

ClimateAction

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CLIMATE-SMART DEVELOPMENT

Empowers Bangladesh Communities

Amid unchecked climate change, extreme weather and climate events pose huge challenges for sustainable development in most parts of the world. Such development may become impossible unless the most vulnerable and exposed areas can increase their climate resilience.¹ The reverse is also true: the most vulnerable, exposed populations risk losing everything unless climate-smart development can sustain their local agriculture, energy, water resources, health and sanitation, security, and safety.² Only climate resilience can safeguard the development gains of communities—indeed, of whole regions.³



BCCRF's Contribution to the Climate Change Exposed Communities

Among its efforts to help Bangladeshis build resilience to climate change, the Bangladesh Climate Change Resilience Fund (BCCRF)⁴ is supporting Bangladesh in strengthening its resilience to climate change. BCCRF has also recognized the long-indispensable roles of local empowerment and numerous nongovernmental organizations (NGOs) in community-based programs and services (often in partnership with government and international development partners) by allocating US\$12.5 million of its climate-resilience funding to NGOs through its Community Climate Change Project (CCCP) (<http://www.pksf-cccp-bd.org>). The CCCP, in turn, provides competitive grants to

Bangladesh is among the many economies historically exposed to natural hazards and vulnerable to disasters that have slowed or sometimes reversed development gains.⁴ Climate-smart development begins by addressing societies' vulnerability and exposure to current climate change: first, by setting up mechanisms to mitigate the effects of current disasters; and, second, by increasing populations' long-term resilience to the increased intensity and frequency of hazards in the coming decades.

Photo by The World Bank.



NGOs to implement community-driven adaptation to climate change. The BCCRF Governing Council designated the Palli Karma-Sahayak Foundation (PKSF) as the responsible agency for this project.⁵ The CCCP focuses on the communities hit hardest by current weather extremes: populations who live in coastal areas affected by saltwater intrusions, in flood-prone chars (silt islands in rivers) and river basins, or in areas afflicted by recurring droughts.

With few resources and no opportunity to relocate, these people know they must develop enough flexibility to adapt and survive.⁷ Every aspect of their lives is at risk—homes, livelihoods, food and water security, health, and well-being. The CCCP's aim is to strengthen their resilience to cope with both current and future climate stresses by improving infrastructure, adapting agricultural practices, and finding innovative sources of income.

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Stories of Climate-Vulnerable Communities

How New Economic Opportunities Empower Women

Although crab cultivation is not new in Bangladesh, the high international market demand—coupled with the need to find alternative economic opportunities in areas suffering from significant saline intrusions—makes it a viable climate adaptation strategy. Most important, crab cultivation provides an economic opportunity for women because small-scale fisheries are adjacent to homesteads.¹⁰ The CCCP, through several of the supported NGOs, is providing specific opportunities for women by training them in crab

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Stories of Climate-Vulnerable Communities

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Box 1. Changing Livelihoods: Saraswati's Story

Saraswati Rani's situation in Biswanathpur is common to many. Saline water intrusions have rendered her family's land unsuitable for agriculture. Her husband has turned his hand to fishing, and with the help of the NGO Satkhir Unnayan Sangstha (SUS), Saraswati has become a crab farmer.

SUS provides training and capital in the form of crabs, nets, and crab feed. Once the crabs are ready for market, Saraswati's husband sells them to middlemen. They reinvest their profits to rear more crabs, and the extra income supplements her husband's fishing income.

Source: *Personal interview, February 2014.*

culture (box 1). It is well documented that training of women in proper technologies increases competence in crab fattening and increases revenue as well.¹¹

Disaster Recovery: A Long Road from Destruction

After Tropical Cyclone Aila struck Bangladesh in May 2009, its torrential rains and floods killed at least 179 people. Severe flooding in coastal regions isolated more than 400,000 people, and many villages were either submerged or completely destroyed by 3-meter-high storm surges. Inland, rivers broke their banks, causing widespread flooding. Countrywide an estimated 500,000 people or more lost their homes. Waterborne diseases soon followed, afflicting more than 7,000 people.

Like most tropical cyclones, Aila washed away roads, damaged bridges, submerged fields, and destroyed homes and livelihoods. Five years later, many people still struggle to cope with their losses, and they depend heavily on the help of local NGOs (box 2). Individuals' stories of recovery are seldom unique, but they serve to highlight the complexity of adapting to the long-term effects of climate change while coping with the sudden impact of weather extremes.

Farming Practices Must Adapt in Drought-Hit Areas

As prolonged droughts become more frequent in Bangladesh, farmers are adapting by switching

to short-duration, drought-tolerant varieties of paddy. The ability to harvest early helps to ensure food security during lean periods, giving farmers the opportunity to cultivate other winter crops in time. Through the CCCP, Ashrai, a local NGO, will introduce these new crop varieties in three drought-prone upazilas in the high Barind region of Rajshahi and Naogaon Districts, along with other remedial measures in each of these areas.

Another practice spreading throughout many farming systems in Bangladesh is goat rearing, which has been introduced or expanded in increasingly drought-prone parts of the country (box 3). Bangladesh now has more than 25 million goats, with an annual growth rate of about 2.5 percent. The Black Bengal goat has multiple benefits: It is a relatively hardy animal, better adjusted to drought than other livestock, and requires relatively little space and care. It is a reliable producer in bad times, a prolific breeder, and has lower nutritional requirements than those of cattle and buffalo. It is also an asset that can be liquidated for finance in times of need, providing the farmer with a buffer against crop failures. In some areas of Bangladesh, goats contribute up to 41 percent of a farm's total income.¹²

In a recent study by the Bangladesh Agricultural University, rural women involved in goat rearing identified these top three major problems: lack of proper training about goat rearing, lack of available grazing land, and high mortality of goat kids.¹³ The training aspect will be addressed directly by the CCCP in the subproject run by the National Development Programme (NDP), a local NGO in Natore District.

Living on a Sandbank

Chars are basically inhabited sandbanks. They constitute less than 1.5 percent of Bangladesh's total land area but are home to about 5 percent of its population. Some chars last through only one or two monsoons, after which they disappear into the river; others may have been inhabited for two or more generations (box 4).

The daily life of char dwellers is based on subsistence agriculture, small-scale animal husbandry, and pond and river fisheries. Many households are quasi-landless, owing less than half an acre, but chars often include a small middle group of dwellers who own enough land to rent to the landless or to hire landless workers.

Box 2. After Aila: Ashima's and Kamrul's Stories

Ashima Mondal lives with her husband and family in West Srinagar. "Before Aila," Ashima says, "we had everything: goats, cows, hens, and ducks. Now we have nothing. In five years, we have had no harvest. Paddy doesn't grow due to the high salinity levels. Food is scarce, and Aila destroyed the tube wells in this area, so we have to collect drinking water from sources 2 to 3 kilometers from here."

Kamrul Islam's story is similar. Kamrul lives in Khulna near the Sundarbans, where Aila devastated livelihoods and took many lives. Kamrul and his neighbors have not been able to return to their old homes since May 2009. Instead, they squat on polders, his entire family squeezed into one small room. Kamrul highlights the impact of salinity on cropping. "In the past, we used to harvest 740 to 925 kilos of paddy from one acre of land," he says. "Now barely 296 to 333 kilos grows. This is a great loss to our agricultural production."

For now, the NGO Jagrata Juba Sangha (JJS) is helping Kamrul and Ashima and their communities raise the plinths of their homesteads so that they will remain above the flood level. JJS is also introducing crab farming to these communities and helping them restore their local sources of freshwater.

Source: *Personal interview, February 2014.*

Box 3. Farmers' Uncertain Fates: Jaker's story

Jaker Hossain is a marginal farmer from Dhalarhat village under the Baro Harishpur Union of Natore Sadar Upazila in Natore District. Jaker has a wife and a daughter. The family's livelihood depends on agriculture. Jaker says "Now it is difficult to grow good crops; nowadays farmers face many natural disasters, especially drought."

In the past couple of years, drought has brought considerable hardship to the Natore District. Marginal farmers, like Jaker, wonder which crops to cultivate (such as rice, jute, and wheat) and how much time it will take to recover from the loss of a single crop. In the past, villagers could rely on rainfall for irrigation, but now the rains are scarce. Groundwater is needed for irrigation, but the pump's output is also decreasing, and sometimes Jaker has to bring water from a long distance at considerable cost. Without water, the crop dries out. Productivity is now so low that he can barely cover his family's food needs. Sometimes he needs to borrow money to cover his unmet costs.

The CCCP, through the NDP, will address the agricultural water needs of Jaker's village by installing deep tube wells for irrigation to increase crop production. They will also provide training and technical support to help 400 households set up goat and sheep rearing.

Source: *Personal interview, August 2013.*

Box 4. Coping with Char Life: Mohammad's Story

Mohammad Bodiuzzaman, his wife, two daughters, and son live on the bank of the Tista River of Goraipia Char under the Tehrai Union of Ulipur Upazila in Kurigram District. Mohammad inherited land from his father, and for a while he could farm rice successfully. But char people must live under peculiar conditions: during the rainy season, the land is underwater, food and drinking water is in short supply, and sanitation is a problem.

Over time, Mohammad watched as the river permanently swallowed his land. He has moved his house about 10 times. Now his property consists of his homestead, two cows, and three goats. He cultivates borrowed land, but floods give way to long droughts, and it is not easy to select the right crops to plant. Mohammad realizes that drought- and flood-resistant crops should be cultivated, that houses must be protected from floods, drinking water must be harvested, the river managed, and embankments strengthened.

The CCCP, through the SKS Foundation and RDRS Bangladesh, supports a variety of activities to help char residents: including raising the plinths of their houses; sinking tube wells to reduce the risk of bacterial contamination of drinking water; provision of drought- and flood-tolerant seeds; introduction of latrines to reduce health risks; and introduction of vaccination program to improve goat rearing.

Source: *Personal interview, August 2013.*

Box 5. To Stay or to Go? Zakir's Story

Zakir Hossain, at 23, lives with his wife, son, daughter, and mother in Montola village under the Romna Union of the Chilmari Upazila in Kurigram District. Adjacent to the Brahmaputra River, the village is accustomed to seasonal flooding, but nowadays these floods are more frequent and persistent, inundating their freshwater wells and damaging their sanitation systems. Crops are lost, and the risk of waterborne disease increases with each day of the flood. With little cash, the family must borrow money to buy food. In the past, they were able to recover, but the increasing frequency of floods make recovery increasingly difficult. The need to earn more money is driving many of the men to seek more gainful employment in Dhaka, creating additional stress on their families.

Zakir reflects on the possible actions to reduce the flood risk, such as dredging the river, building dams, raising the plinths of houses above the flood level, building flood shelters, and raising the road levels to keep communications active. His village probably needs all of the above. The CCCP subproject, managed by RDRS Bangladesh, is focusing on raising plinths and constructing a link road above the projected flood level. Cultivating flood-tolerant rice will also address some of the food security issues and may encourage the male family members to remain in the community.

Source: *Personal interview, August 2013.*

The Quest for Safer Homes

Flooding is an important component of agriculture in Bangladesh, because it deposits silt that fertilizes the land. However, persistent flooding has become a major problem in agricultural communities, damaging homes and threatening livelihoods. Soil erosion has contributed to the silting of rivers, making them more easily flooded and thus devastating riverbank settlements. This flooding will be compounded by rising sea levels, which slows the drainage of the land to the ocean. Raising the plinth of a house helps to create a flood-resistant home (**box 5**).

Improving Sanitation and Health

Sustained use of improved or shared latrines is lowest among the poorest families and those living in disaster-prone areas,¹⁴ where flood-related damage and repair costs are the likely causes of people reverting to unimproved latrines.

Several of the CCCP subprojects tackle these issues by working with local communities and families to upgrade latrines and, in some cases, to move out of shared arrangements. Protecting improved latrines from flood damage in the same way that homes and water supplies are protected is essential to avoid reversion to open defecation and the attendant health risks.

Local Access to Safe Drinking Water

Access to safe drinking water is major concern in many developing countries¹⁵ and is especially challenging for Bangladesh. Since the 1970s—in response to the widespread contamination of surface water with human pathogens—there has been an almost universal shift from the consumption of surface water to ground water.¹⁶ However, this shift generated a new health problem: the presence of arsenic in shallow tube wells.¹⁷

In addition, climate and weather extremes are also stressing water supplies by way of extended droughts, floods, and coastal inundation. Natural sources of water must be augmented in many areas. In Bangladesh, rainwater harvesting is widely practiced at a household level. Rainwater provides an important source of drinking water as well as a useful source of water for blending with other sources to reduce contaminants, such as arsenic.¹⁸ Well-designed rainwater harvesting systems with clean attachments, covered cisterns and storage

tanks, and water treatment as appropriate—supported by good hygiene at the point of use—offers drinking water with low health risks. However, rainwater quality could subsequently deteriorate during harvesting, storage, and household use. Fecal contamination is quite common, particularly in samples collected shortly after rainfall. High microbial concentrations are generally found in the first flush of rainwater, so a system to divert the contaminated first flow of rainwater from roof surfaces is necessary.

Pond reexcavation is also useful to supplement the freshwater supply for household and irrigation use in salinity-prone regions (**box 6**). Pond sand filters (PSFs) increase the safety of the water supply. The importance of access to safe water supplies is reflected in the CCCP subprojects, all of which include either rainwater harvesting, semideep tube wells, or reexcavation of freshwater ponds with the addition of PSFs.

The CCCP's emphasis on local empowerment helps to sensitize communities to the impact of climate change on their livelihoods. "Through CCCP, we target to reach the most vulnerable communities exposed to salinity, floods, and drought," says PKSF Chairman Qazi Kholiuzzaman Ahmad. "CCCP is creating the path, and I am hopeful there will be more opportunities to continue the legacy."

Box 6. Distant, Expensive Water: Sharifa's Story

Sharifa Khatum lives in the village of Ghokhali, Tarail District, Kaligong Upazila with her father and daughter. Sharifa works as a tailor to sustain the family's livelihood after her husband left. Access to safe drinking water is a major problem.

"Due to increased salinity, we suffer from scarcity of drinking water" says Sharifa. "I contacted the NGO SUS [Satkhira Unnayan Sangstha] to help us to dig a pond. In previous times the water was potable, but now it has become saline-contaminated."

"Now, we have to buy water from Kaliganj, almost 8 kilometers from here, and pay Tk 10 per container. It is expensive because we have to pay for the transportation, which includes the cost of the van, too. The ponds are all saline-contaminated, and we cannot use that water for drinking, washing utensils, bathing, or anything else."

To address this crisis, with the support of SUS, Sharifa has dug a new pond with a raised peripheral boundary to protect it from saltwater intrusions. After filtering, Sharifa and her family will have access to safe drinking water. During the monsoon, Sharifa hopes that the pond will store enough rainwater for all seasons so she won't have to buy water from far away.

Source: *Personal interview, February 2014.*



BCCRF Project Funds Dozens of Local Disaster-Resilience Projects

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At present, PKSF has assigned 27 CCCP subprojects to competitively selected local NGOs. The projects include raising homes to prevent daily inundation; repairing roads and planting trees to strengthen road embankments; ensuring access to safe freshwater by rainwater harvesting; excavating ponds and performing desalination in water-scarce villages; and adapting agricultural practices to farm drought-resistant or flood-tolerant crops.⁸

1. "Climate resilience" is "the ability of a social, economic, or environmental system to adjust to or rebound from climate-related stresses while still maintaining its basic function and structure. Climate-resilient systems may not look exactly like they did before, but they are able to prosper despite climate change and related stresses." USAID [U.S. Agency for International Development]. 2014. "Climate Change Adaptation." Online article, USAID, Washington, DC. <http://www.usaid.gov/climate/adaptation>.
2. World Bank. 2009. *World Development Report 2010: Development and Climate Change*. Washington, DC: World Bank.
3. USAID (U.S. Agency for International Development). 2013. "Climate Resilient Development." Brief, Global Climate Change (GCC) Initiative, USAID, Washington, DC.
4. World Bank. 2010. *Natural Hazards, UnNatural Disasters: Effective Prevention through an Economic Lens*. Washington, DC: World Bank.
5. Established in 2010, the BCCRF is supported by Australia, Denmark, the European Union, Sweden, Switzerland, the United Kingdom, and the United States.
6. The Government of Bangladesh established the PKSF in 1990 as a "not-for-profit" company whose principal objective would be to provide funds for microcredit programs to help the poor. PKSF provides assistance through numerous partner organizations directly as well as by supporting their institutional development. In the past few years, the PKSF has broadened its focus to include noncredit programs, such as training, education, health, awareness building, nutrition, direct employment linkages, and marketing supports to provide all-inclusive services for the persistent betterment of the poor. For more information about the PKSF, see the website <http://www.pksf-bd.org>.
7. World Bank. 2013. *World Development Report 2014: Risk and Opportunity: Managing Risk for Development*. Washington, DC: World Bank.
8. The total of 27 projects include 10 in the high-saline areas, 9 in the flood-affected areas and 8 in the drought-prone areas, with each addressing at least one of the six thematic pillars of the Bangladesh Climate Change Strategic Action Plan (BCCSAP). For more information, including the project selection process and recipients, see <http://www.pksf-cccp-bd.org>.
9. The Ministry of Commerce is going to take a number of initiatives to boost crab exports. Demand is increasing significantly, especially in China, Singapore, and Hong Kong (*Financial Express*. 2013. "Steps to Be Taken to Boost Crab Export." December 27. <http://www.thefinancialexpress-bd.com/2013/12/27/10875>.)

In the high-saline areas, for example, where traditional agriculture is failing, farming practices are shifting to cultivating mud crabs (*Sacilla serrata*), which tolerate high salinity and for which the international market is significant and growing.⁹ Such approaches present new opportunities for women to enter the local work force and provide income to purchase the foodstuffs that they cannot produce locally. Collectively, these changes exemplify the capacity of local communities to become more financially self-reliant and resilient to weather and climate extremes. The efforts also highlight the importance of focusing climate services on the ongoing needs of these communities, which will continue to bear the brunt of weather and climate extremes.

INTERVIEWS



Dr. Qazi Kholiuzzaman Ahmad, Chairman, Palli Karma-Sahayak Foundation (PKSF) (Implementing Agency)



Zakir Hossain, Executive Director, Jagrata Juba Shanga (JJS) (NGO)



Sarawasti Rani, Shatkhira District Beneficiary



Sharifa Khatun, Shatkhira District Beneficiary



Ashima Mondol & Kamrul Islam, Khulna District Beneficiaries

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Government of the
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