ICCCAD
International Centre for Climate Change and Development

HELVETAS BANGLADESH

POLICY BRIEF #3

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Water Security for Vulnerable Communities in Coastal Bangladesh in the Face of a Changing Climate

Impacts of climate change severely affect the water 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 water insecurities due to climatic and non-climatic factors, associated consequences on local communities and limitations of current coping strategies. The study also illustrated some solutions adopted by communities to reduce the risks. Among a series of policy briefs under the Panii Jibon project, this policy brief has been formulated to provide recommendations to convert community perceived solutions into actions towards ensuring water security for climate vulnerable communities in coastal Bangladesh.

SCARCITY OF WATER IN CHANGING CLIMATE AT THE SOUTH WESTERN COASTAL BELT OF BANGLADESH

Approximately 20 million people living along the coastline of Bangladesh depend heavily on various natural sources to obtain water for drinking and domestic chores. Apart from River and ground water (tube-wells), people in south-west coastal region frequently rely on pond water which is primarily rain-fed, but also often mixed with River water, soil run-off and shallow ground water [1].

Owing to the very low elevation with some of the terrain being at sea level, and the topography of the deltaic region, the coastal districts of Bangladesh are highly susceptible to different climatic hazards and natural disasters [2]. Researchers predict that the most critical impact of climate induced disasters will be on the fresh water resources [3]. According to the Intergovernmental Panel on Climate Change (IPCC), groundwater, and many Rivers in coastal regions are likely to become increasingly saline from higher tidal waves and storm surges as a result of climate change impacts [3][4]. Increased River salinity coupled with prolonged dry season and lower River discharge in the face of a changing climate will lead to shortages of drinking water by 2050 [5]. Climate change will further exacerbate water scarcity in south-west coastal region with increased occurrence and intensity of sudden shocks such as floods, cyclones, storm surges and riverbank erosion [6]. Models predict that by 2050 an additional 15 per cent of the coastal area of Bangladesh will be inundated with storm surges during cyclones [6]. Expected impacts of climate change on water resources will be more pronounced due to poor infrastructure and fragile socio-economic structure [7]. A growing body of evidence already warn about the impact of increased dependency on saline water on human health and well-being; it is likely to worsen in the face of a changing climate [1]

KEY POINTERS

- Coastal communities in Bangladesh largely depend on surface water and ground water sources to obtain water for daily usage.
- Climate change induced disasters coupled with different institutional, financial and social factors risk the water security of the coastal communities.
- Local indigenous knowledge driven coping strategies and ad hoc support from government and NGOs are often not adequate against worsening climatic shocks and stresses.
- Promotion and establishment of climate resilient water technologies can ensure availability of water in face of future uncertainties.
- Addressing institutional barriers for proper management of infrastructure as well as building social capabilities through knowledge and skill development can provide better access and reliability to improved adaptive measures.
- Promotion of locally-owned means of adaptation to water insecurity by leveraging finance can create better affordability and collective action.

WATER SECURITY AND INTERLINKING FACTORS

Water security refers to the ability to access sufficient quantities of clean water crucial to maintain adequate standards of food and goods production, proper sanitation, and sustainable health care [8]. It exhibits four intersecting risks - environmental, institutional, financial and social. The environmental risks on coastal deltaic floodplains of Bangladesh are two fold- natural and human made. Whereas, the institutional risks largely comprise of uncoordinated policy making and service delivery and poor management of water resources and infrastructure, financial risks include shortfall in investments and insufficient cost recovery [9]. Such combined risks further lead to a range of social risks including gender and wealth inequalities affecting water quality, water access, affordability and reliability.

CAUSES OF WATER SCARCITY AND ITS EFFECTS IN A CHANGING CLIMATE

Increased incidences of different climatic shocks and stresses have a significant impact on the availability of potable water from both surface and groundwater sources in coastal areas. Different non-climatic institutional, financial and social factors further reduce access to water, people's affordability and reliability of water systems, causing long term water insecurity. Declining access to water due to climate change is expected to have major implications on health conditions. The impact of salinization of water sources has been linked with different communicable (water borne and skin diseases) and long term non-communicable (increased hypertension, pregnancy complications and gastro-intestinal) diseases. All these compounding effects lead to overall well-being loss of coastal communities.

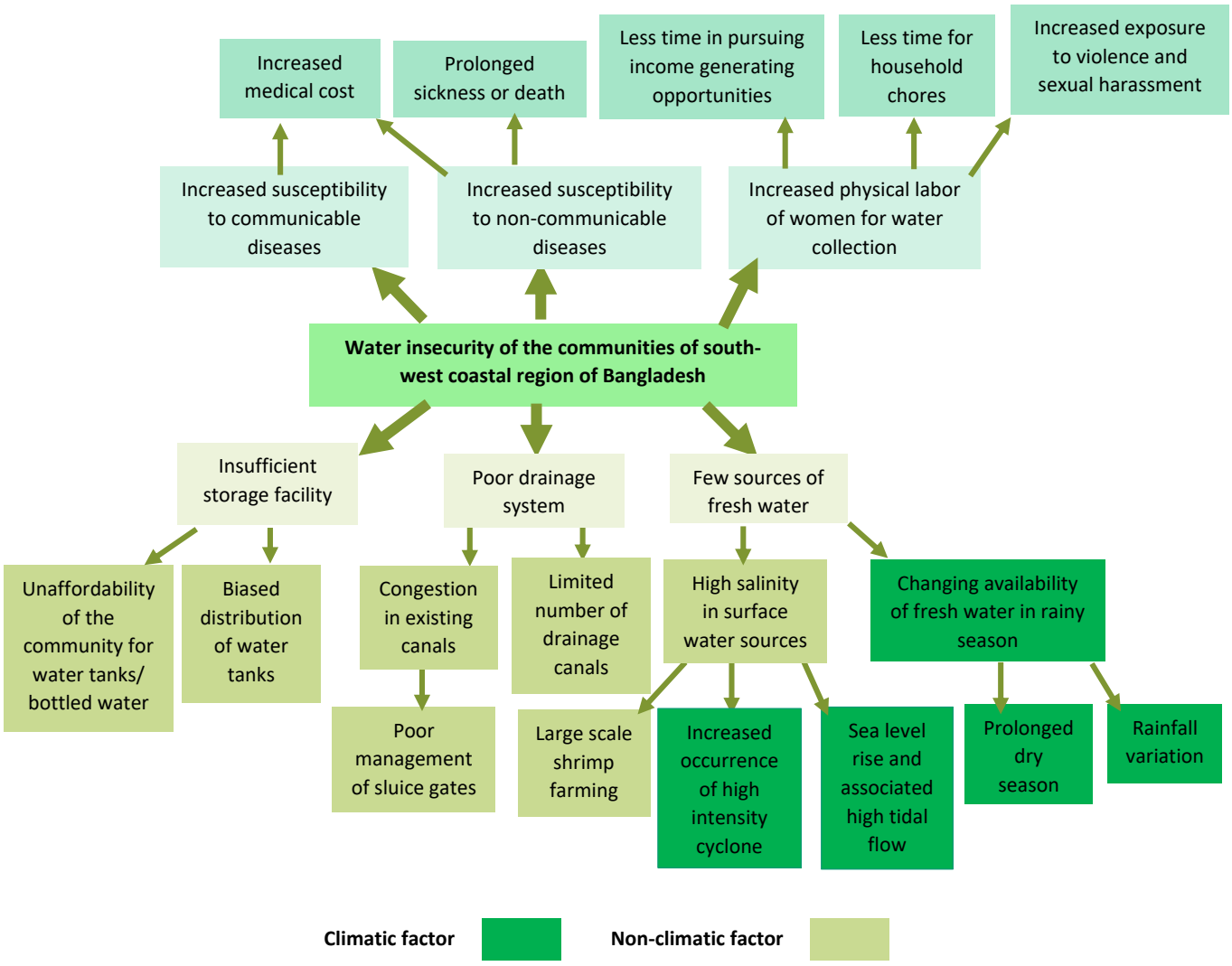


Figure: Cause-effect relationship of water insecurities due to climate change
Source: *Research Report, Panii Jibon Project funded by HELVETAS Swiss Intercooperation, 2018*

COMMUNITY PERCEIVED SOLUTIONS TO WATER SCARCITY

Coastal communities have adopted a range of strategies tapping into local resources and knowledge to cope with climate change induced water scarcity. The most common measures include rainwater harvesting and pond sand filtration (PSF) systems. But neither harvested water nor PSFs ensure long term water security as both systems are largely susceptible to seasonal variation. Besides, ponds in south-west coastal Bangladesh are often inundated by tidal surges and cyclones leaving the water contaminated. Moreover, current coping mechanisms have limitations due to skewed access to resources and lack of knowledge. However, years of experience and peer learning have enabled communities to propose solutions which they feel may help to reduce risks if applied in an appropriate way and time.

Current coping strategies	Limitations of current strategies	Proposed risk reduction measures by the communities	Appropriate time to intervene	Proposed ways of implementation
Use of chemicals to get fresh water	- Leaves smell in water - Does not eliminate salinity from water - Water does not taste good after application	Establishment of desalination plant in an easily accessible location	Dry season	- Engaging citizens to both create community ownership and reduce migration during dry season.
		Provision of sluice gates in appropriate location and establishment/repair of embankments where needed.		- Assessing and prioritizing community needs and actively engaging them in the entire process. - Restricting and regularly monitoring illegal encroachment/cutting of embankments.
Collection of fresh water from nearby sources where PSF is established.	- Collected water is polluted as fresh water sources are widely used for other purposes with no monitoring and maintenance.	Establishment of pond sand filter (PSF) in carefully selected ponds and formation of an active local committee for maintenance	Dry season	- Selection of water sources that improve equity in access and transparency in distribution of PSFs. - Handing over regular maintenance and monitoring to the committee.
Rainwater harvesting during monsoon	- Insufficient number of water reservoirs possessed by local people to collect rain water	Ensure equitable distribution of water tanks at household level through community participation.	Before rainy season	- Ensuring proper selection of candidates - Ensuring regular maintenance

Table: Locally driven current coping strategies and community perceived risk reduction measures in response to climate change
Source: *Research Report, Panii Jibon Project funded by HELVETAS Swiss Intercooperation, 2018*

COMMUNITY PERCERIVED SOLUTIONS INTO ACTION

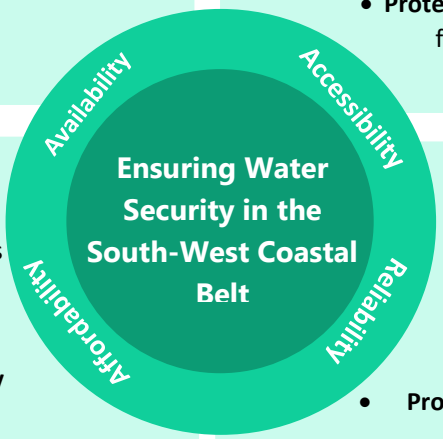
To ensure long term water security and enhance the adaptive capacity of the coastal communities, the action research conducted under Panii Jibon project has come up with the following recommendations based on the participatory consultations with local communities as well as with key stakeholders. Such community perceived solutions have been further validated by local authorities such as upazila and union parisad and local NGOs working in this sector for several years. While some of the proposed interventions are already in _place, proper institutional, financial and operational supports should be driven to ensure long term resilience in the face of a changing climate.

Adapting to Climate Change

- **Establishment of a desalination plant** at an easily accessible location through partnership among Department of Public Health (DPHE), private sector and interventions from NGOs.
- Provision of **improved rain water harvesting** system at household level through partnership among DPHE, upazila and union parisad and NGOs.
- Establishment of **pond sand filter (PSF)** jointly by NGOs, DPHE, union and upazila parisad

Addressing Institutional Barriers

- **Proper management, repair and establishment** of sluice gates on a need basis by Local Government Engineering Department (LGED) and Water Development Board.
- Creation of enabling environment for **distribution of water reservoirs** at household level that enhances equity in water access, jointly by DPHE, upazila and union parisad and NGOs
- **Protection and monitoring of** the use of existing freshwater sources jointly by NGO and local management committees.



Leveraging Finance

- Provision of water reservoirs by local NGOs in an **affordable price** with a cost sharing mechanism
- Introduction of an affordable **cost recovery scheme** by providers of desalination plant considering the socio-economic condition of local people.

Building Social Capabilities

- **Provision of trainings** to community members particularly women by local government and NGOs to build capacity on monitoring the state of water resources.
- **Promotion of knowledge and technologies** on processed starting from water collection to final consumption by DPHE, upazila and union parisad and NGOs

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).**

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