

# Does crab farming offer viability to climate change vulnerability in coastal Bangladesh?

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## Background:

- Long-term climate change impacts in the southwest coastal zone of Bangladesh caused drastic changes in the agroecological system. Salt-tolerating shrimp and prawn farming mostly replaced the traditional crop agricultural system. However, encroaching salt water, recurrent cyclones, rising water temperature, and rainfall variability are causing the unsuitability of the agroecological environment, even for shrimp and prawn farming.
- Consequently, many farmers in the coastal zone are switching to crab farming as the species is more adaptive to drastic climate change impacts (Fig. 1).
- Does this transformation in the aquatic food culture system indicate a threshold level of the local agroecological system or offer long-term human adaptation to changing coastal ocean systems?
- The findings of this study suggest that local transformation in the aquaculture system provides a buffer against environmental risks posed by climate change impacts. Finally, this study calls for capacity building of small-holder farmers through enhancing socio-economic capital, disseminating better farming technology, and facilitating better market access through institutional support for long-term viability to the vulnerability of climate change in coastal Bangladesh.



Fig.1 Mud crab became an important aquaculture species in Bangladesh

## The transformation from shrimp farming to crab farming

- Shrimp farming has been blamed for different negative socio-economic and ecological consequences—the collection of wild shrimp and prawn fry from the wild cause colossal loss of biodiversity. In addition, mangrove degradation, sedimentation, saltwater intrusion, pollution, and disease outbreaks are some other negative repercussions that might cause long-term threats to viability (Deb, 1998).
- This shrimp farming is also believed to be leading towards social and ecological marginalization among coastal communities of Bangladesh. Marginal coastal communities compete for space with coastal aquaculture. Along the coast earlier, canals and water-logged agriculture fields in the rainy season, earlier used by people with low incomes for their livelihood activities, Many *khas*, or government-owned land around the coast, which was earlier used by the poor for their settlements, now has become the private property of aquaculture entrepreneurs (Islam & Chuenpagdee, 2013).
- In the 1990s, shrimp farming was the dominant aquaculture practice in the region, and crab species encroached in the pond as secondary or nuisance species. Crab as a potential culture species became popular as shrimp farming became almost wiped out due to viral diseases outbreak and increased salinity intrusion (Rahman et al. 2017)
- Though shrimp farming now become vulnerable due to increased salinization of soil and waters, viral disease outbreaks in warmer environment, also prone coastal water borne disasters.
- As a response to climate-induced change, many farmers, particularly small-holders, are turned to crab rearing/ fattening practices in the coastal region, particularly the southwest Sundarbans mangrove forest region.



Fig. 2: A small-holder crab farming system. Left: Crab shell to be used in a raw materials for poultry and fish feed. Middle: Grow-out pond for live crab farming. Right: Plastic compartment for fattening soft-shelled crabs.

## Crab farming: Better adaptation strategy?

- Earlier coastal poor are primarily involved in day labor on the shrimp farm and as prawn and shrimp fry collectors for the aquaculture farm. Coastal poor as shrimp farm owners are rare and some family-based shrimp farms exist.
- Now many small-holders have their firm. For example, they might convert a nearby ditch or take a loan or savings and convert a piece of homestead land or nearby farmland in the village into a small soft-shell crab farm. Thus, many climate-vulnerable households are becoming self-dependent (Fig. 2).
- In environmental dimensions, compared to shrimp and white fish species, crab species are less susceptible to disease, more resistant to adverse environmental conditions, and is even able to live without water for a particular time or can survive in variable water quality during disaster period (Salam et al., 2012).
- Further, crab species had a short production cycle, a low capital requirement in production, less risk from harvest failure, and rising demand in the global market, cause crab production becoming a success story in a hostile climate zone.
- Harvesting crab seed from wild sources is also less destructive than shrimp and prawn postlarvae collection, where the latter is collected by fish-meshed non-selective gears that also kill juveniles of the marine species. On the other hand, crab is mainly caught by bait and hook; thus, the selected harvesting method is less destructive to biodiversity.
- Regarding equity and justice, crab farming is more equitable to the communities in the region. Shrimp farming is mainly on a commercial basis, with large investments from outsider entrepreneurs, where local small-holders are often forced to lease their land to the investor. This situation can be explained as accumulation by dispossession. Earlier agriculture in the region employed many populations as laborers or self-employment. However, shrimp farming requires limited manpower. Household-based crab farming also creates self-employment for many.
- Crab production practices are probably the most gender-balanced fishing practice in Bangladesh. Women are actively involved in collecting crab seeds and rearing crabs in ponds. That practice led to women's empowerment as well.
- Recycling and pollution control are also better adapted to crab farming. Crab species are mostly disease resistant and require less food without chemical ingredients. Crab shells are often used as raw material for fish and poultry feeds.
- Consequently, commercial enterprises are increasing (Fig. 3), and crab farming became a buffer against livelihood crises for many marginal and coastal households who sit on the frontline of the climate crisis.



Fig.3 Commercial scale mud crab farming are increasing in the coastal Bangladesh.

## Challenges:

- Without viable hatchery techniques developed and practiced, crab farming is wholly dependent on wild sources. Thus, there is a risk of over-exploitation.
- Many marginal farmers often take loans from money lenders for their entrepreneurship. Long-term debt likely to reduce their adaptive capacities.
- Though the crab trade deserves huge credit in export trade, the sector needed to draw due attention from the government in terms of capacity building, credit facilities, and emergency support, such as during the COVID-19 pandemic.
- The coastal communities face repeated hazards every year; crab farming may help them be resilient, but more is needed to keep pace with increasing vulnerabilities.

## References

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