Determinants of Migration Decision Among Riverain People in Sirajgonj District of Bangladesh

Diba Rani Saha[1] Muhammad Rabiul Islam Liton[2] Ashiqur Rahman[3]

Corresponding Author Email: ashiqur005@mbstu.ac.bd

Received 16/12/2024 **Accepted** 05/03/2025 **Published** 01/06/2025

ABSTRACT

Riverbank erosion is one of the most significant natural disasters in Bangladesh that results in the huge death and destruction of land, biodiversity, and infrastructure. Therefore, victims frequently try to displace themselves to other places. Parallelly, some vulnerable people decide not to migrate themselves. Thus, the study aims to identify the factors that influence the migration decision of this vulnerable group. To pursue the study, however, required data is collected from 108 households from Omarpur and Sadia Chandpur in Chauhali Upazila of Sirajganj. A binary logistic regression model is employed to identify the influential factors regarding migration decisions. Descriptive analysis of the study reveals that lack of educational facilities for children, limited income opportunities, and huge riverbank erosion have a great influence on migration decisions. However, the regression analysis of the study reveals that occupational category, number of earning persons, and households' total income have a positive influence on migration decisions. It explores that households' heads engaged in non-agricultural occupations are more likely to migrate themselves. At the same time, households with more earners and more income want to migrate to a large extent compared to households with lower income. In contrast, households' size, education, and land ownership have a negative influence on migration decisions. Therefore, if the government ensures more education and ensures sufficient land property for riverain people, then the migration rate might be reduced. Therefore, the government should take initiatives to ensure better livelihoods for these vulnerable communities.

Keywords: Determinants; Migration Decision; Riverain People; Binary Logistic Regression.

[1] MSS Scholar, Department of Economics, Mawlana Bhashani Science and Technology University, Santosh, Tangail-1902, Bangladesh.

[2] Associate Professor, Department of Economics, Mawlana Bhashani Science and Technology University, Santosh, Tangail-1902, Bangladesh.

[3] Lecturer, Department of Economics, Mawlana Bhashani Science and Technology University, Santosh, Tangail-1902, Bangladesh.

1. INTRODUCTION

Migration refers to the movement of people from one location to another and their departure from their usual residences for compelling reasons (UNESCO, 2011). When people are compelled to relocate within their country of origin, then it refers to internal migration or internal displacement (UNHCR, 2017). In this case, people are frequently displaced by natural catastrophes, viz., earthquakes, tsunamis, floods, hurricanes, cyclones, riverbank erosion, etc. Such natural disasters result in the death of people and destruction of land, biodiversity, and infrastructure, which significantly reduces agricultural productivity. Hence, many of these vulnerable people lost their livelihoods since agricultural land, homesteads, and other sources of income had to be evacuated (Unnayan Onneshan, 2011). However, these vulnerable people have very few options. If they have the financial resources to purchase new land, they could continue to live in rural areas nearby as cultivators; if they have the social resources, they could continue to work as daily laborers, leaseholders, or sharecroppers; or as dependents on family (Shamsuddoha et al. 2012). These individuals also have the choice of moving to other rural areas where land is available, relocating to government resettlement zones, or moving to nearby towns and working as day laborers, hawkers, or other street vendors. Hence, numerous environmental restrictions, including climate change and unpredictability, land degradation, drought, riverbank soil erosion, and deforestation, cause people to leave the affected area in search of a safer location. Therefore, albeit having a risk of uncertainty for stable economic possibilities, many displaced people tend to relocate in search of better employment possibilities (Hasan et al. 2018). In contrast, it is also observed that many people do not migrate to new destinations but rather stay in their forefathers' land. Hence, there is a controversy about whether the affected people migrate or not. Therefore, the present study aims to find out the answer and investigate which factors influence such migration choices.

2. LITERATURE REVIEW

According to theories of internal migration, differences in wages, work opportunities, and access to healthcare and educational resources, among other things, are the main reasons for such movement. Therefore, a significant number of literatures investigate the reasons. Klassen et al. (2002) revealed that, due to sites in the delta of some of the biggest rivers, including the Meghna, Brahmaputra, and Ganges, riverbank erosion is a common occurrence in Bangladesh. Consequences of this bank erosion have a great impact on social relations, land loss, and changes in occupation of the riverside residents (Haque 1987). In addition, the socioeconomic well-being of residents on the riverbank is also seriously affected by erosion (Karim, 2014). Therefore, many of the affected people decide to migrate to other new locations. In this case, their economic circumstances, social networks, chances for employment, and the availability of resources have a significant influence on taking such migration-related decisions (Islam et al. 2020). In addition to these factors, the gender and age of the household heads also affected such decisions (Hutton and Haque, 2004).

Massey et al. (1998) claim that the desire to migrate is an element of a rational migration theory, albeit sometimes disaster would force people to move away. Further, Brown (2008) suggests that migration, especially forced migration, is not always the result of an environmental push caused by a climate process like sea level rise. It requires some sort of

pull, whether it is environmental, social, or economic, with the exception of circumstances where people escape for their lives due to climate disasters. Therefore, various push and pull factors affect the migration decisions of the affected people.

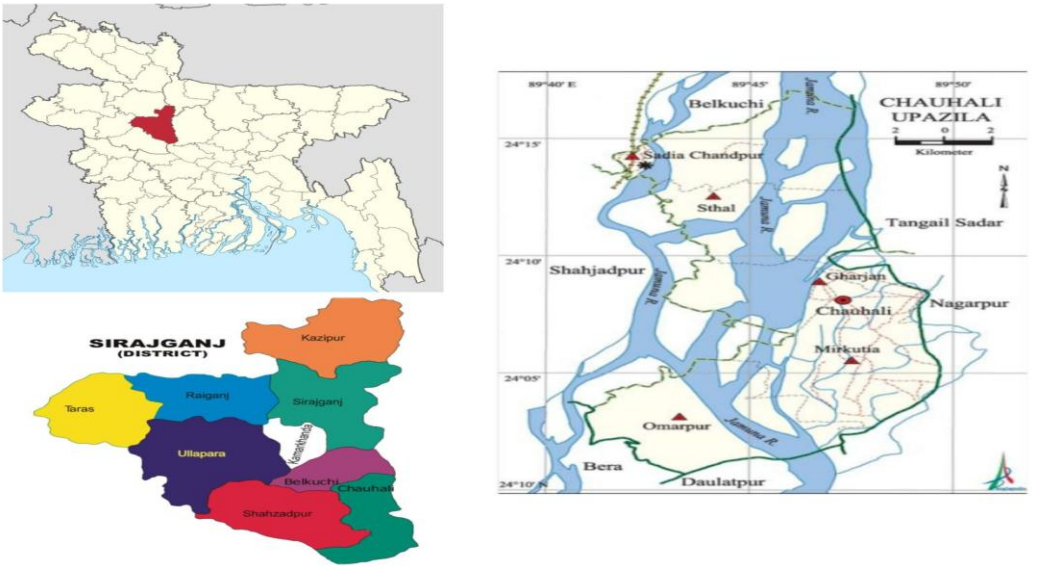
This study fills a gap by conducting a primary data survey in Chauhali Upazila, an area severely affected by riverbank erosion. Unlike many previous studies that relied on descriptive analysis, this research employs a binary logistic regression model to quantify the impact of different socio-economic variables on migration decisions. Unlike general migration studies, this paper analyzes both migrant and non-migrant households, offering insights into why some households choose to stay despite risks. By providing a primary data-based analysis and using the binary logistic regression model to determine the factors impacting migration decisions, this study seeks to close these gaps.

3. METHODOLOGY

Study Area

In terms of riverbank erosion, Chauhali Upazila is one of the most vulnerable areas in Bangladesh. This Upazila has a total size of 21039 hectares and is situated between latitudes 24'01" and 24'17"N and longitudes 89'41" and 89'59"E. The Upazila has a population of about 160,063. Chauhali upazila is divided into two parts by the Jamuna River. Five unions, namely Khaskaulia, Bagutia, Omarpur, Khaspukuria, and Ghorjan, are located on the east bank of the river, while Sadia Chandpur is located on the west bank. Due to its location on the bank of the Jamuna River, it is a char area, and the land of the upazila frequently disappears into the river.

FIGURE 1. MAP OF CHAUHALI UPAZILA



Source: Google Maps

Sampling and Data Collection

The study follows a multi-stage sampling technique. The study focuses on Chauhali, a river-prone area, where households are selected from two unions (Omarpur and Sadia Chandpur). Finally, a total of 108 households are selected randomly, of which 62 are from the Omarpur union and 46 are from the Sadia Chandpur Union. The sample size of 108 households from Chauhali is likely determined based on feasibility, available resources, and ensuring a sufficient sample for meaningful statistical analysis. In addition, the study also collected required data from 55 respondents who have migrated from Chauhali upazila to Nagarpur upazila of Tangail district. The inclusion of 55 migrated respondents provides a comparative perspective, helping to analyze differences between those who stayed and those who migrated. Since the process involves selecting areas first and then randomly choosing households within those areas, this fits a multi-stage sampling method. At the same time, the study also uses some secondary data that is collected from different published journals, articles, newspapers, reports, books, etc.

The Model

Logistic regression is considered a useful method to identify the causal relationship between a binary dependent variable and both qualitative and quantitative independent variables, and the regression is basically applied when the dependent variable is a true or false dichotomy and the independent variables are of any form (Bolin, 2014). Hence, the logistic regression model is used to examine the impact of both qualitative and quantitative independent variables on binary dependent variables. The independent variables can be continuous (interval/ratio) or categorical (ordinal/nominal). All predictor variables are tested in one block to determine how well they forecast outcomes while controlling for the effects of other predictors in the model.

The model is shown below:

$$ln(\frac{P_i}{1-P_i}) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \cdots + \beta_i X_i + \varepsilon$$

Here, P_i = probability of the event occurring (e.g., the probability that the dependent variable Y_i is 1). Since Y is binary, logistic regression does not model Y directly but instead models the probability $P_i = P(Y_i{=}1)$; $ln(\frac{P_i}{1-P_i})$ = log-odds of the event occurring; β_0 = intercept (the log-odds when all independent variables are 0); $\beta_1, \beta_2, \beta_3 \ldots \beta_i$ = slope coefficients for the independent variables $X_1, X_2, X_3 \ldots X_i$ representing the change in the log-odds for a one-unit change in each respective X; $X_1, X_2, X_3 \ldots X_i$ = independent variables; and ε = random error term.

Specification of the Model

Here, the dependent variable migration is taken in binary form, i.e., whether individuals migrate or not (1=migration and 0=non-migration), as the study attempts to understand the reasons causing migration in the eroded areas. The specified form of the model can be demonstrated explicitly with the following equation:

$$Y_{Migr} = \beta_0 + \beta_1 HHS + \beta_2 \text{AGE} + \beta_3 \text{EDU} + \beta_4 EP + \beta_5 LAND + \beta_6 \text{OCCU} + \beta_7 INC + \varepsilon$$

Here, Y represents' choice (1 = migrated, 0 = otherwise). HHS stands for household size, AGE refers to the age of the individual (years), EDU refers to years of schooling, and EP stands for the number of earning persons. LAND is the land ownership of the household, which is a dummy variable (Yes=1, No=0); OCCU is the occupation of the respondents, which is a dummy variable (Non-Agriculture=1, Agriculture=0); INC is family income. β_1 to β_7 are the coefficient to be estimated, and ε is the error term. The inclusion of these independent variables is justified based on their theoretical and empirical significance in migration studies. These variables align closely with those used in previous studies, such as those by Nurullah and Rafiqul Islam (2011) and Saxena & Mohamed (2019), who also apply logistic regression models. Additionally, studies by Singh & Pandey (2017), Venkatesan & Sasikala (2019), and Wafula et al. (2022) have utilized logistic regression to analyze the effect of household characteristics on migration. However, some past studies have used alternative models, such as multinomial logit models (Mallick et al., 2021; Koubi et al., 2022) and probit models (Mamun et al., 2022). The use of binary logistic regression is well supported by prior studies and its suitability for migration decision modeling. Compared to other approaches (such as OLS or multinomial models), it provides more precise estimates of migration determinants, making it the most appropriate choice for this study.

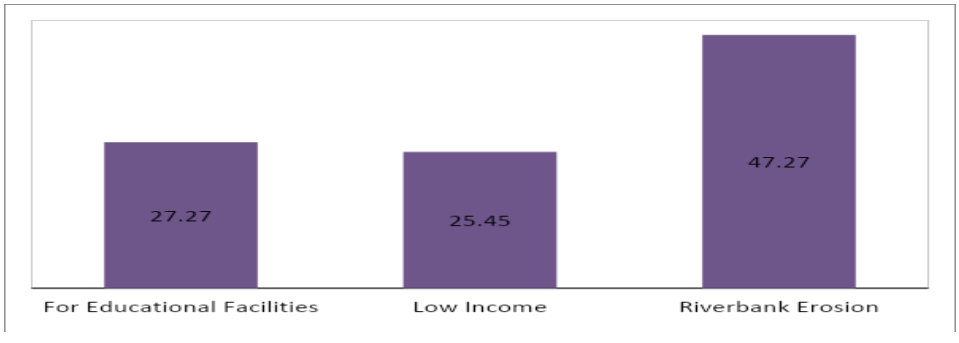
4. DISCUSSION OF RESULTS

This section discusses the results of descriptive analysis and regression models. We have used Stata-14 to explain the variables related to the binary logistic equation to show the determinants of migration-related decisions. It highlights the interpretations along with the social and economic conditions of the respondents.

Causes for Migration

While some respondents temporarily shifted due to riverbank erosion, the majority of study area respondents did so permanently. More vulnerable living conditions were identified among these displaced respondents. The study also found that financial disability and emotional attachment are the primary reasons for non-migration despite hazardous conditions. Additionally, land ownership limitations and low income further restrict their ability to relocate.

FIGURE 2. RESPONDENTS' VIEW ON CAUSES OF MIGRATION (%)



Source: Author's calculation, 2023

According to Fig. 2, the majority (47.27%) of respondents left the study area because of riverbank erosion, and 27.27% left because there weren't enough educational facilities. Nearly 25.45% of the respondents left their forefathers' location due to low income opportunities.

Regression Results

It is observed from Table 1 that occupational category, number of earning persons, and households' total income have a positive influence on migration decisions. The coefficient value of variable OCCU (3.388) indicates that, with the remaining other things the same, if one resident in the study area transformed from an agricultural to a non-agricultural occupation, then the rate probability of migration increased by 3.4%. Again, the coefficient value of variable EP (0.541) indicates that if the number of earning members in responding households in the study area increased by 1 person, keeping other factors unchanged, then the migration probability may be increased by 0.54%. Similarly, in the case of households' monthly income, it is revealed that if households' income increased by Tk. 1000, then the probability of migration may increase by 0.175%. Therefore, it explored that households' heads engaged in non-agricultural occupations are more likely to migrate themselves. At the same time, households with more earners and more income want to migrate to a large extent compared to households with lower income.

TABLE 1. BINARY LOGISTIC MODEL FOR DETERMINING THE FACTORS AFFECTING MIGRATION DECISION

Variables	Coef.	Std. Err.	z	P>z
HHS	-0.3994583**	0.1881975	-2.12	0.034
AGE	-0.0199482	0.0206132	-0.97	0.333
EDU	-0.2235295***	0.0785657	-2.85	0.004
EP	0.541244*	0.3233522	1.67	0.094
LAND	-1.798156*	0.9281887	-1.94	0.053
OCCU	3.388201***	1.137779	2.98	0.003
INC	0.1751***	0.0000425	4.12	0.000
_cons	-1.104808	1.075009	-1.03	0.304
log-likelihood= -56.69, LRchi-square=95.04, Prob > chi2=0.000, Pseudo R^2=0.456				

Source: Author's calculation, 2023

In contrast, the coefficient value of HHS (0.399) indicates that if households' size in the study area increased by 1 person on average, keeping other influential factors constant, then it may decrease the probability of migration by 0.399%. The coefficient value of variable EDU (0.223) refers to the fact that if the educational qualification of the respondents increased by 1 year on average and other factors remained fixed, then the migration probability may decrease by 0.223%. Similarly, in the case of land ownership, it is explored that if 1 non-land owner respondent is replaced by 1 land owner respondent, with the remaining other things unchanged, then the migration opportunity may decrease by

1.798%. Therefore, it is explored that households' size, education, and land ownership have a negative influence on migration decisions.

5. CONCLUSION & RECOMMENDATIONS

Migration causes people to face the difficulties of surviving in a new and uncertain environment, as well as the separation from the major economic and social foundations upon which their existence is built. In contrast, living in affected areas makes the population needier, and agricultural workers experience severe unemployment. Therefore, there exists an indication regarding migration decisions, and various influential factors affect such decisions. According to the findings of the binary logistic analysis, the size of the household of the respondent, the respondent's level of education, the total number of earning persons, the occupation of the respondent, and the households' monthly income are the main factors influencing the migration decision. Therefore, if the government ensures more education and sufficient land property for riverain people, then the migration rate might be reduced. Therefore, the government should take initiatives to ensure better livelihoods for these vulnerable communities.

References

Bates, D., 2002. Environmental Refugees? Classifying Human Migrations Caused by Environmental Change. Population and Environment, Vol. 23, Issue 5, pp 465-477.

Bolin, N., 2014. New party parliamentary entry in Western Europe, 1960-2010. European Journal of Government and Economics, Vol. 3, Issue 1, pp. 05-23.

Brown, O. 2008. The numbers game, Forced Migration Review, Issue 31, pp. 8-9.

Haque, C.E., 1987. Impact of Riverbank Erosion in Kazipur: An Application of Landsat Imagery, *REIS Newsletters*, Jahangirnagar University, Savar, Bangladesh.

Hasan M, Quamruzzaman C, Rahim A, Hasan I, Methela NJ, Imran SA, 2018. Determination of riverbank erosion probability: vulnerability and risk in the southern shoreline of Bangladesh. Int J Energy Sustain Dev, Vol. 3, Issue 3, pp 44–51.

Hutton, D. and Haque, C.E., 2004. Patterns of Coping and Adaptation Among Erosion-Induced Displaces in Bangladesh: Implications for Hazard Analysis and Mitigation, *Natural Hazards*, Vol. 29, Issue 3, pp 405-421.

"Internally Displaced Persons.". United Nations High Commission for Refugees. Retrieved 10 July 2017.

Islam MR, Khan NA, Reza MM, Rahman MM, 2020. Vulnerabilities of river erosion affected coastal communities in Bangladesh: a menu of alternative livelihood options. Global Social Welfare 7:353–366. Available at: https://doi.org/10.1007/s40609-020-00185-1.

Karim AHMZ, 2014. Flood and riverbank erosion displace their indigenous survival strategies in two coastal villages in Bangladesh, Asian Social Science, Vol. 10, Issue 4, pp 16-26. Available at: https://doi.org/10.5539/ass.v10n4p16

Koubi, V., Freihardt, J., & Rudolph, L. (2022). Environmental change and migration aspirations: evidence from Bangladesh. *SocArXiv*.

Klassen, G.J., Douben, K.J., and Waal, M.V.D. 2002. Novel approaches in river engineering, The River Flow, Bousmar and Zech (eds.), ISSBN 90 5809 5096, pp. 7-43.

Mallick, A., & Mallick, B. (2021). Staying despite riverbank erosion: Evidence of coastal Bangladesh. SN Social Sciences, 1(6), 155.

Mamun, A. A., Islam, A. R. M. T., Alam, E., Chandra Pal, S., & Alam, G. M. (2022). Assessing riverbank erosion and livelihood resilience using traditional approaches in northern Bangladesh. *Sustainability*, *14*(4), 2348.

Massey, D.S., J. Arango, G. Hugo, A. Kouaouci, A. Pellegrino, and J.E. Taylor. 1998. Worlds in motion: Understanding international migration at the end of the millennium. London: Oxford University Press.

Nurullah, MD, and MD. Rafiqul Islam (2011), Determinants of socio-demographic characteristics on female migrants: Logistic Regression model || , International Journal of Applied Mathematical Analysis and Applications, Vol. 6(1-2), pp. 95-102.

Saxena, K. K., & Mohamed, M. A. (2019). Statistical analysis of socio-economic determinants of internal migration in Somalia using a logistic regression approach.

Shamsuddoha M, Khan SMMH, Raihan S, Hossain T., 2012. Displacement and migration from climate hot spots in Bangladesh: causes and consequences. Dhaka.

Singh, S.K. and Urvashi Pandey (2017), A Logistic Analysis between Internal Migration and the Development, A Study of Almora District in Uttarakhand, International Research Journal of Commerce Arts and Science, Vol. 8(5), ISSN 2319-9202.

UNESCO, 2011. Migration and Climate Change, UNESCO Inclusive Policy Lab, United Nations Educational, Scientific and Cultural Organization, March 2022.

Unnayan Onneshan, 2011. Accounting climate-induced migration in Bangladesh, Annual Report, 2011. Available at: https://unnayan.org/wp-content/uploads/2021/02/Annual-Report-2011.pdf.

Venkatesan, G., & Sasikala, V. (2019). A Statistical Analysis of Migration Using Logistic Regression Model. International Journal of Scientific & Technology Research, 8(10), 1331- 1336.

Wafula, W. M., Wasonga, O. V., Koech, O. K., & Kibet, S. (2022). Factors influencing migration and settlement of pastoralists in Nairobi City, Kenya. Pastoralism, 12, 1-14.