



Hatchery-Based Mud Crab (*Scylla spp.*) Production in Bangladesh

Management of the Sundarbans Mangrove Forests for Biodiversity
Conservation and Increased Adaptation to Climate Change Project (SMP)

Background: mud crab production in Bangladesh

Mud crab farming in the southwest of Bangladesh, as an income generating activity, has seen a sharp rise, as it is becoming more lucrative to farmers. From fiscal year 2002-03 to 2006-07, the total export value of mud crab increased by 65%¹ and in 2013-14 Bangladesh exported crab worth BDT 3.5 billion (ca. EUR 40 million)². Mud crab fetches relatively high prices and is less prone to disease-related losses than shrimp farming. In addition, mud crab farming is regarded as less vulnerable to local effects of climate change and deterioration of water quality³. The increase in mud crab farming can therefore also be interpreted as an adaptive response to deteriorating climatological and environmental conditions.

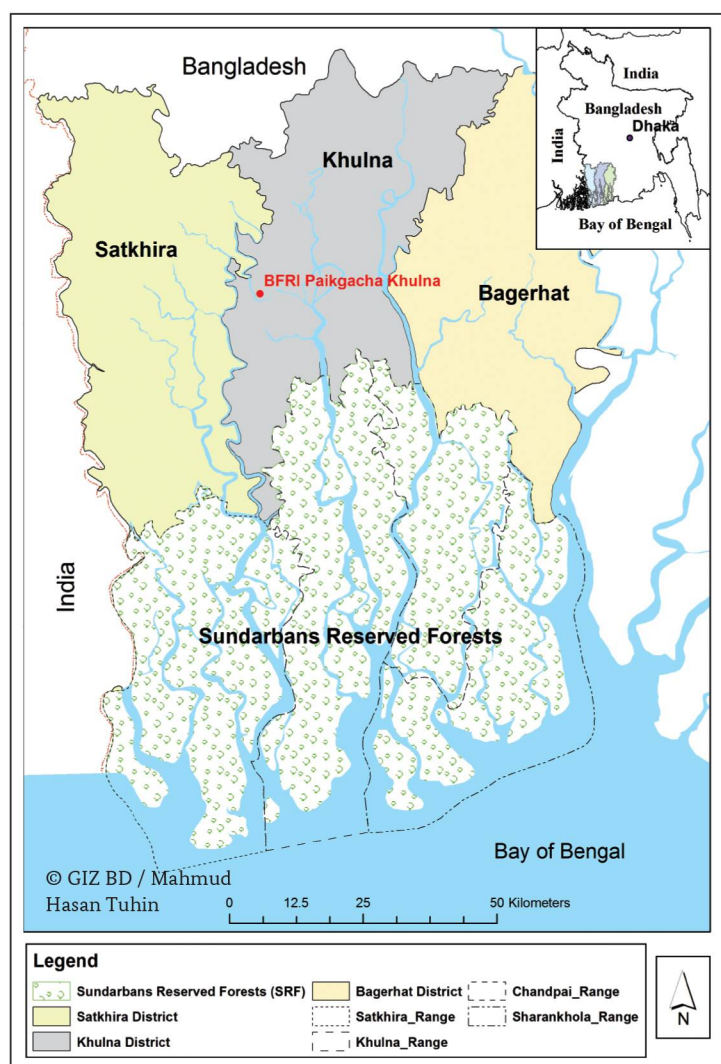
As the industry develops and the production area expands mainly through a shift from shrimp farming to crab fattening, the demand for crablets as seed stock increases. In Bangladesh all the seed stock needed for mud crab farming is collected from the wild, with the estuaries and mangroves of the Sundarbans being the main source of seed stock for the coastal areas in the southwest. Mud crabs are traded through local collection centres, with the coastal districts Bagerhat, Khulna and Satkhira being regional centres for this almost completely export-oriented industry (see map below).



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Although there are no reliable figures with regard to off-take and population trends, there is serious concern that the current level of seed stock harvesting is not sustainable and might lead to a depletion of the resource.

Besides putting the integrity of the Sundarbans' ecosystem and biodiversity under pressure, a crash in the wild population, from overharvesting, would also lead to a situation where the existing industry can no longer be sustained, which in turn would threaten the livelihood of a large number of people. In Bangladesh, crab fishery supports the livelihood of more than 50,000 fishers, traders, brokers, transporters, and exporters⁴.

Hatchery production of crablets is practiced successfully in a number of Asian countries, but requires considerable technical skills and knowledge, which have until recently not been available in Bangladesh. Successful hatchery production at a commercial scale would reduce the pressure on wild stock from the Sundarbans and increase the availability of seed stock to serve a growing demand. This would consequently lead to higher and uninterrupted production and improved livelihoods for those involved in the value chain, especially producers.

¹ Export Promotion Bureau, (2007). Bangladesh Export Statistics, Bangladesh

² Export Promotion Bureau, (2014). Bangladesh Export Statistics, Bangladesh

³ World Bank, (2014). www.worldbank.org

⁴ Molla, M. A. G., M. R. Islam, S. Islam and M. A. Salam, (2009). Socio-economic status of crab collectors and fatteners in the southwest region of Bangladesh. J. Bangladesh Agril. Univ. 7(2): 411-419

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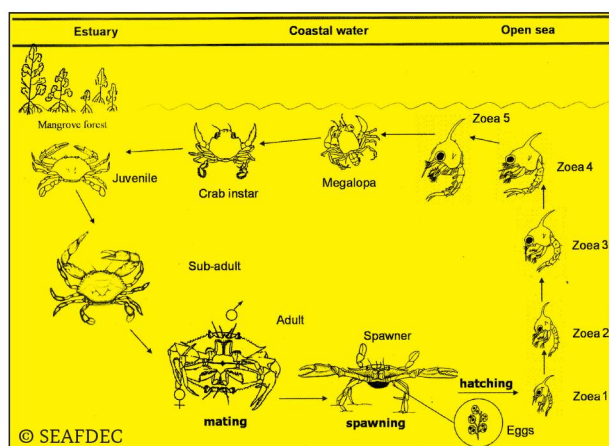
Management of the Sundarbans Mangrove Forests for Biodiversity Conservation and Increased Adaptation to Climate Change (SMP) is a project of the Ministry of Environment and Forests (MoEF) of the Government of the People's Republic of Bangladesh, supported by the German Federal Ministry for Economic Cooperation and Development (BMZ) and jointly implemented by the Bangladesh Forest Department (BFD), and the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) GmbH.

The project aims at strengthening the institutional and organisational framework conditions for a collaborative management of the Sundarbans and its natural resources. With the project approach targeting biodiversity conservation and increased adaptation to climate change, one activity explores possible support towards an economically viable and environmentally sustainable concept of mud crab production in Bangladesh.

Recognizing the importance of mud crab farming as a viable source of income and as an adaptive approach to environmental conditions becoming unfavourable for certain other livelihood options, GIZ has continued its support, which started under a previous BMZ funded project in 2015, for further development of the technology. This is aimed at eventually leading to the development of the local capacity to take up commercial hatchery production of crablets and to reduce pressure on natural resources of the Sundarbans Reserved Forest. Thus, together with the Bangladesh Fisheries Research Institute (BFRI), a concept for hatchery operation to produce crablets as basis for mud crab fattening has been carried on through the second trial under SMP, with continuous technical support by the Southeast Asian Fisheries Development Center (SEAFDEC) in the Philippines.



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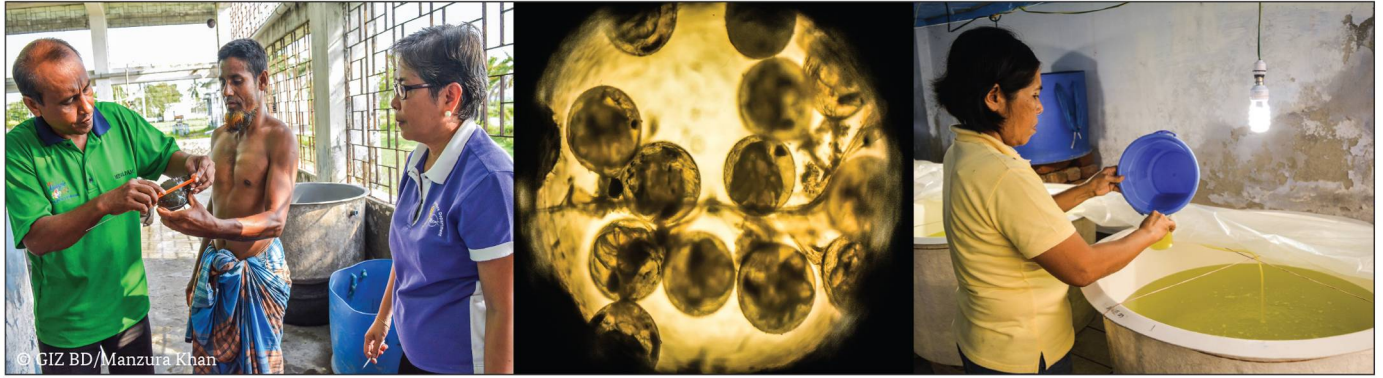


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Activities and achievements under SMP

- Continuous technical assistance by SEAFDEC to BFRI staff was secured during the whole trial period (17th April to 10th June, 2016) to further develop and refine mud crab hatchery and nursery technologies at BFRI Paikgacha Station.
- An exposure visit to the BFRI Paikgacha Station was organised at the end of May, 2016, to inform about the on-going hatchery trial and stimulate exchange among relevant stakeholders in the sector. Prevailing issues such as required facilities for hatchery construction, offspring mortality rate, nursery technology development etc. were identified and discussed with SEAFDEC and BFRI experts.
- The production results improved notably compared to previous years. A production of crablets was reached with 87 hatchlings that survived to the crablet stage (late stage of crab instar; see figure on the left) from a batch of 140,000 zoea (recently hatched crab larvae). The survival rate from the most juvenile zoea (stage 1) to the most advanced zoea (stage 5) was considerably high (15%) compared to the previous trial (9%). However, the overall survival rate up to the crablet stage is quite low at 0.06% even though it increased compared to 0.05% in the previous trial, which remains a challenge.
- BFRI staffs are more experienced and confident to continue and develop hatchery operation further in upcoming cycles.
- An assessment of suitable sites for construction of a new mud crab hatchery in the southwest region of Bangladesh was conducted. As a result, the draft layout and design for an envisioned new hatchery of BFRI is available.
- A video documenting the hatchery operation process is now available at www.youtube.com/watch?v=sD4IgsUg9A8.
- A compilation of lessons learnt and technical recommendations for hatchery operations in Bangladesh is under preparation.

Outlook



Based on the knowledge and capacities gained during the trial mud crab hatchery operation at BFRI, significant contributions have been made towards commercial hatchery-based crablet production in Bangladesh. With the support of SMP, BFRI has played a key role in this advancement and has positioned itself as a center of expertise for mud crab hatchery technology in Bangladesh. Carrying on these trials will imply a continuous learning process that the institution is ready to undertake. The Government of Bangladesh envisions further support to continue building up expertise in the country. Increased coordination among relevant stakeholders in the mud crab sector will be essential in this process and allow for building synergies.

With joint efforts, challenges such as the achievement of a commercial survival rate can be overcome with time. Eventually, further advancing towards economically viable mud crab production in Bangladesh will result in enhancing conservation of the natural resources of the Sundarbans.

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