INITIATIVE ON
Asian Mega-Deltas

Towards Inclusive Canal Water Management for Resilient Agri-Food Systems in Coastal Bangladesh

Key Messages

- Despite significant progress in food production and human development, Bangladesh continues to face persisting inequalities, which are exacerbated by challenges related to natural resources sustainability, degradation and elite capture of common pool resources underpinned by climate-induced hazards.

- In the southern coastal deltaic regions of Bangladesh, freshwater canals are a lifeline to multiple food system-based livelihoods, but these resources are mired in unequal conflicts and contestations, which are an outcome of resources appropriation and control by local elites and ambiguous interpretations of policies and strategies.

- About 92% of Bangladesh's farmers are smallholders, and 75% of this group are marginalized tenant farmers and women who rely largely on agri-food systems-related livelihoods. This group is most affected by the combined effects of policy incoherence and elite domination of common pool freshwater canals.

Context

Freshwater scarcity severely impacts the agri-food systems (crop agriculture, fisheries, and livestock) in the saline-prone coastal areas of Bangladesh, particularly in the dry season. This challenge is shaped by both anthropogenic and climatic factors. Historically, canals have been vital sources of freshwater in the delta regions, serving as lifelines for agri-food systems by storing monsoon rainwater for use during the dry period. Canals also store rainwater and serve as resources for capture fishing which is a key livelihood for large numbers of local communities, particularly the landless, and also provided freshwater for livestock.

However, persistent exploitation and control over freshwater canals through government leasing and local power dynamics excluded the poor through a process that facilitated the privatization of common pool resources (CPRs). This process is widespread in southwest Bangladesh, with far-reaching irreversible consequences. In the villages of Kultoli and Dhankhali in Shyamnagar Upazila, Satkhira, we explored elite domination and encroachment of freshwater canals and its profound socio-economic impacts on women and other marginalized groups, which remain significant barriers to achieving inclusive water governance for resilient Agri-Food Systems.

Method

The study was conducted in the villages of Kultoli and Dhankhali in Shyamnagar upazila, Satkhira district, between May and June 2024. A mixed-methods approach was employed for data collection. We collected household water insecurity data from 114 households. For qualitative data, the study conducted 10 focus group discussions (FGDs), 10 in-depth interviews and 13 key informant interviews (KIIs) with institutional stakeholders at sub-national and national levels responsible for canal water management.

Cover photo: CNRS

Picture 1: Men and Women fishing together in Kultoli canal. (Photo credits: CNRS)

Picture 2: Canals are the source of freshwater, restoring rainwater for the dry season and drainage channels during the monsoon. (Photo credits: CNRS)

Key findings

Canal water appropriation

Coastal canal networks, through which water flows from watersheds to rivers, floodplains, beels, and finally to the sea, are state-owned resources - these are public resources and citizens of the country are owners. As such, the mandated authorities need to develop development and management plans of these resources jointly with the concern communities (citizens) for the equitable benefits of the locals inclusive of diverse social-occupational groups.

However, in practice, the canals in these two villages have been reclassified as non-flowing water resources and, over the past three decades, officially leased to a few influential individuals, primarily for aquaculture (fish, shrimps, crabs) that excluded the communities from their traditional rights of use. Most of these canals in the region are now blocked off, segmented, sub-leased as sites for shrimp-culture or as fishponds, converted into croplands, or filled to create new plots for house construction – all activities that are illegal as per the official leasing conditions. The leaseholders monitor and restrict access to canal water and an anthropogenic water crisis has been created through elite domination – severely restricting water access and use for marginalized, smallholder farmers who make up for more than 80% of the total villagers. Hence, most of the local people have lost their traditional rights to these common-pool resources (CPRs) for irrigation, food production, fishing, and livestock-related livelihoods.

On top of these contextual drivers, climate change adversities further exacerbated the freshwater crisis as the coastal communities had to face erratic rains, droughts, rising temperatures, and 12 cyclones in the last six years from 2019-2024.

Picture 3: Leased canals are often used for aquaculture, like this section that has been illegally obstructed to support shrimp farming, effectively blocking seasonal canal flow. (Photo credits: CNRS)

Water struggle in agri-food system

Rain-fed Aman rice is the main crop, supported by sufficient rainfall, but poor drainage during monsoons threatens many fields. During the dry season, residents face difficult decisions as most of the canal system is leased, privately controlled, or converted to aquaculture, leaving only small sections for community use, which are inadequate to meet water needs. This limits vegetable cultivation during the boro season to a few farmers who rely on canal and pond water. From November to May, freshwater becomes highly contested, with saline intrusion into groundwater adding to the challenges due to extensive aquaculture expansion. The conversion of canals impacts both farming and subsistence fishing, reducing capture fishing opportunities. However, shrimp and crab processing factories have provided new livelihood options for men and women. Some families cope by migrating for work, with women often employed in garment factories or households, leaving their fields fallow until the aman season.

Picture 4: Illegal appropriation of canals increases regional water scarcity and leads to seasonal or perennial drying up of other segments. This means no water for domestic use or food production. (Photo credits: CNRS)

A gender issue

Water issues in Bangladesh are complex and far-reaching, with women bearing the brunt of escalating water insecurity. The study reveals that nearly two-thirds of women face acute agricultural water insecurity, leading to increased domestic workloads, economic losses, food scarcity, physical strain, and heightened emotional stress. While water-related gender issues are often viewed as domestic concerns, this study underscores their growing link to food production. Seasonal male migration further shifts responsibilities onto women, expanding their roles to include farm management and food production alongside household and caregiving duties. However, these expanded roles rarely translate into significant improvements in social equity or women's empowerment, as patriarchal norms, values, and power imbalances persist.

Picture 5: Reclamation of leased canal and rehabilitation restored community access, increased water storage, and now supports local farmers' livelihoods by enabling dry season croppings benefitiing a wider community. (Photo credits: CNRS)

A success story

In rare instances, NGOs have supported local communities in reclaiming and rehabilitating canals, creating freshwater provisions to transform agri-food system outcomes. For example, the rehabilitation of few small canal segments in two villages demonstrated positive impacts on ecological habitats, and communities' livelihoods, food security. These efforts have contributed to improved access to fresh water for irrigating crops during the dry season, open fishing in canals, duck rearing, and watering cattle. Local communities now produce 2 to 3 crops a year as opposed to single monsoon rice cultivation before the canal rehabilitation. However, reclaiming and rehabilitating canals require long litigious processes, and often met with violence and aggression by the outsiders. Above all, despite the long-term presence of various organizations claiming to build local capacity, villagers continue to depend on external actors to address water rights.

Picture 6: Women increasingly participate in agricultural activities. (Photo credits: CNRS)

Actions for inclusive canal water management

To promote sustainable and inclusive canal water management for resilient agri-food systems in coastal Bangladesh, it is crucial to capitalize on the current policy opportunities and enable a shift towards more systemic and structural changes. We recommend specific, strategic actions that can create tangible impacts in agri-food systems:

Restoring water rights for the commons. This requires a comprehensive and equitable approach, beginning with the preparation and updating of the canal database. This should be followed by a systematic plan to cancel existing canal leases, evict illegal structures, and reclaim public waterways. Additionally, canal excavation and restoration must be prioritized to ensure proper water flow and storage, thereby revitalizing these critical resources to support local livelihoods. Communities can leverage traditional water management knowledge, such as using mini ponds, especially during the dry season when freshwater is limited.

Establish community-based **participatory canal water management** to build local capacity for sustainable governance. Engaging communities, particularly vulnerable groups, in decision-making fosters a sense of ownership, shared accountability, and ensures the long-term success of water management initiatives. Bangladesh's National Adaptation Plan (NAP) is relatively progressive in the consideration of gender, disability, youth, and social inclusion, which can be followed to work towards a climate-resilient agri-food system.

A robust, **gender-focused fiscal system** is essential to support and sustain the interconnected water-food-climate innovations. It is crucial to prioritize gender budgeting and provide targeted training for the relevant implementing agencies. This training should focus on enhancing their understanding of gender issues and the impacts of climate change, ensuring better conceptual clarity and methodological precision in addressing these challenges.

Foster **collaboration and coherence** among agencies is crucial to ensure sustainable water management. A key step in this process is appointing a lead agency based on the primary livelihood source, manpower availability, and work outreach (E.g., Department of Agriculture). By leveraging the expertise and reach of the appropriate agency, sustainable water management can be better integrated into the livelihood activities of local communities, promoting long-term resilience and success. Notable, over the years, NGOs may have developed state-of-art knowledge and skills in community mobilization and consensus building among diverse user groups using multiple resource systems like wetlands (canals in this case). NGOs with DAE can strengthen the process of consensual water management in transforming agri-food system outcomes in a crisis-laden coastal areas of Bangladesh.

Conclusions

Freshwater canals, traditionally accessible to all, are essential for food production and domestic needs. Yet their governance as common-pool resources presents complex challenges. This case study highlights the importance of addressing community diversity and entrenched sociopolitical dynamics to ensure equitable resource management. Despite ongoing elite domination, promising efforts are emerging as communities mobilize to combat illegal water capture, amplify marginalized voices, and strengthen collective water management, fostering sustainable and equitable development both within the country and beyond.

Picture 7: A woman growing watermelons on the banks of a rehabilitated canal. (Photo credit: CNRS)

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Disclaimer

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