



Climate Change Induced Human Displacement in Bangladesh: A Case Study of Flood in 2017 in Char in Gaibandha District

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Authors' contributions

This work was carried out in collaboration among all authors. Author BH designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors CMR and MSS managed the proofreading and provided valuable advice to improve the study. All authors read and approved the final manuscript.

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ABSTRACT

This study seeks to investigate the livelihood patterns of the climate-induced people migrated by the flood in 2017 in the char areas. At the same time, examines a number of outcomes i.e. causes of displacement, demographic and socio-economic conditions of the affected people and the opportunities to obtain the local public services. A triangulation approach has been employed, where respectably qualitative and quantitative data have been obtained through focus group discussions, in-depth interviews, participant observation and a household questionnaire survey. The data have been collected from three unions of two Upazila (sub-district) in the Gaibandha district. The results reveal that the flood-affected displaced people were migrated to the close at hand places owing to their economic vulnerability, damage of physical properties. And they were suffering adequately for their joblessness, scarcity of housing, health issues, and lower opportunities to the local civic amenities. The exploratory findings would be a crucial thoughtfulness for the disaster policymakers, managers, and civil societies.

Keywords: Climate change; flood; human displacement; char; Bangladesh.

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1. INTRODUCTION

Bangladesh is well known as one of the most natural disaster-prone countries in the world and it is also enormously vulnerable to climate change [1]. It has already documented that Bangladesh is a disaster risk hot spot country, among the highest risk 173 countries; the rank of this country is the top fifteen [2]. Concerning this, the country is more susceptible to frequent natural disaster such as flood, cyclone, storms and so on disaster due to unique geographical location [3,4]. In which flood is more troublesome natural disaster in terms of a number of people affected and properties damaged. Over the mid of last century, due to climate change, the intensity and extension of flood disaster in Bangladesh is increasing day by days such as 1988, 1998, 2004 and 2017 flood and the damage was havoc (Fig.1). Every year, more or less flood is swelling some part of the country. Almost 80% of the country is flood-prone of which *char* area is one of the most vulnerable for widespread damage. Char (Island) is such land which is comprised as a result of accretion of sedimentation for a long time rowed in the riverbed [5,6]. Basically, it is unplanned land and it formed within 2-3 years [6]. There are 56 big and 226 small char have in Bangladesh [7] where 4-5% of people live in this place [8,9]. Most of the char in Bangladesh, the inhabitants have very few economic possessions, a very weak agricultural-based economy, where people mainly engaged share-cropping, low paid irregular agricultural day labor and livestock rearing are core sources of income for the stranded poor household [10]. Besides, the inhabitants face continuous intimidation owing to flood and riverbank erosion that can perilous to cripple people homestead, crops, and crops land and trigger substantial interruption to livelihoods. However, the lack of food availability is also one of the supreme causes of the vulnerability of the char land people [11]. Living with floods and fighting against floods is a part and parcel of the life of char inhabitants. This is why migration is a common phenomenon for the char dwellers from one char to another char, and this process happened once in the lifetime of the most char dwellers [8]. These kinds of phenomena are continuous processes in the char regions. But when the high flood hit in the char zone like 1988, 1998 and 2017 flood then the vulnerable people do not have a choice to stay their ancestral homestead. This time people cannot stay due to the inundation of homestead, scarcity of food and instruments of combating as well as

the insufficiency of proper formal assistance. Regarding this situation, every year thundered of people displaced permanently and thousands of people are being displaced temporarily. Most of the disaster affected char land people first displaced from their home to safe shelter while feeling the paucity of foods and money then they migrated to nearby cities and across the country. The flood in 2017 was an overwhelming flood in the recent history of Bangladesh which was extremely occurred in this country. During the field survey, it was found that 100% of the crops spoiled, 92.2% of the income loss, 54.6% of the livestock was completely damaged and 44.2% of the houses were wholly destroyed. Moreover, family members died, disruptions in communication and education, health complications, food problems, drinking water predicament and widespread displacement were the core reasons for making study areas more vulnerable. Besides, from the Upazila office, it found that 0.13 million people were displaced due to flood in 2017 from the study zones (PIO¹). The general objectives of this study tried to find out the present livelihood patterns and opportunity to receive of local people amenities of climate-induced displaced people migrated by the flood in 2017 in the char areas of Gaibandha district, particularly those who were taken shelter in nearby cities after losing their home and hearth.

2. CLIMATE CHANGE AND DISPLACEMENT IN BANGLADESH

Bangladesh is a South-Asian small and over populated country, where respectively the entire area and population of this country is 147570 sq. km and 164 million people [16]. The country is located at the intervention between two different environments: The Bay of Bengal in the south side and the north side Himalayas. Almost 10% of the country is merely one meter above from the sea-level and one-third affected by the tide [17]. Now, by every five years, more than 50 million people are being affected by the disaster [14] particularly in the flood plain and coastal zones (Fig. 2). Besides, annually one-fourth of the country is flooded, while 1988, 1998, 2004 and 2017 flood inundated beyond the estimation [18,12,13,14,15] (Fig.1). Climate change is a burning issue which is swelling enormously throughout the world over the last century. This climatic change is also one of the supreme issues in Bangladesh. There are five indicators of climate change that have received extensive

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attention of this country such as annual average temperature, precipitation, catastrophic flooding events, cyclone frequency and strength, and salinization of rivers, groundwater, and soils [19]. As a result of this, due to changing temperatures and precipitation patterns intimidate agriculture and food safety. On the other hand, increase the climatic induced disaster such as floods, cyclones, riverbank erosion, and tidal surges, etc. will annihilate infrastructure, crop production, natural possessions, livelihoods, people's lives, and countrywide economy [20].

Moreover, the prompt affecting climate change Bangladesh now faced unequal development, natural disaster, little economic progress and inadequacy of employment in rural areas, along with swift urbanization, the entire country has made vulnerable to climate change [22].

From the perspective of Bangladesh disaster associated displacement/migration, some scholars opined their notion such as Penning-

Rowell, Sultana, and Thompson [23] argued that push and pull factors are influencing disaster-related migration. M. M. Islam and Herbeck [24] results exposed that there were huge numbers of migrants involuntary to relocate in response to changes in conditions at the places of roots. In the riverbed/char areas or coastal areas, a number of people engaged in fishing activities. But continuously they are being affected by the disaster such as flood, cyclone. Regarding this matter, M. M. Islam and Herbeck [24] found that fishing community livelihood is very fragile by the disaster and also the weak economic capability and prevalent poverty which push to relocation decisions.

Kälin and Schrepfer [25] argued that the link between climate change and displacement is impossible to detect and that a typology of climate change catastrophe could be attributed to human evacuation. However, while examining some of the current and projected effects of climate change, several researchers and

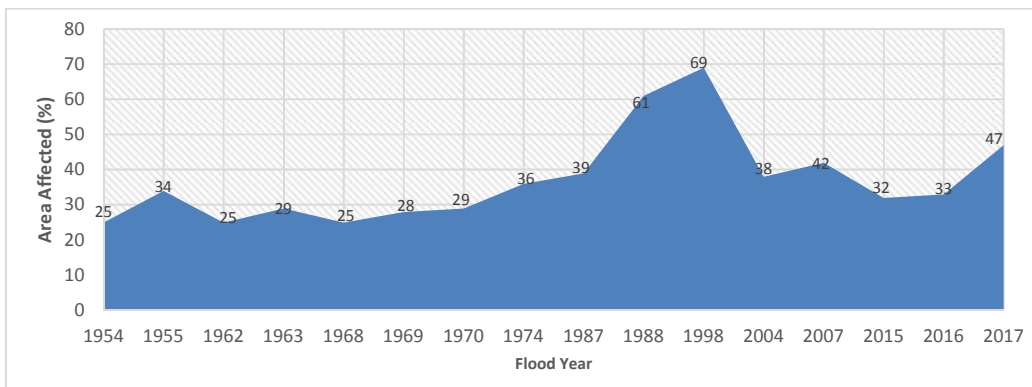


Fig. 1. The extended flow of floods in Bangladesh
 Source: Compiled by the researchers from different sources [12,13,14,15]

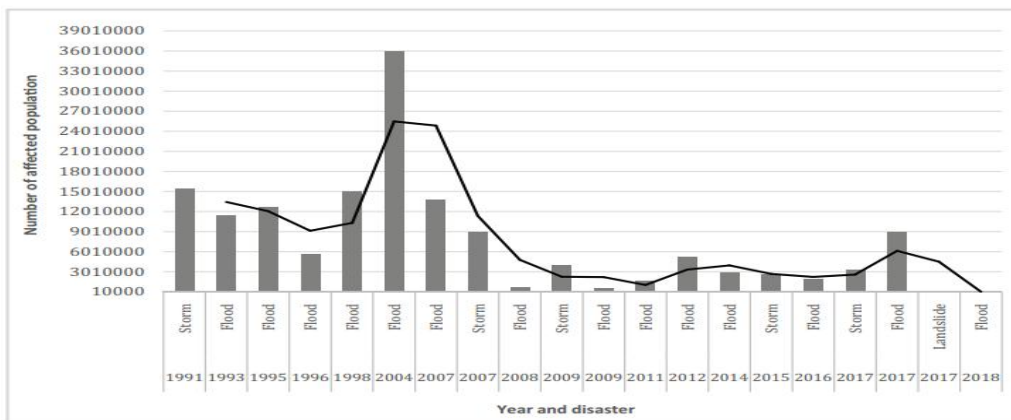


Fig. 2. The number of people affected by various natural disasters in Bangladesh since 1990
 Source: (EM-DAT, 2019)[21]

international organizations have concluded that climate change overtime will likely contribute to 'forced evictions' [26]. On the contrary, Laczko and Aghazarm [27] argued that already a million people migrated or abandon their origin places of dwelling in the world owing to the adverse significances of environmental changes. Besides, Ojeda [28] remarks three basic classes of involuntary inner migration: 'conflict-induced displacement', 'environmentally induced displacement', and 'development-induced displacement'.

Ghimire, Ferreira, and Dorfman [29] findings showed that owing to a massive flood caused exaggerate environmental paucity and then huge displacement from the vulnerable places. Dun [30] revealed that the Mekong delta flood is a common phenomenon where it's very important for people's livelihoods. But when an enormous flood occurred, then flood hugely impact on people's way of life and triggered massive involuntary migration. Haque and Zaman [31] showed that in the flood plain areas features of Bangladesh especially stress on displacement and so on due to riverbank erosion. Risser, Kher, and Htun [32] showed that there were a lot of people displaced and rise crowdedness in the flood-free zones because of floods. Brown [33] stated that the population had been displaced owing to the underprivileged and feeble infrastructure of flooding. Zaman and Wiest [34] depicted that human displacement owing to riverbank erosion, they stressed that the char resettlement plan is a compound mission and

due to the shifting nature of the riverine scheme, perhaps a continuous process.

3. MATERIALS AND METHODS

3.1 Study Area

This study has been conducted among the flood in 2017 displaced people who had taken shelter in the slum zones in two cities namely Gaibandha and Bogra Districts in Bangladesh after losing their home and hearth, and conventional occupations. We selected three Unions namely Fulchari, Fazalpur, Bharatkali of Fulchari and Shagatta Upazila respectively in the Gaibandha district, where more people migrated after the flood in 2017. This area is situated in the northern part of Bangladesh, and almost 265 km far away from the capital city Dhaka to Gaibandha. It is one of the most vulnerable places to happen frequent natural disasters like floods, riverbank erosion, etc. In which flooding is an ongoing process, and it happens more or less every year. But the intensity of flood is more outrageous, particularly in char areas. In char, the majority of the people are farmers, agricultural day laborers, fishermen, small businessmen, etc. Basically, being an agricultural-based economy, the dwellers of these areas have very few economic properties; do not have sufficient capability to meets the least access to basic needs. Besides, around 80% of the char inhabitants are living under ultra-poor [10]. There is no physical connection with the mainland; basically, this area is isolated and fragile.

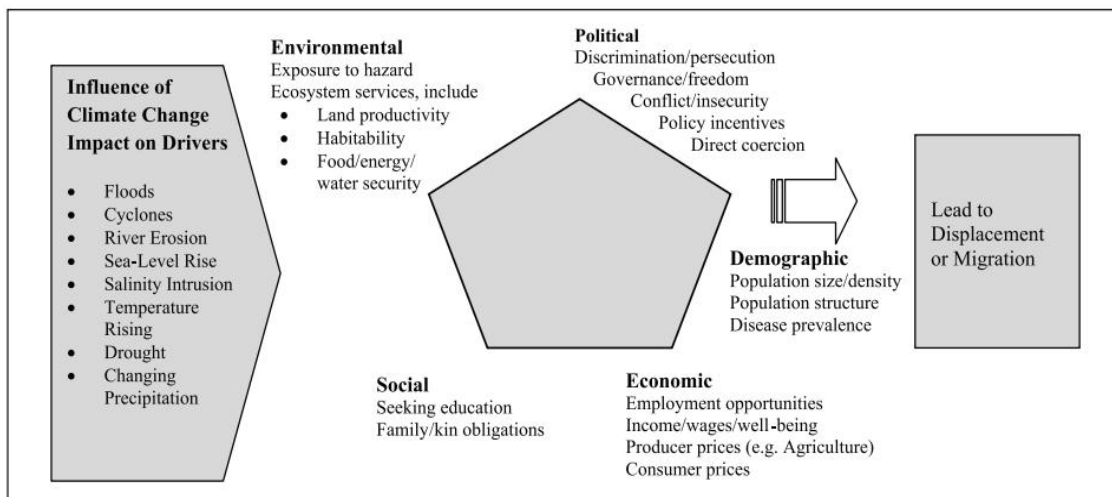


Fig. 3. The influence of climate change on the drivers of migration

Source: [16].

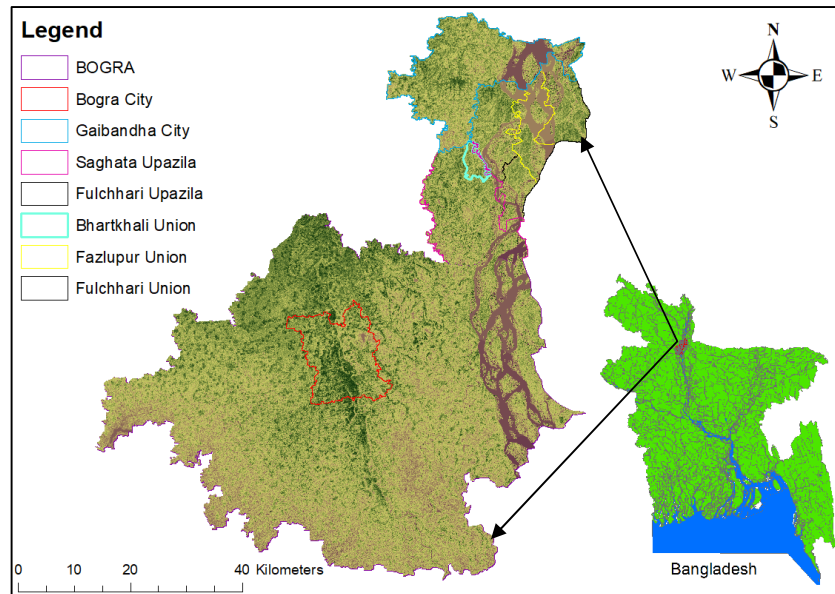


Fig. 4. Location of the study area (Using Arc GIS 10.5)

3.2 Methods

The study is predominantly directed based on qualitative data while at the same time quantitative data have also been used. Because of this, a mixed-method approach has been employed to make this research meaningful, where qualitative data have been collected from FGDs, depth interviews, KII (Key Informant Interview) participant observation; quantitative data have collected from a household semi-structured questionnaire survey. On the other hand, secondary data have also been collected from several sources such as books, journals, published thesis and websites, etc. The survey completed among 136 displaced/migrated people from 37 households and the respondents selected through purposive sampling because along with displaced people, there was no actual measurement households list. The unit of analysis of this research was the households since the households are the social unit [35]. From the selective respondents six FGDs have been completed to explore the perception of

flooding and confront livelihood encounters, and there were 8-12 members had in every group. Besides, 14 depth interviews (seven male and female) conducted among the respondents to know the real scenario of their livelihood patterns, economic vulnerability, and complications to get local public services etc. The number of male respondents was more than the female (71.3% male & 28.7% female) because of social rituals and prejudice (Table-2).

After collecting the data and information on the basis of the objective of this study, the quantitative data have been analyzed by using SPSS (IBM version-20) and MS Excel, and qualitative data carried out through textual and document analyses. The secondary data collected by the researchers have also been edited, examined, verified and reviewed to avoid overlapping, contradictions, and miscalculations. At the same time, the edited data is presented by classifying tables, charts, graphs, so that those are more meaningful and easily accessible to readers.

Table 1. An overview of methodological tools

Data collection methods	Instruments	Source of data	Total units
Interview	Semi-structured questionnaire	Flood affected-displaced people	136
FGDs	Guideline	Flood affected-displaced people	52
In-depth Interviews	Guideline	Flood affected-displaced people	14
KIIs	Checklist	GOs & NGOs employee, School teacher, Community people	8
Participant Observation	Checklist	Households	2districts

Table 2. Demographic characteristics of the respondents

Category	Variables	Frequency	Percentage	Total	Mean
Age	20-30	29	21.3	100%	50.80
	30-40	38	27.9		
	40-50	43	31.7		
	50-60	16	11.8		
	60-70	7	5.1		
	70 -80	3	2.2		
Gender	Male	97	71.3	100%	
	Female	39	28.7		
Marital Status	Married	101	74.3	100%	
	Unmarried	26	19.1		
	Widow	7	5.1		
Education	Widower	2	1.5	100%	
	Illiterate	103	75.7		
	Literate	33	24.3		
	Primary	25	75.8		
	Secondary	6	18.2		
Family & Size	SSC	2	6.0	100%	3.4
	Nuclear	131	96.3		
	Joint	5	3.7		
	small (1-4)	105	77.2		
Size	medium (4-8)	26	19.1	100%	3.4
	Large (8-12)	5	3.7		

Source: Field Survey

4. RESULTS AND DISCUSSION

4.1 Demographic Features

A demographic characteristic is one of the most absolute indicators to know about the community or people's initial indication. This section has been discussed such as age, gender, marital status, education and family of flood-displaced people.

The Table 2 showed that among the displaced people, 31.7% of respondent's age range is 40-50. Respectively, 21.3%, 27.9%, 11.8%, 5.1% and 2.2% respondents are staying in the range of 20-30, 30-40, 50-60, 60-70 and 70-80. On the other hand, the average age of the respondents is almost 51. Most of the respondents are male (71.3%) and only 28.7% of respondents are female. Since Bangladesh is a Muslims based country, for this reason, the majority of the women do *pardha* (veil) in accordance with Islamic norms, values and customs. That's why women did not keen interest as study respondents. Marriage is a basic provision, and it is a central place in the social structure of any society [36]. 74.3% of the respondents are married and 19.1%, 5.1%, and 1.5% are unmarried, widow and widower respectively. Education is the root of the progress of a nation, without education is not possible to eradicate

illiteracy. But among the respondents, most of them are illiterate (75.7%), and 24.3% of respondents are literate where 75.8% are primary level, 18.2% and 6% of respondents are SSC² and HSC³ level respectively. Due to financial hardship and bad communication in the char areas, people are not well educated and this is the main phenomenon to make them more vulnerable. 96.3% of respondents are live in the nuclear family because after the flood disaster, household members are displaced their home and then they migrated to different cities separately. Only 3.7% of respondents are live in the joint family yet. In the case of family size, majorities are dwelling in a small family (77.2%), 19.1% and 3.7% of the respondent's family size is medium and large respectively.

4.2 Nature and Causes of Displacement

After happening floods disaster in the study areas, usually, people face household's equipment's and crop damages. But while the high or extreme floods hit in this area then the intensity of pain increases twice or more. As it happened in 2017, it was the highest flood in the recent history of Bangladesh and the damages were havoc. As a result of this, people lost all

² Secondary school certificate

³ Higher secondary certificate

their resilience to survive. During the field survey, it explored that the majority of the people displaced from their houses and some of them stood in their homes because of homesickness. We were informed through FGDs that people first took shelter in a flood-free place such as emergency shelter, high places, embankment, etc. after occurred the 2017 flood. But when foods and pure drinking water scarcity was arisen, and then the affected people migrated to the close at hand urban places. Besides, some of them migrated towards capital city Dhaka and commercial city Chittagong. One of the key informants stated that there were some people who also migrated to the south-west part of this country to sell labor. According to NGOs provided information, among the 2017 flood-affected displaced people who took shelter in Gaibandha and Bogra cities, most of them involved in odd jobs such as daily labor, rickshaw pulling, street hawker, housemaid servant etc.

On the contrary, many of them conducted their life rely on their relatives and friends. Fig. 5 revealed the livelihood cycle of the study area which is driven by flood disasters continuously.

During the field survey, we also focused on the actual causes of migration of the char land people which is why we asked the study respondents to know the most significant cause of their migration towards the nearby cities. The data showed that 53.7% of respondents believe that due to damage of home and cultivable lands, we migrated here. 16.9% of respondents mentioned that the prime cause was the lack of work opportunities to migrate here. On the other hand, 13.3%, 8.8%, 2.9%, 2.2%, and 2.2% were damage of homestead, food water crisis, and the problem of sanitation, insecurity of women-adolescent and others as regards to migration.

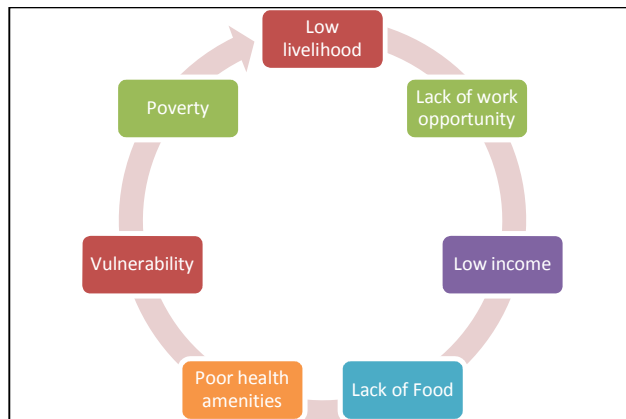


Fig. 5. The Livelihood cycle driven by floods in the study area
Source: Field Survey

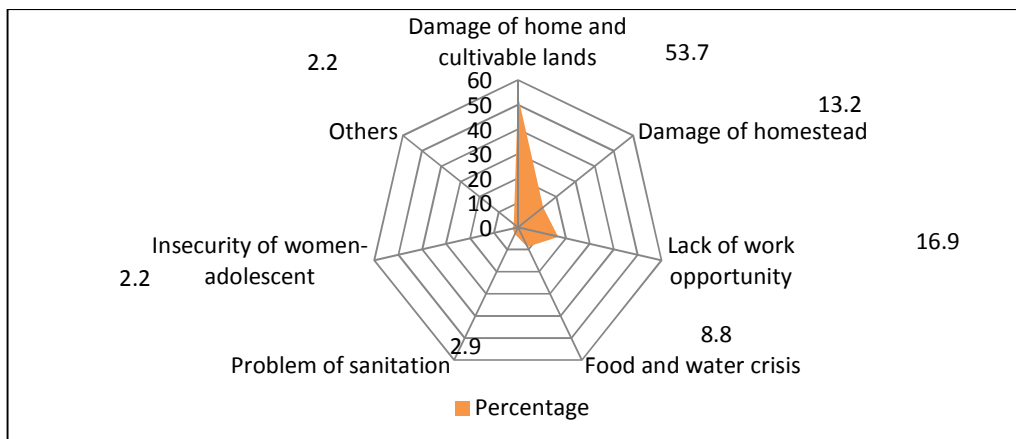


Fig. 6. Causes of migration of flood-affected displaced people
Source: Field Survey

4.3 Inclination of Displaced People

During the field survey, we also tried to find that those who migrated towards the nearby cities. For this reason, we asked among the respondents regarding this matter. Where 50% displaced people migrated, who were from the extreme-poor backgrounds and their income was very low while 28.6% from poor and their income was also bad. On the other hand, 7.4%, 5.9%, 5.9% and 2.2% of displaced people were from the lower middle class, middle class, higher middle class, and rich family (Fig. 7). The income scenario background of rich and higher middle-class families was comparatively good than the other groups but ultimately it was not healthy income to conduct life. From the key informant interviews, it revealed that in the remote rural area's village particularly in char, most of the families are in under a higher middle class. However, the severity of flood in 2017 was havoc as regards to middle-class income group. They were lost their home and hearth including crops and forced to sell their assets as well as spend the last penny of their deposits to meet basic needs as they could not reach any amenities or relief due to their social dignity. The GOs and NGOs employee reported that poor classified people left their homes at the beginning of flood in 2017 towards the cities as they had to live hand to mouth. On the other hand, other class's family also migrated from their inherited homes when failed to fulfill their basic requirements to survive.

4.4 Habitat and Livelihoods of Displaced People

This segment has been deliberated regarding climate-induced people dwelling and livelihood setup after migrated to Gaibandha and Bogra cities. Where mainly focused on displaced people's housing, foods, occupation and income, these are interpreted in the below sub-head sections.

4.4.1 Housing grade and food intake

The flood-affected displaced people after migrated from their ancestral house, most of the people (72.1%) live in a rented house in the migrated cities while 21.3% and 6.6% of people live in their own made house in khas land⁴ and friends and relatives house respectively (Fig. 8).

⁴ Khas land is a state-owned fallow land where nobody has property rights. However, during the survey I found that the

From the field survey, we knew that the quality of housing is not viable. Almost 58% of migrated people live in the fence and mud-made houses and they had to pay for this 250-350 taka per month. A very few people found among the respondents who were live in brick wall and corrugated iron (CI) sheet made houses. There were no people found who live in modern buildings. Around 93% of inhabitants enjoyed the electricity for only light at night and for this had to pay 90 taka per month. Besides, there were some people found who solvent migrated had to pay more 170 taka for light and fan. This kind of phenomenon usually seen in slums, and the slums owner handling this particularly those things are related to money.

On the other hand, the majority of the displaced people around 77% were taken meals two times while 23% took three times in a day (Fig. 9). From the FGDs, interviews, and observation, it found that although they took food several times in a day but they did not take formal⁵ food like rice, fish, vegetables etc. particularly there were huge people had who ate dry food like *chira*, *muri*, *ghur* etc. Besides, an NGO employee highlighted that there were some people had who do not earn; some of those people were begging foods from door to door.

4.4.2 Occupation and income

At least, a stable occupation can be a durable way to lead to life among the different stratum people. But among the displaced people from the char, most of the people involved very peculiar jobs and these were not steady. During the interview's session, it found that 45.3% of respondents had not any jobs. They were fully workless. 16.9% and 16.2% of respondents engaged in rickshaw van puller and wage laborer. On the contrary, 7.4%, 6.6%, 5.9%, 2.2%, 2.2%, 1.5%, 4.4%, and 1.5% involved in a housemaid, rice-mill labor, agricultural labor, street hawker, industrial labor, vegetable seller, and others works respectively (Fig. 10).

It is true that this type of occupation is not enough to earn a good amount of money. The field survey revealed that the respondent's income was not more than 250 taka per day. Concerning this, the highest income groups were rickshaw pulling and industrial labor (100-180 taka). This kind of occupation is so hard, which is

villagers use the local khas land without paying the rent officially.

⁵ Rice, fish and vegetables are the main food of Bangladesh

why those who were weak could not engage. Besides, the lowest income groups were street hawker, vegetable seller, and housemaid. Their average income was 70 taka per day. During the field survey a KIIs reported that due to lack of

experience and training, the displaced people do not get suitable jobs in cities. It was also found that they could not adapt rapidly after migrated to the city. For this reason, they need to take a long time to get the job.

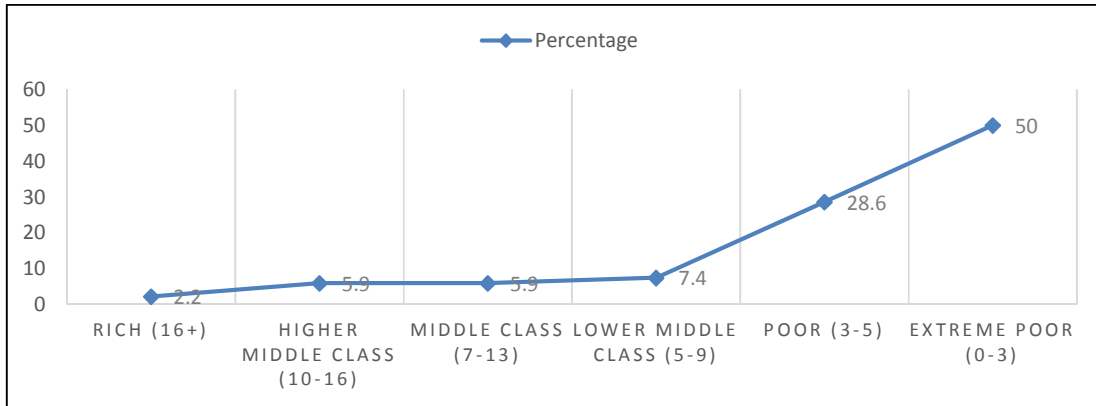


Fig. 7. Socio-economic groups of displaced people [The no. in brackets indicate their amount of income in thousands BDT (BDT 1=85 USD this year)]

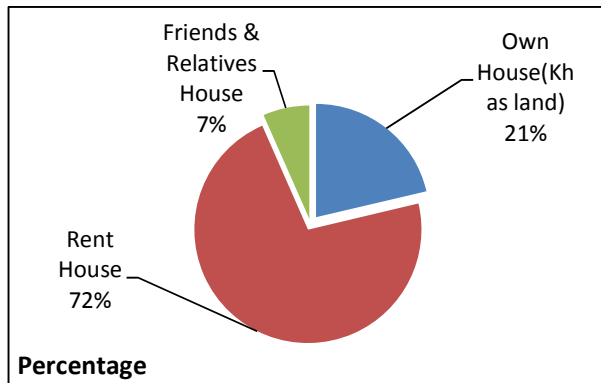


Fig. 8. Dwelling places
Source: Field Survey

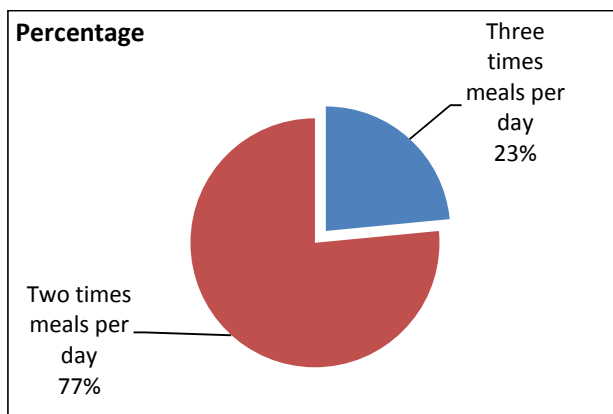


Fig. 9. Food habits
Source: Field Survey

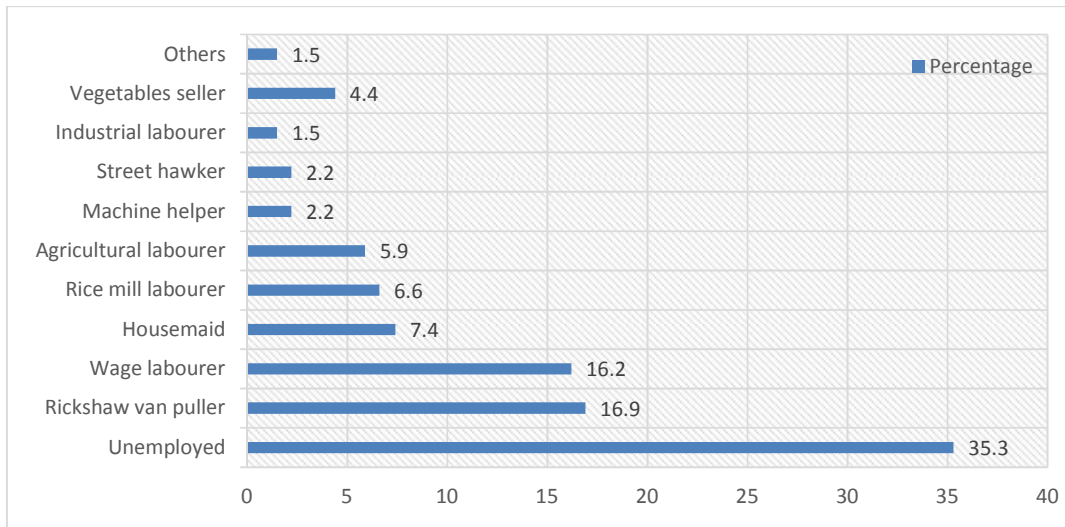


Fig. 10. Occupation of the displaced people

Source: Field Survey

4.5 Opportunity to Receive the Local Civic Amenities

Disaster can be destroyed a society within a very short time, and then the disaster-affected people become hopeless and helpless in a moment. Any longer, this flow is very common in char areas of Bangladesh. Every year people are confronting high or low floods, as a result of this, people lost almost everything especially those who are poor in char. In such a situation, they need proper assistance from GOs and NGOs to survive the

bad situation. But the reality is that people did not get proper help as they want. Then the affected people obliged to migrate towards the cities or towns. The data revealed that the push factor was more dynamic to migrate the displaced people towards the nearby towns. While they reached the towns do not get proper livelihood support from the relevant sources because of over-populated. Since the city authority has no additional mechanism to deal with this situation. Thus, the displaced people suffer more and living a very uncomfortable life.

Table 3. Access to local public amenities

Category	Variables	Frequency	Percentage	Total
Source of Water	WASA ⁶	4	2.9	100%
	Tub well (located in Street/slums)	67	49.3	
	Road Side Public Tap	54	39.7	
	Ponds	11	8.1	
Health Facilities	Government Hospital	16	11.8	100%
	Private Clinic	0	0	
	Kobiraj/traditional Remedy	75	55.1	
	Quack Doctor	14	10.3	
Sanitation	Medicine Shop	31	22.8	100%
	Hygiene Latrines	38	27.9	
	Unhygienic Latrines	98	72.1	
Education	Yes	10	7.4	100%
	No	126	92.6	
	Government School	7	70	
	NGOs School	3	30	

Source: field survey

⁶ Water Supply and Sewerage Authority or WASA is the main body administering Water supply, Drainage and Sanitation system in Bangladesh

From the Table 3 displayed that among the migrated people, the highest amount of people (49.35%) collected water from the tube well which is located in the street and inside the slums. And 39.7% of respondents gathered water from a roadside public tap. On the other hand, WASA provided water only 2.9% of displaced people. The shocking information was that 8.1% of people used water from near ponds.

The field observation and interviews with respondents, it cleared that after six months of flood in 2017, GOs and NGOs did not provide any health facilities towards the displaced people. NGOs employee came to slums to collect installment. Our findings showed that among the respondents 55.1% received treatment from kabiraj/traditional sources. 22.8%, 10.3%, and 11.8% were taken cure from medicine shop, quack doctor and government hospital. Besides, there were no people found receiving treatment from a private clinic.

Displacement people were more suffered as regards to a hygienic latrine. Even they could not execute defecation properly. Here the author's means of hygienic latrine is that those latrines are healthy and maintain proper way such as *pucca latrine*⁷. Besides some of the latrine found in the migrated places like made by the slab, the CI sheet is also considered as hygiene latrine. Data showed that after migrated to the cities, almost 85% of displaced people did not defecation in a latrine. As a result of this, most of the helpless people defecation in open sky places. However, during the field survey, it was found that 72.1% of people used unhygienic latrine while 27.9% of people used a hygienic latrine. In addition, the unhygienic latrine is such latrine which is adjacent to drainage line by pipe, and the human waste was found floating in the dirty water places because of the weak construction of drainage.

During the field survey, only 7.4% of respondents stated that their children went to school and the rest of them opined no. Among the school-going children, 70% were attending government primary school while 30% in the NGOs school. Basically, almost all households did not send their children to school. We saw that most of the children were helped the family, even some of them took a risk to earn money such as a welding shop, garage, battery shop etc. During

the FGDs, the majority of the displaced people opined that due to financial hardship, we did not send our child to school; because if our child works in a shop, he earns some money as well as will be benefitted our family.

5. CONCLUSION

Bangladesh is a natural disaster-prone country in the world and it is baffled people's normal lifestyles as well as of cripples the economy unusually. On the other hand, the disaster is swelling impetuously due to climate change, which is why the strength of damaged has enlarged twice more. The findings of the study showed that the damaged of flood in 2017 was havoc and the huge number of people displaced from their ancestral roots, they took shelter in the nearby town. Most of the displaced people engaged in abnormal work to run their families. This study also revealed the root cause of displacement in the char dwellers where found damage of house and cultivable lands was the key feature for displacement. Besides, the tendency of migration was more from the extreme poor background people's side because of their paucity of income, and after the migration, the people's livelihood was very fragile. On the contrary, the opportunity to receive the local public service was also very low. The findings also disclosed that scarcity of shelter, joblessness, the paucity of capital and awareness of the climate change situation and insufficient levels of knowledge were obstructing factors adjusting within these new inner-city communities. This study did not pay attention to the organizational (GOs & NGOs) role as regards to rehabilitating the displaced people. Therefore, the present study proposed to explore the organizational role along with the community people strategies in further research.

6. RECOMMENDATIONS

Flood makes people more vulnerable uninterruptedly and there is no means of way to defend this disaster in the flood plain areas predominantly in char. As a result of this, people of this region are being helpless and hopeless day by day. This is why the stranded people are taking some strategies to cope with this bad situation. Even they bound to decided such a decision like abandon their traditional dwelling, sell rearing livestock, etc. which make them more defenseless in the unacquaintance places. However, the present study has been tried to propose some policy recommendations which could be addressed to this issue.

⁷ *Pucca latrine is that latrine which is made up of bricks, cement, stones like material.*

- ✚ To protect the flood disaster, it needs proper exploration so that the main encounter phenomenon can be unfolded. After that, all stakeholders (GOs, NGOs, local representatives, CBOs, Media, Donor and so on) should be united to confront the uncomfortable situation, and take an integrated measure which can be means of a suitable way to alleviate the intensity of disaster in the char areas.
- ✚ Since the disaster does not eliminate but a systematic way can be reduced the severity. For this reason, along with several mechanisms to diminish disaster, the afforestation project can be enlarged which will help to lessen the thrilling water stream which defends household damage in the char land people from the flood disaster as well as it will be worthful to reduce CO₂ gas from the atmosphere.
- ✚ Resettlement is the most essential ongoing process for involuntary migrant which is quite tough to tackle for the least developed countries like Bangladesh. In addition, due to a lack of finance and land resources in this country, resettlement is relatively incapable to take initiatives. But an enormous amount of money allocation can be an outstanding example for building civic infrastructure such as housing, sanitation, electricity, water amenities which will be supported to accelerate the project. Concerning this issue, Government would come forward to take this measure and make a suitable fund. Besides, Bangladesh has no policy on displacement and inner migration [3], therefore government also can make an appropriate policy in terms of phenomenon of displacement/migration feature of Bangladesh.
- ✚ GOs & NGOs can take an initiative to encourage community-based coping capacity among the char land dwellers and provide proper assistance to run the tactics fruitfully. Besides, they also can integrate indigenous knowledge and modern technology. Government and key stakeholders should involve with the communities and local authorities conducting more workshops, training programs, and rehearsal in making them aware of the flood risk in view of climate variability.
- ✚ GOs and NGOs should care about the post-disaster stage. In relation to this, they should be given more emphasize on the

long-term phase and provide more free-cost of loan to resilience their IGA (income-generating activities). As well as, be ensure them to make available various types of civic amenities during the crisis period particularly emergency and post-disaster stages.

- ✚ In order to protect the lives of affected people, the city authorities should be prepared for additional people during the duration of the disaster. In this regard, post-disaster recovery, such as food for work, proper relief, and rehabilitation, natural financial support, sanitation, should be ensured so that the poorer people at risk feel at least their lives are safe.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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