



THE INTERSECTION OF CLIMATE CHANGE, MIGRATION AND CHANGING ECONOMY

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Our Mission:

Empowering workers to raise their voices for dignity on the job, justice in their communities and greater equality in the global economy.

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Cover photo: Two Bangladeshi women catch shrimp from a river with nets in Shyamnagar, southwest of the capital Dhaka. Shrimp is Bangladesh's second largest export after garments. REUTERS/Rafiqur Rahman—stock.adobe.com

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Abbreviations and Acronyms

BBS	Bangladesh Bureau of Statistics
BMET	Bureau of Manpower, Employment, and Training
BRAC	Building Resources Across Communities
ILO	International Labor Organization
IOM	International Organization for Migration
KII	key informant interview



Introduction

BACKGROUND

Bangladesh is one of the 10 countries most vulnerable to climate change. Situated on a floodplain, with a low-lying coastline and a host of rivers, the country and its people are threatened by rising sea levels, flooding, riverbank erosion, cyclones, storm surges and hotter summers. These phenomena are exacerbated by climate change and contribute to loss of livelihoods, migration and poverty.

Among other effects, salinity intrusion in southwestern coastal areas threatens the people of the region as well as the environment (Rabbani *et al.* 2013, Habiba *et al.* 2013). The southern regions of Khulna and Satkhira are highly exposed to salinity and characterized by poverty (ibid). According to a Bangladesh Bureau of Statistics (BBS) report, both cultivable land and rice production have decreased substantially. Research shows that in 1992, about 20 percent of the area had low levels of salinity, whereas in 2012, 80 percent of the area was affected by high levels of salinity (ibid). As a result, the production of *aman* rice in Satkhira district has declined by 100,000 tons in just two years. As rice production decreases, the vulnerability to poverty and food shortages rises.

People in the area have three existing options to adapt to the changing climate: choosing saline-resistant cultivations, reducing dependency on rice production, or migrating or changing livelihoods (ibid), including engaging in shrimp cultivation.

Experts have varying perspectives on the value of shrimp cultivation. Some (Dasgupta *et al.* 2014) consider it to be a lower-value livelihood opportunity for poor people affected by salinity because of its lower return versus rice production. Shrimp cultivation can also cause further salinity. Another study shows that shrimp cultivation, though not without various challenges, can be an effective adaptation measure against saline intrusion, and can reverse migration trends among poor people of coastal regions (Johnson *et al.* 2016).

Migration has shown to be an adaptation strategy for people who face livelihood issues due to climate change (Siddiqui and Billah 2014). Studies carried out in Shatkhira and Khulna found that people who historically made their living from agriculture became interested in shrimp cultivation during 1990s. The same people, however, started migrating to nearby towns and cities in 2012 due to visible changes in the environment and its impact on their earlier occupation. Climate change has been perceived to be a likely trigger for migration of these people.

About 15 million people in Bangladesh could be on the move by 2050, potentially causing the worst forced migration in human history due to climate change. Literature shows that the main causes of migration in Bangladesh include unemployment, fear of recurrent disaster, poverty and food insecurity (Akhter *et al.* 2016).

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Studies also identified that the rate of temporary or seasonal migration is higher than permanent migration. Most migrants choose city areas as their migration destination. Lastly, the migration rate is higher among lower economic groups.

AIMS OF THE STUDY

Against this backdrop, the Solidarity Center conducted a study to investigate what links climate change, economic activities and migration in the coastal areas of Khulna and Jashore, Bangladesh. The study examines two central questions: How does climate change impact economic opportunities available to workers in Khulna and Jashore? And, how do climate-change–driven variations in job opportunities impact workers’ decision to migrate internally and/or internationally? More specifically, the study aims to:

- Identify economic activities available in the study areas for working people
- Understand the changes in economic activities of the workers due to climate change
- Recognize the push factors affecting migration decisions of the workers.

METHODOLOGY

To understand how climate change intersects with the economic opportunities and migration choices of working people living in Khulna and Jashore, the study employed a qualitative research approach. Both primary and secondary sources of data have been used for the study. The primary data was collected from Khulna and Jashore, where the Solidarity Center has programs, whereas secondary information was collected from relevant studies and papers.

Researchers conducted literature reviews, key informant interviews, qualitative survey of workers and two focus group discussions to collect data. A review of existing literature (published and unpublished reports, journal articles, policy papers and briefs) was conducted to understand the extent to which climate change impacts people’s livelihoods in Bangladesh. Moreover, official records and survey reports prepared by the government and nongovernmental organizations were also used for the purpose of the study. In addition, nine key informant interviews were carried out with representatives of nongovernmental and civil society organizations and members of the community in the research locations. A semi-structured questionnaire was used for the interviews.

In order to substantiate the information about climate change’s impact on people’s economic activities, a qualitative survey was used to interview 50 workers who were employed in shrimp and fish processing, hatchery, transport and domestic work sectors, as well as returnee migrant workers in Khulna and Jashore. The total sample included 28 (56 percent) women and 22 (44 percent) men. In Jashore an equal number of men (14) and women (14) were interviewed. In Khulna 8 men and 14 women were interviewed. A structured questionnaire was used to understand the profile of the people, the economic activities undertaken by them as well as their future plans. Lastly, two focus group discussions with male and female workers were conducted in Khulna and Jashore to triangulate the information gathered from other sources. The discussion topics included the nature and extent of climate change in their respective areas, economic activities of low-wage workers and the current trend of internal and overseas migration.

Conceptual Framework

CLIMATE CHANGE AND BANGLADESH

The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as a change of climate that is attributed, directly or indirectly to human activity, which alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (UNICEF 2016). The gradual rise of average air and oceanic temperatures has changed the rainfall and snowfall patterns, causing droughts and heat waves, intensifying tropical cyclones and floods, and increasing sea levels globally.

Bangladesh is considered to be highly vulnerable and is already experiencing the adverse impacts of global warming. The following impacts have been observed: hotter summers; irregular monsoons; untimely rainfall; heavy rainfall over short periods (causing saturation and landslides); very little rainfall in dry periods; increased river flow and inundation during monsoon; increased frequency, intensity and recurrence of floods; crop damage due to flash floods and monsoonal rain; crop failure due to drought; prolonged cold spells; salinity intrusion along the coast; coastal erosion; and riverbank erosion.

In recent years, Bangladesh was hit by two consecutive cyclones: Sidr in 2007 and Aila in 2009. Cyclone Sidr affected nine districts of Bangladesh and caused about 3,406 deaths and more than 55,000 injuries. Heavy rain accompanying cyclones and tidal waves due to wind effects caused extensive physical destruction, casualties, damage of crops and livestock, and flooding in 30 districts across southwestern coastal Bangladesh. The most devastated districts were Bagerghat, Barguna, Patuakhali and Pirojpur. Cyclone Aila hit the southern coastline of Bangladesh on May 25, 2009. It was a unique event as a massive storm had not hit the Sundarbans in the last three decades. The Satkhira and Khulna districts of Bangladesh suffered the heaviest damage along with Bagerhat, Barisal, Bhola, Chittagong, Cox's Bazar, Feni, Lakshmipur, Noakhali, Patuakhali and Pirojpur.

THE IMPACT OF CLIMATE CHANGE ON ECONOMIC ACTIVITIES

Economic activities in this study refer to paid farm and non-farm activities performed to make a living. It also includes unpaid agricultural work on one's own land for subsistence production. Kabir and others (2016) show that climate change impacts the socioeconomic condition of people, affecting vulnerable populations most, and has a serious effect on the livelihood patterns of the affected population. Their research also shows that the coastal population's financial life has been affected by climate change. For example, the lack of job opportunities while having to maintain household expenses has led to some families, and in some cases the heads of households, to leave their village and migrate to cities. Most of the residents (in both villages) have historically earned their living by fishing and farming. Agricultural production in these areas declined dramatically after disasters hit, and farmers are suffering financially.

MIGRATION AS AN ADAPTATION STRATEGY

Migration in this study refers to the temporary or permanent movement of men and women from their area of origin to another rural or urban area, across the border or overseas, to perform certain economic activities. This study will refer to four broad categories of migration: internal displacement in the aftermath of environmental shocks; internal rural-to-urban migration for short or long periods in search of work; cross-border migration to India; and international labor migration to the Gulf countries, Malaysia, Europe and elsewhere.

The very first United Nations Intergovernmental Panel on Climate Change (IPCC) assessment report in 1990 found that “the gravest effects of climate change may be those on human migration.” Migration in Bangladesh is common, primarily within the country’s own borders, and mostly rural to urban. It is usually temporary and voluntary in nature, mainly to seek income-earning opportunities. However, in areas affected by environmental and climatic shocks—such as floods, river erosion and cyclones—or chronic stress, such as salinization, migration is a means to escape increased environmental stresses and reduced viability of livelihoods, or as a last resort where there is a total lack of opportunities. Migration due to flooding, river erosion or cyclones is commonly categorized as displacement since migrants are forced to leave their habitual residence. Migration for slow onset changes such as salinity, however, is classified by some as voluntary since individuals appear to have the choice to migrate or remain. In sum, there is a grey area between their choice and compulsion to make that choice. Akhter and her colleagues (2016) show in another study that the main causes of migration of coastal people were unemployment, poverty and food insecurity. The rate of temporary/seasonal migration was higher than permanent migration, and most migrants choose city areas as their destination. Mainly lower economic groups (extremely poor, poor and lower middle class) migrated from this region due to economic insecurity. Creating decent work opportunities and ensuring food security are the main solutions for improving this problem.

While internal displacement is most directly linked to environmental shocks and stressors, the gradual erosion of livelihoods in many locations due to climate change will in some way impact migration across the board. According to the International Organization for Migration (IOM), short-term and short-distance movement of populations is often an immediate response after disasters, with implications both for those displaced and host communities. In Bangladesh, on average, more than 50 million people are affected by environmental shocks every five years. Migration does offer an effective adaptation strategy for at-risk populations where adaptation in situ would be virtually impossible. However, migration and relocation present enormous challenges for both the migrant and destination communities. With this backdrop, the report will examine the cross-cutting issues of climate change, economic activities and migration in the Jashore and Khulna region.

The Context

KHULNA

Located in the southwestern part of the country, on the Rupsha and Bhairab Rivers, Khulna District covers an area of 4,395 square kilometers (1,697 square miles). It forms a part of the Greater Bengal Delta and flows with the Kopotokkho and Madhumati rivers. It is bounded by Jashore and Narail districts in the north, the Bay of Bengal to the south, Bagerhat district in the east and Satkhira district in the west. It is home to around 2.4 million people, 50 percent of whom are women.

Economic Activities

Agriculture is the main source of livelihood for people in Khulna, accounting for nearly 35 percent of earnings. The remaining earning categories are: non-agricultural labor (6 percent), industry (about 4 percent), commerce (about 20 percent), transport and communication (5 percent), service (18 percent), construction (2 percent), religious service (0.2 percent), rent and remittance (0.8 percent) and other (9 percent) (BBS, 2001). The majority of workers in Khulna are employed by non-farm entities that are permanent establishments. Wholesale and retail trade and motor vehicle and motorcycle repair appeared to be the largest sectors, employing 129,500 people; followed by manufacturing with 14,114 establishments and 121,421 jobs; transportation and storage with 26,437 establishments and 34,368 jobs; and accommodation and food service activities, with 10,940 establishments and 24,564 employment.



In all, 440,604 people are engaged in formal work in one of 164,506 establishments in Khulna, of whom 81.5 percent are male and only 18.5 percent are female. The rural areas feature 99,255 establishments of which 50,346 are permanent, 3,742 are temporary and 45,167 are home businesses. In urban areas, 168,485 (83 percent) men and 34,969 (17 percent) women participated in the labor market; while in rural areas, 190,668 (80 percent) were men and 46,482 (19 percent) were women in 2013. Men continue to dominate the job market, however, female participation in the labor market increased from 10.4 percent in 2001 to 18.5 percent in 2013.

JASHORE

Jashore District is located in southwest Bangladesh, covering 2,570 square kilometers. It is surrounded by Jhenaidah and Magura districts to the north, Satkhira and Khulna districts to the south, Narail and Khulna districts to the east, and West Bengal (state of India) to the west. The total population of the district is 2,471,554 (1,277,650 male and 1,193,904 female). Bhairab, Chitra, Betna, Kobodak and Mukteshwari are the main rivers flowing through the district.

Economic Activities

According to the 2013 Bangladesh economic census, the majority (74.4 percent) of people in Jashore District live in rural areas, where 40 percent of workers are permanently employed and almost 2 percent hold temporary positions. The economic census shows that 447,156 people are engaged in various non-farm economic activities (84 percent men and 16 percent women). Of that total, 73 percent are engaged in permanent establishments, 2 percent in temporary establishments and 25 percent in home businesses.

The percentage of female workers was significantly higher in 2013 compared to almost 11 percent in 2001. The gender disparities are similar in rural and urban areas.

Similar to Khulna, BBS data found wholesale and retail trade and repair of motor vehicles and motorcycles to be the largest sector, employing 443,072 people; followed by manufacturing with 116,987 jobs; transportation and storage, 51,120 jobs; other service activities, 35,271 jobs; and accommodation and food service activities (hotels, restaurants), 28,945 jobs. These macro data correspond with the survey and key informant interviews conducted for this study.

Profile of the Respondents and Survey Findings

PERSONAL AND ECONOMIC PROFILE

Family Size, Age and Socioeconomic Status

The sample population for this study was working men and women between the ages of 20–66, with 46 percent of interviewees (23 individuals) in the 26–35 age group. The study followed a purposive sampling method and selected people from the lower socioeconomic status to understand the impact of climate change on their economy and living. The monthly household earnings of the interviewees ranged between 5,000 taka to 35,000 taka (approximately \$59 to \$412). More than one-third (38 percent) of the respondents' average household monthly income was between 6,000 taka to 10,000 taka (approximately \$71 to \$118), whereas 34 percent of interviewees earned between 11,000 taka to 15,000 taka (\$130 to \$177) per month. Both groups said they struggled to make ends meet. Three interviewees were less economically stressed, with monthly earnings between 25,000 taka to 35,000 taka (\$294 to \$412). The study did not find significant differences among men and women interviewees in terms of income.

Current Employment Status

The study interviewed low-earning men and women who were engaged or had been engaged in a wide range of activities including agricultural work, factory work, domestic work, transport work and petty trade. The largest number of people interviewed worked in the fish processing and packaging industries, while the second largest group was engaged in small business in Khulna. Conversely, in Jashore a combination of agricultural, domestic, rice mill, hatchery and transport workers were interviewed. Five respondents in Jashore and five in Khulna were unemployed at the time of interview. Among the 50 interviewees, only one transport worker was aware of an association of rickshaw pullers in his area, but he was not a member of that union. In the rest of the cases, interviewees either did not know whether a union existed in their occupation or were aware and not willing to become a member. Workers interviewed for the study were found to be more dependent on their social and family networks for job opportunities and other economic activities/opportunities. Notably, they also said that they did not have enough time to be involved with union activities.

Monthly Earnings

The study found that respondents' earnings varied across occupations. For example, agricultural workers' earnings ranged between 1,500 taka to 10,000 taka (\$18 to \$118) per month depending on the availability of jobs. Wages can vary based on gender. The wage of male agricultural workers is usually 300 taka to 400 taka (\$3.50 to \$4.70) per day, while women agricultural workers are paid 250 taka to 300 taka (\$2.90 to \$3.50) per day. In addition, a domestic worker can earn a maximum of 4,000 taka (\$47) per month per employer. Transport workers have more flexibility in earnings depending on the season and can earn up to 20,000 taka (\$236) per month. Rice mills mostly employ women and pay 6,000 taka to 7,000 taka (\$71 to \$82) per month. Fish packaging factories employ both men and women workers and their salary depends on the type of work they perform, with men often employed in higher-paying positions.

MIGRATION PROFILE

Overseas Migration

With an aim to understand climate changes' impact on internal and external migration, respondents were asked about their migration experiences. In total, the study interviewed six individuals (five women and one man) who had returned from abroad. The women went to Oman, Saudi Arabia and Qatar, whereas the only male migrant interviewed returned from Saudi Arabia. Half of these migrants went abroad through family or neighbor connections while the other half used middlemen (*dalals*). All women interviewed were employed as domestic workers and worked between one to eight years. The male returnee, who worked as a carpenter, stayed abroad for only one year. The highest and lowest salary drawn by women workers were 25,000 taka (\$294) and 5,000 taka (\$59) per month, respectively, while the man earned 25,000 taka (\$294) per month while abroad. Among the six returnees, only three (the man and two women) expressed their willingness to go abroad again, with the goal of securing a future and an education for their children. The rest of the respondents did not want to migrate abroad due to physical illness and family reasons.

Internal Migration

The study discovered that 11 respondents (five women and six men) had participated in rural-to-urban migration (hereafter referred to as internal migration). These respondents identified themselves as outsiders (migrants) in the area where they were interviewed. Five respondents said they had previous migration experiences but had returned home later. The study interviewed nine migrants in Jashore and two in Khulna. Approximately 78 percent of the respondents were non-migrants. The study also identified some long-distance internal migration experiences within the respondent group. At least two women had migrated to Dhaka and Gazipur to work in garment factories, whereas two men had migrated to Madaripur and Mymensing. Only three men among the 50 interviewees said they would migrate internally if they could find better economic opportunities. No women interviewed expressed a desire to migrate internally for work. Respondents did not identify any direct relationships between their decision to migrate and climate change. However, they did mention the lack of employment opportunities and low wages, which were indirectly caused by climate change.

Findings and Discussion

EFFECTS OF CLIMATE CHANGE IN JASHORE AND KHULNA

Khulna

Across all the key informant interviews and focus group discussions, the most commonly identified climate impacts and changes were increased salinity and its impact on agriculture. Increased frequency of flooding and inundation from high tide, tidal surges, river erosion and siltation were also frequently mentioned. Climate change issues in Khulna and adjacent areas are considered to have a very high impact, especially the combination of low-frequency disaster events, such as cyclones, with chronic flooding and water salinity issues. Interviewees also reported the increased frequency of slow-onset changes, such as lack of precipitation, siltation and salinity, as well as rapid changes, such as the increased frequency of cyclones and floods, as critical impacts of climate change. However, respondents also ranked the impact of these changes lower than other, more everyday, problems such as the unavailability of work and low wages. Overall, salinity and disaster risks dominated discussions in Khulna while challenges of waterlogging and seasonal change were the center of discussion in Jashore.

Climate change issues in Khulna and adjacent areas are considered to have a very high impact, especially the combination of low-frequency disaster events, such as cyclones, with chronic flooding and water salinity issues.

Participants agreed that over the past two decades, Khulna has experienced climate change in the form of waterlogging. As one key informant said: "From August to October, the area witnesses huge pile of siltation on the riverbed due to lack of sufficient precipitation." It is due to insufficient rainfall (related to climate change) throughout the year that has reduced the water flow in the river, causing an accumulation of mud and silt (sediment) in the riverbed. The interviewee explained that because of the raised riverbed, when surges of water flow from upstream, the riverbank easily overflows and floods the adjacent area with water. Due to the lack of dredging and over-siltation, these flooded areas become stagnant.

Frequent cyclones were also mentioned as another feature of climate change. An NGO worker and climate activist explained that, "Satkhira was badly affected by [cyclone] Aila. During both [cyclones] Sidr and Aila, the unions of Dacope, Koral, Pikegacha, Koilashganj went under water. It was difficult to differentiate between the river, sea and lowlands. The mainstay of people's economy in the region was shrimp cultivation. However, after two devastating cyclones, people could not return to their homes."

Another environmental change, salinity, started to increase in Khulna around 2000. Typically, the water level decreases during the month of June due to a lack of precipitation, resulting in increased salinity. Historically, the water was only saline for three to four months, but now it remains salinated for six months. Participants felt that increased salinity has become a daily problem because of the increased

impacts of tidal surges. To some extent, this problem is an unintended consequence of shrimp cultivation practices, in which canals were dug to bring salty water in from the sea to the land. Unfortunately, the increased saltwater in agricultural land has resulted in lower crop yields. As one respondent put it, “The lands which used to be cultivated for rice during 1980s and 1990s are no longer viable now due to salinity increase in the land.”

Jashore

Jashore is not a coastal region, yet it is also badly affected by floods, waterlogging and arsenic in the soil—which is how a large portion of agricultural land has become uncultivable.¹ With a view to protect the southwest region from flooding during high tide from the nearby Bay of Bengal, in the 1960s the government raised more than 50 polders² in different parts of Jessore as well as some parts of Khulna and Satkhira. Initially, the project helped recover a significant amount of arable land and enhance agricultural production. Later, however, the same polders appeared to have had a detrimental effect on people’s

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livelihoods. In Jashore, respondents frequently cited the example of Vabadaha, a huge marshland that has become prone to permanent waterlogging for the last few decades. Experts noted that the polders were effective in stopping saline water from flowing into the area but also prevented sediment deposition there. This caused adjacent riverbeds to become higher than the enclosed area and left the latter permanently under water. The embankment over Horihar river also resulted in the untimely waterflow into the river and caused the flooding of 96 villages. In the Sarsha, Chowgacha and Jikorgacha regions, the riverbed siltation has caused an increase of arsenic levels in the water.

ECONOMIC ACTIVITIES

Khulna

In urban Khulna, both men and women work as tailors, petty shopkeepers, food vendors, vegetable sellers and in various other occupations. Horijan community members in Dumuria and Fultala are engaged in low-skilled and low-status jobs such as cleaning and shoe polishing. Some jobs are normally gender-specific, such as domestic, brick kiln and temporary and low-wage railroad work, which have traditionally been performed by women in the region.

The largest sector of employment in Khulna is shrimp and fish processing. The 27 shrimp processing companies in Khulna each employ 200 to 5,000 workers. Shrimp are collected and processed in the summer at different stages. The work of separating shrimp heads from the body is considered an economic activity that is mostly done by low-income people working from home (March to October) in Natun Bazar, Naihati, and Baghmara. Prawns, on the other hand, are produced during the winter (October to March).

¹ Arsenic comes from the underground water. Farmers irrigate crop land using shallow pumps.

² A polder is an embankment encircling an area to artificially prevent saline water intrusion into the area during dry season.

³ Since shrimp do not get sufficient food from nature to yield high production levels, farmers often overfeed them.

Shrimp Cultivation

In the past, shrimp (bagda) used to be naturally cultivated from October to March. Over time, cultivators started to induce salt into the land for greater shrimp production. In the beginning, salinity was at a tolerable level, as they could pull in the water as needed and drain it out post-cultivation. However, too much siltation on the riverbed due to low precipitation levels and the lack of dredging resulted in flooding and waterlogging, which has had a tremendous impact on shrimp cultivation. Failure to drain the saltwater from the land forced shrimp cultivators to begin producing shrimp in the summer and the winter—meaning operations are ongoing year-round. In some cases, overfeeding³ (to compensate for the lack of food naturally available and to create higher yield) brought new viruses as well. There is also lack of freshwater reservoirs for shrimp cultivation in this region.

A medium-sized shrimp *gher* (farm) requires 200 workers to 250 workers at different phases. The daily wage of a shrimp laborer is between 400 taka to 500 taka (\$4.70 to \$5.90), and most are hired on a daily basis. The average size of shrimp farms has been reduced from the 50 acres to 100 acres of the past to only a few acres now, and some of them have been modernized (automated) to the point where human hands are not required at all phases of production. The production of other fish has also decreased due to changes mentioned above.

Figure 1: The supply chain of shrimp and fish



Shrimp are produced and packed at several stages for sale in both local and international markets. First, baby shrimp are collected from local hatcheries to be raised in shrimp *ghers*. Once they are big enough, middlemen (*faria*) collect the shrimp from the *gher*. They supply these shrimp to the local depot, which then sells it to the district-level depot. Some 22 to 25 company depots buy shrimp from Khulna agents to export to countries around the world. The “stock-lot” is often sold in the local (national) market. Most of the workers employed in shrimp processing companies are migrants from nearby areas that have been affected by salinity.

Once the raw materials (shrimp and fish) arrive, they are forwarded to the quality control department to separate them from ice (de-blocking) and are graded according to size. Then they are washed and de-headed. Usually 40 workers to 50 workers conduct shrimp de-heading in three shifts. The next stage is quick freezing and blocking, according to buyers’ requirements (importers). Around 120 workers do this work in three shifts.

More than 60 percent of workers are women, who are considered “good at selecting, de-heading and packing.” Male employees are more likely to consistently continue their work with a company, whereas women may stop working due to pregnancy, marriage or childcare responsibilities.

This study was also able to collect perspectives from employers on recruitment in the shrimp and fish industry. Some of the comments included an acknowledgment that labor recruitment in the industry was affected by the reduction in supply of shrimp and fish. The lack of a worker training center was also discussed. Furthermore, the companies shared that worker migration can be an issue for them as some workers prefer to participate in the “Food for Work” program as they can receive better pay. Lastly, the employers mentioned that some workers migrate due to wage discrimination, non-payment of wages and the lack of a bonus, fringe benefits and welfare fund for the workers.

Agriculture

Rural areas in Khulna are dependent on agricultural employment from February to April (harvest season). Workers perform various jobs such as weeding and watering. In the coastal belt, women are encouraged to produce watermelon. Other occupations include cobblers, fishermen, honey collectors, craftsmen and woodcutters.

Since 2000, farmers have been encouraged to produce saline tolerant paddies. To fight the adverse effect of salinity, the International Rice Research Institute (IRRI), under joint collaboration with the Bangladesh Rice Research Institute (BRRI) and the Bangladesh Institute of Nuclear Agriculture (BINA), developed four saline-tolerant rice varieties that can grow in high levels of salinity. However, even with this technique and the use of saline tolerant paddies, profit margins are slim after accounting for the cost of the rice production and wages. An agricultural worker’s daily wage is 300 taka to 500 taka (\$3.50 to \$5.90), generally including some produce and food. Men are increasingly less interested in agricultural work, and poor women are filling that void. According to local workers, agriculture is no longer considered profitable due to climate change so people tend to change occupations. Several former farmers now work in fish processing companies instead. One of them said: “Even four to five years ago, we used to produce a lot of vegetables, but nowadays we see nothing.” To overcome their loss in agricultural production, some farmers cultivate shrimp in paddy fields. However, there is a high risk of viral infection involved in this process. It is mostly due to the lack of knowledge about cultivation which is responsible for such losses. They don’t know what will be profitable for them.” It is apparent that adaptation to climate change is influencing employment changes. Khulna is now producing climate-friendly fruits such as guava, and people are already shifting to shrimp cultivation. However, the study found that the workers could not always draw an explicit connection between the causes of livelihood changes and climate change.

Jashore

Unlike Khulna, Jashore is not a shrimp producing area. Rather, it is a major producer of rice, jute and vegetables. Compared to Khulna, Jashore residents are less likely to migrate; they tend to stay and work in the nearby biscuit, jute and net factories, or rice mills. Notably, a large number of men make a living pulling rickshaws. Over the decades, transport and motor vehicle repair shops have opened employment opportunities for many locals and internal migrants in Jashore. The key informant interviews revealed that there are public transport routes to 24 destinations across the country and around 300,000 people are employed in this sector in Jashore.

About 35 hatcheries in Jashore employ locals and migrants as temporary seasonal workers, typically from February to May. The fry (baby fish) produced in these hatcheries are sold to the root-level farmers or *gher* owners. One employer and owner of a hatchery explained that more than 90 percent of the workers employed in his hatchery do not have their own land. During May to October, hatchery workers take

temporary jobs such as rickshaw pulling, construction work and petty trading (vegetable or fish selling). At the end of December, they go back to the village to harvest crops and clean the paddy fields for the next crop. In low-lying areas, International Rice Research Institute paddy is sown from the month of May and, in higher lands, from the month of June. In some areas, farmers cultivate fish fry in the paddy field. The transport of fish and fry is a prevalent economic activity, and around 1 million people are employed in this sector.

INTERNAL MIGRATION

Khulna

Few people migrated from Khulna immediately after Cyclone Aila and Sidr because sufficient humanitarian and economic aid was provided to the survivors at that time. However, people started migrating from the affected areas in 2015. One respondent explained that, “while donation and cash flow were abundant, people were not imparted with skills to carry on their livelihoods at a later stage when humanitarian assistance would be withdrawn.” Consequently, people started to migrate out of Aila- and Sidr-hit areas to Khulna. The region also witnessed in-migration of people from Barishal, especially from flood-affected areas. Some cited the easy transport system as one of the main reasons.

As far as education and skills are concerned, most migrants have low levels of education (up to class V) and limited technical skills. These migrants are mostly involved in rickshaw pulling. They also work as aides (*kulis*) to carry luggage at rail stations while others drive motorized trishaws called “Easy Bikes.” Some local residents claimed that the migrant workers find it difficult to get jobs in the shrimp and fish industries due to some internal politics of local labor leaders. The employers, however, claimed that they employed both local workers and migrants. The research team visited the living areas of fish company workers and were informed that they were all internal migrants.

Jashore

Internal migration is high in Jashore, and over the past 10 years around 250,000 to 300,000 people have migrated to Jashore from adjacent districts in search of work. It has created unplanned urbanization and slums. It is also estimated that 50,000 to 60,000 thousand people commute daily from different areas to Jashore for work. As a result of this supply-side labor pressure, the local people of Jashore town are seeing wages decrease. To cope with decreased wages and loss of income, more and more people have become involved in formal and informal trade with India, commonly referred to as “baggage party.” People involved in this trade go abroad with or without a passport paying local *dalals* (brokers) to help them cross the border and bring commodities such as clothes back to sell in the local market. Women are more involved in this business than men as they are generally less likely to be caught by law enforcement agencies.

Internal migrants mostly work as day laborers for contractors on construction sites, roads, embankments and/or *ghers*. Migrant men are also found in occupations such as van drivers, rickshaw pullers and Easy Bike drivers. The average daily wage of these workers is 350 taka to 450 taka (\$4.10 to \$5.30), and men normally receive higher wages than their female counterparts. The focus group discussions revealed that lack of jobs and low wages are the main reasons people migrate from rural to urban areas. This corresponds with the findings of the survey conducted under this study.

OVERSEAS AND CROSS BORDER MIGRATION

Khulna

Overseas labor migration has been prevalent in the Khulna region since 2000, when men started migrating to the Gulf and Malaysia in search of higher-paying jobs. It is notable, however, that many respondents for this study said that they consider overseas labor migration to be less profitable than staying home in many cases because the high initial costs of securing the job, paying middlemen and obtaining the necessary documentation outweigh the short-term wage benefits. While the apparent cause of migration is lack of employment in their areas, climate change remains the underlying cause. Increased unemployment coupled with the lack of agricultural or alternative economic activities still influence people to find jobs abroad. Some people prefer to migrate to India due to the geographical proximity of West Bengal and better economic opportunities there. Furthermore, migrants work as channels of information and function as informal recruitment networks. For example, successful migration of a relative or a neighbor can encourage other men and women from the same area to migrate for better earnings. According to locals, patriarchal norms do not prohibit women's migration from the southwestern region of Bangladesh as is seen in other parts of the country such as Dhaka, Cumilla, Chattogram or Noakhali.

In Khulna, no direct connection between climate change and overseas migration could be identified by the locals interviewed for this study. One respondent said, "Overseas migration is a culture. It has nothing to do with climate change. It is good for low-income and low-skilled workers. But (for) people who know some work (are skilled in some trade), migration may not be a good option." This is an example of how migration is perceived in the locality. Interviews with civil society organizations reveal that female migrants do not always receive training before migrating. Respondents told us that "in order to avoid training, they often go to centers where they can get a certificate relatively easily without taking full training." This trend increases the risk of irregular, unsafe and undocumented migration of women and increases their vulnerability to trafficking.

Jashore

The rate of overseas migration from Jashore is higher among women. Interviews and focus groups with local people revealed that there are a few areas in the Jashore district from which women in large numbers have migrated to the state of Mumbai, India, for work. In local vernacular, these are known as "Bombay communities." According to interviewees, approximately 25,000 to 30,000 Bangladeshi women from these communities are employed in Mumbai. The migration takes place through social networks. Many of these women migrated abroad to pay off their dowries. As a local government leader said: "Polygamy among men increases in this region due to lack of economic activities due to climate change and opportunities to earn money in the form of dowry. Female migration to India from Jashore is thus indirectly connected with the climate change."

Conclusion and Recommendations

SUMMARY OF MAJOR FINDINGS

This study was undertaken to collect firsthand data and information in the Khulna and Jashore regions on the linkages between climate change and its impact on economic activities and internal and international migration. Since the study was conducted for an initial assessment and to capture preliminary effects of climate change, it was unable to go into detail with regard to the implications of coping and adaptation strategies that people employ in response to a changing climate. However, some interesting findings did emerge:

The Effect of Climate Change

It is evident that Khulna and Jashore are affected by climate change differently. While slow changes such as salinity and rapid changes such as cyclones are affecting agriculture and people's way of life in Khulna, manmade projects such as embankments and canals to protect land and agriculture have created permanent waterlogging and flooding that threaten traditional agricultural livelihoods in Jashore. In both areas, people have taken up non-farm economic activities to deal with climate-related problems. For example, low-income people in Khulna have pivoted to work in shrimp and fish processing factories, rickshaw pulling and domestic work. In Jashore, many people have become transport workers while others work in rice mills and local industries. The study found participation of both men and women in these sectors, although women's wages are lower than their male counterparts in all occupations.

Changes in Economic Activities

In many cases, the new economic activities chosen by local and migrant farmers were not profitable enough for them. Most respondents explained that they live hand to mouth. None of the respondents were part of any well-designed adaptation strategy undertaken by the government or another agency. The study also found that workers are poorly able to cope with the changes in their livelihood. They lack information, training and financial resources to adapt to employment changes, and as a result, they mostly rely on their friends and families for information and other types of resources to find a job. The respondents could not directly make the connection between changes in their livelihood and the impacts of climate change. However, the push factors cited for job change and migration indirectly correspond with climate change. In addition, workers' involvement with unions were found to be minimal. They were found either ignorant about the existence of such unions or unwilling to join such unions. Another factor was that most of the industries and occupations of the respondents did not have unions. It was beyond the scope of this study to probe or examine whether management had busted the unions.

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Migration as an adaptation strategy

In and out migration of people from both Khulna and Jashore are common and recurring phenomena. More recently, men and women from this region are also migrating to the Gulf and Malaysia for employment. Cross-border migration to India for employment and business is common in these border areas. In all cases of migration, respondents cited push factors such as unemployment, low wages and the lack of agricultural production at home. Thus, respondents did not directly identify climate change as a motivating factor in changing employment activities and in their decision to migrate. However, they did provide evidence that suggests that the underlying causes of migration and newer types of economic activities have emerged from the need to adapt to both rapid and slow changes in the climate. Less than a quarter of the people surveyed for this study experienced internal migration, whereas only 12 percent had migrated to the Gulf. This is consistent with national data. Also, cross-border migration to India for employment and business is not uncommon in these border areas due to geographical proximity and social networks. Compared to cross-border migration, overseas labor migration to the Gulf and other places is relatively new in the area and is still lacking proper preparation, such as pre-departure training and information dissemination on labor rights or migrant worker assistance.

RECOMMENDATIONS

Based on the findings from survey, key informant interviews and focus group discussions, the study presents the following nine suggestions:

✓ **Reducing the Impact of Climate Change**

Strong advocacy with the government is required to recover rivers, canals and large bodies of water from increased siltation; to prioritize studying the impact of climate change on communities; and to devise innovative, evidence-based, sustainable, and just/equitable land-use solutions.

✓ **Raising the Level of Awareness About Climate Change and its Impacts**

The study indicates that there is a low level of understanding among workers about climate change, how it impacts them and the economy. It is important to raise the general level of awareness among affected people so they can collectively advocate for government adaptation strategies to protect against climate change impact. Awareness building is also important for reducing carbon emissions by local people to prevent further environmental damage.

✓ **Decentralization of Economic Activities**

To manage the concentration and inflow of people from climate-change-affected rural areas to urban centers, measures should be taken to decentralize economic activities. Creating sufficient economic opportunities and decent work in their home communities is the primary solution to avoid further economic distress and migration. At the same time, a rights-based approach should be taken so that migrants can deal with the impacts of climate change.

✓ **Skills Training and Seed Money**

To create better access to income-generating activities, skills recognition and skills development activities should be conducted for low-income and lower-skilled workers in the Jashore and Khulna regions. Investment and training for producing traditional goods, such as embroidered clothing, may also create self-employment opportunities. Fish and shrimp processing companies also expressed the need for skilled workers to increase the functionality of the sector. In collaboration with the Department of Youth

Development and other relevant government agencies, training opportunities for climate-affected people should be introduced along with access to seed money to support and encourage entrepreneurship.

✓ **Creating a Database of Workers**

Fish and shrimp processing companies in Jashore and Khulna have been employing workers for decades, however companies frequently suffer from labor migration when skilled workers depart for more lucrative opportunities. Company representatives recommended creating a central database of workers, which could help companies hire skilled workers more efficiently.

✓ **Overseas Migration Services**

Pre-decision and pre-departure orientation and counseling services should be undertaken on a larger scale for people who intend to go abroad for employment. These services could also raise awareness about safe migration and anti-human trafficking.

✓ **Reducing Wage Discrimination Between Men and Women**

To reduce the wage differential between men and women employed in various sectors, greater awareness among both workers and employers is necessary. This would be an opportunity and a space for unions to be more active and educate workers on the benefits of belonging to a union.

✓ **Improving Respect for Freedom of Association**

Improving respect for freedom of association and capacity building of workers to organize unions is critical, as it is a key strategy for informing workers on how to adapt to the impacts of climate change and create the conditions for decent work everywhere.

✓ **Large-Scale Research**

Large scale research needs to be conducted in Khulna and Jashore to better understand the interconnected drivers of economic activity, recent changes and the impact on migration. This is important because the causes and impacts of climate change and adaptation strategies vary across regions.



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