in Cox's Bazar. Only medicine from pharmacies showed a significant difference (χ^2 = 5.75, p = .02), with most other maternal health variables not statistically significant. Considering relative advantages and disadvantages, the average weighted scores for Bhasan Char (0.42) and Cox's Bazar (0.41) show no meaningful difference in maternal health vulnerability between the two areas. However, as indicated by the scores, both areas fall under a moderately low level of health vulnerability (Nasar et al., 2022).

Overall, the Health Vulnerability Index (HVI) (calculated by averaging the weighted scores of health-related indicators) for Bhasan Char is 0.42, which reflects a moderately low level of health vulnerability and for Cox's Bazar is 0.38, which also reflects a moderately low level of health vulnerability. The scores are very close, meaning that overall health vulnerability is almost the same in both areas, with Bhasan Char being only slightly more vulnerable than Cox's Bazar. Factors contributing to this slight difference include limited education, lack of awareness regarding health and medicine usage, weak economic conditions, and minimal organizational support. Besides, government healthcare services in Bhasan Char are inconsistent, and NGO presence is sparse. Motivation among service providers also appears low. Limited administrative capacity and insufficient funding—both from national and international sources—have resulted in increased dependence on informal care, including quack doctors and traditional Dais. This poses significant risks to community health, particularly maternal and child healthcare

Environmental Vulnerability

Table 7

Environmental Vulnerabilities of Rohingyas

Nature of support	S	NV	*Bhasan Char*			Cox's Bazar		
			f	%	WS	f	%	WS
Soil erosion	1	.00	154	100	0.0	154	100	0.0
Deforestation	2	.50	0	0	0.0	154	100	77.0

Loss of bio-diversity	3	1.0	0	0	0.0	154	100	154.0
Total			154		0.0	462		231.0
Weighted Score (avg)			**0.0**			**0.50**		
Impact on living								
Strong wind and Loss of shelter	4	1.00	0	0	0.0	154	100	154.0
Damage to infrastructure	3	.67	0	0	0.0	154	100	103.18
Poor living conditions	2	.33	0	0	0.0	154	100	50.82
Only clean water support	1	.00	154	100	0.0	154	100	0.0
Total			154		0.0	616		308.0
Weighted Score (avg)			**0.0**			**0.50**		

Note. i) It's a multiple response Table ii) f means frequency, % means percentage iii) NV = Normalized Value, WS = Weighted Score (NV*f). Weighted Score (avg) = WS/ sum of

Source. Field Survey (2023).

Cox's Bazar is more environmentally vulnerable than Bhasan Char. While 57% of Cox's Bazar respondents reported landslide risks, only 21% did in Bhasan Char. Deforestation and biodiversity loss were widespread concerns in Cox's Bazar, but none of the Bhasan Char respondents reported these issues. Soil erosion was acknowledged as a threat by all respondents in both regions. Regarding the impact on living conditions, Cox's Bazar residents reported highly vulnerable shelters and constant fear of losing them during disasters, whereas Bhasan Char residents felt secure due to planned housing and stronger infrastructure.

However, a different kind of concern was prevalent in Bhasan Char, as almost all respondents expressed anxiety over the erosion of the island itself, especially in the southern parts, despite the emergence of new land in the north. Still, all the respondents acknowledged that authorities were attentive to the island's stability. Access to safe drinking water was

another shared issue, as almost all respondents from both areas reported suffering from saline water contamination.

Finally, the Environmental Vulnerability Index (EnVI) score was calculated by averaging the weighted scores of the indicators. The EnVI score supports this result, with Bhasan Char scoring 0.0 (indicating the lowest level of environmental vulnerability) compared to Cox's Bazar scoring 0.50 (indicating a moderate level of vulnerability).

Table 8

Multidimensional Vulnerability Index (MVI)

Dimension	*Bhasan Char*	Cox's Bazar
Economic Vulnerability Index (EVI)	0.81	0.33
Social Vulnerability Index (SVI)	0.51	0.42
Health Vulnerability Index (HVI)	0.42	0.38
Environmental Vulnerability Index (EVI)	0.0	0.5
Multidimensional Vulnerability Index (MVI)	0.44	0.41

Source. Estimated result

The Table compares vulnerabilities of Rohingyas at Bhasan Char and Cox's Bazar across economic, social, health, and environmental dimensions. Because of their exclusion from citizenship rights and legal recognition, the Rohingyas live as subhuman beings, leading a stateless life marked by constant uncertainties and marginal existence (Uddin, 2020). This condition contributes to higher overall vulnerability in Bhasan Char (MVI 0.44), primarily due to greater economic instability and weaker social networks. In contrast, Cox's Bazar demonstrates slightly lower overall vulnerability (MVI 0.41), though it faces higher environmental risks. Health vulnerabilities remain moderate in both locations. These findings indicate that Bhasan Char requires greater socioeconomic support, whereas Cox's Bazar needs targeted interventions to address environmental challenges.

CONCLUSION AND POLICY RECOMMENDATIONS

The study aims to compare the status and severity of vulnerabilities of the Rohingya community in Cox's Bazar and Bhasan Char. Findings reveal that Rohingya people in Bhasan Char experience greater economic crises due to limited income opportunities, weaker market orientation, and fragile livelihood patterns. In contrast, residents of Cox's Bazar benefit from better income opportunities and improved access to training and markets. Socially, families in Bhasan Char demonstrate stronger cooperation; however, separation from relatives and geographic isolation weaken their overall integration, as a result of forced migration and relocation. Neighborhood relations in Bhasan Char are stronger than in the Cox's Bazar camps, although disputes often arise due to limited resources and shortages of aid. Conversely, Cox's Bazar faces a higher frequency of criminal activities and congestion, which intensify conflicts among camp residents.

Both locations also differ in healthcare conditions, although in some cases Rohingyas face similar health issues. The Rohingya people in Cox's Bazar suffer more from chronic illnesses compared to those in Bhasan Char, while infectious diseases are more prevalent in Bhasan Char. It is evident that Rohingyas are deprived of proper healthcare during emergencies despite the presence of government and NGO clinics in both areas. The health situation in Bhasan Char is further worsened by a higher dependency on quack doctors. In addition, informal birth attendants and maternal care services remain weaker in Bhasan Char compared to Cox's Bazar. From an environmental perspective, Cox's Bazar is more vulnerable to landslides, deforestation, and biodiversity loss, while soil erosion affects both regions. Residents of Cox's Bazar fear insecure housing during disasters, whereas Bhasan Char residents feel safer due to the planned housing framework, although they remain concerned about the erosion of the island itself.

Based on the Multidimensional Vulnerability Index (MVI), Bhasan Char is more affected by multidimensional vulnerabilities due to economic hardship and social segregation, while Cox's Bazar shows relatively lower multidimensional vulnerability but faces greater exposure to environmental hazards. The study suggests that relocation from Cox's Bazar to Bhasan Char has not been an adequate solution, as residents of

Bhasan Char face significant challenges across multiple aspects of life. Considering the situation of psycho-social isolation, the government could enhance inter-locational communication and mobility opportunities under secured regulations for Rohingyas in Bhasan Char to strengthen their social integration. This study can therefore serve as a useful reference for national and international policymakers in formulating strategies for short-term and long-term protection, resource allocation, and sustainable livelihood programs. Although the Government of Bangladesh has aimed to provide better livelihoods and security, further steps are needed to address the severity of healthcare vulnerabilities in both locations. The government should also seek international assistance to overcome funding shortages for the Rohingya population. In addition, the United Nations should take a more proactive role by mobilizing international donors, ensuring sufficient funding, and coordinating humanitarian programs that strengthen livelihood and security support for Rohingyas in Bhasan Char.

Furthermore, the study emphasizes the importance of Rohingya repatriation through urgent international collaboration to resolve the long-standing crisis. In this regard, UNHCR can play a role in mobilizing aid from financially developed countries as a temporary measure. Applying international pressure on the Myanmar government is crucial to ensure repatriation, which is essential for securing the Rohingyas' ultimate safety and identity. It is also necessary to maintain a balance between the rights of host communities and the rights of the Rohingya people within a legal framework. For future research, ethnographic and longitudinal approaches, supported by stronger statistical methods, should be employed. Further studies are needed to explore the deeper problems of the Rohingya community, particularly by examining their lived experiences.

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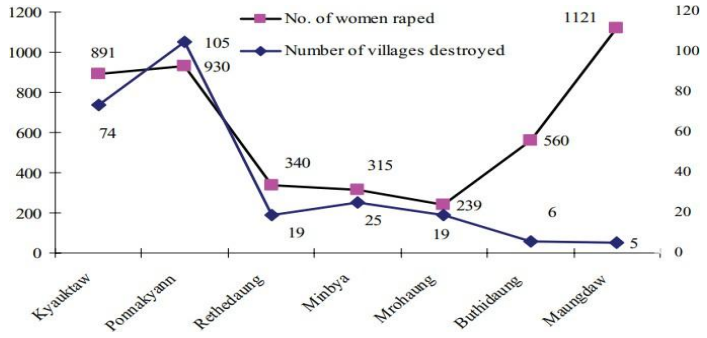
APPENDIX

Figure 1

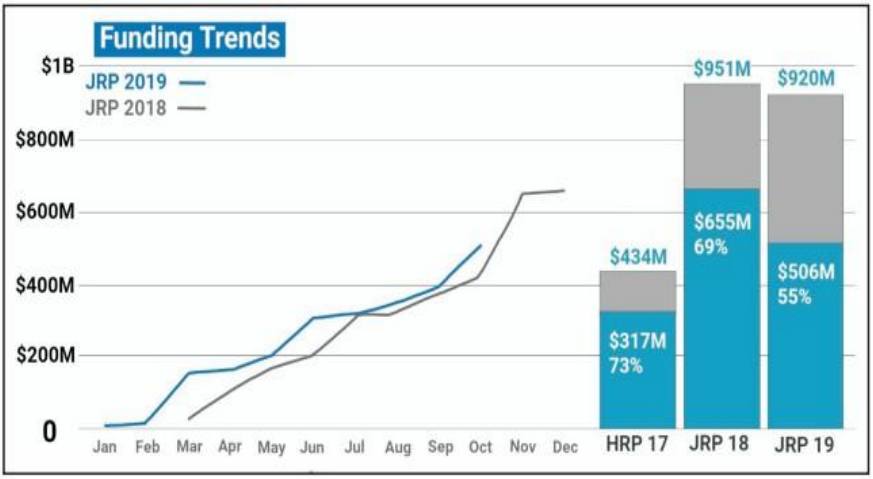
Summary of the Atrocities Afflicted in the Arakan, from 1978 to 1983



Source. Shwe (1989) cited in Ullah (2011).

Figure 2

International Funding Trends for Rohingya Support over the Years



Source. "Rohingya Refugee Crisis Joint Response Plan 2019 funding update", Inter Sector Coordination Group, (22 October 2019). Cited in Banerjee (2020).