



Waiting for
Change

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The Water We Want

Research on solving drinking water salinity in
Southwest Bangladesh through CSR intervention

Living with Erosion

Research on CSR Intervention for Climate Change
Adaptation in Coastal South



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Foreword

Bangladesh is going to be one of the worst sufferers of global climate change and environmental degradation. Natural disasters like flood, cyclone, river erosion, salinity of water and scarcity of sweet water are now issues of grave concern to us. People directly affected by climate change are struggling hard for their living and livelihood, but finding it very difficult. Amidst macro level development of the country, these vulnerable communities are remaining poor for years and decades. Climate change and natural disaster are not only creating barrier to breaking the cycle of poverty for the affected people, but also limiting the pace of economic growth of the country. The issue needs to be addressed with high priority.

MRDI, in partnership with Bangladesh Bank has taken up the task of analyzing the situation of two disaster prone areas in which CSR intervention can address the sufferings of the vulnerable people. These are one village of the coastal district of Bhola and three villages in the Sundarbans area.

A research team has conducted the study. Review of relevant documents, questionnaire based survey, Focus Group Discussions (FGD), Participatory Rural Appraisal (PRA) and Key Informant Interview (KII) methodologies have been applied in carrying out the research.

People of all walks of life of the study areas have been involved in the process. They spontaneously responded to the questions and participated in the discussions to express their acute problems.

People of the Sundarbans villages unanimously identified scarcity of safe water as not merely as a problem, but as a crisis that is related to their life and death. Number of initiatives were taken previously to address the crisis, many of which failed and some produced partial results. During the study they suggested some measures for a long term solution to the problem. Most of them requested for support to store rain water in a scientific and hygienic manner. Other measures were also suggested to supplement this method. Since CSR funds have already demonstrated visible impact in these three villages in reducing poverty, people feel that business community can come up with support to put an end to the most acute problem of this vulnerable community.

Picture of Char Patila is that of a poverty stricken community, living a deplorable life deprived of all service facilities. Disasters hit them frequently and change in climate affects their life and livelihood adversely. Salinity of the soil has changed their crop pattern. Abject poverty has put them in a vulnerable situation, hardly allowing them to take a free occupation like fishing, agro-farming or income generating activities.

Taking the situation into account, the team has suggested some livelihood options and grounds for CSR intervention in Char Patila. It is evident from previous experiences that CSR funds work best in addressing poverty in remote and uncared areas.

Dr. Atiur Rahman, Governor of Bangladesh Bank has always been a driving force to our CSR advocacy programmes. We are sincerely thankful and grateful to him for his kind support and guidance in conducting the study.

Deputy Governor of Bangladesh Bank Shitangshu Kumar Sur Chowdhury provided valuable support and cooperation to us as always. We extend our hearty thanks to him. We are thankful to the officials of sustainable finance department of Bangladesh Bank for their cooperation in conducting the assessment.

A team of dedicated researchers worked hard to conduct this study. We are thankful to Miraj Ahmed Chowdhury who led the team and prepared this report. Thanks to Saurav Rahman and the video team for their relentless work for producing a good report and documentary. The video documentary in DVD which is inserted in the inner jacket of the publication will give a vivid picture of the situation of climate affected areas. Members of women's somities at Koilashganj, Bon Laudob and Dhangmari were sincerely helpful in collecting field data and conducting meetings. We are thankful to them. Special thanks to Unnayan Dhara Trust, Char Fashion, Bhola for sincere cooperation in organizing the meetings and collecting data.

Women and men of the villages of the Sundarbans and Char Patila responded spontaneously and extended sincere cooperation to the study team. Without their cooperation, conducting this study would not be possible. We are sincerely thankful and grateful to these people who are at the centre of this study.

Last but not the least, MRDI officials worked really hard to complete the study and publish the report. Their contribution must be acknowledged with thanks.

This study aims to expand CSR interventions in climate change affected areas. Businesses, particularly the banks, out of their sense of social responsibility, are helping vulnerable communities come out of the vicious cycle of poverty. They can play yet another important role in addressing this burning issue of climate change. Our efforts will be fruitful if the banks and other stakeholders find the report useful to mainstream their CSR efforts for a sustainable social change.



The Water We Want

Research on solving drinking water salinity in Southwest Bangladesh through CSR intervention

Abstract

The Management and Resources Development Initiative (MRDI) has been working on advocacy for promotion and expansion of Corporate Social Responsibility (CSR) programs for about seven years. Encouraged by its experience drawn from CSR advocacy, MRDI is now implementing the second phase of CSR for Advancement and Social Emancipation (CASE) project in partnership with Bangladesh Bank.

One of the major focuses of this project is to identify scopes of CSR interventions to address the impact of climate change and environment protection. As south west is the most climate vulnerable region in Bangladesh, it has been chosen as a potential area of investigation to assess the development needs of the local people.

The study covered Bon Laudob, Dhangmari and Koilashganj, three villages at Dacope Upazilla in the district of Khulna. The area is adjacent to Sundarbans repeatedly buffeted by tidal floods and cyclones. The biggest climate change impact for the community is the extreme surface and ground water salinity and complete unavailability of safe drinking water.

Objectives of this research were to: 1) assess the severity of salinity and its effect on health, education and income, 2) examine the existing mechanism for adaption and 3) determine and outline a potential scope of CSR intervention for sustainable solution.

A random sample of 160 households in three villages had been surveyed to collect quantitative data. All the respondents complained that the water they drink is salty and 42.5% said that it was smelly too. Almost all of them were found to collect drinking water from ponds in dry seasons. And 70% of the households try to make it safe using alum, a few boil it but all of them responded that even after that, the water remains undrinkable.

Survey results suggested, mostly women collect water from ponds and at least 30% of them had to spend more than two hours every day for it. On a question to prioritize the impact of saline waters, almost all of them ranked health hazard and sickness first; income reduction and education the second and third respectively in the list. Alarmingly, every month there was someone who fell sick in more than one third of the households. They suffer mostly dysentery and skin diseases that a local doctor said was purely because of salinity.

There were two Focus Group Discussions with adult males and females of the community to get qualitative information. They said, since last eight years, people of this area had been trying every possible way to get safe drinking water. They tried Tubewells, Pond Sand Filters, rainwater harvesting but each of their effort failed to provide any sustainable solution to the acute salinity problem.

It was identified in FGDs that a desalination plant could be useful. There were two such plants in distant unions of Dacope, which had proved successful. Establishment of a desalination plant required big investment that could be managed or arranged by the community. Therefore it was concluded that if any CSR initiative could help setting up a desalination plant in the area, the Community was ready to provide land and contribute to manage the project sustainably. Even with limited income and poverty they are ready to pay for it.

Chapter 01

Introduction and Methodology

Context

Bangladesh is one of the most climate vulnerable countries in the world. It has challenges in the future and also successes at the present in tackling the problem with its own resilience, policy and resources. The United Nations Environment Program has awarded Prime Minister of Bangladesh, H.E Sheikh Hasina as one of the 'Champions of the Earth' in 2015 for her outstanding leadership in the frontline of climate change. One of the major reasons for this award is that she has set the example for other leaders, proving that investing in the environment can achieve sustainable social and economic development.

Keeping the national success in mind, this research aims at identifying possible scopes of intervention for private corporations and institutions to engage their social responsibility fund in combating climate change impacts and facilitating adaption tools to the most vulnerable and under-privileged people. In this quest, the study targeted Khulna region as potential area for investigation.

There are various faces of climate change. It starts from sea level rise, heightened storm damage, drought, excessive rainfall, loss of wetlands, increased salinity and so on. While most research has focused on inundation and losses from heightened storm surges, increased salinity from saltwater intrusion may pose another serious threat through its impact on household water supplies. Understanding the significance and magnitude of this threat may be critical for long - term development and poverty alleviation in countries with vulnerable coastal regions (Brecht, et al. 2012).

The area targeted

It is estimated that, around five million people of coastal region badly suffer due to ground water salinity and lack of safe drinking water. Therefore, this research explored the threat posed by extreme ground water salinity in the target area of Dacope, one of the most vulnerable and remote Upazila of Khulna. Three villages of Dacope were selected considering large size of the population, proximity with each other as a potential CSR intervention area and vulnerability to climate change impacts. They are Bon Laudob, Dhangmari and Koilashganj, located adjacent to each other.

Methodology

To investigate the impact, affect, severity, status of existing adaptation mechanism and potential solution, this research relied on collection of data, both qualitative and quantitative. The study included some 'Key Informant Interviews' for analysis and reviewed various literatures related to salinity in Bangladesh for a broader perspective and as secondary source of information.

The qualitative data was gathered by a baseline survey in the target area. The questionnaire was prepared by experts following WASH survey guideline of the United Nations agencies. It was tested and reviewed by a panel of independent experts before the final survey.

The survey was conducted by a team of experts among 160 households in three locations. Samples were selected randomly with particular concentration on adults — male and female equally. The sample size covered around 14% of total households in three villages. 50% of the respondents were women and 50% were men.

Three FGDs were conducted in three villages to gather qualitative information. Each FGD comprised 10 to 14 respondents (both male and female adults). The FGDs were conducted by an expert team. The groups comprised farmers, teachers, local elected leader, housewives, youths and women leaders. The responses of the participants were recorded and transcribed. After the FGD sessions, the team leader reviewed the issue-based responses.

The Key Informant Interviewees (KIIs) and the people for in-depth interviews were identified by the assessment team. At the end of the FGDs, KII and in-depth interviews, the team leader prepared a draft paper with key messages from the discussions.

Chapter 02

Saline villages of Southwest

Location and the people

Koilashganj is a village of ward-6 under Koilashganj union of Dacope upazilla in Khulna district. Bon Laudob is just beside Koilashganj and a village of the same union in the administrative ward no: 4. Dhangmari is a village of Ward-9 under Banishanta union of Dacope upazilla. It is surrounded by a natural wall of "Gol pata" (*Nypa fruticans*) plant. On the east is Mongla port, on the west Bon Laudob; Khejuria village is on the north & Dhangmari canal of Posur river in the south. All three villages are situated at the entrance of the Sundarbans mangrove forest. They are crisscrossed by a network of rivers and creeks. They are connected by a WAPDA road and another major linkage between them is the Dhangmari River.

There are around 1200 household in three villages with a population of 5668. Number of males is a little higher than the number of females in all three villages and in the case of Bon Laudob, the difference is wide. This area is predominantly populated by Hindu community. Males are the head of 95.6% households. Out of 160, only seven were found headed by females. The average family size is of 4 to 5 members. HH sizes are found bigger in Dhangmari with an average number of 6.

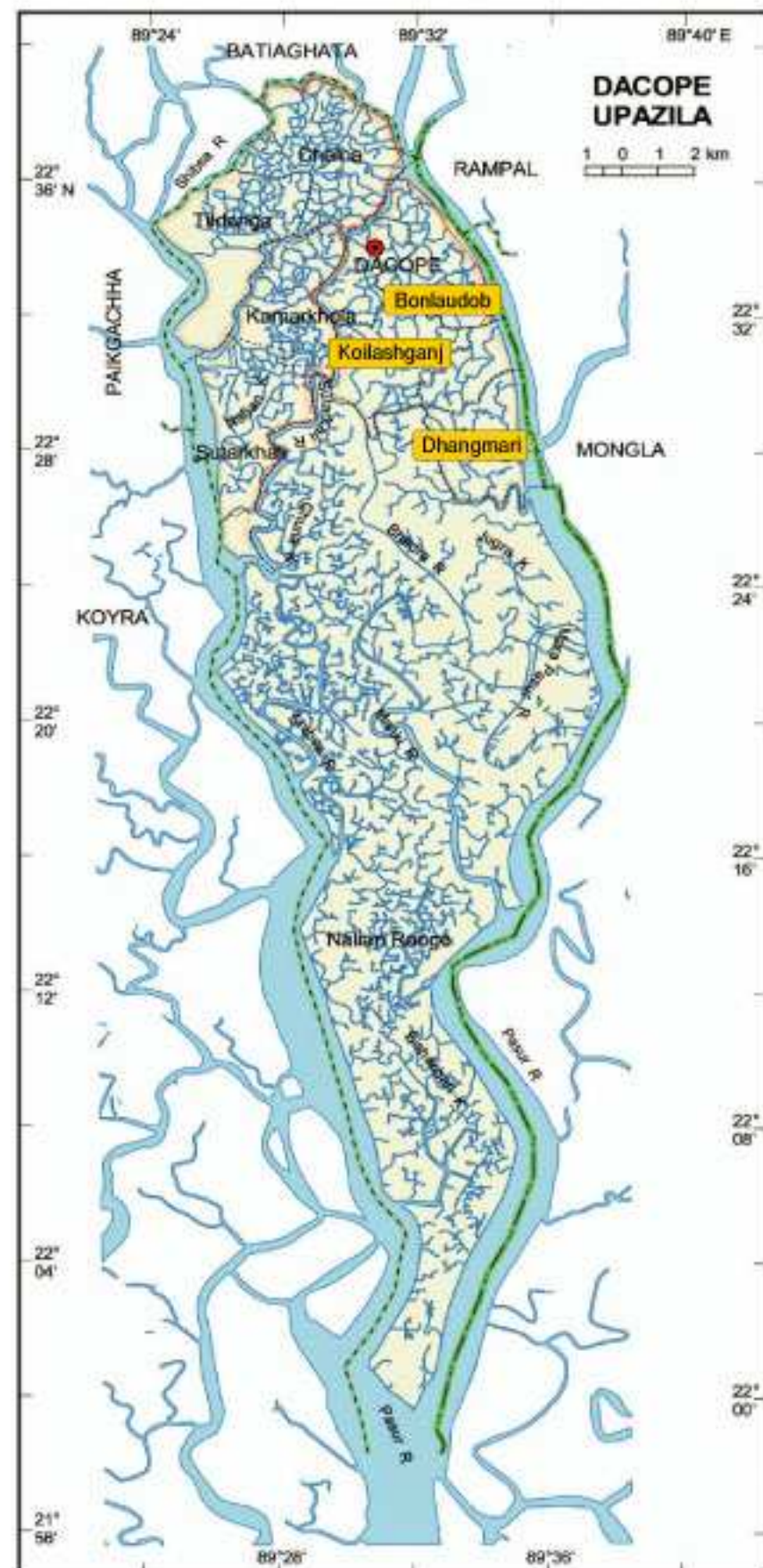


Table 1
Demography & households

Village/Info	Koilashganj	Bon Laudob	Dhangmari
Households	488	342	367
Population	2061	1405	2202
Male	1045	800	1134
Female	1016	605	1068
Male in %	50.7%	56.9%	51.5%
Female in%	49.3%	43.1%	48.5%
Average HH Size	4.2	4.1	6.0

Education

More than a quarter of the family heads were illiterate in the target area. 41.3% of the respondents said that their family heads had only primary education. Almost one third had received secondary level education and a few of them passed higher secondary. Despite their poor socio-economic condition, all the family heads are sending their kids to school, even to college for higher study.

Description	Response	In Percentage
No	42	26.3%
Primary	66	41.3%
Secondary	47	29.4%
Higher secondary	5	3.1%
Total	160	100.0

Table 2
Household head education information

Health Facilities

Health hazard is a major concern to the villagers of Bon Laudob and Dhangmari. There is no health clinic or hospital in the vicinity of these two villages. In cases of emergency they have to travel 4 to 8 kilometers to Bajua Bazar, where there are a few private doctors. Similar situation prevails for maternal health care including child delivery. Patients and health service seekers have to walk or avail uncomfortable transportations like rickshaw van, Nosimon & fishing trawlers. People often go to the local traditional healers with their health problems.

Koilashganj has a hospital. Two doctors provide local people medical services though only for two days in a week. Only primary medical care is available in that hospital. It is also situated in a corner of the village. In cases of critical needs villagers travel to Upazilla Health complex at Dacope Sadar.

Patterns of livelihood

The main occupation or livelihood of this village depends upon Agriculture. About 89% of the respondents either grow cereals in their own land or depend on lease crop sharing. Among the respondents 37% are day laborers, engaged in various types of activities. Around 7% are engaged in business, wage earning job like teaching and NGO staff and self employment.

Economic Status

By and large, people of Koilashganj, Bon Laudob and Dhangmari are poor in terms of their income. A little more than quarter of the total respondents were found above the poverty line. Rests are poor earning less than an equivalent of \$1.25 a day.

Around 38% houses in the target area are just huts made of either Mud or Bamboo & the roof of Golpata. More than half of the families enjoy a little better houses with a roof of tin (CI sheet). Out of 160 respondents only four live in a building. There is electricity connection in 30% of the houses. Only 14% use solar power to light their residence and more than half of the households do not have any electricity.

Almost 70% of the respondents do not have any access to information. Few have television and/or radio in their residence and only 2 out of 160 use internet. But around 84% are found to have cell phones in their households.

Table 3
Monthly Income of
households

Description	Response	In Percentage
Below 2500	118	73.8%
2501-5000 taka	38	23.8%
5001-10000 taka	3	1.9%
10001-20000 taka	1	0.6%
Total	160	100.0%

Climate and vulnerability

The target area is located in a typical monsoon climate area. It has three main seasons: Summer during March to May; monsoon during June to October; and winter during November to February. The rainy season is hot and humid having about 80 percent of the annual rainfall. The winter is predominately cool and dry. The summer is hot, dry and interrupted by occasional heavy rainfall. Almost 89% of the respondents said they suffer bad weather around five to six months of the year. (WDB, 2013)

The southwest is itself one of the most climate vulnerable areas of Bangladesh. Koilashganj, Bon Laudob and Dhangmari are not exceptions. When asked during survey, what kind of climate shock they suffer most, respondents listed flood and excessive rainfall in the top. Cyclonic storm was in the third.

Cyclones have hit the coasts of Bangladesh very frequently in the recent decades. From 1901 to next 57 years only 11 cyclones had lashed the coast. In next 52 years number of cyclones along the coast rose to 55. It means in just five decades, the number of cyclones hitting Bangladesh coast has increased 5 times than of same period before. The recent most devastating cyclones hammering the coast under Khulna district were in 2007 (Sidr) and 2009 (Aila). These cyclones directly affected 50% people of Dacope. (Source: *Bangladesh Meteorological Division*)

Salinity: A climate change impact

Increasing surface and ground water salinity is a matter of great concern now for the life and livelihood of communities in Bon Laudob, Dhangmari and Koilashganj. Local inhabitants said during FGDs that especially after Aila and Sidr, the salinity intrusion in the area during dry season has become a common phenomenon.

Further salt water intrusion by rampant tidal surge and floods in the after years has made the problem so acute that even after six years of the cyclone none of the ground water sources can provide safe water for either drinking and or household use. According to them, tidal flooding during wet season (June to October), direct inundation by saline or brackish water and upward or lateral movement of saline ground water during dry season (November to May) contribute significantly to the development of ground water and soil salinity.

During monsoon the salinity levels are very low because of the increased amount of fresh water in the water bodies. The level of salinity starts increasing from January due to the reduction of upland discharge and reaches the peak in April and then starts decreasing again. There is also a relationship between river flow and salinity level, the lower the flow the higher the level of salinity. The degree of salinity varies widely with area and season, depending on availability of freshwater, intensity of tidal flooding and nature of saline groundwater movement.

Both water and soil salinity has increased along coastal areas of Bangladesh, in an alarming rate during the last couple of decades. There are various studies that examined reasons of it. An article published in the Bangladesh e-Journal of Sociology in 2012 identifies upstream reduction of natural water flow to be one of the major causes for salinity increase. It suggests that the factors which are influential for increasing level of water and soil salinity include global climate change and sea level rise and man-made destruction due to widespread commercial shrimp farming. (Basar, 2012)

Coastal areas of Bangladesh mainly suffer salinity in rivers, other surface sources, ground water and soil. Surface water salinity means there is no water to drink in rivers, lakes, ponds and canals. And extreme groundwater salinity implies salty water in tube-wells for the villagers. However all types of salinity are inter connected with each other. Survey found, almost 99% of the households use freshwater ponds for drinking water. But in the case of other uses, like shower or cooking, the sources of water are diverse. Although they mostly depend on ponds and canals, some of them rely on river and a few on tube-wells and rain water tanks. So to examine water salinity, this research studies salt level in rivers, ponds and canals.

Description	For drinking	Other Use
Only Pond	98.75%	41.3%
Only Canal	-	1.3%
Both river and pond	-	7.5%
Both pond and Canal	1.25%	47.5%
Only river	-	2.5%
Total	100.0%	100.0%

Table 4
Main sources of water

Level of water salinity

This research measured water salinity level in the target area, though on a limited scale. There were two samples, first from a lake in Bon Laudob and the second was from a pond in Dhangmari. They were collected during early November and tested by Thana Fisheries officials. The result revealed a salinity level of 1.5 ppt in the lake and around 2.4ppt in the pond. Officials said that salinity level was found higher in past years than the present samples. According to them, due to heavy rainfall this year, the salinity is found quite low. A previous test result by MRDI in April 2013 found, 20 ppt of salinity in lakes and 15 ppt for a similar pond.

Increasing trend of water salinity

To identify a pattern of the salinity we have reviewed other national and international researches. There are several studies on salt water intrusion and salinity in coastal region of Bangladesh. A recent article by Aneire Ehmar Khan et al. investigated historical pattern of salinity level in the rivers of Dacope Upazilla.

It studied data from CEGIS and found "average level of river salinity in Dacope was 8.21 ppt (range, 1.35-12.9 ppt) during the dry season and 0.64 ppt (0.19-3.90 ppt) during the monsoon season; shallow groundwater salinity averaged 2.6 ppt during the dry season (0.4-11.4 ppt) and 0.60 ppt (0.4-3.8 ppt)." during the monsoon season. When such results are compared with findings of this research, it appears that salinity level in this area has increased significantly during last 15 years in ground waters (from 0.60 ppt to 2ppt on an average) during non-dry season.

However, CEGIS has conducted a field survey to measure salinity level in various points of river Passur from April 2014 to April 2015. The survey studied the Passur-Mongla confluence which is just few kilometers away from the target area. The result suggests river salinity level in that area was 10ppt during April and 9.5 ppt in June 2014. It was reduced to zero in October and then again reached 14ppt in the month of April 2015. This data also indicates a very high level of salinity and a significant increasing pattern comparing with the year 2000 data from the same organization.

Table 5
Salinity at Passur River at Passur-Mongla confluence

Apr'14	Jun'14	Oct 14	Jan 15	Apr 15
10.0	9.5	0.0	5.0	14

Source: CEGIS Field Survey -April, July, October 2014; January and April 2015

The current recommended dietary intake of sodium is 2 g/day (< 85 mmol/day), according to the report of a joint expert consultation of the WHO and the Food and Agriculture Organization (FAO) in 2002. However, AE Khan suggested in the article that the population of Dacope might be consuming 5-16 g/day sodium in drinking water alone during the dry season, depending on their drinking water source. The article concluded that this level of consumption was unacceptable by current standards. (A.E. Khan et al., 2011)



Focus groups and KIIs on climate change and salinity

Findings

- ✓ The participants unanimously identified the salinity in water as number one problem in this area. Some elderly participants recollected the changes in climate during last 40 years of the area. According to them, compared to the past the salinity in water has increased remarkably now be it of pond or tube well. Even sinking a deep tube well gives the same results.
- ✓ After 'Aila' the earth composition has changed. The whole earth crest has become saline. The layer of earth is so porous that even if the depth goes up to more than 90 ft. down, the water is saline. During Aila the saline water submerged the open sources of water like ponds, big pond or reservoir.
- ✓ They have observed a gradual increase in cyclone and flooding. They have also noticed river beds filled up by siltation. The reduction of the navigability of the rivers and its tributary caused increased salinity. They considered it as an impact of climate change.
- ✓ Respondents said, since childhood they had 6 seasons round the year. But now it has reduced to 3 e.g. winter, rainy and summer. The annual amount of rainfall has also remarkably reduced. (without providing data) Once they had rain water with oily or marshy smell. Some people called it acid rain.

Chapter 03

The salinity impact

Scarce water

"We can provide guests with foods but not water. The scarcity of drinking water is so high", said one participant in a FGD at Dhangmari. These words reflected the affect of water salinity in the lives of Koilashganj, Bon Laudob and Dhangmari. The biggest curse it posed to the people of this area is the scarcity of drinking water. Participants said in the FGDs that, previously they could depend on pond water for up to 7 months of a year. Now they cannot. Almost all the ponds have become extremely saline. There are only 3 or 4 ponds left that are less salty. They cannot meet the need of more than five thousand people in the dry season. Now the community has to depend on rainwater. A container of 1000 liters of rain water serves a family of 4/5 members only for 3 months. The rest of the year they are compelled to drink either unsafe pond water or the saline water.

Women hit hard

It is found that women and children in this region are hardest hit and affected by scarcity of water. Survey conducted for this research found, usually adult female member of the family goes to the source to fetch water in more than 95% households. Most of the protected ponds are scattered in far flung areas and need hours to fetch a pitcher of water. On an average they have to walk 0.85 km for collecting



water. More than 38% of the respondents have to travel at least one hour to bring the water home. In 30% cases travel time is two hours or more. And sometimes the distance exceeds 4-5 km which affects their time, money and security of themselves and also their children. In at least 17% of the HH, female children go to the source to bring water, which affect their education badly. It is also found in literature reviews that salinity increases life threatening disease risks for pregnant women in coastal areas. The female members of the families often go to fetch water soon after delivery resulting displacement of the uterus.

However, respondents in the survey were asked to list the worst impact of water salinity in an order of priority. This report examines them.

- Health Hazard
- Income reduction
- Education of children

Case Study

Where the water is seldom a life!



Kaushik Mandol is the only son of Babu Mandol, a grocery shop owner, and his wife Aparna. The well off family lives in Koilashganj Union in Dacope Upazila. They own a mobile phone and a television besides having a 1000-litre water reservoir set up at the house premises. Kaushik, now 2, has been a sick child since his birth suffering from bouts of pneumonia, diarrhea and dysentery. He was taken to the divisional headquarters for medical treatment but without any improvement in his condition. Advised by doctors Kaushik was given bottled water bought from local market. His stomach behaved well the days when he drank bottled water. The family bought a 2-litre bottle of water for Kaushik after every couple of days that would last him for two days. That meant Babul Mandol had to spend from Tk. 400 to Tk. 500 each month to buy bottled water for Kaushik. The family could not continue it for more than four months. Then the family turned to rain water and boiled pond water. It did not suit the boy. He has been afflicted with the old diseases once again, says his mother Aparna. The nearest source of sweet water is 40-minute walk from his home. Aparna used to collect water from this source before Kaushik's birth. That water did not suit him. The pond-sand-filtered water, locally known as filter pond, takes an hour to reach from her home. She is too afraid to leave her baby alone at home to go that far to bring safe drinking water. Her husband too can't go leaving the shop. For a few days, the family bought water from a water vendor, at Tk. 5 per pitcher. They stopped taking this water after dirt was found in it. Preserved rain water can last the three-member family up to two months. They collected two pitchers of water a day. With no other option Mandol's family drinks water from the homestead pond after boiling it and using fitkiri. "If boiled well, the water poses less risk of diarrhea. But dirt remains at the bottom, the water never gets completely clean. There is much dirt that we can't see with our eyes. We feel bad. No mother can stay well if the child is sick. The mother gets sick too."

Health Hazard

Inadequate supply of safe drinking water in this locality causes many water borne diseases. Women and girls suffer from dysentery, diarrhea, peptic diseases, fungal infections, skin diseases and scabies because of using saline and contaminated water.

Almost 90% of the respondents complained that they are afflicted most with diarrhea and dysentery among the diseases. Gastric/peptic ulcer and skin diseases are also common health problems as responded 55% of the people surveyed.

Table 6
Frequency of illness
in a family

Description	Response	In Percentage
Once or twice a year	31	19.4%
Three or four times in a year	47	29.4%
Once in a month	57	35.6%
Once in a week	25	15.6%
Total	160	100%

Key Informant Interview

Dr. Bidhan Chandra Roy

Physician at Koilashganj

- The water of the ponds of the Dacope area is not only saline. It is infected by other germs. The risk of infection of mother and children of the area is there from the pond water.
- The number of children come to his chamber as patients is high compared to others.
- In winter season when water level goes down in both pond and tube well, the pneumonia, diarrhea infection increases among the population of the village. Increasing number of patients with water borne diseases like dysentery and typhoid report to the doctors' chambers.
- Advised them to use boiled water. Those who can afford I advised them to take bottled water.
- Over time the outbreaks of jaundice among the villagers threaten their lives.
- It appears the patients of Koilashganj come in high numbers as the water of that area is very much saline and polluted too.
- As collecting water from far away is a hard work and mainly women do the job, there is a tendency of drinking less water among pregnant women, resulting in dehydration.
- Saline water causes high pressure among the pregnant women. It poses risks of death of the mother and the baby at birth.
- Vaccination is regularly done. Awareness is high about National Immunization Day.
- The poorest population gets treatment from 'community clinic. It is popular among the villagers for services.

The diseases are just one side of the story. More alarming is propensity of sickness in that locality. The survey found, every month at least one member of family falls sick and this is the reality in 35% households in that locality. And around 30% of the respondents said, frequency of illness is three or four times a year in their families.

This research reviewed various literatures for scientific evidences on impact of water salinity on human health. A recent article by Aneire Ehmar Khan et al. provided some objective assessment about how saline drinking water increases risk of Pre-eclampsia and Gestational Hypertension in Coastal Bangladesh.

They found that the mean water sodium level in all the water sources combined was 516 mg/L. Assuming an intake of 2 L, it is equivalent to 1.1 g/day of sodium intake from drinking water alone, which is more than 27 times higher than the intake from the recommended sodium limit of 20 mg/L in drinking water. The mean water sodium levels from drinking water alone, detected in the population of Dacope, contribute to almost 52% of the dietary goal of 2 g/day set by the WHO. Moreover, 38% of pregnant women consumed more than 1.2 g/day of sodium from drinking water, showing that a large number of people in this population are exposed to unacceptable levels of sodium.

The article concluded that salinity in drinking water is associated with increased risk of pre-eclampsia and gestational hypertension in this population. Given that coastal populations in countries such as Bangladesh are confronted with high salinity exposure, which is predicted to further increase as a result of sea level rise and other environmental influences, it is imperative to develop and evaluate affordable approaches to providing water with low salt content. (A.E. Khan et al. 2014)

There is a great health impact on children too. In a KII, Sanjoy Mandol, the assistant teacher of a local primary school said "School children suffer from drinking water. We cannot provide water to them in school. They have to bring water in the bottle. Those who cannot bring, they suffer. Students often suffer from stomach diseases. Absence in class due to dysentery or diarrhea is a regular issue."

Income Reduction

The health problem is itself an obstacle to income and better living. In the three villages of Dacope, most of the families suffer sickness in almost monthly or at least quarterly basis. Due to illness they cannot go to work or explore opportunities. Besides this, a number of 143 people among those 160 respondents in the survey said that their income has reduced as working hours spent to collect water. But this is only a narrow side of the affected income.

The participants of FGD informed that the salinity of the earth caused reduction of fertility with negative effects in harvest. In past paddy harvest were around 10-12 maund in each bigha of land which has reduced to 5 to 6 even if they have to use huge amount of fertilizers and insecticides and water. This area was of high yield of watermelon and coconut but now it has reduced remarkably. The production of other vegetable and fruits also come down.

One of the KI said in an interview that the fish culture had also been affected due to this salinity. Species of fish had decreased in rivers and ponds. The number of fisherman families declined from 200 to 20 in Koilashganj.

However, a recent World Bank policy research working paper finds that, households in areas with high inundation and salinization threats have significantly higher out-migration rates for working-age male adults, dependency ratios and poverty incidence than households in non-threatened areas. The study looks at the impacts of inundation risk, salinization and market access on household composition, economic welfare, and poverty in coastal Bangladesh. When salinity, inundation risk and market access are switched from their least harmful to most harmful levels, the poverty impact is striking: the probability that the economic status of a coastal household is in the bottom 20 percent rises six-fold, from 8% to 56%. (Dasgupta, 2014)

Case Study

Salinity and the income dilemma



Krishnapada, a 68-year-old day labor from Bhutemari in Koilashganj, earns Tk. 200 to 250 a day and that takes his monthly income to Tk. 6,000 to Tk. 7,000. Half the money he sends to his son who studies in a college at Mongla. He spends the remaining part of the income to run a two-member family, including purchase of medicines worth Tk. 600 a month for his sick wife. Krishnapada looks for work which does not come all days week in this remote village. Many refuse to hire him because he is considered too old to work.

Because of his wife's illness Krishnapada has to do the daily chores at home like dusting the house and fetching water. A pitcher is enough for him and his wife. He has to travel for about two hours to collect water from a filter-fitted pond far from his home. So he can't collect water every day as he can't afford to be late in the market for fear of losing work for the day. That leaves his family to depend on water from a pond close to his home. The water is too salty to drink and so he tries to boil it to make it drinkable. The boiling does not help much.

This saline water does not suit Krishnapada's wife who suffers from ulcer problem. The saline water compounds her illness. Doctors have advised her against drinking the pond water. Krishnapada has to weigh between two options: work to run the family or collecting safe drinking water. Standing at the courtyard of his home on a later November day a bewildered and concerned Krishnapada speaks about his dilemma. With no money left he must go to work to earn for the family and treatment of his wife. At the same time he has run out of drinking water. Not a drop of water at home with which his wife can take her medicines. Work or to the "filter pond"—that is the question. In the end he decides to go to work to earn for the day's food. What about the water? "That I will collect from the home pond," he says as he heads for the bazaar. To another question he says he does not care about salinity any more. "Those who born in salinity can't expect to drink good water."

3.5 Future of salinity

Another World Bank study identifies soil salinization in coastal Bangladesh as a major risk from climate change. It says, in the coming decades, soil salinity will significantly increase in many areas of Barisal, Chittagong and Khulna districts. The study assesses changes in soil salinity in coastal Bangladesh from 2001-2009, using salinity information recorded at 41 soil monitoring stations by the Soil Research Development Institute. It projects a median increase of 26% in salinity by 2050, with increases over 55% in the most affected areas. (Dasgupta, 2014)

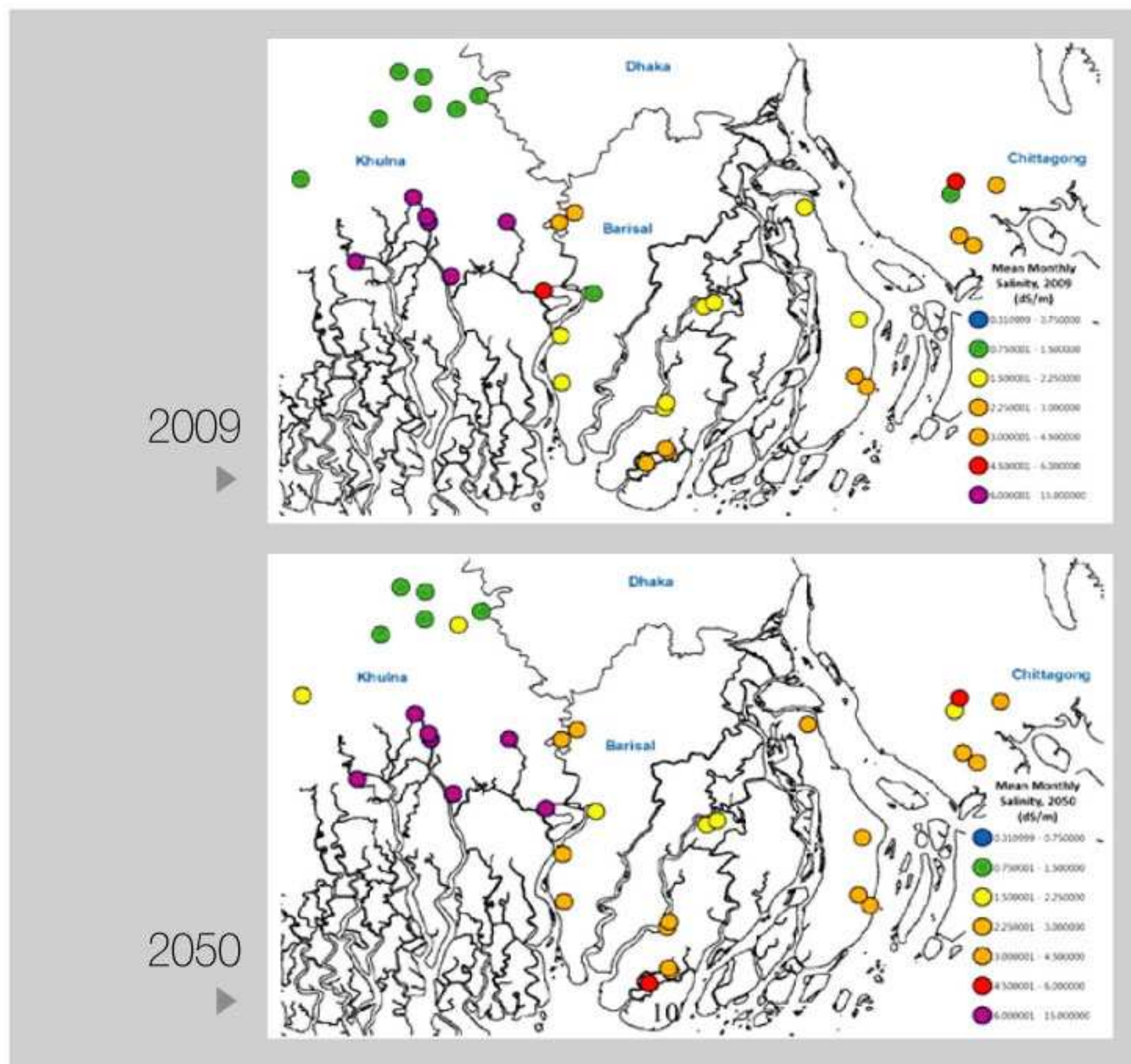


Figure 2: Observed and projected soil salinity measures: 2009, 2050 (WB)

The Department of Public Health Engineering (DPHE) and the Institute of Water Modeling (IWM) have conducted a study titled, "Joint Action Research on Salt Water Intrusion in Groundwater in the Coastal Area." The preliminary findings of the study suggest, due to climate change area of fresh water zone will decrease compared to present situation and areas under severe salinity will increase by 14% by 2050. The study was carried out in parts of three districts of Khulna, Jessore and Satkhira covering about 1534 square kilometres, aiming to assess salinity extent and intrusion, and aquifer vulnerability in the area. Given the outcome of recent research reports, it is evident that the ground water salinity is going to increase further in the coastal southwest. (Dhaka Tribune, 2015)

Chapter 04

Fighting the salt

A never ending fight for adaption

People of Koilashganj, Bon Laudob and Dhangmari are resilient. For the last one decade they fought every natural disaster. While Sidr and Aila washed away most of their houses, live stocks and crop, they turned around and rebuilt everything. Now it is hard to imagine the destruction of those cyclones while watching the vibrant life, busy market or activities of the people. As salinity started growing in their land and water, these people searched for and fought with every possible solution against it.

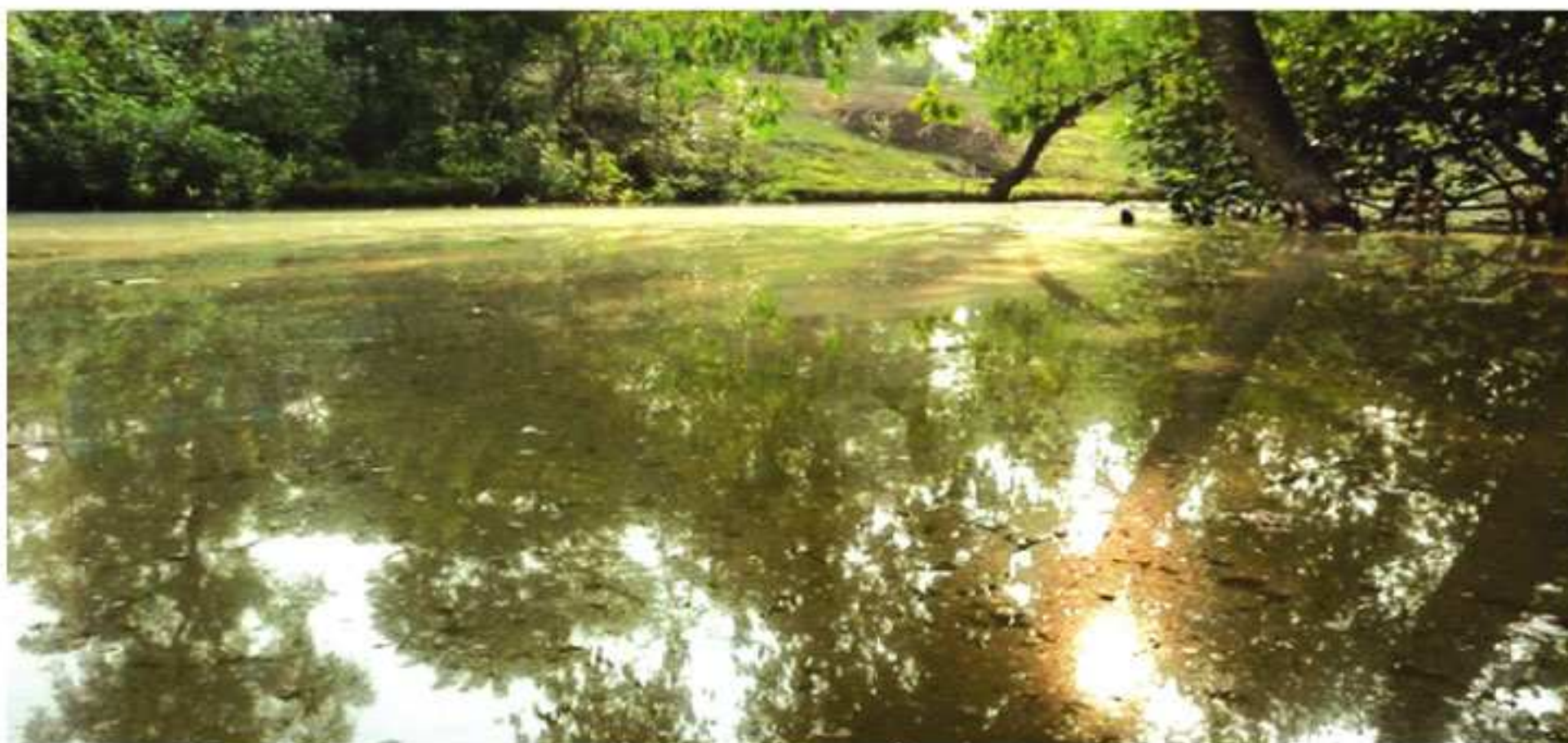
The demand for drinking water is not acute throughout the year. The variation in demand could be as stated as follows:

- **Low** : Asar-Sravan-Bhadro
- **Medium** : Aswin- Kartik-Agrahayan and Poush
- **High** : Magh-Falgun-Chaitra and Baishak

In each type of demand their response varies also. Generally people of this area depend on rain water harvesting for drinking water during the time of low demand in monsoon. Some of them can preserve water till medium demand period; who cannot generally go to protected ponds. But during the high demand weather in between late winter and early summer, all of the population suffers as water in all sources dry up and salinity level reaches to its highest.

This research examined why every attempt of adaptation by local people had failed to a great extent and what should be a permanent solution. The team visited houses, observed each adaptation strategy, discussed with household members about pros and cons.

Village/Info		Koilashganj	Bon Laudob	Dhangmari
Table 7 Available water source with public access 	Protected Pond	2	1	0
	Tube-well	2	4	5
	Rainwater reservoir	4	1	6
	Pond Sand	5	3	0
	Filter	2	1	0



Ponds

Aparna Mandal, a housewife in Koilashganj generally collects water from the pond at the vicinity of her home. She tried every possible way to treat this water by filtering with alum and boiling. But it hardly becomes safe. She said her kid was attacked by dysentery for drinking this water several times. The doctor in the city asked to feed the baby bottled water. But that is rare in this remote area. When the team visited this house, her husband was suffering from stomach pain.

There are hundreds of ponds in the three target villages of Dacope. It had been the most popular source of potable water in the area. But almost all of them are saline now and water cannot be used for drinking. Residents of these villages use them for bath and washing clothes only. As level of salinity started increasing, some of these families tried to treat the pond water by lime. But during dry season, it becomes so saline that they cannot even take bath in most of those.

There are only three protected freshwater ponds in Koilashganj and Bon Laudob. None in Dhangmari. Water in those ponds is not actually sweet, only salt level is tolerable. These protected ponds, annually replenished by rainwater, are a main source of potable and drinking water in this area where most of the villagers flock to collect water. But during summer even those become unsafe. Generally, they attempt to treat saline pond water by alum, boiling or purifying tablets. But it fails in 99% cases. The pond waters are also not safe from pollution. The cow dung including other waste around the pond mix and make the pond water polluted amid salinity. Yet most of the people are drinking that water, as there are no other sources.



Tubewell

There are only 11 tubewells in the households of three target villages. All of them provide extremely saline water. It was before Aila, people who had tubewells could get fresh water from it. But after that cyclonic tidal surge and flood, salt water intruded in all of them. As soil salinity increased rapidly after years, it affected the aquifers and resulted in almost a permanent salinity in underground water.

Key Informant Interview

Gazi Jahangir Alam

Ex member of Koilashganj UP

- Water Development Board has found no sweet water layer in the earth crest of this area.
- To combat salinity the WDB excavated several ponds and reservoirs to preserve rain water. But over the year they also became saline.
- It may be due to lower layer. "When in winter the pond's water layer goes down it mixes with the salinity of the porous earthen layer. This makes the sweet water become saline".
- At present, the villagers are taking the pond water and filtering it at home. For the poorest it is difficult to have a good filter for having a germ and saline free water. Those who are well off can preserve more rain water too.
- Some fish industries tried to sink deep tube well but failed to have sweet water.

There are some who thought; salinity underground might decrease as many years gone by. Abdus Somed Forazi of Bon Laudob is one of them. He filled the pond in front of his house with soil and set up a tubewell instead. But as the team asked about quality of the water, he replied, sometime it was so saline that tasted bitter. Whatever they wash turns red with iron. There is so much iron that the water takes red color when potted. The tubewell is kind of abandoned now.

Rainwater harvest

Due to high salinity problem, a good number of households have been found to harvest rainwater in the rainy season for drinking. But the quality of this water deteriorates due to improper management of preservation, collection, storages and usage pattern of rainwater. These processes are not maintained in an organized manner and appropriate technologies are not followed.

There are other reasons too that make rain water harvesting an optional solution but not a permanent one. Taslima Begum of Dhangmari has a plastic water tank at the roof of her house. That tank can reserve at least 1000 liters of rain water. When the team reached her during early November, she said, this amount of water is only enough for a month or two. She harvested rainwater during monsoon. Now there is no rain, and the stored water can only meet the need of one more week; while almost 5 long months of dry season are ahead. She will have to go back to those ponds when stored rain water finishes.



Taslima has around 18 members in their joint family. If each drinks one liter of water a day, it will take less than two months to finish up the harvested rain water. So this mechanism of adaption also does not provide a sustainable solution to her.

Participants in FGDs informed that after Aila in each house they had started to preserve rain water in the tank with a capacity of 1000 to 2000 liter. But most of the poor families cannot afford buying a tank that costs 7 to 10 thousand taka. The 90 percent household do not have plastic (HDP and PP) made (Gazi) tank. Those who do not have tank have to use earthen pots and preserve waters and meet day's requirement.

After the Aila, many NGOs stepped in to solve the water crisis in this area. They came up with many devices and distributed small water filters for individual use. But the spares are not available in local market, so these solutions could not sustain. There are around 11 rainwater reservoirs supplied by NGOs in the area. But they are not for all. Beneficiaries of these reservoirs are mainly members of cooperative societies that operate them. Capacity of these reservoirs varies from 5000 to 10 thousand liters. There is a plant in Dolkhola of Koilashganj. The plant of NGO 'Bachte Sekha' helps students for three months of rainy days. Rest of the year they bring bottles of pond water to school.

Therefore, it can be concluded that rainwater harvesting is a major adaption mechanism for the people of the three villages for safe drinking water, but this again is a solution for a short period of time.

Pond Sand Filter

It was nearly noon on the 16th of November 2015. The research team was in Koilashganj to visit a Pond Sand Filter (PSF) project. They found a medium size pond where water was being taken by a pipe to an overhead tank. There was a pump running on solar power to draw the water. The tank itself was a filter with layers of sands and coals. The water was coming down to water taps below after being filtered. There was a line of around 20 women with pitchers in hand waiting to collect filtered water from taps.

There the research team met a lady who came from a village named Harintana. It took her 2 hours to come by foot. She was going back with pitcher full of water. She said, that was the only source of drinking water around her. During this conversation, sounds of discontent started to come from the plant site. A few women were returning with their pitchers empty. They said, the tank has by then gone empty. The pump was not working and all their wait and walk went in vain. Another of them said, "The filter does not work now and the water is also bad. We want better water, but no place to get."



There was Tridip Roy, the manager of the project. He said, "This project, designed for supplying water to 285 families, everyday serves more than 1000. As a result, the tank goes empty, the filter gets too dirty to clean in short time and water quality also deteriorates."

There are in total eight PSFs in the village of Bon Laudob and Koilashganj. Five of them are now out of order. The NGO which introduced these filters, had to close them after extreme bacterial infection was found in water. Currently, only three operate. The water they produce are less saline and clear but infected. This is the main problem of this system.

However, during a FGD one of the participants said the poor people of the locality could not afford to change the filter over the period. They were also less aware of the need. He said, that is why, PSFs were not successful. Moreover there is no way to test the water locally. One has to go to UZ Public Health office to test water.

The research team found an abandoned PSF at Bon Laudob. Prodeep Roy, a local farmer told the team that it ran for around two to three years before being abandoned. According to him, it was a temporary method. Even the filtering was not good. The NGO that introduced this plant had trained a few to operate. But they could not manage it well afterwards. He said, "Now we need a permanent solution for at least one thousand families, suffering here."

Alternatives for a sustainable solution

Pipe line: The nearest source of fresh water is around 60 KM away from the target villages. It is located near the upper side of Sundarbans in Dalippur of Khulna. Mohammad Ahaduzzaman, Officer in charge, Koilashganj Forest Camp, one of the KIs in this research said, that water was very good and could be brought to Dacope villages through pipe. But Gazi Jahangir, a former UP Member said in response to the possibility of bringing sweet surface water from the nearby river that it was possible but would be of high cost. According to him, only GoB can go for this type of investment, but he doubts cost effectiveness considering the demand of the area.

Desalination Plant: There is a great support for desalination plant in the community. In all three FGDs, people from all spheres of the society offered opinion in favour of this option as a sustainable solution to their problem. Some of them have seen one or two and most of them never seen any. But all heard that desalination plants are useful.

Most of the participants are aware of a very nearby desalination plant in Koilashganj. Gazi Fish Company, a private organization has built it for their industrial need. The surplus water is distributed among their own staff members. Villagers cannot get water from that plant. They said there were two other such plants, one at Bajua and another at Laudob, but distantly located from the places.

Participants have raised the question of cost in all the KIs and FGDs. Though they do not have a clear idea about how much money is required to build a desalination plant, but they know they are too expensive for the community to install set-up one by themselves. However UP chairmen and members said even government budget allocated for these unions are too low to implement such a project.

One participant said that they found it a suitable one and could be used for meeting the need of the villagers. But he asked, "Who will do this for us?" And there the conversation ends.



Recommendations and Challenges

- This research finds, all attempts to get safe drinking water are exhausted in the villages of Koilashganj, Bon Laudob and Dhangmari. Particularly, the residents of Dhangmari are in an unthinkable disadvantageous situation. All there ponds are saline, tube-wells are abandoned, NGO initiatives like PSFs are not enough for treating bacterial infection. Other option like bringing freshwater by pipe from upper Sunadarban is ambitious. And GOB funding for water system development is inadequate. Therefore, a suitable solution for the people of these villages is the installation of a desalination plant. This research recommends it as a potential CSR investment area in combating the impact of climate change. It will not only help them to get clean safe drinking water but also will contribute to reduce diseases, maternal and infant mortality. Yearlong safe drinking water can ensure better income and productivity in this disadvantaged region.

Advantages of desalination plants are:

- It can ensure fresh water all along the year and not sensitive to seasonal changes in salinity
- It can ensure germ free water that is not possible in rainwater harvesting or PSFs
- It uses surface water sources like rivers, lakes and canals, that reduces pressure on ponds and ground water sources
- It can produce a large quantity of water in a single day to meet the need of whole community which others cannot.
- Considering the large number of beneficiaries, even a big investment makes it cost effective
- Yet the best source of fresh drinking water for the community is rain, than anything else. For at least 3 to 5 months people from all income levels get drinking water from rainwater harvesting either by plastic tanks or by clay pitchers in their home. The well off households can manage to buy plastic tanks to store 1000 to 2000 liters of water that helps them sustain for a longer time. It is recommended in FGDs and KIs that if any intervention can provide poor people, especially who can't afford to buy, such tanks it can change the water security scenario of the area to a great extent. It can also be a scope of CSR intervention for helping people overcome their sufferings, though for a limited time only.
- Only installation of a water treatment plant alone will not solve the problem. As recommended in the FGDs and KIs, it is also important to preserve the ponds by constructing dykes and protect it from pollution by the animals and other sources. There should also be continuous initiative to preserve rainwater and filtration of ponds equally.
- For any initiative to become successful there should be community engagement in management. Most of the previous initiatives failed or did not sustain because of lack of community involvement.
- Another major challenge is financial sustainability. It is found that major efforts like PSFs and Rainwater reservoirs suffered due to lack of finance in operating cost. In many cases simply delays in changing filters or cleaning up the tanks caused permanent damage to the sustainability of those projects as people were unable or unaware of the fact that they require to pay for making it running for a long period of time. So there is a need for community led operation that they pay for the water according to their capacity and own the project to make it sustainable. There are many instances when NGOs left the area after establishment of a plant, that failed, as there were no community initiative and ownership.



Chapter 05

Desalination plant and sustainability

This research examines cost effectiveness of a desalination plant, considering it as the best long-term solution to drinking water scarcity in the saline villages of south west. It studied WHO documents to measure the relevance, effectiveness, challenges, present status and future of such plants around the world.

About a desalination Plant

The principal purpose of desalination is to enable sources of brackish or salty water, otherwise unfit for human consumption, to be used for this purpose. The use of desalination to provide drinking water is increasing and is likely to continue to increase because of water scarcity driven by pressures arising from population growth, over-exploitation of water resources and pollution of other water sources. While most (around 60%) of currently constructed capacity is in the eastern Mediterranean region, desalination facilities exist all over the world, and their use is likely to increase in all continents.

Most present applications of desalination are for estuarine water, coastal water and seawater. Desalination may also be applied to brackish inland waters (both surface water and groundwater) and may be used on board vessels. Small-scale desalination units also exist for household and community use and present specific challenges to effective operation and maintenance. (WHO, 2008)

Desalination technologies were introduced about 50 years ago and were able to expand access to water, but at high cost. Developments of new and improved technologies have now significantly broadened the opportunities to access major quantities of safe water in many parts of the world. Costs are still significant but there has been a cost reducing trend, and the option is much more widely available. When the alternative is no water or inadequate water greater cost may be endurable in many circumstances.

More than 12,000 desalination plants are in operation throughout the world producing about 40 million cubic meters of water per day. The number is growing rapidly as the need for fresh water supplies grows more acute and technologies improve and unit costs are reduced. Desalination plants use water tainted by salts (seawater or brackish water) or other contaminants as their sources. It appears that performance, operating and product quality specifications have evolved virtually on a site-by-site basis relative to source and the specific end product water use. (WHO, 2008)

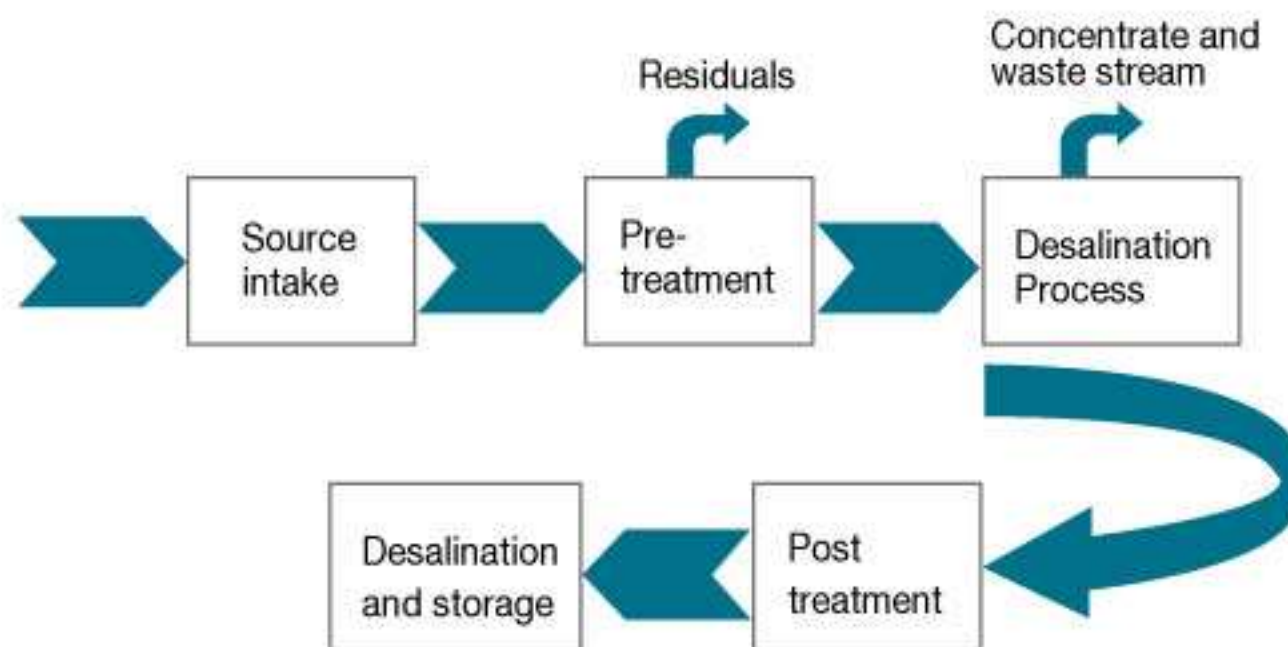


Figure 01: Typical sequence of desalination treatment and distribution process

Desalination facilities require an intake system capable of providing a reliable quantity of source water (raw feed water) of a reasonably consistent quality and with a minimum ecological impact. As the first step in the pre-treatment process, the type of intake used would affect a range of source water quality parameters and would impact the performance of downstream treatment facilities. Intake designs are highly site specific, possibly more so than any other aspect of the desalination facility. Like most process systems, desalination plants operate most efficiently and predictably when feed water characteristics remain relatively constant and are not subject to rapid or dramatic water quality fluctuations. (WHO, 2008)

Cost effectiveness

This research also has examined the cost effectiveness of one desalination plant in Dacope that can cover the freshwater need of troubled inhabitants in the villages of Koilashganj, Bon Laudob and Dhangmari. It is found that one desalination plant that produces 3000 liters of fresh water per hour may cost 1.75 crore taka (Budget attached). This budget considers a worst case scenario where salinity level in surface water is 22ppt and no electricity connection in the project area.

This plant can produce 48000 liters of purified water in one day considering a continuous 16-hour operation. Assuming 10 liters of water demand for each household in a day (basis of assumption is each family takes one pitcher of water a day from PSFs. Standard capacity of a pitcher is 10 liters), it is found that around 12000 liters of water is needed in three villages of Dacope. But the chairman of Koilashganj Upazilla suggested that, there were about 10,000 people living in nearby villages. So, if a plant can be established in a proper place, it will not only solve the water crisis of Bon Laudob, Koilashganj and Dhangmari but also people of other villages other than those. Therefore a plant with that capacity is viable.

The plant can be operated from adjacent free flowing canal and rivers, where water flows round the year. The most advantageous factor with this desalination plant is that it can be used even after any flash floods and cyclones. It takes into account even the potential risk of further increase in salinity in the waters of that area, even after 20 years.

It is found in the budget that, operational cost for a year in a desalination plant may reach Tk. 59 lac that includes fuel, chemical and salary of management staffs. This cost will reduce sharply to almost one third (Tk. 20 lac), if the plant can be run by electricity, taking into consideration of the degree of load-shedding and fuel consumption in a backup power generator.

However, this plant requires 440 KV power connection for operation. Rural Electricity (Polli Biddut) provides 220 KV connections for households in that area. But there are instances of 440 KV lines for small industrial projects. If a connection of required specification can be managed within the area, the operational cost will be very minimal for the local community.

Cost effectiveness and sustainability

It is calculated that one liter of water costs 34 paisa if the plant runs on diesel only. This price is reached considering 59.2 lac taka as yearly operation cost. In this calculation, the daily cost is around 16,220 taka. If it is divided by the daily water production of 48000 liters, the price per liter of water stands 34 paisa. When water is produced by electricity, the production cost stands at only 13 paisa per liter, using the same calculation.

It was indicated in the FGDs that local people are ready to pay for quality water. They were asked in a discussion at Koilasganj, what amount of money really they are ready to spend. Their response is in the table below:

Table 8 Willingness of FGD participants to pay for purified water	St.	Demand per family in liter	Payment capacity in Tk.	Tk/liter
	o	30	100	0.3
	o	20	30	0.7
	o	40	50	0.8
	o	20	30	0.7
	o	20	35	0.6
	o	45	100	0.5
	o	50	100	0.5
	o	25	50	0.5
	o	40	50	0.8
	o	30	30	1.0
	o	40	30	1.3

The above table shows that people are ready to pay from 30 paisa to 1.30 taka per liter of water depending on their income level. The average price stands at 68 paisa per liter based on their responses while mean and mode of this numbers suggests readiness to pay at least 5 paisa per liter of water.

People of Dhangmari said in a FGD that if a desalinating of water plant was installed in the community, they might buy water from it. The participants came to consensus that they will pay 25 paisa per liter (Tk. 10 for each 40 liter of drinking/sweet water). But again a management issue is there. The residents of the other village Bon Laudob said that they were ready to pay 50 paisa per liter.

There are instances in another Union of buying water from a locally managed purification plant. FGDs informed that, the Laudob Bazar (not to be confused with Bon Laudob) committee has installed a plant and they sell desalinated water by 20 paisa a liter. It has been running successfully for two years. Another plant in Bajua by a NGO Najrin Foundation sells water at 1 taka per liter. However, from the above responses this research suggests that, it is possible to sell one pitcher of water (10 liters) to the people of these villages, which make a desalination plant commercially sustainable.

One of the major bottlenecks of single water source is that many have to walk a long distance from residence to collect water. But if one liter of water can be sold at 50 paisa, it will be cost effective even to deliver the water in front of their doorsteps either by Rickshaw-van or boats as per demand. Therefore, there is an opportunity of commercial success of a desalination plant if it can be managed and operated by the community properly.

In response to coverage of the recurring cost of such plant one of the KIs, an ex- public representative assured, "Why not? We are paying for dish antenna, cell phone, electricity. So we should be able to buy water too. But it may be difficult for the poor." Therefore he suggested, 1tk per liter was fine but for the poorest the amount should be less.

Management Issue

Management came out as the most important part for sustainability of a desalination plant in the area. Participants of FGDs and KIs observed, "Many NGOs came after the 'Aila'. They had helped us with tremendous support. They distributed small water filters for individual use of poor households. But the spares were not available in local market. As days went by, NGOs disappeared. They supplied tanks to store water. The plants were also there but the NGOs could not continue the day to day management of the water purification system. Neither the local community was involved to the task of taking regular care of the plant. As a result they failed." Below are few of their suggestions:

- If any plant is there, it should be operated by the community. They will manage that well, with full responsibility. But if the responsibility is not to the proper person, there is risk of failure.
- Misuse of water was there in other initiatives. Villagers did not replace a tap that was broken. Water continued to run. Community did not care because it was a free water plant.
- The buying of water produced from a plant depends on the awareness of the population.
- It depends on the health consciousness and consequence of the cost incurred during illness like diarrhea and dysentery.
- If the community does not take the responsibility for day to day management, a commercial approach can be considered.

Key Informant Interview

Mihir Mandol

Chairman, Union Parishad, Koilashganj

- Here, salinity is in the earth and in the air. Things are worsening. The saline water is invading us quite early in the season, even before the start of the winter. Tube wells are not working. Rain filters have been set up with the help NGOs and government organizations at Keikabra. But these are not sustainable. But desalination plants are working. There are two plants at Dacope.
- NGOs have made several steps like harvesting of rainwater and GIZ has made filters and laid water pipes. These have become unsustainable. Chairmen or local committees have been given responsibilities to look after these facilities. But the customers or the users of these services are not paying for their maintenance. We are asking the users to pay but it's not working. The people here are yet to develop the mentality of paying money for safe water.
- If someone installs a water plant and ensures home supply of water, people will pay for the water like what they do in Dhaka city. We have reached that stage and I think it may be a system in just five years. Then people will realize they can't afford not to pay for it or for the maintenance of the plants. It may be expensive. But as we pay for electricity and workers; so people will pay for that water.
- Villagers have reached low middle class and there is hardly anyone who cannot pay. They have now this ability to pay. They can't live without sweet water. Or else diseases will spread. If we can provide them with sweet water, they will definitely buy it.
- If we have a plant in Koilashganj Bazar it can supply sweet water to the people of three mouzas. If another is set up at Ban Loudob or at the Dighi of Alimadan; then three more villages will be covered. In total over 10,000 people will get the drinking water.
- There won't be any problem of getting Khas land for a desalination plant. That can be leased out in the name of the company. There will be no problem either for getting pond or water source.

Chapter 06

Grounds for CSR intervention

This chapter describes why CSR intervention for a sustainable solution to drinking water scarcity in the saline southwest region of Bangladesh, is worthy. It examines contemporary discourse of development, government and Bangladesh Bank policy to identify reasons for such investments.

Development Priority

In Bangladesh, about 30% of the cultivable land is in coastal areas where salinity is affected by tidal flooding during the wet season, direct inundation by storm surges, and movement of saline groundwater during the dry season (Haque, 2006). In consequence, the potential impact of salinity has become a major concern for the Government of Bangladesh. Recently, the Bangladesh Climate Change Resilience Fund (BCCRF) Management Committee has highlighted salinity intrusion in coastal Bangladesh as a critical part of adaptation to climate changes.

Lack of public fund concentration

Despite this attention in policy level, allocation of national budget for safe water supply or adapting with salinity, in the coastal areas is frustrating. We have studied budget expenditure of two union councils of targeted villages to see how they spend for development. It is observed that most of the money is being spent on road construction, health, sanitation and irrigation. During last three years, sustainable water supply and adaptation with ground water salinity has not even been in the expenditure list, although the people consider it to be the worst problem they are suffering.

Table 9
Budget allocation for target UPs

Union Council	Koilashganj	Baniashanta
Year 2014-15	30.36 million Tk.	17.5 million Tk.

Source: The National Web Portal of Bangladesh

Taking the lead

Solving the safe water scarcity problem in saline coast of Bangladesh is an immediate priority, though with least budgetary attention. It provides a unique setting for CSR intervention to take the lead and set an example. Helping the coastal people to adapt with inundation and salinization by providing a desalination plant can not only solve the drinking water crisis, but also contribute to better health, better education for children, better income and above all sustainable development.

Supporting SDGs

The world is entering into a new development paradigm naming Sustainable Development Goals from 2016. It has 17 goals to achieve in the next 15 years. Providing access to safe water to the poor and climate vulnerable coastal people will contribute in achieving the Goal 6 of SDGs that calls to "Ensure availability and sustainable management of water and sanitation for all."

It will help to achieve the target of universal and equitable access to safe and affordable drinking water for all and also substantially reduce the number of people suffering from water scarcity. It is also in line with the Goal 13 that urges on strengthening resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

SDGs are set of ambitious promises that the world leaders have agreed upon. It requires at least 1.5 trillion USD additional financing a year to implement than the present level of development spending. The SDG calls for greater private investment in development to meet this financing gap. Bangladesh can create a new example in financing for development, by guiding CSR investment in a desalination plant for coastal southwest to achieve an important SDG.

Empowering the women

Gender is a dominant discourse in present development framework. One of the major components in measuring success of any intervention is how it engages women and makes their life better. Findings of the research suggests a desalination plant in the target area will help 95% of adult women in households who are responsible for collecting waters from distant places. It will reduce their time spent in that activity and enable them to engage in productive works. It will also ensure better health and hygiene for them.

Matching the Bangladesh Bank Priority

BB has issued subsequent circulars on the priority areas of CSR engagements for banks and financial institutions in the communities they operate in. After education, the CSR guideline has given the highest importance to support assistance for underprivileged population segments asking around twenty percent of total CSR expenditure allocation in this area. It includes direct grants for medical treatment and preventive public health and hygiene initiatives like provision of safe drinking water, hygienic toilet facilities for poor households.

This research has found, almost 73% respondents surveyed in the target area of Bon Laudob, Dhangmari and Koilashganj live below the poverty line. They have been disconnected by three rivers and the Sundarbans from the sub-urban land. They do not have access to the market and produce from agricultural land is sharply reducing due to extreme soil salinity. More than 50% of the survey respondent said that their only income source is agriculture and the salinity made them vulnerable to poverty. They have been found, underprivileged. Supporting them is highly consistent with the BB CSR policy.

Such intervention will create opportunity to engage the investing entity with a large community who are vulnerable to climate change and ground water salinity. It will earn respect for the bank from the people and build up better image of the institution in the society. It may help the bank exploring new business opportunity in the area which in turn will contribute to a much appreciated central bank policy of inclusivity.

Budget for a Desalination Plant

Sl	Item	Cost for TDS 22 ppt (22,000 mg/liter)
1.	Diesel generator, apprx. 50 KVA	2,000,000.00
2.	Container for desalination plant installation	400,000.00
3.	Civil work for base container, tanks etc.	150,000.00
4.	Desalination plant, 3000 l/h (can be operated 16 hour/day)	9,000,000.00
5.	Lab instrument	100,000.00
6.	Annual chemical consumption @16 hour	1,355,147.00
7.	Operator salary, annual	360,000.00
8.	Annual fuel cost @16 hour/day	4,204,800.00
	Grand Total	17,569,947.00

Note : Overhead cost for the implementing agency is not included in the budget.

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Living with Erosion

Research on CSR Intervention for Climate Change
Adaptation in Coastal South

Abstract

The Management and Resources Development Initiative (MRDI) has been involved in advocacy for promotion and expansion of Corporate Social Responsibility (CSR) programs for about seven years. Encouraged by its experience gathered from CSR advocacy, MRDI has embarked upon implementing the second phase of CSR for Advancement and Social Emancipation (CASE) in partnership with Bangladesh Bank. A key objective of this project is to identify scopes of CSR interventions to address the impact of climate change and environment protection.

Bhola, a southwestern district on the lap of the Bay of Bengal, is called the 'ground zero' of climate change in Bangladesh. (COAST, 2015) It is buffeted by cyclones, tidal surges, soil erosion and other climate shocks more often than any other areas in the country. Char Patila is a village of Char Kukri Mukri, a remote off-shore island in this district. This is the remotest of remote, where people are poorest of the poor struggling with natural calamities throughout the year.

Poverty is another roadblock for the development of the area. The inhabitants are also deprived of healthcare services as well as job opportunities. People of the isolated village are mostly dependent on fishing and agriculture for their livelihood. Objectives of this research were to 1) investigate the determinants of livelihood vulnerability by climate change 2) assess the impact and adaptation response and 3) explore the potential of CSR interventions.

To attain those objectives, a random sample of 210 households was surveyed to collect quantitative data. It is more than half of the household of the village and covers around 10% of the total population. One Participatory Rural Appraisal (PRA) was applied for social mapping, mobility and wealth ranking exercises. There were two Focus Group Discussions (FGD) comprising male and female participants and Key Informant Interviews (KII) to get qualitative information on climate change impact livelihood and people's suggestions for sustainable solutions.

It was found in the survey that, the biggest toll, the climate change took, was on their income. Fish stock in the river decreased and due to salinity production from agriculture declined a lot. People were increasingly being food in-secured. The natural calamities claimed their lives and a number of participants spoke about the loss of their sole earning members of the family who perished in the sea. Many were found living in inhuman condition trying to survive by cattle rearing, poultry, and vegetable farming in homestead. At least in 25% of the families, there was someone who died because of extreme weather.

As the area was remote they had very few options for adaptation. Male household heads were found engaged in traditional occupations despite gradual decrease in their income. Females generally were not engaged in any income earning activities, thus unable to contribute to economic well being of the family. While asked, what kind of intervention they would like most could think only of cattle farming and growing backyard vegetables. It was identified that, even if they were supported by those, it would be unsustainable due to lack of market opportunity to sell their perishable products (like, milk or vegetables). Many in the area had cattle and backyard vegetable farms, but not enough to reduce poverty.

Only 24% of the respondents suggested handicrafts making as a solution for sustainable livelihood, though they did not have any knowledge on that. However, when investigated KIs and FGD respondents said that, livelihood alternatives like handicraft and lifestyle product making could bring change in the area if the women could be engaged properly. 100% of the Household Heads (HH) in the survey responded that, they were ready to allow female members of their family to work.

The research team visited Jessore to observe one CSR intervention that created opportunities for 100 marginalized women by providing them with training in tailoring, embroidery and block print. It was found that only in three years, this initiative greatly changed the poverty landscape in the village. Their product can be found at posh departmental stores in the capital. The newly-trained women were found training other women from villages around, the new livelihood option that brought a big change.

It was concluded that all the adaption response for better living had failed in Char Patila. Traditional livelihood mechanisms like agriculture and fishing could not provide better livelihood option to most of the poor population. They need alternatives. From FGDs and observation the research recommended that CSR intervention in a Livelihood Program for Women could be helpful to the vulnerable community in reduction of poverty and adapting to the adverse effect of climate change.

Chapter 01

Introduction and Methodology

Context

Bangladesh is one of the most climate vulnerable countries in the world. It has challenges in the future and also successes at the present in tackling the problem with its own resilience, policy and resources. The United Nations Environment Program has awarded Prime Minister of Bangladesh, H.E Sheikh Hasina as one of the 'Champions of the Earth' in 2015 for her outstanding leadership in the frontline of climate change. One of the major reasons for this award is that she has set the example for other leaders, proving that investing in the environment can achieve sustainable social and economic development.

Keeping the national success in mind, this research aims at identifying possible scopes of intervention for private corporations and institutions to engage their social responsibility fund in combating climate change impacts and facilitating adaption tools to the most vulnerable and under-privileged people. In this quest, the study targeted Bhola considered as the "Ground Zero" of climate change, as a potential area for investigation.

Bangladesh is vulnerable to disasters mainly due to her geographic location. Disasters such as floods, river bank erosion, cyclone, tornado, cold wave, drought, arsenic contamination in ground water, water logging, salinity intrusion etc. are gradually intensifying due to climate change and posing risks for the coastal people in Bangladesh. The climate change has affected the livelihood of coastal people in many folds including scarcity of pure drinking water, malnutrition, extreme poverty, health problems, losses and damage in crop cultivation, fisheries, poultry, vegetables garden etc. It has also created a state of unemployment among the people of coastal communities. As a result, the affected people are losing their means of livelihoods and are forced to take several alternative means of livelihoods to cope with the adverse impact of climate change related disasters. (Nasreen M, 2013)

The area targeted

The research area Char Patila is facing tremendous recurrent climate hazards that affect directly and indirectly the livelihoods of the community. NGOs are working there but there are persistent gaps in saving livelihoods. Thus, much of disaster relief and recovery intervention fails to address the need to support livelihoods, dealing with immediate needs of the people (Cannon 2006). The need to focus on livelihood arises because climate change is already altering the productivity of the ecosystems of the rural poor (Bapna et al. 2008; Uy et al. 2011).

Methodology

To investigate the impact of climate change on livelihood, severity, status of existing adaptation mechanism and potential solution, this research relied on collection of data, both qualitative and quantitative. The study included some 'Key Informant Interviews' for analysis and reviewed various literatures related to climate change and livelihood impact for a broader perspective and as secondary source of information.

The qualitative data was gathered by a baseline survey in the target area. The questionnaire was divided into five parts. The first part was on respondent information and the second part for household data. The third segment of questionnaire was designed to get an idea of their economic status and livelihood strategy and the next was to assess the impact and severity of climate change. The last part sought information on existing adaption situation and a solution. The survey was conducted among 210 respondents randomly, 58% were female and 42% male.

Focus Group Discussion (FGD): Two FGD sessions were organized in the village. A group of ultra-poor women participated in the first FGD. Another mixed group of men and women took part in the other session to discuss the impact of climate change. Around ten participants attended each of the FGD sessions.

Key Informant Interview (KII): Six key informants including local government representative, teacher, NGO activists and other opinion leaders were interviewed in Char Patila and Char Fasson.

Participatory Rural Appraisal (PRA): This methodology was applied in Char Patila to have a better picture of the village. 15 men and women participated. They took part in social mapping, mobility and wealth ranking exercises. First, they drew a borderline map of the village on a large brown sheet of paper. They identified the place they were sitting on. That was a cyclone shelter. Then they identified the locations of roads, canals, mosque, ponds, school, market, agricultural land and household. The next step was mapping of their mobility for livelihood, health care services, shopping, education, agriculture information & services like seed, fertilizer etc., security (police) and other purposes. The final exercise was wealth ranking of the inhabitants of the village. The participants divided the villagers into four ranks in terms of their financial ability such as middle income, low income, poor and ultra-poor.

Chapter 02

Meet Char Patila

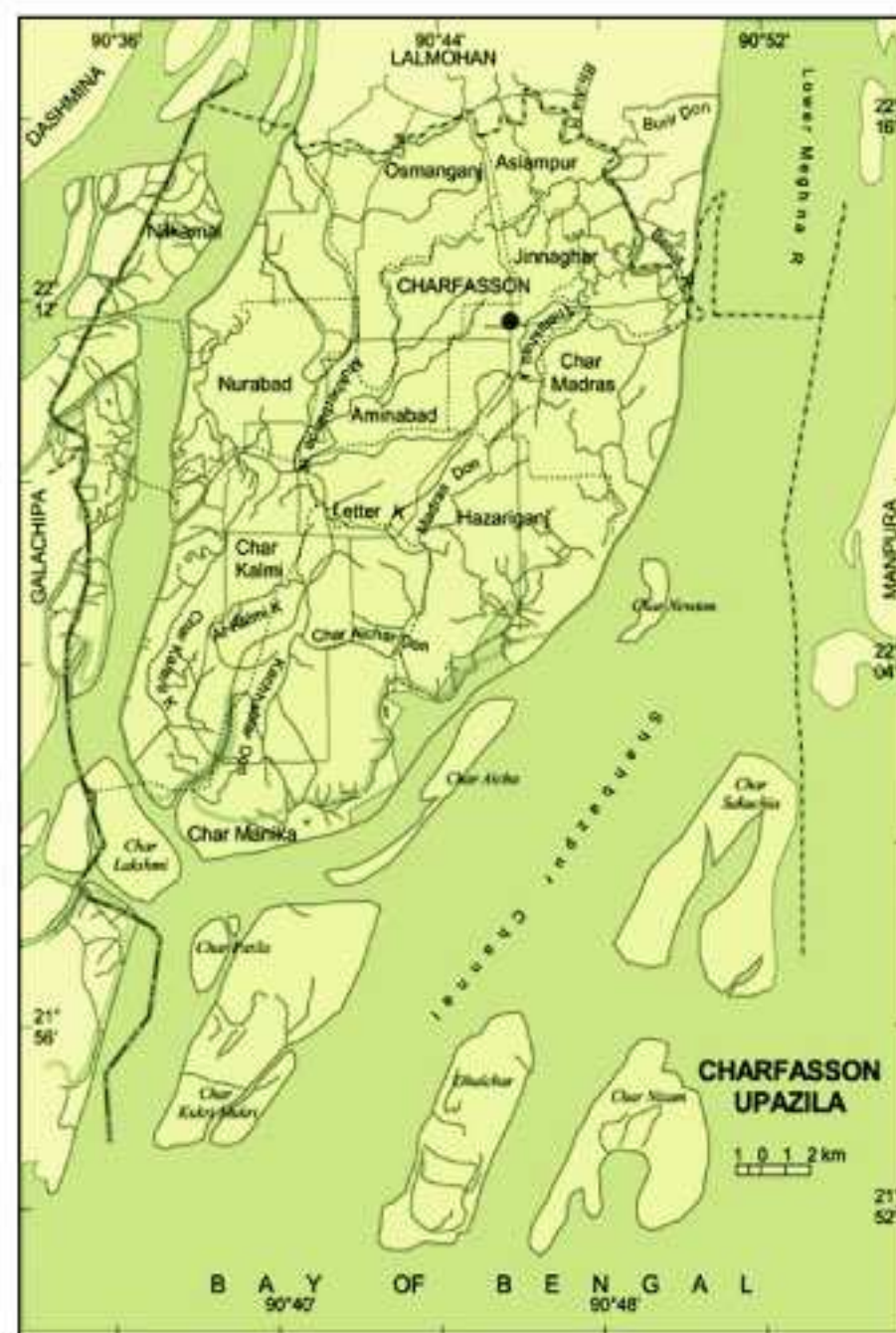
Location and the people

Char Patila (90°38', 21° 58') is located in the southern most part of Bangladesh. It is in the Char Kukri Mukri Union of Char Fasson Upazilla under the administrative district of Bhola. (See map below). This village is situated at Shahbazpur Channel of Lower Meghna River just where it meets the Bay of Bengal. Surrounded by water and around 100 Km away from the district headquarters; this village even separated from the union HQ by a canal.

Table 1
Demography & households

Village/Info	2015 (UP)
Households	362
Population	2372
Male	1315
Female	1057
Male in %	45%
Female in%	55%
Average HH Size	5.4*

*(Census, 2011)



Map of Char Fasson

There are 362 households in Char Patila according to the local Union Parishad office. Total population is 2372 and among them about 55% are female and 45% are male. Average household size in this village was 5.4 according to the census of 2011 by BBS and population density is around 138 per square kilometer.

Education

Sharif-Para Primary School is the only educational institute for the people of Char Patila. There are around 1086 children old enough to go to school. But only 285 of them are enrolled in the local primary school, while another 776 are excluded from any kind of education. Most of the children are sent to work by their parents due to extreme poverty.

As there is no high school in Char Patila, few families in the area were found interested in sending their children for secondary level. The nearest high school is around 10KM away (See Mobility Chart from PRA). Students have no other way but to avail a boat to study beyond primary level travelling that distance every day. There are only 25 students in this area who study in a secondary level high school in distant Char Kukri Mukri.

Demand for education is increasing but the status of education among parents was found very poor in the survey. Survey found, almost 80% of the household heads are completely illiterate. Only 17% of them attended primary school and a few studied up to higher secondary. According to the census, literacy rate in Char Patila was only 9.1% during 2011.

Table 2 Household head education information	Primary	Secondary	Higher Secondary	Graduate	Post Graduate	Illiterate
	35	4	2	0	0	169
	17%	2%	1%	0%	0%	80%

The education scenario has improved slightly than before but enrollment in school in this area is still very low due to poverty. There are 359 out-of-school children among the 210 families surveyed for this research. Among them 62% are female.

Livelihood Strategy

In the PRA, the participants have developed their area map with demarcation of water bodies including source of water, agricultural land, pond, mosque, road, market, school, canals, river, and shelter for resource-less poor (Asrayan) colony. (See PRA social mapping)

The participants mentioned the threat of cyclone and surge from river which are threatening their life and livelihood. They have also identified the inhabitants' base on the occupations like fishing, farming/agriculture; fish cultivation spread all over the char. The marking of the river canal and water bodies indicates places of the professional inhabitants of fishermen, boat labors, dry fish production etc.

The professional inhabitants like peasants for harvesting paddy and homesteads used in vegetable growing. The marginal land where the houses are there for homestead gardening. The poorest population engaged in home based poultry (duck and chicken) and engaged in the cattle (cow and goat) at their home and land around the home. They also take the cattle to the bank of river (Meghna) and canals. The persons engaged in small business of the markets have also been identified as source of marketing the products of the inhabitants.

However, fishing is the main source of income for the families in Char Patila with 61% of the total population engaged in this occupation, found the survey. The next major important livelihood sources are trading and agriculture. Significant number of populations is just day laborers.

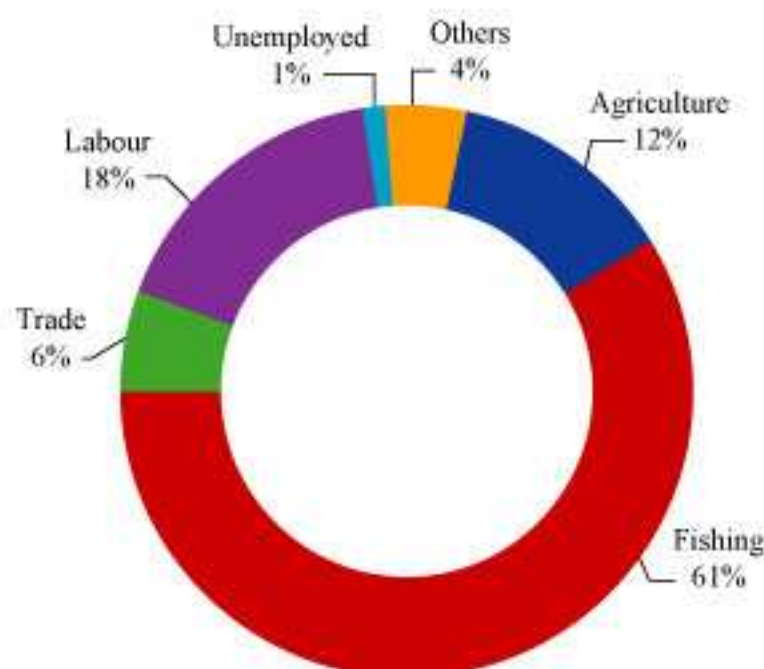
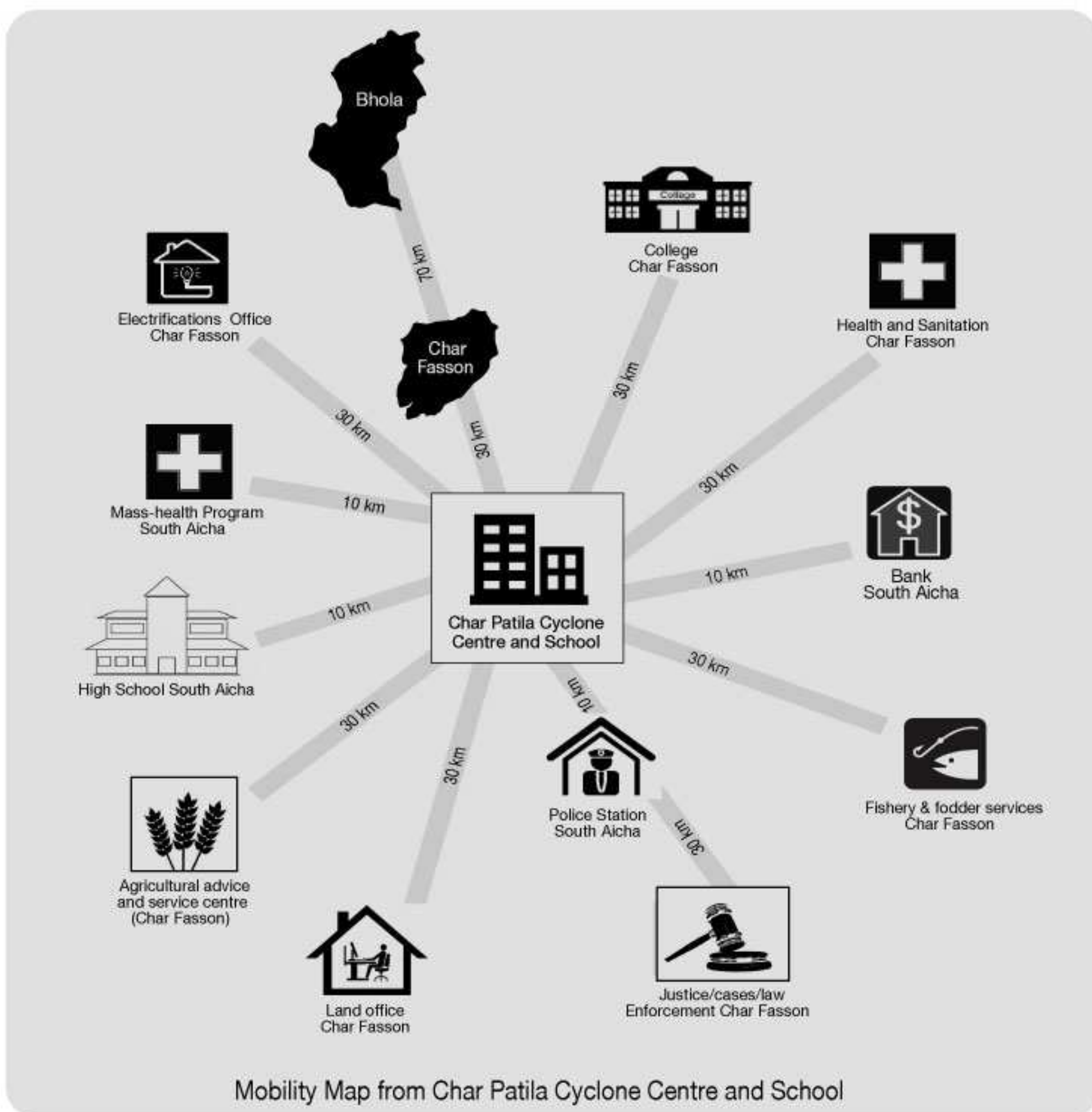


Chart 01 : Household Occupation

Health Facilities

Diseases like fever, cold, cholera, diarrhea, typhoid, itching, skin disease, pox, headache, pneumonia, abdominal pain as well as different types of gynecological diseases are common among Char Patila inhabitants. They take treatment from local traditional naturopathic physicians and medicine sellers. Moreover, poverty restrains them from buying proper medicines. There are 3 individuals who are termed as doctors because they own medicine shops, even though these are a kilometer away from the village.

People of this locality are also deprived of government's immunization programmes. At the same time no family planning programs are in operation in this village. Annually, 150 child deliveries take place by the Traditional Birth Attendants (TBA). In case of pregnancy or child birth related complications the patient is taken to Char Fasson upazilla Sadar or Bhola district traveling 70-100km by boat. During the time of climate shock the problem becomes even severe. The open latrine is still one of the major sources of infectious diseases like diarrhea and dysenteries. In this area 80% of the households have no water seal scientific latrine.



Poverty

According to the survey, around 28% of the populations are ultra-poor who earn less than \$1.25/day. Most of the people are in the category of poor who earn between 3 thousand to 5 thousand taka per month. The rest are middle and low income class. The poverty rate may seem similar to the national average but respondents in FGDs and PRA said it is even worse.

The participants of the PRA have ranked the total khanas or families as per income as daily wages or sale proceeds of the products. Here many of them calculated the income as wage earning working days in a month. This was a participatory exercise and each of the participant did the ranking on their own judgments. The khanas were classified as 20 as middle class comprising 100 population, 30 as Lower class comprising 180 population, 100 households or khanas comprised of 600 and 250 khanas or households comprised of 1400 population. The 20 khanas of middle class income varies from Tk.100-550 a day, the 30 khanas of lower class varies from Tk. 70-200, the 100 khanas of poor varies from Tk. 60-150 and the 250 khanas of ultra poor class varies from Tk. 50-100 according to their mapping. (Although actual number of HH are 362, the participants of PRA calculated this wealth ranking on the basis of their perception that HH number in the area is around 400.)

Views of the participants give the following profile of wealth ranking of the population:

- Middle income : 5%
- Low income : 7.5%
- Poor : 25%
- Ultra-poor : 62.5%

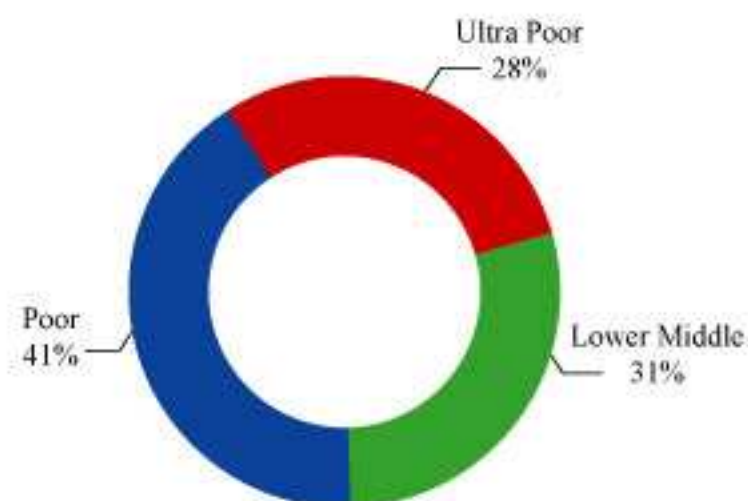
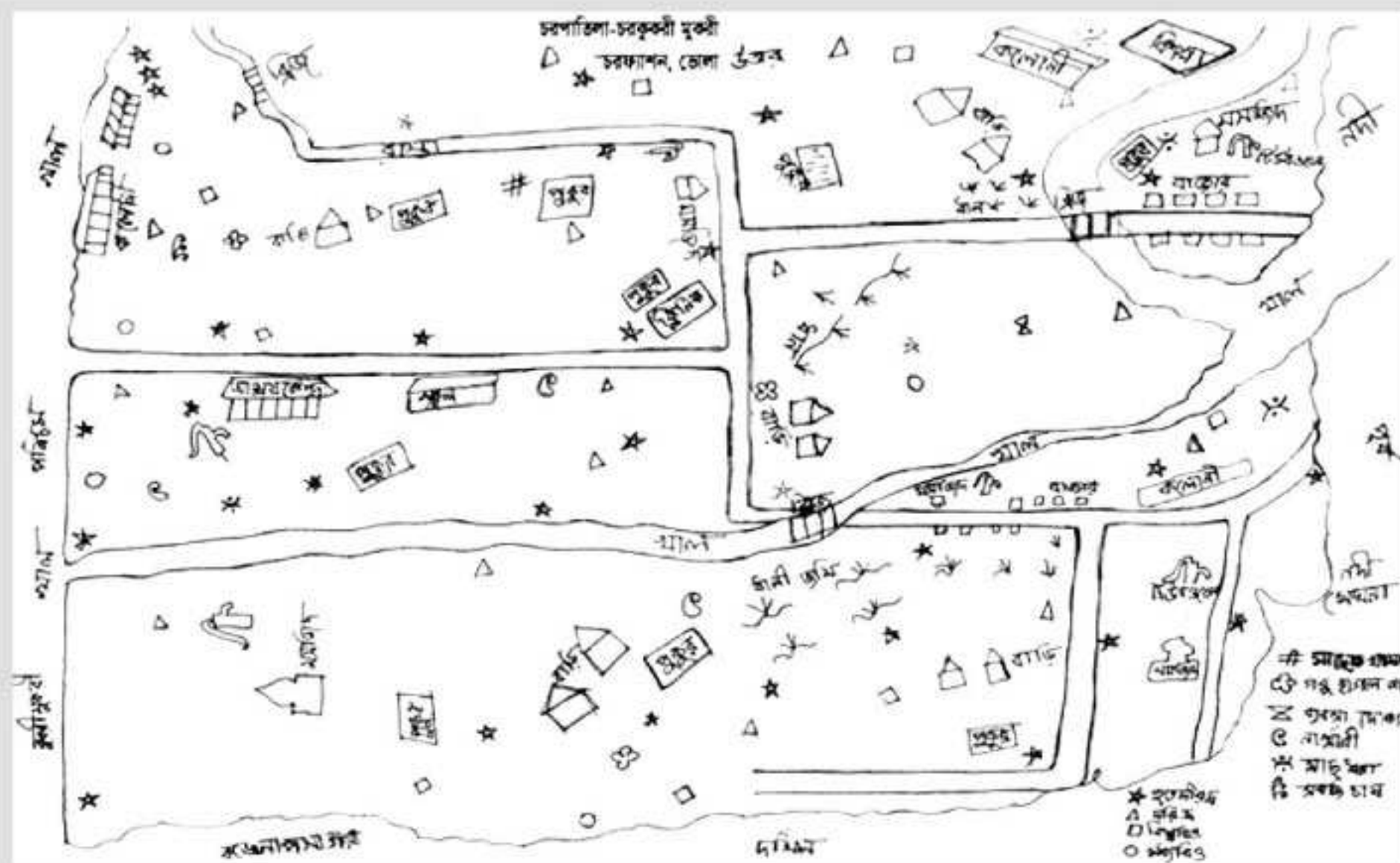


Chart 02 : Economic Status



PRA Social Mapping

Chapter 03

How Climate Change Impact the Livelihood

Pattern of Climate Change

People of Char Patila are exposed to the coastal hazards more than people living in any other parts of the country. The people who live in the exposed coast are considered as vulnerable partly or fully to surge flooding, as well as some other problems such as salinity, water logging, etc. The population near the coast is even sparser than the inner parts as the lands are less productive. (M.F. Karim, N. Mimura, 2008).

People of this remote island, surrounded by rivers Meghna, Tetulia and the Bay of Bengal, suffer erosion, early or late rainfall, storms and extreme cold. The survey identified major climate shocks in the targeted area. More than 75% of the respondents perceive tidal flooding to be the most worrisome shock after high wind. They also complained about erosion and abnormally cold weather during winter as major impacts of climate change. At least in the cases of tidal flooding and strong wind, most of them think that intensity of these climate shocks are increasing.

The highest rainfall of the year still occurs in the months of Ashar and Srabon (the monsoon in Bangladesh). However, for the past 5/6 years rainfall in Ashwin and Kartik (post monsoon) has been increasing significantly causing severe devastation to crops and fishfarming. The frequency of cyclones has increased over the years (Hasan, M. K). During the monsoon, most of the houses and infrastructures go under water with exception to the area adjacent to Meghna and Tetulia River embankments. Cyclone coupled with tidal surge inundates the whole area with unusual high tide during full moon and devastate the livelihood settings.



This is how the women participants identified the climate change impact in their village during the FGDs:

"In past the composition of climate was of a set of components like rain, temperature, water chemistry, wind, tides and surges but now a visible change in those components are there. The annual rainfall has got reduced, the salinity of river has increased including changes in other ingredients of water, the level of tides has got higher, more frequency of tidal bores, cyclonic storms have increased; the erosion of river has increased resulting siltation in Meghna river bed."

Due to the change in climate the coastal communities have faced several challenges including climate change-induced disasters as well as difficult means of livelihood. A recent study by Mahbuba Nasreen et al. reveals that among such disasters cyclone is one of the key challenges. Like cyclone, flood, water logging and salinity intrusion have become major problems in the coastal areas because these havocs damage agricultural production and create state of unemployment among coastal people. The effect of climate change has created new risks in the society for which the people are becoming more prone to risks and they are unable to cope with such disasters and hazards. (Nasreen M, 2013).

However, the people of the island Char Patila were asked during the survey that how climate change did impact their life. The response from 100% of the respondents was 'income reduction'. They added deaths, health hazards and food in-security in the list but unanimously rated climate impact as the main reason behind extreme poverty. Therefore, this research examines the impact of climate change on the life and livelihood of Char Patila from various perspectives.

As described earlier the livelihood of this island largely depends on Fishing and Agriculture, this chapter investigates the impact on climate change on these major income sources.

Impact on Fishing

"In the life of fishermen the scarcity of fish in the river, and its estuary, costal sea-belt and even deep sea brings the misery. The majority of fishermen has no boat or net of their own and has to share the catches. The natural calamities take their lives and a number of participants claim the loss of their sole earning members of the family died in sea. Many of them now pass an inhuman condition in life and trying to survive by cattle farming, poultry, and vegetable growing in homestead. But the frequent attack by the forest animal is another problem by which their livelihood is threatened."

This was how participants in a focus group discussion were describing the misery of fishermen who are almost two-thirds of the islands population. Most of them have no secondary occupation, so fishing is a sole income source for them. The livelihoods largely depend on the fisheries from river and sea; the impacts against changes in climate render those more to the brink. Sometimes they cannot go for fishing due to extreme rainfall and winds (Hasan, M. K).



One Key informant said, "Fishermen of Char Patila used to go for fishing with hired labors. Now-a-days they cannot afford to pay the wages to labor because of low catch. Now they take the family members in the boat to cut the cost of labor. The amounts of fishes have reduced in river as in sea."

Most of the fishermen borrow money from the local Mahajans or lords to buy nets. Neither do they have any boat to go fishing. Groups of about 8-10 poor fishermen rent boats, nets or money before they start for the sea. As the fish stock is reducing, they cannot repay the high-interest loan they take. The result is a never ending

indebtedness. KIs in the study said that they were sure that nobody can improve the livelihood if they remain burdened with debts throughout the year and the generation. Even the Mahajans do not want to give them boat or money anymore because of poverty and inability to repay. Therefore many of them are forced to flee and migrate to other areas to survive.

Impact on Agriculture

Participants informed in the FGDs that, salinity in water was not as high in the past as it is now. In narrating the change in climate they told about a remarkable change that took place in the island after Aila. The saline water submerged the land. It not only damaged the harvest but also the soil of the char. The canals and ponds of the village have all turned saline. The roots of the trees, soil of homesteads got destroyed. Fish of the water bodies, livestock and poultry birds of households perished.

The area now depends only on rain water and only one harvest a year. Due to the salinity caused by the frequent attacks of cyclones and tidal surges, the harvest in the agricultural land has reduced. Now the women need to go for fishing in the river and canals including the forest to bring additional income for family.

It was found in the survey that around 50% of the population does not have any land at all. Only 7% of them have agricultural land that they lease to the landless poor farmers for share cropping. Irony is that, those who depend on share cropping frequently suffer as the harvest is low due to salinity and other natural disasters.

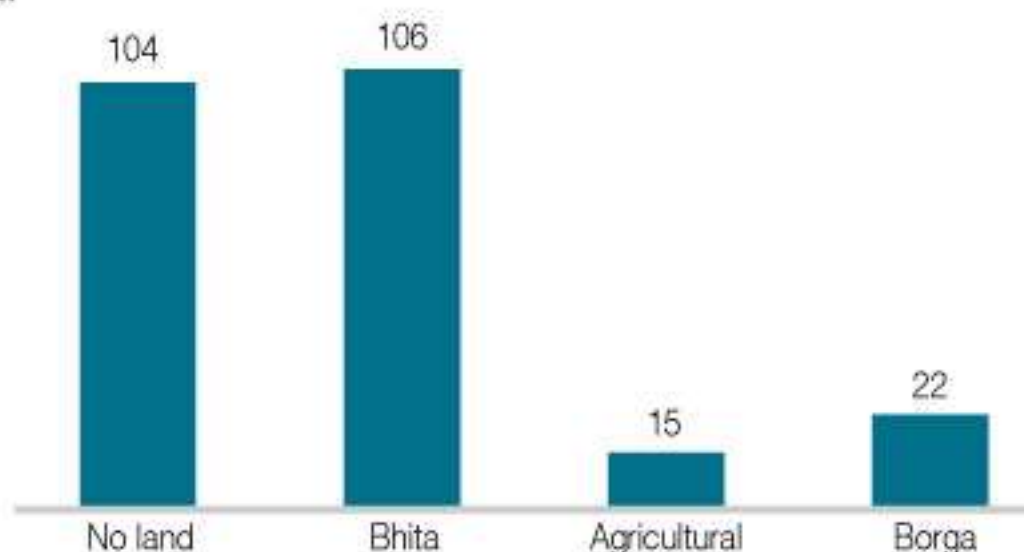


Chart 03 : Ownership of Land

One of the participants in FGD described the hardship. He said, "The opportunity of agricultural activities has shrunk. It took months and a year for the land to be suitable for growing paddy. As we have no land of our own, we have to depend on the conditions of land owner. They claim exorbitant amount of money in giving lease or maximum share of paddy in case of share cropping. For saving our life we have to accept their conditions."

One Key Informant said "The land is grabbed by powerful groups. Now the marginal farmers have to lease the land from them to cultivate. When surge of saline water hits the harvest, owner of the land does not share the loss. As there is only one harvest, it further leads them to poverty.

Impact on Life

It was found in the survey that, in about 12% of the families at least one member has died due to climate related shocks. In most of the cases reason behind such deaths is extreme bad weather while fishing in the sea or river. As the main earning source of the family dies, the rest of the family instantly falls into deep trouble. It was reflected in the survey that, in cases of such deaths all of the affected families had become either poorer than before or their income reduced. Cyclone-related deaths and injuries among people in this area increased manifold. This has caused social and economic insecurity to the member of the affected families.

Table 03 Has any member of your HH ever died in climate related shocks?	Yes	No
	25	185

Key Informant Interview

Monir Ahamed Shuvro

Director, Unnayan Dhara Trust

- He said the major threat comes from the continued change in climate resulting high salinity of water.
- The farmers of the char have a single crops or two Aman (a paddy) a year because they have to depend on the rain water only. No way to have a Robi harvest during lean period due to saline water.
- Eighty percent of fishing is associated with money lender in the form of boat & net. High exploitation keeps the fishermen below poverty level.
- The catch of Hilsha fish in sweet water has reduced because of increased salinity of river water. It has affected not only the Hilsha but also other fish species.
- The high surge in normal time also increased flooding the fields.
- In the past a fisherman used to go for fishing with hired labors. Now-a-days the fishermen cannot afford to pay the wages to labors because of low catch. Now they take the family members along for fishing to save money. The amount of fish catch has reduced in river as in sea.
- The harvest of water melon is also being damaged by the high surge of normal tides. The saline water entering the field and soaking the watermelon.
- One important thing is that previously high surge of water used to come/hit the land following the storm signal. Now it comes without any signal and submerge the land with crops.
- The fishermen use to catch Hilsha or any other fish while netting and leave the other small species back to water. Now-a-days they do not. They just leave those in the land. Because of increased poverty they have started to catch fish by current nets. They catch Jatka and other smaller fish not fit for catch.

Impact on Livestock

It is one of the major sources of livelihood in Char Patila. Survey found, there are around 50 cows and 40 goats among 210 households. The poor are mostly not the owners of these cattle. Poor families share and rear these animals with the owners. Generally one has to give half the milk produced in a day and give one calf in a year to the owner as per contract. Yet Livestock have always been extremely vulnerable to climate shocks.

Cyclone Aila (2009) devastated the coastal people and their livelihoods. The major toll on Char Kukri Mukri was in the livelihood resources. There was no coastal embankment and the tidal water washed over the area with extreme current. The villagers lost their agriculture and particularly most of their livestock and poultry. Due to intensive salinity in the soil, they could not get feed for their livestock and the surrounding area became polluted.

Chapter 04

How eroding livelihood make them poorer

This research examined the climate change induced poverty scenario in Char Patila by unemployment, low harvest and shrinking opportunities of income. People of this island are becoming poorer due to the impact of climate change. They cannot catch fish as before, they cannot grow rice on the fields as it grew in past, they cannot search for other mechanism of adaptation as the area is remote and impoverished. Neither do they have any knowledge nor opportunity for trying new income generating activities.

Extreme poverty is compromising the other factors like mobility, debt, food security, women empowerment and other social issues in this area. This chapter looks at some of these issues that prevail in Char Patila that have arisen from the livelihood challenges posed by climate change.

Migration

"Impact of climate change on Employment, Income and occupation Income is the most important factor that determines the standard of living of the households. In the coastal areas, the majority of the villagers live on 'hand to mouth'. Respondents of poor and destitute households are unable to afford three meals a day for their families. Only middle and large farmer households have better income and better quality food whereas other occupational groups who are living below poverty line are unable to afford any balanced meal. Sometime the income and occupation attainment is severely disrupted by frequent hazards and it incurs huge damage of standing crops and other standing resources. It is evident that the coastal people are subject to victims of natural calamities and on average they remain unemployed more than 4 months a year." (Nasreen, 2013).

It was found in the survey that one member in at least 26% of the households migrate outside Char Patila to seek new income opportunities. Most of them travel to nearby urban areas in search for a job and stay there almost for 3-6 months on an average. If there were other livelihood opportunities, this migration could be stopped which in other way could contribute to more production and income in the island.

Debt Burden

The area is so poor that around 60% of the population has to borrow money for survival. Among them 24 families were found to take loan twice. In 25% of those families the main reason behind taking loan was for subsistence like buying food, to meet the cost of treatment or expenditure of festivals and repaying previous loans. Poor fishermen were found to borrow from Mahajans for buying nets or repairing boats. Only a few had taken loans for business.

There are no banks to provide them loans on a reasonable rate. There are NGOs that provide micro credit but only 22% of the families were able to get money from them. Therefore, most (63%) of them had to take loans from Mhajans, where the interest is very high. Participants in FGDs said, The NGOs deals in micro credit do not want to give loan to the extreme poor as they do not find them credit worthy. The fear is that, during any natural disaster owners of land or livestock's or boat will take away their produce or catch and the poor will not be able to return the loan.

Table 04 : Why they had to borrow money?

For business	During Marriage	To build/maintain house	For agriculture/fisheries/livestock	During sickness	Buying Fishing net	To repay previous loan	For food and daily family expenses	Others	Boat Purchase/repair
13	3	4	39	4	25	15	8	1	15

Food Insecurity

The survey found, due to poverty 73% of the households run short of foods for six to eight months in a year. The rest had to suffer the same for at least 4 months. This makes Char Patila as one of the most in-secured places in the country at any circumstances.

Changes in food availability and in food affordability due to climatic disturbances also add an additional health burden to households and communities. Reductions in fishery-dependent incomes can also reduce the ability to purchase

store-bought food during periods of natural resource scarcity causes malnutrition and under- nutrition for communities. Similarly, infrastructure damages due to extreme events or flooding can diminish access to local markets, reducing the availability of food products as well as increasing their prices. (Hasan et al.)

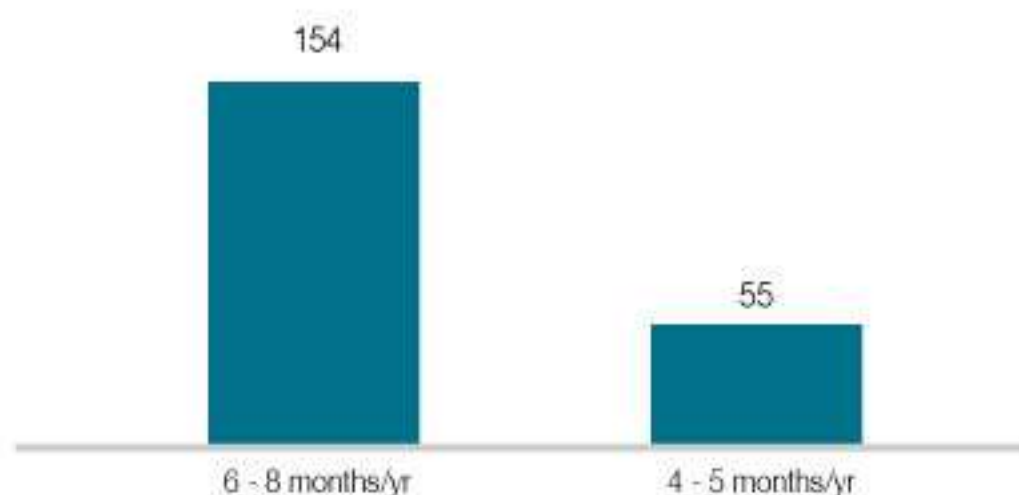


Chart 04: How many months do you run short of food in a year?

Impact on Women

Even if the women are willing to work, there is no income opportunity for women in Char Patila. So when climate impacts reduce income of male household heads the whole family suffers. The survey found, none of the women in the 210 households surveyed were engaged in any income earning activities. The majority of them are housewives. Most unmarried or widowed women and those above the age of 18 are unemployed and they have no opportunity. It was found that among the poorest of the households women members catch fish, shrimp and crab in the forest to meet the daily need of food and other expenses. Foxes and other wild animals coming from the forest pose a great threat to their security, as identified in the FGDs and KIs.

Table 05 : Activities of women

Activities	Response
Assistance for agriculture work	6%
Catch fish, shrimp and crab in forest	22%
cattle and poultry farming	1%
cattle farming	4%
Domestic help/ servant	1%
Housewife	30%
Making mat	1%
Poultry farming	1%
Unemployed	26%

However, some previous studies (Nasreen, 1995, 2008) suggest, although a disaster affects all segments of population, there are gender variations to vulnerability and resilience during disasters. Women and girls in the disaster prone areas face number of problems just because of their gender, let it be lack of income opportunity, food or social insecurity and access to service. As a result, women and girls in poor and marginal households become more vulnerable and distressed (Nasreen, 2012).

Case Study

A school impoverished by climate change and poverty

Abul Kashem, the headmaster at Sharifpara Primary School, is fighting a losing battle against school dropouts. This year only 18 students have taken part in the Primary School Certificate exams. They are among about 100 students who got enrolled in Class 1. In the five years since then, only 18 have remained, while others dropped out.



Free text books distributed by the government and aid coming from NGOs have helped many families to send their children to schools. Despite the incentives it has been difficult to retain the students in schools, says the headmaster blaming the dropout to poverty. "The children come from poor families. They take the children out of school so they can work in the field adding crucial income to the struggling families," says Kashem. "Money is more important than education of the children," he says.

The process of dropouts is slow in case of girls. More girls than boys complete primary education. Says Kashem "Among the 16 PSC examinees this year 14 were girls and four boys." But for girls schooling stops at Class Five as there is no secondary school in this island and the nearest secondary school is 20 kilometers from this island. Only 25 students have reached secondary school level from this remote and difficult area.

"After completing primary education most girls are forced to sit at home, many of them married off earlier than the legal marriageable age of 18," says the headmaster. "The guardians worry about the security of the girls. Neighbours gossip about them. So they marry them off early."

Chapter 05

Quest for a Solution

It is evident that problems of adaptation in the climate vulnerable area like Char Patila cannot be solved only with short term approach of tackling an immediate crisis like better education facilities, health care system or providing financial assistance. Any solution for the community has to address the livelihood crisis.

It was said in the FGDs that many NGO had intervention in that area. Yet neither empowerment of the women nor development of status for poor men in various occupations was visible at the end of their effort. It was suggested that the poorest population needed support in bringing change in conceptual poverty. They urged on the need of creating faith among people for any successful initiative as previously they felt being cheated by donors and NGOs who left them alone after few days of intervention.

This study examined various ways of adaptation to get the people out of poverty. In this quest three questions appeared as important; as 1) What are the areas of intervention and 2) How one potential intervention approach is better than others? and 3) who are the people to intervene?

What are potential interventions?

Asked what should be the best option for a sustainable future, almost all the participants prioritized cattle farming as the number one solution. The second best solution to them was growing vegetables in the backyard as 95 of the respondents supported it as a potential intervention. And the third was making handicrafts. They had also shown interest in traditional adaptation mechanisms like running convenience shops, fishing, cultivation and poultry farming as other priorities.

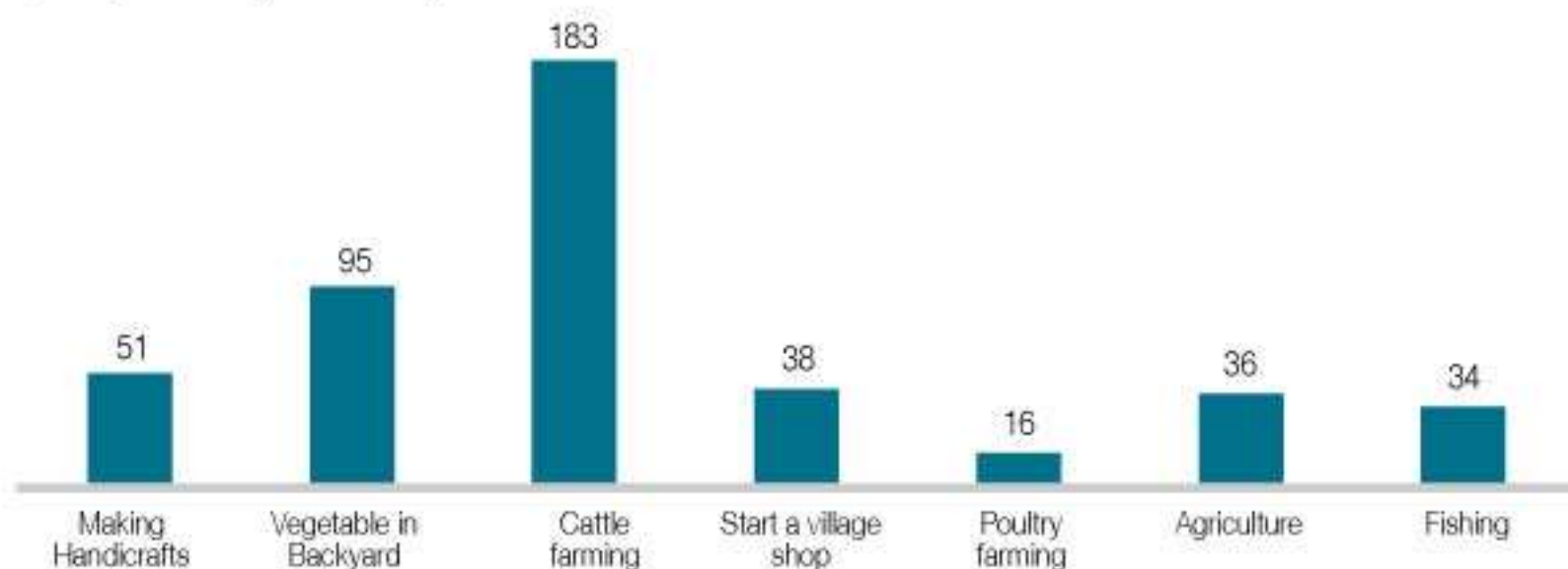


Chart 05 : What people want

Results from the FGDs were not an exception. Although in a more open mode of sharing information respondents had provided various other options to get rid of poverty and fight the climate change. Below is a list of them:

- Financial support for knitting of fishing net
- Providing machines for sewing and stitching work
- Direct financial aid
- Providing a piece of 'Khas' (government owned) land to the poorest
- Support for seedling growing or nursery development
- Providing Saline tolerant seeds for better cereal production.
- Establishment of a poultry grade dry fish production factory for employment.

Which one is the best option?

This appeared to be the toughest question to the research team to find an answer. The respondents made their priority on the basis of their psychological mindset. One key informant explained, "During the FGDs with both women and men, participants said that they cannot think of a livelihood other than the traditional ones like fishing, harvesting, vegetable growing, livestock and poultry rearing. Such response shows how poverty has narrowed the chance for any new livelihood."

However, to start with the most popular option of cattle or livestock farming, it can be said that most of the poor households want to have their own cow or goat. It is a symbol of asset in the island that has a market value and can be sold to anyone during emergency. But how sustainable is this option to alleviate poverty?

Livestock & Poultry: Based on such responses, various NGOs started providing micro credit for cattle few years ago. But this approach failed. Yet to this date, the livestock rearing remained difficult in marginal land and poultry birds are still not be a source of livelihood. Many of the poor families failed to pay the installments of principal amount due to acute poverty, although the rate of interest was minimal.



Previous studies conducted in the same area suggested, although the coastal people tried to meet their basic needs by rearing cattle and poultry, they are gradually becoming unable to afford fodder and feeds for cattle and poultry. Due to lack of grazing fields and feeds, many of them were found later selling their animals with low prices (Nasreen, 2013). People are living by rearing and selling poultry in the market in other rural areas of the country. But in distant places like Char Patila having quality poultry feeds can be costlier due to transport cost. The most problematic part of cattle and poultry is they are very much vulnerable to climate shocks like storms and floods. As the intensity of shocks is increasing, one such incident can wash away all their investment and future potential of rebound. This is how climatic variability has created a new challenge in nurturing domestic animals.

Vegetables and Agriculture: The second best option was vegetables farming. But reality of Char Patila is, most of the poor people do not have a land of their own. They reside in cottages built on Khas lands. There are around 50% who have their own 'Bhita', but in most cases size of the land is too small to grow enough commercially viable vegetables. It can be helpful for improved food security but hardly can alleviate poverty, as suggested in the KIIs.

Access to market is another big challenge for vegetable farming. The island Char Patila is relatively small and separated from the union headquarters by a river channel. And the larger market of Char Fasson or Bhola is so distant that it would take hours to take their produce to that market. So their perishable agricultural produce can hardly be sold at larger markets and there is a risk of getting lower price. Moreover, as suggested in the FGDs, the quality and quantity of vegetable production deteriorated for salinity in soil and water.

Fishing and Net Knitting: Fishing has always been major source of livelihood in this area. The population of Char Patila historically fisherman but could not be the owner of the lands. Instead exploitation over the years, made them land and resource-less by the money lenders and those who are influential. Even they do not have boats and nets of their own. So they have to share them with boat and net owner. In return the Mahajans take most of their catches or they have to pay loans selling those fishes. This is a vicious cycle, continuing through centuries. As fish stocks are reducing, any intervention in this area has risks of un-sustainability. In fact his study aims at identifying an alternative solution that can help these households for future adaptation.

Knitting (bindi) fishing net is another option of the local people. It is a common occupation in Kachchapia of Bhola. People of this area have a comparative advantage in the production and marketing of such nets. Moreover, FGDs informed, making fishing net requires a special craft and not all can do that. Traditionally control of nets belongs to those who have control of boats. Therefore, even if the poor families can be provided support for knitting, there are risks that Mahajans may resist use of what they produce. That is why, in a low demand scenario and monopolistic market, knitting fishing net cannot provide better income sources to a greater poor segment of people in the community.

Sewing and Handicrafts: Around 24% of the respondents in the survey suggested making handicrafts as an option to adapt to climate change. Even in FGDs women and men supported it, though placing it after cattle farming. There are both advantages and disadvantages of this approach. Problem is people of this area have no idea or experience about making handicrafts, stitching cloth products or sewing dresses. Neither do they have any market access to sell their products.

Advantages are, this approach can be a good new alternative for adaption as other options are already found exhausted. Another major positivity is, it engages women in income generating activities who are otherwise unemployed or engaged in unproductive works. Even if the agricultural production is low and fish catch reduces, women can support their families with their income. This can be a solution for the community only if proper training, capital and market access can be ensured, as voiced in the FGDs. It can expedite women empowerment and poverty alleviation in this island and therefore recommended by this study as the most potential intervention.

The answer for who

The above recommendation itself provides an answer. Male household heads are engaged in traditional occupations despite gradual decrease in their income. Females generally are not engaged in any earning activities, thus they cannot contribute to economic well being of the family. If females in the society can be targeted and be brought in the income generating economic activities, it will change the poverty landscape of the poor households and bring prosperity to the community.

However, 100% of the Household Heads in the survey responded that, they were willing to allow female members of their family for it. And the women, only with a few exceptions, responded that they are ready to start a business or work of their own. Therefore, it is evident that despite all the barriers like poverty, poor education and health facility; people of Char Patila are ready to accept a bigger change in their society, to combat climate change and also adapt to it. So it can be concluded that, a carefully designed livelihood training program that facilitates training of making handicrafts, capital to bring the knowledge into reality and market access to ensure sales of what they make, can alleviate poverty in the ever troubled island.

Case Study

A tale of want

At 36 Noorjahan Begum lost her husband who perished while fishing in the turbulent Bay of Bengal. She was left with no asset but two kids who are too young to go to work. Since her husband's death she has been evicted from a piece of land where he used to live as a share cropper. This has forced her to take shelter at the government colony built to house the extreme poor at Patilar Char in southern Bhola district. Haunted by hunger Noorjahan struggled to survive with the two kids working as a housemaid, a work not always available on this impoverished island. So at times she goes begging from door to door.

"My children and I try to live on whatever doles I can collect from the neighbours," says Noorjahan, now 37. "Whenever a festival comes I try to collect rice from them."

That is far from enough. Noorjahan needs at least 500 taka a month to feed the kids alone. "I have no income. Nor is there anyone who can lend me even 10 taka," says the poor woman who has hardly anyone to help her. Her in-laws (brothers of her husband) avoid her lest she asks for money.

"I want to work, but there is no work here. I can survive without food for a couple of days. But the children can't. Now if I get help from somewhere I can survive with my children."



A tale of win

For 15 years Ajifa has lived in a house built on a khas land. She is now preparing to move to a new house she has built on a piece of land she has bought with her own income. She dreams of a future when her daughter and two sons will get higher education and start a decent career. What has changed the life of Ajifa, once a meek wife of an electrician husband struggling to survive on his



meager income with three children and her aging father-in-law and mother-in-law?

The answer is: Basatpur Women and Children Development Centre. The centre is located at Basatpur, Ajifa's village under Sharsha Upazila in Jessore district close to the Indian border. Ajifa registered with the centre when it started imparting training to 40 poor and destitute women of the area on sewing and tailoring in morning and afternoon shifts. In the middle of the five-month training Ajifa bought an old sewing machine with the stipend money she received from the centre.

That was 15 years ago. It was also the beginning of a new life for Ajifa. With the sewing machine she started taking orders from neighbours to make dresses for them and their children. The income thus earned has helped Ajifa to buy new furniture for her house and gold ornaments for her daughter. "In just three years my life has changed for the better," says Ajifa.

At one stage Ajifa joined the association formed by the women at the centre. Like others she started working for the centre making garments that are sold at the capital's upstart shopping mall, UNIMART. The money she earns in wages for her work with the association is paid through her bank account that opened with the intervention of the association. She saves most of this money and helps run the family with the income she earns making dresses for the local people besides her work at the centre. With her income she makes a good contribution to the education of her ninth-grade daughter and the second-grade son. The third one is too young to go to school. Ajifa gets stipends for her school-going children from the centre. In addition to that she also chips in with her own income.

"In the past I was unable to bear the expenses of my children's education. Now I can," says Ajifa flashing a smile on her face.

Ajifa is aiming at going higher.

"This land where we have our house does not belong to us. We have purchased land in another place. The land has been filled with earth I have bought at about 6,000 taka. We will build a tin-roof house there. It will be our house on our own land," says Ajifa.

"I dream about a bright future for my children. They will one day pass MA," she says.

She has proved herself a brave woman to have such a dream.

An example in CSR

Success that inspires

Destiny would have sealed their fate otherwise, as has been the case for many of their peers. Not anymore. Time has changed. And it's a welcome change for the good.

Even in recent past many young women of Jessore's sprawling regions along the Indo-Bangla border used to fall easy prey to human traffickers. In desperate bid to avail a better

livelihood abroad, those women, many of whom of tender age, would return home tormented, devastated both physically and mentally. Those dejected young lives with their dreams shattered would carry on that agony throughout rest of their life. In the process, many of those trafficking victims used to find the doors of their paternal lodge as well as in-laws' house shut for them. Not anymore.

A skill training centre at remote bordering village of Basatpur has helped these vulnerable women find some alternate ways of living a better life. No longer they consider the risky move of crossing the border and put their lives at the mercy of destiny. By graduating themselves in the skills of tailoring and stitching from this training centre, the brave women of Basatpur now shape their own lives.

Eighty nine women have received training in both tailoring and hand stitching in two batches. At this training centre they have learnt not only the skills but also have started applying the acquired skills in making apparels and knick-knacks that have also found some market linkage and access thanks to some external supports.

It all started with The City Bank Limited which welcomes the idea of such a centre imparting training to poor rural women and then agreeing to spend its corporate social responsibility (CSR) fund in this noble venture which was a part of CSR advocacy initiative of Management and Resources Development Initiative (MRDI) and Manusher Jonno Foundation (MJF).

Women of Basatpur have formed an association to work together to make the change for themselves. The association - Basatpur Mohila O Shishu Unnayan Sangstha - (Basatpur Women and Children Development Association) is registered with the Department of Women and Children Affairs. Women of this association now participate in different awareness programmes under district women affairs office.

Community involvement played another supportive role for development of these women. Local mosque committee donated a piece of land for this group where the training centre has been constructed. Now it is found that this is a government owned khas land and somity members are in the process of applying to government for registering this land in its name.

Somity members are now operating their business under the umbrella of Gaon Swapna - Dream of village - a brand outlet for marketing handicraft products. Their handmade products have found a place in the shelves of UNIMART, the biggest hypermarket of the metropolis. Now all of the somity members have their own bank account through which they receive their payment against sales.

On demand from the community The City Bank has extended its support to train another 80 women. Now 50 women have their own sewing machines. Ten women are earning Taka 10 thousand per month. In addition, bank is giving stipends for the schooling of the children of the somity members. To ensure quality education, students are taking coaching classes before appearing at the PSC, JSC and SSC exams. Students of SSC are also getting board exam fees.

Today Basatpur women begin their day with a smile of assurance and solvency. All these have been possible due to a planned use of CSR fund of City Bank. This success will be an inspiration to others.



Chapter 06

Replication of success: Women's livelihood programme

Taking the success of Basatpur and analysis of probable livelihood options in mind, a similar intervention is proposed for empowerment of women of Char Patila and promotion of their livelihood. Though a different community, these women expressed a strong desire to earn money to support their families and live a decent life. They aspire for a better future for their children in terms of education, health, dwelling and dignity. One women's centre will be established on a community-donated piece of land in a suitable location of Char Patila.

Objectives

- To identify 80 women of the community interested in learning sewing and stitching skills for income generation.
- To set up a training centre, equipped with all necessary equipment, materials and personnel, in order to help the target women attain self-reliance.
- To create work opportunities for 80 marginalized women in three years by providing them with training in tailoring and hand stitching.
- To form a sustainable women's association in the village for livelihood and empowerment of women.

Duration of the Project: 3 years

Beneficiaries: Direct beneficiaries are marginalized women of Char Patila. Children and other members of the families will be the subsequent beneficiaries.

Cost Estimate: An amount of Taka 12,591,000.00 will be needed for implementing the intervention. Budget is given at the end.

Activities

- **A quick survey:** A survey will be conducted in Char Patila village to make a list of women who are interested in receiving skills training. Details of their families will also be taken.
- **Establishment of the centre:** One training centre will be set up at Char Patila on a piece of land donated by community or on a khas land. A one storied building with a floor space of 1500 square feet will be constructed for training and subsequent activities. Construction work will be conducted and supervised jointly by the selected local organization and MRDI. Sewing machine, necessary equipment and materials will be procured to make the centre functional.

- **Samity formation:** A local mohila samity (Women's association) will be formed to ensure ownership of the beneficiaries and sustain the centre in the long run. Women of the village will be eligible to become members of the samity. It will be run by an executive committee. The samity will be registered under the directorate of women and children affairs.
- **Training:** Two training courses will be conducted simultaneously, course-1 on tailoring and course-2 on hand stitch embroidery. Duration of a course will be spread over five months - with 100 working days. A total of 80 trainees, 20 in one batch, will participate in both the courses. Training module of Basatpur will be used to conduct the courses.
- **Production and marketing:** The trained women will produce dresses and stitch items to sell them and earn money. So marketing of these products is a vital factor. Leaders of the samity will survey local market and also explore the possibilities of selling the products outside Bhola. MRDI will facilitate by linking them with marketing outlet Gaon Swapna.

Implementation procedure

A local organization with credible track record of operating social development interventions will be identified as implementing partner of the project. MRDI will monitor the progress of activities through visits and report analysis.

Sustainability

This intervention aims to create work opportunities for poor women to support their families who are victims of climate change and natural disasters. A women's samity will be formed at the project site Char Patila. Training, production and marketing will be operated under the jurisdiction of the samity. Implementing organization will provide technical support. Registration of the samity with the Women's Directorate will provide a legal footing. During the three years of the project, the samity will attain a sustainable position. Savings of the members and working capital will provide them a financial base. As a registered organization it will also receive support from the government. The community will treat it as their own organization. Income generated by women will inspire the community to continue activities of the samity beyond the project period. Women in particular will feel and own the benefits of the intervention. So they will sustain it in their own interest.

Resource requirement / Budget

Sl.	Head of expenditure	Amount in Taka
A.	Activity for Identifying Intervention location & Beneficiaries	100,000.00
B.	Construction of Training Centre (1500 Sft one-storied building)	5,000,000.00
C.	Training and running Cost (4 Batches x 20 women x 80 days per batch x 2 types of training)	1,810,000.00
D.	Working Capital after training completion	400,000.00
E.	Project Management, monitoring & supervision Cost for 3 years	3,381,000.00
F.	Coordination fees for the Implementing Organization	1,600,000.00
G.	Programme Launching Cost	300,000.00
	Total	12,591,000.00

Chapter 07

Grounds for CSR Intervention

This chapter describes why CSR intervention for a sustainable solution to livelihood development in the coastal south of Bangladesh, is worthy. It examines contemporary discourse of development, government and Bangladesh Bank policy to identify reasons for such investments.

Development Priority

Poverty reduction has always been the first priority of GoB. It approved 7th Five Year Plan (2016-20) aiming to empower people by creating employment and skill development opportunities, supplying credit for SME development and many other ways for people to be more productive. Along with growth, the 7th Plan will emphasize social protection, urban transition and a sustainable development pathway resilient to disaster and climate change (UNDP, 2015). The plan has also set a target to reduce moderate poverty to 18.6 percent by FY20 and extreme poverty to 8.9 percent by FY20. (Plan com., 2015)

However, achieving this target is not possible by government alone. It requires support from the private sector also. CSR investment in livelihood development in Char Patila can contribute to the national priority of poverty alleviation, reducing inequality, creating employment and skill development opportunities and develop a sustainable pathway resilient to disaster and climate change.

Supporting those who need the most

Bhola is the Groud Zero of climate change. The people of this are suffer due to the act of adverse nature more than those living any other place in the country. And Char Patila is the remotest part of this district, where most of the people are living in extreme poverty. Investing in livelihood development in this area will indeed support the people who are in dire need. Such CSR intervention will not only raise household income, but also contribute to better health, better education for children and above all sustainable development.

Char Patila is under the Char Kukri Mukri union. Every year they get a very little amount form government budget and most of it is spent for protecting the land from erosion. Char Patila receives a minor share of the small budget, as it is far and separated from the administrative center. Therefore, it is almost impossible to bring any livelihood change in the area with public fund. Few NGOs have tried with their own initiatives. But success is rare as the question of livelihood remained unresolved. Therefore, it provides a unique setting for CSR intervention to take the lead and set an example by solving the livelihood crisis, what the neediest people need most.

Supporting the SDGs

The world is entering into a new development paradigm called Sustainable Development Goals from 2016. It has 17 goals to achieve in the next 15 years. 'Eradicate extreme poverty for all people everywhere by 2030' is the first among 169 promises made in this agenda. The "Goal 1" also asks for building the resilience of the poor to reduce their exposure and vulnerability to climate-related extreme events and disasters. So, any CSR investment in livelihood development will contribute to achieving these targets.

Such initiative can promote job creation, entrepreneurship and encourage growth of SMEs; and also can reduce inequality by ensuring sustained income growth of the bottom 40 per cent of the population. With these contributions, ensuring women's full and effective participation at all levels of decision-making in political, economic and public life; can be achieved. One CSR intervention thus can actively take forward implementation of Goal 8, 10 and 13.

Table 06 : Which SDG targets it can contribute

Target 1.1	By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day
Target 1.5	By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters
Target 5.5	Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life
Target 8.3	Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services
Target 10.1	By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average
Target 13.1	Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
Target 17.7	Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships

SDGs are set of ambitious promises that the world leaders have agreed upon. It requires at least 1.5 trillion USD additional financing a year to implement than the present level of development spending. The SDG calls for greater private investment in development to meet this financing gap. Bangladesh can create a new example in financing for development, by guiding CSR investment in a desalination plant for coastal southwest to achieve an important SDG.

Empowering the women

Gender is a dominant discourse in present development framework. One of the major components in measuring success of any intervention is how it engages women and makes their life better. Findings of the research suggests, almost no women in the area are at all involved in any income generating work. CSR intervention in handicrafts training, providing finance and access to market can help many women in this area get out of poverty. It will also empower them in the society.

Matching the Bangladesh Bank Priority

BB has issued subsequent circulars on the priority areas of CSR engagements for banks and financial institutions in the communities they operate in. After education, the CSR guideline has given the highest importance to support assistance for underprivileged population segments asking around twenty percent of total CSR expenditure allocation in this area.

This research has found, more than 60% of the population is poor in Char Patila. They live in one of the remotest part of the country. They are excluded from access to market and finance and there is no potential livelihood mechanism to get themselves out of poverty, other than those compromised by the impact of climate change. They are underprivileged. Supporting them is highly consistent with the BB CSR policy.

Such intervention will create opportunity to engage the investing entity with a large community who are vulnerable to climate change. Such CSR expenditure can promote adoption of environmentally sustainable output practices and lifestyles as prioritized in BB policy. Providing access to knowledge and finance to these marginalized people will contribute to a much appreciated central bank policy of inclusivity.

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