

# Ensuring Livelihood Security for Climate Vulnerable Communities in Coastal Bangladesh

*Impacts of climate change severely affect the livelihood security of the communities in the south-west coastal region of Bangladesh. An action research conducted in two selected villages of Khulna in 2018 shed light on specific local vulnerabilities to livelihood, its consequences on local communities and limitations of current coping strategies in the view of a changing climate. This policy brief provides recommendations for concrete actions towards building resilient livelihoods for climate vulnerable communities in coastal Bangladesh.*

## SOUTH-WESTERN COASTAL BELT IN THE CONTEXT OF CLIMATE CHANGE

Bangladesh, especially its coastal belt is highly vulnerable to a range of environmental stressors. Owing to its geographical location and funnel shaped coastline, the country has historically been subjected to regular cyclones, storm surges, riverbank erosion, floods and salinity intrusion<sup>[1][2]</sup>. Concurrently, its deltaic topography and abundance of rivers have served as a hotbed of natural resources to provide livelihood support for local populations. Local communities in south-west coastal region are mostly dependent on natural resources such as rivers, land, forests with majority of the population being engaged in either agriculture or fishing for income generation. About 30% of the cultivable land of Bangladesh is in the coastal areas which are frequently affected by cyclones, storm surges, riverbank erosion, salinity and dry spells.

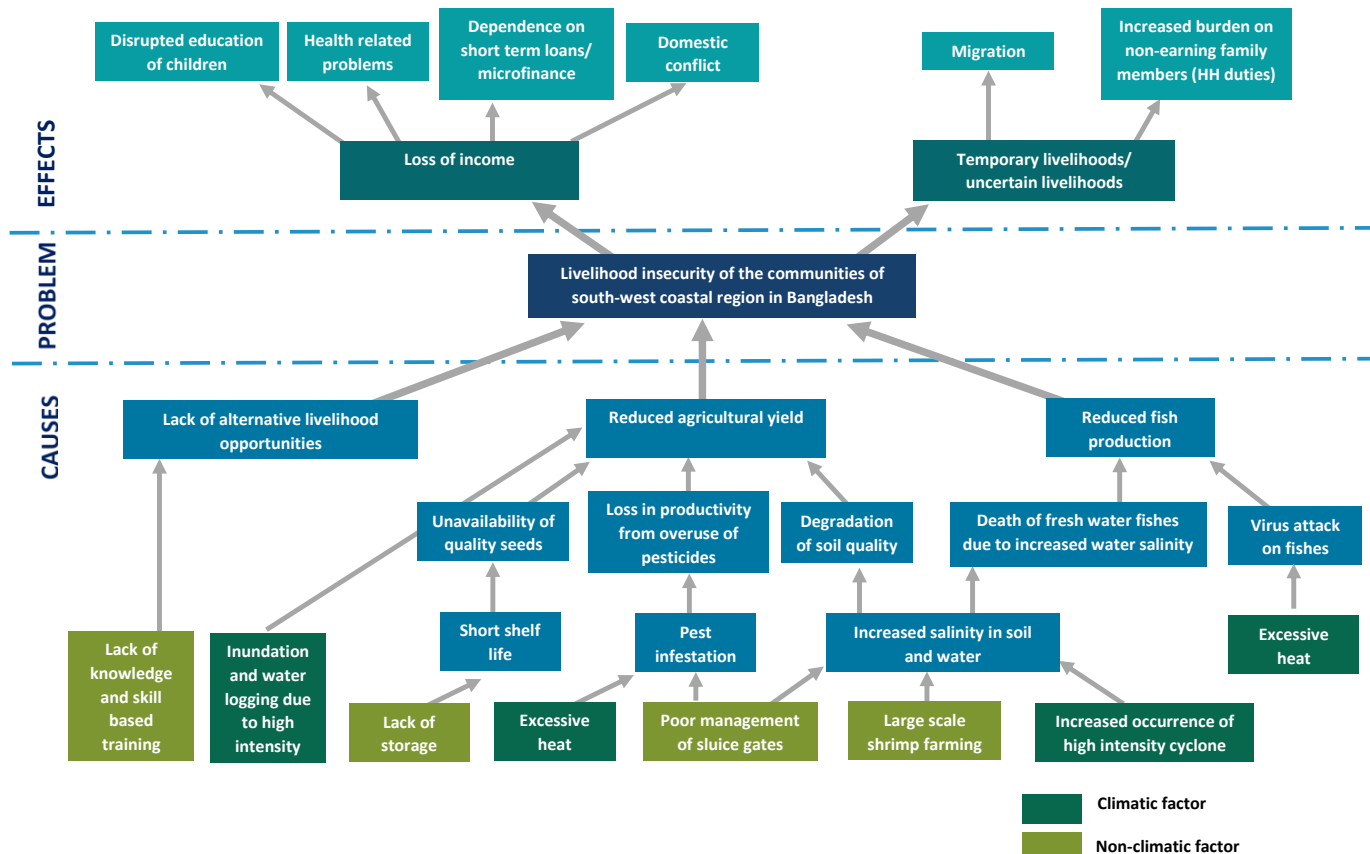
Climate change is likely to increase river salinity leading to shortages of drinking water and irrigation, and significant changes in the aquatic ecosystems in the Southwest coastal areas of Bangladesh during dry season by 2050<sup>[3]</sup>. Another study of Mondal et al. found that, the number of consecutive rainy days has increased, and the trend is statistically significant for Khulna and Satkhira. IPCC special report on 1.5° C predicts that, increase in heavy precipitation in coastal regions along with tropical cyclones and increased sea levels may lead to increased flooding. Shahid in his study of 2010, observed the seasonal variation of temperature using the data from 17 stations for 1958-2007 and come up with the result that, except for winter mean temperature is significantly increasing with an increase of 0.04°C per decade in Khulna station<sup>[4]</sup>. Farmers are already unable to grow multiple crops during the year<sup>[1]</sup>. Crop models and global climate models project that potential production losses will be greatest in the more vulnerable southern sub-regions<sup>[5]</sup>.

## KEY POINTERS

- Rising temperatures and salinity intrusion along with increased occurrence and intensity of cyclones, storm surges, floods have significant impacts on agricultural yield and freshwater fish production in coastal Bangladesh
- Overdependence on natural resources coupled with lack of skills, knowledge and limited alternative livelihood opportunities threaten livelihood security of local communities
- Maladaptive practices such as shrimp farming, coupled with inefficient management of existing infrastructure further perpetuate livelihood loss.
- Existing coping strategies are largely inadequate for protecting livelihoods against worsening climatic shocks and stresses
- Promotion of climate resilient livelihood means/resources along with alternative non-agro based livelihood opportunities are essential to reduce loss of livelihood.
- Capacity development of vulnerable communities as well as local authorities on climate resilient livelihoods is crucial for ensuring livelihood security

## WHAT CAUSES LIVELIHOOD INSECURITY?

Climate change induced shocks and stresses pose the greatest risk to the agricultural sector in Bangladesh and the coastal districts specifically on which most of the people are dependent on. The short-term effects of climate change-induced changes in the environment to agricultural sector include damage to housing and agricultural land, food and water insecurity. In the longer term, agricultural practices have been and will continue to be disrupted further as fisheries and arable land are encroached by saline water from rising sea levels. However, some non-climatic human induced factors further intensify the livelihood loss of the coastal community.



**Source:** Research Report, Panii Jibon Project, 2018

### Reduced Agricultural Yield

Significant crop failure and low profitability of agricultural farming in recent years, has opted people in south-west coast to drop out of agriculture. Gradual increase in the levels of groundwater and soil salinity, which the regular and frequent occurrence cyclones have contributed to, have resulted in low crop yields over the years. Cyclone Aila in 2009 caused a sudden surge of salinity intrusion and resulted in massive crop losses and destruction of farmlands. High-intensity, short duration rainfall often leads to inundation and heavy waterlogging, and damaging properties. Waterlogging coupled with excessive heat during summer, perpetuates pest infestation which also affects crop yield.

### Hampered Fresh Water Fish Cultivation

Communities engaged in fishing for their livelihoods have given up freshwater fishing as rising levels of salinity in the river has led to a decline in fish supplies. Gradually increasing levels of salinity in village ponds have diminished cultivation potential in the ponds as well. Freshwater fish cultivation in the village are also significantly affected by virus attack, which the community respondents attributed to salinity as well as excessive heat during summer months.

### Proliferation of Large-Scale Shrimp Farming

Major losses in fish yield started when the widespread practice of shrimp farming in the community began. Small scale shrimp cultivation evolved into shrimp 'ghers' over time, resulting in intrusion of saline water into nearby freshwater ponds. The recent proliferation of shrimp farming coupled with poor management of sluice gates have emerged as key non-climatic factor driving levels of climate change induced salinity in the coastal villages. However, cultivation of shrimps is also hampered by the same viruses which are detrimental to freshwater fishes.

## Lack of Alternative Livelihood Opportunities

Loss in agricultural yield and fish production induced by various climatic shocks and stresses, have made communities vulnerable. For decades, seasonal migration for secondary occupation has been employed by community members, mostly males during a specific time of the year. But due to lack of alternative livelihood opportunities, migration patterns have changed over the last decade or so. Male members now migrate to other places all throughout the year in search of alternative livelihoods leaving their female counter parts to manage all other aspects of life on their own.

## CONSEQUENCES OF LIVELIHOOD VULNERABILITY

Emergence of livelihood insecurity in the last decade or so, have resulted in significant income losses for households with sharp increase in monthly deficits. As a result, households are often trapped in a vicious cycle of indebtedness. However, with reduced yield of crops and fishes, monthly expenditure on food for families has increased leading significant reduction in consumption of nutritious foods causing various health problems.

Livelihood vulnerability to climate change is experienced disproportionately by women for a variety of socioeconomic and cultural reasons. These include a more direct dependence on natural resources; limited access to resources, limited access to education and information; limited roles in decision-making; limited mobility and more. Lack of skill and knowledge have restricted women's access to livelihood opportunities other than agriculture. As a result, women are slowly losing their financial independence which they used to have through earnings from homestead production. It further worsens the situation of domestic abuse, and reduces their decision-making power. Besides increased level of salinity and prolonged dealing with saline water lead to higher occurrence of skin diseases among women.

## CURRENT COPING STRATEGIES AND ITS LIMITATIONS

Communities in the coastal belt have been coping with these shocks via an array of mechanisms for generations drawing from indigenous and learned knowledge. However, lack of necessary resources and limited awareness regarding the implications of a changing climate, have rendered most of these efforts ineffective in recent years.

Climatic Shock/Stress	Impacts	Current coping strategies	Limitations
<b>Cyclones</b>	<ul style="list-style-type: none"> <li>• Destruction of crops in field and vegetables in front yard.</li> <li>• Loss of fish and shrimp production.</li> </ul>	<ul style="list-style-type: none"> <li>• No effective current strategies are undertaken by the community to protect crops.</li> <li>• Protection of shrimp gher using bamboo fence.</li> </ul>	<ul style="list-style-type: none"> <li>• They might be able to protect one-third of the crop if they receive early warning, otherwise they lose all of it.</li> <li>• There is no storage for crops and fishes/shrimps nearby. So, they can't store much of their products hearing the early warning.</li> </ul>
<b>Floods and waterlogging (heavy rainfall)</b>	<ul style="list-style-type: none"> <li>• Loss in agricultural production</li> <li>• Inundation of ghers and intrusion of salinity into other freshwater bodies.</li> </ul>	<ul style="list-style-type: none"> <li>• Protection of shrimp ghers using bamboo fence.</li> <li>• No effective coping strategy to reduce agricultural loss.</li> </ul>	<ul style="list-style-type: none"> <li>• There are sluice gates to drain water - however they are poorly managed.</li> </ul>
<b>Salinity intrusion (soil, water resources, groundwater)</b>	<ul style="list-style-type: none"> <li>• Degradation in soil quality and strength.</li> <li>• Vegetable and crop production loss</li> <li>• Loss of fishery.</li> </ul>	<ul style="list-style-type: none"> <li>• Use of different fertilizers to tackle soil salinity in agricultural production</li> <li>• Shift towards saline tolerant shrimp farming practice.</li> </ul>	<ul style="list-style-type: none"> <li>• Over application of fertilizers has further degraded soil quality over time</li> <li>• Shrimp farming further increases salinity in the area. It cannot be taken up by the mostly poor population and benefits a select few, while adversely affecting the poor.</li> </ul>
<b>Irregular weather pattern and excessive heat</b>	<ul style="list-style-type: none"> <li>• Loss in crop production due to pest incidence</li> <li>• Changes in cropping patterns and practices</li> </ul>	<ul style="list-style-type: none"> <li>• Use of pesticides as well as medicines to tackle pests</li> </ul>	<ul style="list-style-type: none"> <li>• Pesticides can only yield about ¼ of expected production</li> <li>• Unaffordability of high-quality pesticides by the mostly poor population.</li> </ul>

**Source:** Research Report, Panii Jibon Project, 2018

Supports in the form of relief including food and immediate materials are given by different organizations but very few specific interventions targeting livelihood insecurity are in place. However, most of these are subjected to poor operations and maintenance by responsible authorities. Bangladesh has various policies such as 'Jatiyo Chingri Nitimala 2014' in place for proper distribution of agriculture and shrimp farming and guidelines for performing shrimp

farming, but lack of good governance hinders desired sustainability. Lack of coordination among different government departments further exacerbates the process.

## MEANS OF BUILDING COMMUNITY RESILIENCE

To ensure livelihood security and enhance adaptive capacity in the face of changing climate, the action research conducted under Panii Jibon project proposes the following policy recommendations-

### Provide climate resilient livelihood means/resources

- Provision of saline and flood tolerant seeds for free/ at minimum cost by agricultural department and relevant agencies of local government.
- Establishment of well-administered collection centers and storage facilities by local government in each locality to ensure proper market facilities.
- Promotion of the use of organic pesticides by district agriculture department.
- Strict enforcement of “Jatiyo Chingri Nitimala 2014” by local government to ensure equitable distribution of agriculture and shrimp farming.

### Promote climate resilient livelihood through capacity development of local authorities and community people

- Mainstreaming climate change adaptation along with DRR in local development planning.
- Provide training to union and upazila level agriculture, fisheries and other relevant local government officials on climate change and climate change adaptation.
- Disseminate the knowledge and skills from the local government officials to communities through public hearing for effective implementation.

### Promote alternative livelihood opportunities

- Provision of skill-based training on non-agriculture-based income generating activities by technical education department at the climate hotspots
- Provision of special training to women groups on alternative livelihood opportunities such as tailoring, handicraft etc.

**Towards Sustainable and Resilient Livelihood**

### Ensuring good governance at the local level

- Proper management and maintenance of existing sluice gates and embankments by local government and Bangladesh Water Development Board.
- Re-excavation of freshwater canals and revoke illegal leases on public water bodies by local government and union parishad.

### Allocate, mobilize and ensure proper use of funds towards achieving climate resilient livelihoods at local level

- Establishment of a local-level climate financing mechanism with fund management led by local government institutions (LGIs) utilizing Bangladesh Climate Change Trust Fund by Ministry of Planning.
- Building capacity of LGIs to manage funds for climate action and ensuring a bottom-up, participatory approach to both allocation and monitoring of funds by local government.

Panii Jibon project will have a policy dialogue with relevant government departments and ministries to communicate the proposed recommendations for effective policy implications.

The policy brief has been prepared under the **Panii Jibon (Water is Life) project 2018-2020**. This project is a **HELVETAS Swiss Intercooperation** led initiative being implemented in collaboration with its local partners. The overall objective of Panii Jibon is to build resilience and reduce well-being loss of climate change affected disadvantaged communities, and particularly vulnerable women and youth, in the disaster-prone areas of South-West Bangladesh (Khulna and Bagerhat). To achieve the goal of the project, **International Centre for Climate Change and Development (ICCCAD)** undertook an action research in collaboration with **HELVETAS Swiss Intercooperation** in 2018 with funding support from the **Climate Justice Resilience Fund (CJRF)**. This policy brief builds part of a policy brief series that synthesizes research findings, analysis and policy recommendations on the basis of the action research.

## REFERENCES

- [1] Shamsuddoha M, Chowdhury R. Climate change impact and disaster vulnerabilities in coastal areas of Bangladesh. COAST Trust; 2007 [cited 29 April 2019]. Available from: [http://www.equitybd.net/wp-content/uploads/2015/10/Disaster\\_BD.pdf](http://www.equitybd.net/wp-content/uploads/2015/10/Disaster_BD.pdf)
- [2] Agrawala S, Ota T, Ahmed A, Smith J, Aalst M. Development and climate change in Bangladesh: Focus on coastal flooding and the Sundarbans. 2003 [cited 26 April 2019]. Available from: <https://search.oecd.org/environment/cc/21055658.pdf>
- [3] World Bank Group. Impact of Climate Change and Aquatic Salinization on Fish Habitats and Poor Communities in Southwest Coastal Bangladesh and Bangladesh Sundarbans. 2016. Available from: <http://documents.worldbank.org/curated/en/199851468000266963/Impact-of-climate-change-and-aquatic-salinization-on-fish-habitats-and-poor-communities-in-southwest-coastal-Bangladesh-and-Bangladesh-Sundarbans>
- [4] Shahid S. Recent trends in the climate of Bangladesh. Climate Research. 2010 [cited 18 March 2019]; 42(3):185-193. Available from: <https://www.int-res.com/articles/cr2010/42/c042p185.pdf>
- [5] Yu W, Alam M, Hassan A, Khan A, Ruane A, Rosenzweig C, Major D, & Thurlow J. Climate change risks and food security in Bangladesh. Earthscan; 2010. Available from: <http://documents.worldbank.org/curated/en/419531467998254867/Bangladesh-Climate-change-risks-and-food-security-in-Bangladesh>

### For further information, please contact-

**HELVETAS Swiss Intercooperation**  
H 13/A NE(K), Road 83, Gulshan-2  
Dhaka- 1212, Bangladesh  
Phone +880 1716859298  
Email: [infobd@helvetas.org](mailto:infobd@helvetas.org)

**International Centre for Climate Change and Development (ICCCAD)**  
House No- 27 (5th Floor), Road-1, Block-A,  
Bashundhara R/A, Dhaka 1212, Bangladesh  
Email: [istiakh.ahmed@iccad.net](mailto:istiakh.ahmed@iccad.net)