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Assessing the Factors Influencing Migration Decision of Climate Refugees in Coastal Areas of Bangladesh

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Abstract

The major impacts of climate change play a substantial role in triggering human migration, especially in the coastal areas. The individual or combined effects of climate change are likely to trigger mass human movement both within and across international borders. People rarely move for a single reason; the motivation to migrate is complex of many factors. The main goal of this article is to identify the factors related to the decision to migrate taken by refugees in the coastal area. To assess this objective we employ exploratory factor analysis and structural equation modeling (SEM) and find that different factors influence refugees' migration decision differently. From the findings, it is seen that loss of shelter, extreme events, decreasing soil fertility and food shortage, variability in temperature patterns and exhaustion of natural resources are the most important environmental factors that affect the decision to migrate of climate refugees. Low income, increasing price, decreasing purchasing power are the most important economic factors that influence migration decision. No social factors have significant effect on migration decision while safety as a political factor has a moderate influence on refugees' decision to migrate. Finally, this article provides some recommendations for recognition of and protection for migrants forced to move to safer places due to certain direct impacts of climate change, notwithstanding the existence of multi-causality.

Keywords

Climate Change, Climate Refugee, Coastal Area, Migration

1. Introduction

For the last few years, there has been an expanding concern in connections be-

tween climate change and migration in all spheres. Climate change is intrinsically influencing the existence of millions of coastal people who are being imposed to leave their habitat to seek refuge in other areas. It is indicated by the Intergovernmental Panel on Climate Change (IPCC) that migration flows associated with climate change are predicted to rise, specifically in the world's poorest countries due to extreme weather events, such as stronger and more frequent storms, floods, and droughts, as well as long term problems, such as desertification, rising sea levels and riverbank erosion [1]. Several studies evaluate that these hazardous events could force 200 million to 1 billion people to maneuver permanently or temporarily within their own countries or internationally [2]. The UN High Commissioner for Refugees stated that 36 million people were displaced by natural disasters in 2009, and about 20 million of those were forced to move for climate change related issues [3].

Climate variability has appeared as a key discussion for environmentally vulnerable countries especially Bangladesh because this country is widely conceded as one of the most climate vulnerable countries in all over the world. Bangladesh is a flood plain basin contemplated as the coast of rivers and canals [4]. The country is inclining imperceptibly from the North to the South, convening the Bay of Bengal at the southern end. The whole coast runs parallel to the Bay of Bengal, forming 710 km long coastline [5]. The coastal zone covers 19 out of 64 districts facing or in proximity to the Bay of Bengal, encompassing 153 Upazilas [6]. About 30% area of Bangladesh belongs to the coastal area, which is regularly and recurrently battered by calamities like cyclone, tidal surge, inundation, intrusion of saline water, sea level rise and riverbank erosion costing thousands of lives and a huge amount of properties [7]. As such, thousands of people are being forced to move or flee either temporarily or permanently, from their homes. In reaching this estimate, the Association for Climate Refugees (ACR) held workshops in all 7 divisions of Bangladesh (Dhaka, Rajshahi, Rangpur, Barishal, Chittagong, Sylhet and Khulna) from March to May 2010. Each divisional workshop was attended by 25 - 30 community leaders who provided estimates for the amount of families that had been displaced for climate-related reasons from their respective districts and sub-districts. According to the Association for Climate Refugees (ACR) Tidal floods (as a result of sea-level rise) have affected 236 sub-districts in the coastal areas of Bangladesh. Most of the villages in the affected sub-districts have been flooded by tidal saline water twice a day for the last 3 years. 32 percent of the inhabitants (2,462,789 of 7,693,331 total inhabitants) in the affected unions have had their houses and lands destroyed by repeated cyclones and king tides. Of these 2,462,789 people, 64 percent (1,568,980 people) have been displaced locally, on remaining embankments or in higher ground in the exposed areas. 27 percent (675,113 people) have been displaced to other locations within Bangladesh, including to Dhaka. 9 percent (218,656 people) have been displaced international borders. Besides that, Riverbank erosion has affected 179 sub-districts in the mainland areas of Bangladesh. Most of

the villages in the affected sub-districts have been eroded by flash flood waters every year for the past three decades. 42 percent of the inhabitants (1,452,588 of the 3,490,500 total inhabitants) have had their houses and lands destroyed by annual river erosion often coupled with floods of these 66 percent (951,531 people) have been displaced locally on neighboring embankments or on higher ground. 26 percent (375,793 people) have been displaced to other locations within Bangladesh, including to Dhaka. 8 percent (125,264 people) have been displaced across international borders [8]. According to Stal (2009) Floods in coastal Bangladesh are expected to affect several million people, leading to mass displacement. Floods cause displacement in a simple manner. Floods damage and destroy the land, houses, infrastructure, and other tangible goods and assets. The loss of standing crops causes a serious decline in income for a family dependent on agriculture. Moreover, a landowner whose crops are damaged no longer needs labor for agricultural works which creates unemployment and cause migration [9]. In Bangladesh, tornados and tempest floods are the two essential reasons for movement. The nation faces visit twisters and tempest floods where a noteworthy local distinction exists. Twenty-six violent winds hit Bangladesh since 1970 [10]. The two noteworthy tornados slaughtered 500,000 and 140,000 people in 1970 and 1991 separately. A solid twister named SIDR struck the nation in 2007 yet individuals figured out how to take asylum in Shelters. Compared to previous cyclones, death toll was low (3500 persons) yet this cyclone displaced more than a half million people (World Bank, 2010). World Bank anticipated that another 7 million waterfront individuals will go up against violent winds by 2050 due to the evolving atmosphere. In addition, another violent wind named Bijli uprooted 200,000 individuals. The last devastated cyclone Aila, that hit the country in May 2009, dislodged 76,478 families of Satkhira and Khulna districts [11]. Considering the situation we can say that the nexus between climate change and migration is complex. People move from one place to another for many reasons. A range of factors propel the migration choice and provoke millions of people to leave their habitat for a better lifestyle, social security, economic solidarity or religious tolerance. As such, the main focus of this article is to identify the factors affecting migration decision of climate refugees in the coastal areas of Bangladesh.

2. Conceptualizing "Climate Refugee"

To define people displaced due to climate change Norman Myers (2005) in 2005 defined climate refugees as:

"People who can no longer gain a secure livelihood in their homelands because of drought, soil erosion, desertification and other environmental problems, together with associated problems of population pressures, and profound poverty [12]."

Even the International Organization for Migration (IOM) has proposed the

following definition to be able to categorize these people:

"Environmental migrants or climate migrants are persons or groups of persons, who, for compelling reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are obliged to leave their habitual homes, or chose to do so, either temporarily or permanently, and who move either within their country or abroad [13]."

Both environmental refugees and climate refugees are invoked to describe populations that have been displaced or are at risk of displacement associated with environmental changes. The term climate refugee especially has been mobilizing to describe as:

"Large numbers of people predicted to be permanently or temporarily displaced by climate change effects such as drought, desertification, deforestation, soil erosion, water shortages and rising sea level [14]."

"People who have to leave their habitats, immediately or in the near future, because of sudden or gradual alternations in their natural environment related to at least one of the three impacts of climate change: sea-level rise, extreme weather events, drought and water scarcity [15]."

3. Theoretical Framework and Hypothesis

According to Castles (2002) environmental conditions are part of a complex pattern of causality. They argue that environmental, economic, social, and political factors are interrelated and need to be examined jointly in order to understand the role environmental factors play in population movements (**Figure 1**).

3.1. Environmental Factors Affecting Migration Decision

Temperature variations and disastrous events incite short-distance internal relocation. Among various examinations exploring the connection among drought and migration, decreased precipitation is connected to expanded movement to urban territories in sub-Saharan Africa [16]; an expansion in interior movement inside Tanzania [17]; and an expansion in short-separate moves with regards to
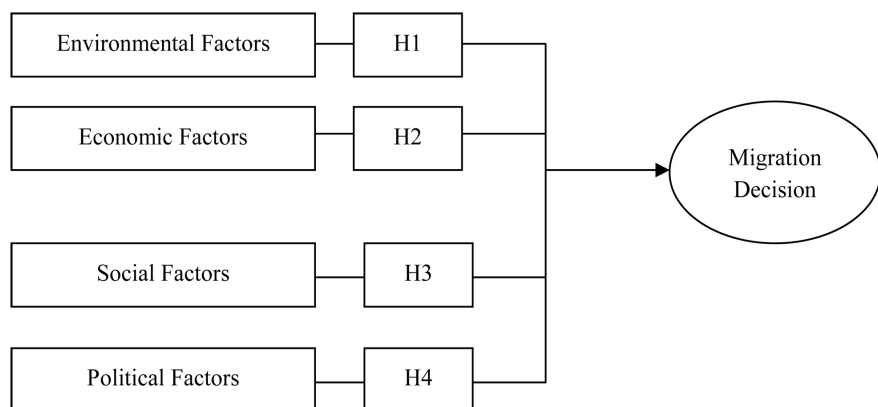
Figure 1. Research model.

Mali and Burkina Faso [18] [19]. Periods of extended droughts have also been shown to promote internal migration due to a decline in soil fertility for farming [20]. Bohra-Mishra *et al.* (2014) find that in Indonesia, which has a generally high baseline temperature, a further increase in temperature increments inter-provincial relocation of families. Beine and Parsons (2012) locate a positive role of hazards on internal movement to urban territories. Consistent with this finding, existing micro-level studies generally conclude that natural disasters result in short-distance internal migration [21] [22]. In light of these current discoveries, we speculate that disasters are probably going to impact internal movement, particularly given the proof that in the fallout of calamities individuals use their social network and move to the closest safe location. Environmental factors that may potentially affect human migration range from extreme, sudden events and natural disasters, to more gradual changes in climate [23]. Thomas Homer-Dixon (1991) pointed to seven major environmental problems which may contribute to population displacement: greenhouse warming, stratospheric ozone depletion, acid deposition, deforestation, degradation of agricultural land, overuse and pollution of water supplies, and depletion of natural resources. The above discussion led this study to posit the following hypothesis:

*H*1: *Environmental factors have high influence on refugees' migration decision*

3.2. Economic Factors Affecting Migration Decision

The neo-classical microeconomic perspectives tend to focus more on the human capital and economic dimensions of migration decision-making than environmental context during a hazardous situation. Here, migration is viewed as shaped by cost-benefit calculation with a personal investment in migration behavior only being justified by sufficient returns to the behavioral investment. Environmental considerations are, in a sense, implicit here since environmental hazard or other risks may represent negative locational characteristics, while positive environmental attributes likely increase destination attractiveness. Econometric migration models have disclosed associations with locational amenities and some suggest that an indication of the societal value placed upon such amenities, or dis-amenities, is reflected in wage differentials across locations [24]. According to this approach, individuals migrate from lower-wage to higher-wage locations to increase their current and future incomes. Consistent with this approach, neoclassical micro-economists regard migration as a rational calculation by individuals to maximize their earning [25]. Prospective migrants will take the decision to migrate if they can have a positive net return from movement [26]. Adverse environmental changes can negatively impact on household-asset value and income through land and property degradation and through declines in agricultural performance (e.g., reduction in crop yields). It can also increase the price of goods and decrease purchasing power. This may in turn negatively influence the well-being of people whose income, employment, is

directly or indirectly related to the agricultural sector [27]. The above discussion led this study to posit the following hypothesis:

H2: *Economic factors have high influence on refugees' migration decision*

3.3. Social and Political Factors Affecting Migration Decision

Recent studies have also identified social, political factors as a possible driver of human migration along with economic and environmental determinants [28]. A recent body of literature has considered various economic, social, demographic, environmental factors that may influence migration [29]. Critical consideration of temporal shifts in individual and household level migration decisions can be found in Zelinsky's (1971) explication of the "mobility transition hypothesis." With a focus on the association between modernization and migration, Zelinsky argues that social and political opportunities inherent within modernization yield increases in personal freedom and declines in the difficulties inherent in breaking ties with residential origins. These changes, it is argued, enhance the role of personal preferences in migration decision-making processes [30]. Modern technology and social network increases households' ability to act freely upon these preferences for taking decision to migrate to safer residential environments [31]. The above discussion led this study to posit the following hypothesis:

H3: *Social factors have high influence on refugees' migration decision*
H4: *Political factors have high influence on refugees' migration decision*

4. Materials and Methods

In this research, quantitative research design has been employed for assessing the factors influencing migration decision. The study areas for this study have been selected from disaster-prone coastal areas like Haridhali Union of Paikgachha Upazila of Khulna District, Haimchar Union of Uttar Algi Durgapur Upazila of Chandpur District and Sreepur Union of Mehendigang Upazila Barisal District. There are no baseline data about the household numbers of climate refugees in the selected study areas. As such I have made a baseline survey and found approximately 1682 Households of climate refugees. For these 1682 households, 150 households from three different areas have been selected randomly by using the sampling size formula ($n = Nz^2pq/Nd^2 + z^2pq$) as the sample of this study [32]. Household Head (Male or Female) have been selected as the unit of analysis to collect the data about the entire household. Multi-stage Sampling has been selected for choosing the sample from the population because the sample population was scattered over a wider geographical area and no frame or list is available for sampling. From the most disaster-prone areas (Shatkhira, Khulna, Potuakhali, Chandpur, Bagerhat, Faridpur, Barguna, Barisal, Chittagong, Cox Bazar) Khulna, Chadpur, Barisal have randomly been selected as a primary cluster of disaster-prone coastal district. There are total 9 Upazillas, 8 Upazills, and 10 Upazillas respectively in this district. From these clusters Paik-

gachha Upazila of Khulna District, Haimchar Upazila of Chadpur District and Mehendigang Upazila Barisal district has been selected randomly. In Paikgacha Upazilla there are total 10 Unions, in Haimchar Upazilla there are total 6 Unions and in Mehendigang Upazila there are total 14 Unions. From this Unions Haridhali Union, Uttar Algi Durgapur Union and Sreepur Union have been randomly selected as a specific study area. Survey method has been used to collect data from the respondents as such; a structured questionnaire has been generated and is measured on the Likert scale. The reliability and the validity of the questionnaire have been thoroughly examined, while the Factor analysis technique has been used to analyze the data using SPSS software version 23.0. We use varimax rotation for the exploratory factor analysis (EFA). The appropriateness of the sample size is checked using the Kaiser-Mayer-Olkin (KMO) test. The benchmark for sample adequacy is 0.7 or above. The total variance explained is compared with the benchmark of 60 percent. The rotated component matrix provides variables and items that are derived by the software along with their loadings, which are then compared with a benchmark of 0.45.

4.1. Measurement Instruments

To ensure the validity of all measures regarding factors affecting migration decision, the measurement items for latent constructs were developed from prior studies. Then, its' items have been measured on a Likert scale. The detailed items of each construct and their sources are listed in Table 1.

Table 1. Summary of construct with measurement items.

Variable	Coding	Items	Source
Environmental Factors	ENV1	Variability in Precipitation and temperature patterns	[16]-[22]
	ENV2	Extreme events such as cyclone, floods, droughts, erosion	
	ENV3	Decreasing soil fertility and food shortage	
	ENV4	Exhaustion of natural resources	
	ENV5	Loss of Shelter	
Economic Factors	ECO1	Low income	[24] [25] [26] [27]
	ECO2	Unemployment	
	ECO3	Underemployment	
	ECO4	Increasing price	
	ECO5	Decreasing purchasing power	
Social Factors	SOC1	Family conflict	[28] [29]
	SOC2	Welcome by relatives	
	SOC3	Welcome by NGO'S	
	SOC4	Urban oriented education	
Political Factors	POL1	Welcome by Government	[28] [29]
	POL2	Safety	

This study modified some items to better fit the current research context. Measurement items for Environmental Factors, Economic Factors, Social Factors, and Political Factors were adopted from the climate change and migration literature [Afifi *et al.* (2014), Barrios *et al.* (2006), Findley (1994), Henry *et al.* (2004), McLeman & Ploeger (2012), Lu *et al.* (2012), Salauddin & Ashikuzzaman (2012), Feng *et al.*, (2010), Marchiori *et al.* (2012), Black *et al.* (2011), Castles (2002)].

5. Results and Discussions

5.1. Descriptive Statistics

The first output from factor analysis is a table of descriptive statistics that involves all the variables responsible for the migration decision is under investigation. Looking at the mean we can conclude that Loss of shelter (4.78), Extreme events (4.65), Decreasing soil fertility and food shortage (4.12), variability in temperature patterns (3.62) and exhaustion of natural resources (3.59) are the most important environmental factors that affect the decision to migrate. Low income (3.83), increasing price (3.07), Decreasing Purchasing Power (3.29) are the most important economic factors that influence migration decision. No social factors have significant effect on migration decision while safety (2.07) as a political factor has a moderate influence on migration decision (Table 2).

Table 2. Table of descriptive statistics identifying main factors responsible for migration decision using factor analysis.

	Descriptive Statistics		
	Factors Affecting the Migration Decision	Mean	Standard Deviation	Analysis N
Environmental Factors	Variability in precipitation and temperature patterns (ENV1)	3.62	1.060	150
	Extreme events such as cyclone, floods, droughts, erosion (ENV2)	4.65	0.602	150
	Decreasing soil fertility and food shortage (ENV3)	4.12	1.086	150
	Exhaustion of natural resources (ENV4)	3.59	1.171	150
	Loss of shelter (ENV5)	4.78	0.542	150
Economic Factors	Low income (ECO1)	3.83	1.163	150
	Unemployment (ECO2)	3.02	1.497	150
	Underemployment (ECO3)	2.79	1.349	150
	Increasing Price (ECO4)	3.07	1.332	150
	Decreasing Purchasing Power (ECO5)	3.29	1.292	150
Social Factors	Family conflict (SOC1)	1.57	1.077	150
	Welcome by relatives (SOC2)	1.96	1.474	150
	Welcome by NGO'S (SOC3)	1.37	0.799	150
	Urban oriented education (SOC4)	1.31	0.741	150
Political Factors	Welcome by Government (POL1)	1.50	0.968	150
	Safety (POL2)	2.07	1.455	150

Source: Authors' calculation.

5.2. Reliability Analysis of the Construct

It is concerned with the consistency and stability of the measurement. In the current study, there are four independent scales and one dependent scale used in survey questionnaire to measures the constructs of the research model. In this study, there were sixteen scales used in the survey questionnaire to measure the constructs in the proposed model; Environmental Factors (EF), Economic Factors (ECF), Social Factors (SF) and Political Factors (PF) of migrated people in the coastal areas. A reliability coefficient was run on SPSS for each set of constructs and the results are presented in Table 3, which shows the Cronbach's alpha (a) value for each variable. The result of this analysis shows that all of the constructs got a high reliability and more than 0.70 except political factors (PF). Cronbach's a value result varied between 0.631 and 0.912. Overall, the result shows that all alpha values of the study instruments are reliable and exhibit appropriate construct reliability.

5.3. Factor Analysis

5.3.1. Kaiser Meyer Olkin (KMO) and Bartlett's Test

Kaiser Meyer Olkin (KMO) and Bartlett's Test measures the strength of relationship among variables. The KMO measures the sampling adequacy which should be close than 0.5 for a satisfactory factor analysis to proceed. Kaiser (1974) recommend 0.5 (value for KMO) as minimum (barely accepted), values between 0.7 - 0.8 acceptable, and values above 0.9 are superb. Looking at the table below, the KMO measure is 0.622, which is close of 0.5 and therefore can be barely accepted (Table 4). Bartlett's test is another indication of the strength of the relationship among variables. From the table, we can see that Bartlett's Test of Sphericity is significant (0.00). As such, this test indicates very strong relationship among variables.

5.3.2. Measurement Model

Confirmatory Factor Analysis (CFA) entails associating the latent variables with their measured variables by restricting the former to load with their respective measured variables such that they are allowed to correlate. In the Confirmatory factor Analysis (CFA), convergent validity relies on the average variance extracted (AVE) and Composite Reliability (CR) as a base. Table 5 shows that the estimated constructs loading ranged from 0.48 to 0.92 and AVE ranged from

Table 3. Cronbach's alpha reliability results.

Variables	Items Number	Cronbach's alpha	Comments
Environmental Factors	5	0.885	High
Economic Factors	5	0.836	High
Social Factors	4	0.784	Good
Political Factors	2	0.631	Moderate
Migration Decision	2	0.912	Excellent

Source: Authors' calculation.

Table 4. KMO and Bartlett's test.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.622
	Approx. Chi-Square	596.968
Bartlett's Test of Sphericity	Degree of Freedom (df)	120
	Significance (Sig.)	0.000

Source: Authors' calculation.

Table 5. Convergent validity for the constructs.

Variable	Item	Standardized Loading	AVE	CR
Environmental Factors	ENV1	0.74		
	ENV2	0.85		
	ENV3	0.87	0.639	0.898
	ENV4	0.82		
	ENV5	0.71		
Economic Factors	ECO1	0.64		
	ECO2	0.71		
	ECO3	0.70	0.587	0.875
	ECO4	0.85		
	ECO5	0.89		
Social Factors	SOC1	0.72		
	SOC2	0.67		
	SOC3	0.73	0.431	0.747
	SOC4	0.48		
Political Factors	POL1	0.59		
	POL2	0.78	0.484	0.648
Migration Decision	MG1	0.86		
	MG2	0.92	0.747	0.922

Source: Authors calculations.

0.48 to 0.74 and CR ranged from 0.64 to 0.92 are greater than the recommended levels [33] [34]. Since the factor loadings, composite reliabilities and average variance extracted of the construct are at acceptable levels.

5.3.3. Discriminant Validity

In this study, discriminant validity was assessed by comparing the absolute value of the correlations between the constructs and the square root of the average variance extracted by a construct. When the correlations are lower than the square root of the average variance extracted by a construct, constructs are said to have discriminant validity. As shown in table, all squares roots of the AVEs are higher than the correlations between constructs and that definitely confirms adequately discriminant validity. The results shown in Table 6 reveals that all constructs in this study confirm the discriminant validity of the data.

Table 6. Discriminant validity results for the measurement model.

	ENV	ECO	SOC	POL	MIG
ENV	**0.799**				
ECO	0.54	**0.766**			
SOC	0.41	0.67	**0.690**		
POL	0.32	0.70	0.49	**0.696**	
MIG	0.49	0.55	0.63	0.60	**0.865**

Source: Authors calculations.

5.4. Hypothesis Testing

The structural model analyzes the relationships among the variables and the significance of these relationships (Table 7). At this point, we are able to reject or accept the study's hypotheses. The results suggest that economic factors and environmental factors have a significant relationship with the migration decision. This is in line with hypotheses H1 and H2 respectively. We therefore, accept these two hypotheses. The hypotheses for the variables social factors and political factors have no significant relationship with migration decision; however, rejected.

6. Discussions

Richard Black, after reviewing a wide range of studies on environmental degradation induced migration, claims that there is no convincing evidence that it leads to large-scale displacement. He also points out that the links postulated in the literature between environment and migration are not explicitly demonstrated. Black recognizes that environmental degradations and catastrophes, such as rising sea levels, flood, cyclones, and declining water supplies are very real and important factors in the decision to migrate. But he finds little evidence of actual permanent large scale displacement directly caused by these factors. But from my research findings, the statistical tables and the data show that environmental factors are the main factors that triggered massive displacement in the coast. It is because most of the climate migrants live alongside the coast which is geographically so much vulnerable to natural disasters. So when sea level rises all their locations go under water or when riverbank erosion happens all their land washed away so they do not have any other option without taking migration decision. So in my research areas, environmental factors are the main factors that trigged migration.

Lonergan (1998) suggests that environmental factors cannot be easily separated from other socioeconomic and political factors and processes triggering migration. Castles takes a more nuanced view, noting that migration involves complex patterns of multiple causalities, in which natural and environmental factors are closely linked to economic, social, and political ones (Lonergan & Swain, 1998). But from my research findings, the statistical tables and the data show something different. Environmental factors trigged the economic factor in

Table 7. Structural model and hypothesis testing.

		Estimate (β)	P Value	Decision
H1	Environmental Factors → Influence Migration Decision	0.193	0.010	Accept
H2	Economic Factors → Influence Migration Decision	0.218	0.000	Accept
H3	Social Factors → Influencing Migration Decision	0.052	0.779	Reject
H4	Political Factors → Influencing Migration Decision	−0.070	0.430	Reject

the study areas but not the social and political factors. Environmental factors such as extreme events, decreasing soil fertility and food shortage, variability in temperature patterns, loss of shelter and exhaustion of natural resources trigged economic factors like income, price, and refugees' purchasing power. Social factors like family conflict, urban-oriented household, welcome by NGO's or welcome by relatives didn't play much significant role in taking migration decision. That is because of the economic hardship of their relatives is not so good to take the responsibilities of others. Another reason is that most of the refugee relatives stay in one room areas where they don't want to take the burden of others. Another reason is that the relatives who are wealthy enough to take the responsibilities of climate refugees are unwilling to do so because of their status. In Bangladesh, the government built primary schools in remote places so like developed countries urban-oriented household does not play a crucial role for migration decision. In developed countries like the United States, Environmental NGOs (ENGOs) play a role in the establishment and enforcement of environmental priorities. Not exclusively are ENGOs conquering insufficiencies in great global law, they currently assume distinctive jobs in need setting and the implementation of worldwide standards. They can articulate powerful universal, single-purpose standards because they do not have to trade off for other objectives. They have little incentive to subordinate science to other political or economic considerations. Finally, they can regularly coordinate with neighborhood ecological gatherings. ENGOs are additionally specialists of social learning. They add to societal change by surrounding the issues, building networks, and setting precedents. But in Bangladesh, most of the ENGOs are not functioning properly. They just provide some relief when climate migration took place. Otherwise, their functions are limited. That's why this factor plays less impact on the migration decision of refugees. Besides that refugee migration is also influenced by political factors like political safety and welcome by the government. In Bangladesh the government didn't specify any priorities or policies for the people who could be displaced due to hazardous events. So most often government took necessary steps after migration has been initiated by the refugees, not before the migration. Thus, it does not play a crucial role in taking migration decision.

7. Concluding Remarks

Using confirmatory factor analysis (CFA) and structural equation modeling (SEM) we explore the influential factors that affect the climate refugee's decision to migrate. We have found that environmental degradation, resource depletion, and natural hazards play a contributing role as an important push factor in affecting population movement in coastline areas. Environmental degradation as a result of climate change may be one of the many triggering factors for migration but it is not the only cause. Environmental hardships are often aggravated by issues such as economic hardship also (unemployment, income, increase in price etc.). So when environmental deteriorations cause displacements, they are often the byproduct of economic factors also. This research considers the conceptualization of the environment as a primary cause of forced displacement. But as a whole migration involves complex patterns of multiple causalities, in which natural and environmental factors are closely linked mainly with economic factors as well. Considering the situations of climate refugees the following recommendations have been suggested:

1) A particular national plan for climate refugees should be illuminated by the Government to resolve climate displacement related issues. This national plan could be subsumed with Government's climate change adaptation strategy also.

2) It is important that the Government clearly identifies the bodies with primary responsibility for climate displacement. In particular, climate displaced persons should have a clear understanding of which institutions are able to provide social, financial and resettlement assistance.

3) Government should provide emergency relief services and establish first aid centers in heavily remote and coastal areas for climate displaced persons.

4) All areas that cannot be protected through increased coastal defenses for practical or economic reasons need to be included early in long-term resettlement and reintegration programs that make the process acceptable for the affected people.

5) International communities, and especially donor countries, must also support efforts to eliminate corruption and vastly improve transparency. It is not enough to simply provide funds for climate displacement programmes and policies, it is essential that funds are monitored and effective implementation of programmes is ensured.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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