Bangladesh Journal of Political Economy

Vol. 36, No. 2, December 2020, pp. 155-172
Bangladesh Economic Association
(ISSN 2227-3182)

Reasons behind Migration: A Study in the Coastal Areas of Bangladesh

Rafia Islam Lina*
Md. Alamgir Hossain Bhuiya**

Abstract

Bangladesh is a deltaic coastal country and one of the most vulnerable countries due to climate change globally. From the coastal areas, a considerable portion of the population is displaced almost every year, both temporarily and permanently, due to natural calamities and other socio-economic reasons. The purpose of the study is to find out the impact of climate change on migration in the coastal areas of Bangladesh. Primary data is used to investigate the study objectives. Data were collected from the coastal regions of Bangladesh. A multi-stage cluster random sampling technique is used to select the sample unit. The total sample size is 450. The data are collected by interview method with a structured questionnaire. To analyse data, descriptive statistical analysis and econometric analysis have been used to investigate the study's objectives. The econometric analysis suggests that climatic vulnerabilities and economic insolvency have a significant impact on migration. Other variables (social problem, education, lack of health care facilities, and lack of job opportunities) have influenced migration, but the result has not been statistically significant. A unit increase in climatic vulnerabilities increases the odds in favour of migration decision by 3.753 points. So, it is clear that sudden onset and slow onset climatic events influenced migration in the coastal regions of Bangladesh. One unit increase in economic insolvency leads to an increase in the odds of migration by 2.465

* Associate Professor, Department of Economics, Comilla University, Cumilla. E-mail: afiaislam43@gmail.com
** Professor, Department of Economics, Islamic University, Kushtia. E-mail: bhuiyaalamgir @gmail.com

points.Climate change makes coastal peoples and their livelihood, earrings sources, and job facilities vulnerable, and they migrate from their place of residence to another location. So, the stakeholders and policymakers should undertake a climate resilience development policy to create alternative livelihood activities or employment opportunities, along with skills development in the coastal regions of Bangladesh.

JEL Classification *R23 · N35 · J61 · J11*

Keywords *Migration · Coastal Area · Bangladesh*

Introduction

Bangladesh, one of the most densely-populated countries globally, is situated in the world's most significant delta, formed by the rivers Ganga, Brahmaputra, and Meghna. Coastal environments, particularly at risk, include mangroves, tidal deltas and low-lying coastal plains, sandy beaches, coastal wetlands, estuaries, and coral reefs. These bio-geophysical possessions will have consequent effects on ecosystems and eventually affect socio-economic systems in the coastal zone. As a result, a large number of people migrate from their villages to nearby areas. Lein (2000) stated that Bangladeshi coastal communities hadfaced environmental challenges for the last few centuries. Ministry of Environment and Forest of Bangladesh Government (2005) mentioned that Bangladesh and its population are highly vulnerable to the adverse effects of climate change. The scale and frequency of extreme climate events have been steadily increasing, making survival difficult and expensive. Myers (2002) described that people could not cope with these events; more than 26 million people in Bangladesh are likely to migrate, i.e., almost 16% of the country's total population. Migration occurs in response to multiple pressures, and it is difficult to isolate environmental pressures from ongoing economic ones. Thus, the effects of climate change increase the impetus towards migration, forcing people to search for safer environments that can offer them reliable livelihoods and household security (Black, 2008).

Migration is not a new phenomenon in Bangladesh. The process of rural to urban migration in Bangladesh started a long time ago. It existed in the historic and Mughal periods. During the British period, migration was low in this subcontinent because of economic, social, and cultural reasons. After the partition of India in 1947, migration in Bangladesh (then East Pakistan) was mainly international, being pursued by the influx of refugees from India. Rural-urban migration, however, even before the liberation of Bangladesh in 1971, did not receive momentum. After liberation, several socio-economic and political factors have contributed to increasing the internal migration rate in Bangladesh.

However, a mix of pull and push factors have been identified to account for the internal migration in Bangladesh (Chaudhury, 1976).

Islam (2004) stated that the coastal zone covers 47,201 square kilometre land area, which is 32 percent of the country's total landmass. UNCLOS (1982) mentioned that the water area covers 370.4 km (200 nautical miles) from the coastline estuaries and the internal river water. According to the coastal zone policy (CZPo, 2005) of the Government of Bangladesh, 19 districts comprising 163 Upazilas and the Exclusive Economic Zone (EEZ). A total of 48 Upazilas are exposed to the sea, and lower estuaries among 12 districts, are defined as the exposed coast, and the remaining 115 Upazilas of the coastal districts are termed as interior coast.

In Bangladesh, the typical climate change elements that affect lives and livelihoods in the coastal locations are temperature increases and variations in rainfall. It was found that the coastal study districts, e.g., Khulna and Patuakhali were very vulnerable to both rapid onset events and processes, such as cyclones, storm surges, tidal floods, and slow onset events, like salinity intrusion and sea-level rise. Most of the people in the coastal areas migrate due to climate change. People living in the rural areas, especially in the coastal areas of Bangladesh, are often affected by hazards directly linked to climate change, such as cyclones and storm surges. Frequent storms, floods, and droughts were everyday things that made the situation worse in Bangladesh. Due to these forces, 12-17 million Bangladeshis moved to India, and half a million moved internally (Homer-Dixon, 1999; Lee, 2001; Swain, 1996).

Many works have been done on this issue in the context of different regions of Bangladesh. It is found that climate change adversely affects migration, especially in the coastal zones. A small number of works have been done in the coastal areas. Was so identifying the main reasons behind migration in the coastal areas is highly needed in Bangladesh.

The objective of the study

The general objective of the research is to find out the main reasons behind migration in the coastal areas of Bangladesh. However, the specific objectives of the study are to find out:

i) The economic reason responsible for migration and
ii) Climatic factors and their effects on migration.

Literature Review

A significant body of literature indicates that prehistoric human settlement and migration patterns had strong linkages to changes in climatic conditions and other

socio-economic conditions. Climate change is a significant component of global environmental change which influences drivers of migration across overlapping environmental, demographic, political, social, and economic spheres (Black et al., 2011; Foresight, 2011). Projections suggest that a large part of such migration will be in the Global South, within countries or nearby countries, including areas of environmental risk (Foresight, 2011).

Afolayan and Adelekan (1999) exposed that male household members have often migrated to Khartoum in search of wage labour when low rainfall hinders agricultural production in Western Sudan. Meze-Hausken (2000) presented that families undertake migration during times of drought after other measures, such as reducing food consumption and selling off possessions, have been exhausted in dryland areas of Ethiopia.

Stern Review (2007) also mentioned that both sea-level rise and other climate-induced changes could submerge one-fifth of the current territory of Bangladesh. Sea level rise has already caused land erosion, increased salinity in coastal areas. More than one million people have already lost their homes, and 70 percent of these people became landless due to river erosion. Initially, these people stayed in nearby areas. RMMRU (2007) mentioned that at present, affected people have adequate knowledge that the slow siltation process and high population pressure will make their condition worse and ultimately force them to move to somewhere safe, especially in urban areas.

Bangladesh has been rated as the third most vulnerable country globally in terms of people affected by sea-level rise. By 2050, supposing a sea-level rise of 27 cm, around 33 million people would be suffering from surging. A 1 m rise in sea level would submerge a complete 18 % of the total land area in Bangladesh (Pender, 2008). Islam (2004) mentioned that global warming will cause an annual temperature rise of 0.4 degrees Celsius in Bangladesh and result in greater frequency and intensity of cyclone storms. At least 70 significant cyclones have hit the coastal belt of Bangladesh for the past two hundred years. The extent of sea-level rise and cyclones will strongly affect the coastal system and its living style. Non-climate stresses may already have unfavourably affected the coastal living style, and thus it is unable to cope with additional pressures. As a result, people moved from coastal areas to the nearest villages.

Syed and Amin (2016) indicate that the average maximum temperature of the country has increased in pre-monsoon by 0.016°C per year, in monsoon by 0.034°C per year, in post-monsoon by 0.018° and in winter by 0.015°C between 1978–2007. The research also indicates that the average temperature of the Barisal region (which covers Patuakhali study district), Rajshahi, and Sylhet

(which represents Sunamganj study district) region was increasedthroughout 1978–2008. It is expected to continue. The predictions are that Bangladesh will experience an increase of 1.5°c by 2050 (World Bank, 2013). Regarding rainfall patterns, the most recent report indicates that the average rainfall may increase by 3.3 mm per year in monsoon and 8 mm per year in post-monsoon in Bangladesh. The same report indicates a negative trend in both winter and pre-monsoon. Some of the climatic and environmental variables such as temperature rise, excessive rainfall are the main factors for increasing vulnerability in households over the country. Temperature rise and excessive rainfall affect households' lives and livelihoods. Thus they moved from an unfavourable place to a favourable place.

Some studies found a positive association between asset loss and the decision to migrate (Rayhan and Grote, 2007; Paul, 2003). Some claimed that population pressure, landlessness, and unemployment in the rural areas forced people to settle down in the risky areas, making them more vulnerable to climate change and environmental degradation (Islam, 1992).

Some studies found, "increases in the frequency and intensity of tropical cyclones in the last 35 years can be attributed in part to global climate change" (Emanuel 2005, Webster et al., 2005 and Bengtsson, Roger and Roeckner 2006 cited in World Bank, 2010:4). World Bank projected that another 7 million coastal people will confront cyclones by 2050 because of the changing climate. The total number of damaged houses will increase to 1.6 million because of cyclones induced by climate change. Bangladesh will continue to encounter climate change because of the rising sea level and the melting ice caps (ice mass consisting of less than 50,000 squarekilometres). Moreover, the warmer ocean will bring in more intense cyclone activity (World Bank, 2010).

Cyclone Bijli displaced 200,000 people. The last devastated cyclone Aila, which hit the country in May 2009, displaced 76,478 Satkhira and Khulna districts (International Organization for Migration, 2010). However, the New York Times (May 25, 2009) reported that "In coastalBangladesh, emergency officials, moved about 500,000 people to temporary shelters after they left their homes to escape tidal waves churned by high winds."

Ninemonths after Aila, around 200,000 people were still reported to be homeless. Initially, people moved out to the nearby areas, returned after a while to their homes. A vast majority became seasonal migrants, as they feared no employment opportunities would be available for them in the surrounding areas (International Organization for Migration, 2010).

Islam (2004) also mentioned that almost 9,00,000 people died owing to catastrophic cyclones throughout the last 35 years. The Noakhali and Chittagong received 40 % of the cyclones, which is the most vulnerable area for the landfall

of cyclones. The Chittagong and Cox's Bazar coast received around 27 %, whereas Khulna -Sundarban and Barishal-Noakhali cost are relatively less susceptible (Rahman, 2001).

From data of the last 100 years, it has been observed that the surface temperature has increased by between 0.4 C and 0.80C (New Age, 2007). The average temperature rise in Bangladesh has been predicted to be 10C by 2030 and 1.40C by 2050. Such increased temperatures will intensify droughts in the future in susceptible areas. A total of 19 droughts occurred over the 31 years from 1960 to 1991. They affected about 47% of the area and 53% of its population (Ali, 2007).

Zaman (1989) states that 88 percent of migrant agricultural communities in Bangladesh remained within two miles of their previous residence following land erosion and loss of homes due to flooding. Similar trends were found on cyclone response too. Such rapid-onset disasters lead to temporary displacement to nearby areas as people lack resources to move farther, and many return and reconstruct their homes (Piguet, 2011). Besides, people prefer to stay with family and friends, are linked to social networks (Barnet and Weber, 2009), and live in ways familiar to them (Perch-Nielson et al., 2008). However, it may be noted that migration is not always a primary response to a disaster, mainly when emergency aid compensates for damage (Kniveton et al., 2009). Often seasonal and circular migration is an essential livelihood option that helps communities gather resources from their destination while offsetting the resource pressure back home. Movement induced by climate change is likely to be short-term and occur internally over short distances, especially in low-income countries (Sward and Codjoe, 2012; Gemenne, 2011).

Internal migration to urban areas is showing a sharp increase (Planning Commission, 2010). An estimated half a million people move to cities every year, mainly from coastal and rural areas. Income diversification is the primary driver for this group of migrants (Islam, 2012).

Bangladesh has received floods every three years for the last twenty years, and affected people do not defer their migration decisions because the risk increases if a repeated flood occurs in the same land (IOM, 2010). Rayhan and Grote (2007) reported that at least one member migrated permanently from one-fourth of the households. Out of five households, four households' members left their homes because of unemployment due to repeated floods, which took place in the area. Approximately 89 percent of them migrated to urban areas. Only a few, six percent migrated to other rural areas, and five percent migrated to another country.

Millions of people in the coastal areas of Bangladesh are under threat of climate change and climate variability issues. According to Rabbani (2009), more than 35 million people will be displaced from 19 coastal districts of Bangladesh in case of a 1-meter sea-level rise in this century. IOM (2009) indicated in a study that many people have already migrated to the urban slums from the coastal zones of Bangladesh due to frequent cyclones, storm surges, river erosion.

The Cyclone Aila, which hit coastal Bangladesh on May 25, 2009, caused a massive loss of properties and infrastructure and displaced many people from their homes (DMB, 2009). The coastal embankments damaged by the cyclone and tidal surges could not be repaired even after one year (Oxfam, 2010).

The coastal areas are particularly vulnerable to tropical cyclones and associated storm surges. In 1970, 1985, 1991, 1997, 2007, and 2009 caused huge losses and displaced millions of people in the coastal areas (Akter, 2009).

In 2009, during Cyclone Aila in Bangladesh, 190 people were killed, and around 4.82 million people were affected in 11 coastal districts (Leighton et al., 2011). Based on the Ministry of Disaster and Management and Relief (MDMR, 2013), the central city districts, especially Dhaka, are common destinations for people displaced by disasters.

IOM (2010) states that land lost to sea-level rise will reduce agricultural productivity and erode agricultural employment, eventually causing many to migrate. Other recent research conducted by the Comprehensive Disaster Management Programme (CDMP) in 2014 under the Ministry of Disaster Management and Relief takes note of the four internal displacement factors (river erosion, flooding, waterlogging, and salinity) and the ways that they manifest in internal displacement in Bangladesh (CDMP, 2014). It is more immediately evident in the coastal areas because of the rising sealevel. However, the CDMP initiated study limits its focus to displacement only, excluding the situation of people who might voluntarily choose to migrate. In the same way, Shamsuddoha et al. (2012) state that Cyclone Aila displaced around 300,000 people from the coast of Bangladesh.

Shamsuddoha et al. (2012) highlight the different ways environmental processes displace people. Displacement arising from sudden-onset disasters is often immediate. In contrast, in the context of slow-onset disasters, people's environment and livelihoods are gradually affected, compelling people to first undertake economic migration, which might initially be temporarily or seasonal, followed later by permanent migration. In the study, people who had better financial, social, and human capital tended to approach migration in a more planned manner, while the poor and vulnerable who had fewer or no options were

displaced or remained trapped in vulnerable locations. Foresight (2011) reported echoed the same concern for trapped populations on a global scale. It discusses environmental migration, global migration trends,particularly internal migration in low-income countries, and projects that millions of people will be trapped in areas vulnerable to environmental change in future decades.

Research Methods

The study is mainly based on primary data collected through interviews using a structured questionnaire covering 450 households from the three exposed coastal Upazilas, namely Ukhiya, Sarankhola, and Char Fason of Bangladesh. The sample units have been selected by the multi-stage cluster random sampling method. The number of household heads from each village is 150. Data were collected from July to September 2018. By using SPSS and MS- Excel, the data have been analysed. Both descriptive statistical analysis and econometric analysis, the Logistic regression model, have been used to analyse and interpret the data.

Findings and Discussion

The primary reason behind migration in the coastal areas of Bangladesh: To estimate the influencing factors behind migration, the empirical logit model can be written as,

$$Y = \beta 0 + \beta 1X + \mu$$

Where Y is the migration status (1 = Respondents who migrate, 0 = Respondents who do not migrate), $\beta 0$ is the Y-intercept, whereas $\beta 1$ is a coefficient to be estimated. X is the explanatory variable that represents the primary reasons behind migration.

The simple Binary Logistic regression has been used to investigate the relationship between migration and significant reasons behind migration in the coastal areas of Bangladesh. To run logistic regression, it is essential to ensure that there is a relationship between two variables. For that reason, at first, it is required to check the cross-tabulations or Chi-Square test. Here, the independent variable is categorical, so starting by running cross-tabulations and checking the Chi-Square test is required.

1. Cross tabulation and Chi-Square Test:The cross-tabulation shows a relationship between the two variables. From the result, it is found that the value of Chi-Square is 17.537, and it is significant. So, there is a relationship

exist between migration and the significant reasons behind migration. The tables are shown in the appendix. The Logistic regression model can estimate migration as the dependent variable and significant reasons behind migration as the categorical independent variable.

2. Logistic Regression: From the result, it shows that migration ("Yes") is coded as one (1) and not migration ("No") is coded as 0. The Categorical Variables Coding table shows that the six main reasons behind migration have been re-coded in the logistic regression as dummy variables. In logistic regression, there are comparing groups to each other. In order to make a comparison, one group has to be omitted from the comparison to serve as the baseline. In the study logistic regression, "Lack of job opportunities" has been selected as the baseline (or constant) dummy variable to which it will compare the predictions for "Economic Insolvency," "Climatic Vulnerabilities," "Social Problems," "Education" and "Lack of health care facilities." Therefore, "Lack of job opportunities" will not be included in the model. It is also present in the appendix.
3. The Omnibus Tests:The omnibus Tests of Model Coefficients are used to check that the new model (with explanatory variables included) is an improvement over the baseline model. It uses chi-square tests to see a significant difference between the Log-likelihoods (specifically the -2LLs) of the baseline model and the new model. If the new model has a significantly reduced -2LL compared to the baseline, it suggests that it is explaining more of the variance in the outcome and is an improvement. The Omnibus Tests of Model Coefficients output table shows the results of a Chi-Square test to determine whether the main reasons behind migration significantly influence migration. The Chi-Square has produced a p-value of 0.11, making the migration status model significant at the 5% level. Here, the Chi-Square is highly significant (Chi-Square = 14.772, df = 5, p = 0.011) so the model is significantly better.

   Here, there are three different versions; Step, Block, and Model.The Model row constantly compares the new model to the baseline. The Step and Block rows are only crucial if adding the explanatory variables to the model in a stepwise or hierarchical manner. If it is building the model up in stages, these rows would compare the -2LLs of the newest model with the previous version to ascertain whether or not each new set of explanatory variables was causing improvements. In this case, it has added all seven explanatory variables in one block and therefore has only one step. It means that the chi-square values are the same for step, block, and model. The Sig. values are p =

.011, which indicates the accuracy of the model improves when it adds explanatory variables.

4. Model Summary:The ModelSummary (Table 6) provides the -2LL and pseudo-R2 values for the entire model. The -2LL value for this model (377.598) is what was compared to the -2LL for the previous null model in the 'omnibus test of model coefficients, which told there was a significant decrease in the -2LL, i.e., that the new model (with explanatory variables) is a significantly better fit than the null model. The R2 values tell us how much variation in the outcome is explained by the model (like in linear regression analysis). Nagelkerke's R2 suggests that the model explains roughly 5.5% of the variation in the outcome. From the result, it is found that the model is correctly classifying the outcome for 84.2%. It is shown in the appendix.
5. The Variables in the Equation Output:This table provides the regression coefficient (B), the Wald statistic (to test the statistical significance), and the all-important Odds Ratios (Exp(B)) for each variable category. Table 1 shows the Variables in the Equation output table. At first, it is required to check the significance level. From the table, it is found that reason (1) or "Economic Insolvency" has a p-value of 0.034, making it significant at the $p<.05$ level, and this reason has a positive and robust effect on the dependent variable. Migration is influenced by economic insolvency. One unit increase in economic insolvency leads to an increase in the odds of migration by 2.465 points. It can be explained by the fact that economic insolvency makes people vulnerable and when they migrate. This table (Table 1) also indicates that an economically insolvent respondent has odds of being migrated that are 2.465 of the odds of someone lacking job opportunities.

Table 1 also shows that reason (2), or "Climatic Vulnerabilities," has a p-value of 0.002, making it significant at the $p< 0.05$ level. The result indicates that Climatic vulnerabilities positively, strongly, highly representatively, and significantly affected the migration decision. A unit increase in climatic vulnerabilities increases the odds in favour of migration decision by 3.753 points. So, it can be said that an increase in climatic vulnerabilities hampers the living place, livelihoods, earning sources, assets, health, productivity and make people vulnerable. Lastly, vulnerable people decide to migrate from their own place to another place. It is also found that a climatically vulnerable respondent has odds of being migrated that are 3.753 of the odds of someone who lacks job opportunities.

From the table, it is observed that reason (3) or Social Problems (p = .410), reason (4) or education (p=.797), and reason (5) or lack of health care facilities (p=.450) have no significant impact on migration in the coastal areas of Bangladesh. Social Problems have a positive but insignificant impact on migration decisions. Suppose social problems rise in 1 unit, the odds in favour of migration decision rise by .478 points. However, it has no significant impact on migration decisions.

Education also has a positive sign but insignificant impact on migration decisions. One unit increases education, increasing the odds in favour of migration decision by 1.196 points. However, this factor has no significant influence on migration decisions.

Another variable that has been taken as a determinant of migration is the lack of health care facilities, and it also has an insignificant impact on migration. However, its signs are also positive. If the lack of health care facilities rises by 1 unit, then the odds in favour of migration decision rises by 2.391 points. However, it has no significant impact on migration decisions.

Climatic Factors and their Effects on Migration: Bangladesh is heavily impacted by manifestations of climate change. These are prevalent across the

Table 1: Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Reason			15.616	5	.008			
	reason(1)	.902	.425	4.514	1	.034	2.465	1.072	5.666
	reason(2)	1.322	.422	9.839	1	.002	3.753	1.642	8.574
	reason(3)	-.738	.895	.679	1	.410	.478	.083	2.764
	reason(4)	.179	.696	.066	1	.797	1.196	.306	4.678
	reason(5)	.872	1.155	.570	1	.450	2.391	.249	23.009
	Constant	.738	.367	4.048	1	.044	2.091		

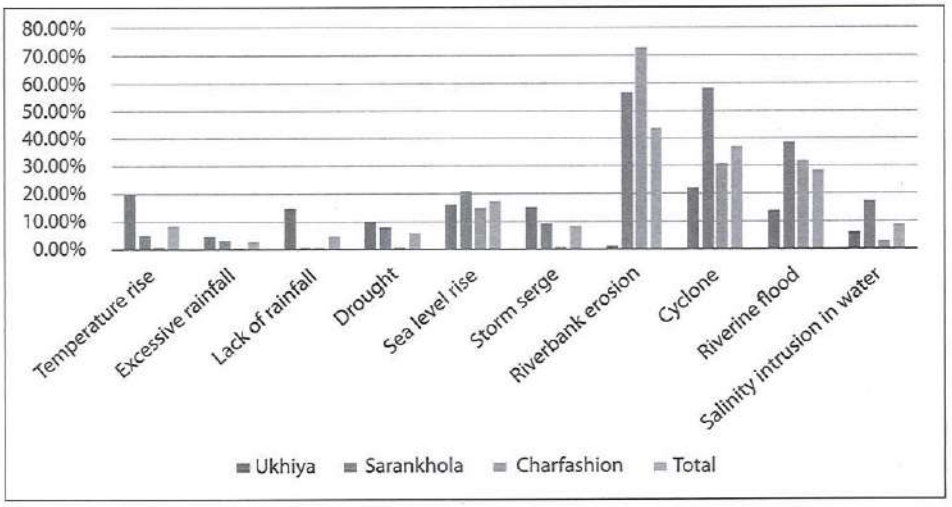
a. Variable(s) entered on step 1: reason.

country at different geographical locations affecting lives and livelihood opportunities, particularly in the most vulnerable coastal region. Though the three study locations are affected by several natural hazards exacerbated by climate change, the effects are more intense in some areas than others. In order to assess the impact of climate change and environmental degradation on migration, the

respondents of the study areas were asked to identify some significant natural hazards that influenced their decisions to migrate.

The respondents from Ukhiya mentioned significant hazards that influence their migration decisions are temperature (20%), cyclone (22%), and lack of

Figure 1: Major climatic change and environmental hazards that contribute to migration decisions



rainfall (14.67%). In Sarankhola, cyclones were identified by nearly 59 percent of the participants as primary reasons for migration, riverbank erosion by 57.33percent, riverine flood by 38.67 percent, and sea-level rise 20.67 percent, and salinity intrusion in water by 17.33 percent of respondents. In Char Fason, riverbank erosion was identified by 73 percent of the respondents as the primary reason for migration. They also identified riverine floods by 32 percent, cyclones by 30.67 percent, and sea-level rise by 14.67 percent as the main reasons for migration. From the data, it is observed that riverbank erosion (44%), cyclone (37.11%), riverine flood (28.22%), sea-level rise (17.11%), and salinity intrusion in water (8.67%) are the primary driver of migration in the coastal areas of Bangladesh. Besides, temperature (8.44%), excessive rainfall (2.67%), lack of rainfall (4.89%), drought (6%), and storm surge (8.22%) are the factors that affect migration decisions.

Conclusion

The study has provided an experimental evaluation for the main reason behind migration in the coastal areas of Bangladesh. In line with existing literature, this study finds that climate vulnerability has a negative and significant relationship with migration in Bangladesh. The study found that the significant reason behind

migration is climatic vulnerabilities, which is 51.11%, and then is economic insolvency (35.56%) in the coastal areas of Bangladesh. From the empirical analysis, it is also found that economic insolvency and climatic vulnerabilities have a significant impact on migration, and on the other hand,the remaining factors have an insignificant influence on migration. One unit increase in economic insolvency leads to an increase in the odds of migration by 2.465 points. A unit increase in climatic vulnerabilities increases the odds in favour of migration decision by 3.753 points. The study also identified significant natural hazards such as riverbank erosion, cyclone, riverine flood, and salinity intrusion in water that influenced respondents to decide migration.As a result, many people move from their region to other regions to seek a better life and livelihood.

Limitation

Following limitations are noted in conducting the research-

i. It is tough to communicate with the selected households because of the poor communication system in the coastal areas.
ii. Coastal people are mostly illiterate. They are not always agreeing to provide information that was required for the study

Recommendations

The study suggests the following recommendations for the policymakers and researchers as well-

i) An Internal Migration and Relocation Policy needs to be developed as part of an effective adaptation and development strategy.
ii) Institutional arrangements to manage internal, seasonal, temporary, and forced migration is urgent.
iii) Develop skills of the potential migrants so that they can acquire decent jobs in the regions of destination.

References

Afolayan, A. A., & Adelekan, I. O. (1999). The role of climatic variations on migration and human health in Africa. Environmentalist, 18(4), 213-218.

Akter, T. (2009). Climate change and flow of environmental displacement in Bangladesh. Centre for Research and Action on Development, Dhaka.

Ali, M. S. (2007). Desertification: Slow onset of an irreversible disaster. The Daily Star, 19, 2007.

Black, R., Adger, W. N., Arnell, N. W., Dercon, S., Geddes, A., & Thomas, D. (2011). The effect of environmental change on human migration. Global environmental change, 21, S3-S11.

Chaudhury, R.H. Ahmed, N.R., & Huda, S. (1976). Management of In-migrants to Urban regions of Bangladesh, in National Report on Human Settlement in BangladeshHABITAT, Vancouver, May 13- June 14, pp. 97-114.

Emanuel, K. A. (1987). The dependence of hurricane intensity on climate. Nature, 326(6112), 483.

Foresight. (2011). Migration and Global Environmental Change: Future Challenges and Opportunities. Final project report. London: Government Office for Science.

Homer-Dixon, T. F. (1999). Environment, scarcity, and violence. Princeton University Press.

International Organization for Migration. (2010). World migration report (Vol. 2). International Organization for Migration.

Islam, M. (1992). Natural calamities and environmental refugees in Bangladesh. Refuge: Canada's Journal on Refugees, 12(1), 5-10.

Islam, M. R. (2004). Where Land Meets the Sea. University Press Limited, Dhaka.

Lee, S. W. (2001). Environment Matters: Conflicts, Refugees & International Relations. World Human Development Institute Press.

MezeHausken, E. (2000), 'Migration caused by climate change how vulnerable are people in dryland areas?', Mitigation and Adaptation Strategies for Climate Change 5(4), 379–406.

Myers, N. (2002). Environmental refugees: a growing phenomenon of the 21st century. Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences, 357(1420), 609-613.

Oxfam. (2010): one year from cyclone Aila, people are still struggling to survive, Oxfam, May 26, 2010,<http://www.oxfam.org.uk/applications/blogs/pressoffice/?p=12910& press releases>, May 2, 2010.

Paul, B. K. (2003). Relief assistance to 1998 flood victims: a comparison of the performance of the government and NGOs. Geographical Journal, 169(1), 75-89.

Pender, J. S. (2008). What is climate change? And how it will affect Bangladesh. Briefing paper (final draft). Dhaka, Bangladesh: Church of Bangladesh Social Development Programme.

Piguet, E. (2011). The migration/climate change nexus: An assessment. In International Conference: Rethinking Migration: Climate, Resource Conflicts, and Migration in Europe. Bremen, Germany, October (pp. 13-14).

Rabbani, M. G. (2009). Climate forced migration: a massive threat to coastal people in Bangladesh. CLIMATE Asia: Climate Action Network-South Asia Newsletter. Bangladesh Centre for Advanced Studies (BCAS), Dhaka, Bangladesh.

Rahman, M. S. (2001). Tropical cyclone in Bangladesh. Quarterly Nirapad Newsletter, 4th issue, Dhaka.

Rayhan, I., & Grote, U. (2007). Coping with floods: Does rural-urban migration play any role in survival in rural Bangladesh. Journal of Identity and Migration Studies, 1(2), 82-98.

Rayhan, I., & Grote, U. (2007). Coping with floods: Does rural-urban migration play any role in survival in rural Bangladesh. Journal of Identity and Migration Studies, 1(2), 82-98.

Shamsuddoha, M. (2012). Displacement and Migration from Climate Hot--spots in Bangladesh: Causes and Consequences. ActionAid Bangladesh.

Stern, N., & Stern, N. H. (2007). The economics of climate change.The Stern Review. Cambridge University Press.

Swain, A. (1996). Environmental migration and conflict dynamics: focus on developing regions. Third World Quarterly, 17(5), 959-974.

Sward, J., & Codjoe, S. N. A. (2012). Human mobility and climate change adaptation policy: A review of migration in national adaptation programmes of action (NAPAs).

Syed, M., & Al Amin, M. (2016). Geospatial modeling for investigating spatial patterns and change trends of temperature and rainfall. Climate, 4(2), 21.

Webber, M., & Barnett, J. (2010). Accommodating migration to promote adaptation to climate change. The World Bank.

World Bank (2007): Climate Change and impact on coastal countries, World Bank, <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contented:21215328~pagePK:64165401~piPK:64165026~theSitePK:469382,00.html>, May 26, 2010.

Zaman, M. Q. (1989). The social and political context of adjustment to riverbank erosion hazard and population resettlement in Bangladesh. Human Organization, 48(3), 196.

Appendix

Table 1: Cross table of Migration decisions by the respondents and major reasons behind migration.

Migration decision by the respondents		Major reasons behind migration						Total
		Economic Insolvency	Climatic Vulnerabilities	Social Problems	Education	Lack of health care facilities	Lack of job opportunities	
	No	26	26	3	4	1	11	71
	Yes	134	204	3	10	5	23	379
Total		160	230	6	14	6	34	450

Table 2: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.536[a]	5	.004
Likelihood Ratio	14.772	5	.011
Linear-by-Linear Association	7.547	1	.006
N of Valid Cases	450		

a. three cells (25.0%) have an expected count less than 5. The minimum expected count is .95.

Table 3: Categorical Variables Coding

		Frequency	Parameter coding				
			(1)	(2)	(3)	(4)	(5)
Main reasons behind migration	Economic Insolvency	160	1.000	.000	.000	.000	.000
	Climatic Vulnerabilities	230	.000	1.000	.000	.000	.000
	Social Problems	6	.000	.000	1.000	.000	.000
	Education	14	.000	.000	.000	1.000	.000
	Lack of health care facilities	6	.000	.000	.000	.000	1.000
	Lack of job opportunities	34	.000	.000	.000	.000	.000

Table 4: Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	14.772	5	.011
	Block	14.772	5	.011
	Model	14.772	5	.011

Table 5: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	377.598[a]	.032	.055

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Table 6: Classification Table

	Observed		Predicted		
			Migration decision by the respondents		Percentage Correct
			No	Yes	
Step 1	Migration decision by the respondents	No	0	71	.0
		Yes	0	379	100.0
	Overall Percentage				84.2

a. The cut value is .500