

30. Fishing Bans and Compensation Schemes for Fisheries Conservation and Livelihood Development: Challenges and Opportunities

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A group of fishers involved in fishing in the Meghna River, Bhola (Photo: Atiqur Rahman Sunny, 2021).

*The Government of Bangladesh has taken several initiatives to conserve fish, including the national fish hilsa shad (*Tenualosa ilisha*) and enhance community development. This chapter assesses the role and contributions of compensation schemes that support fisheries conservation and livelihood sustainability. Under this scheme, the government established six fish sanctuaries and enforced several fishing ban seasons. Simultaneously, the government adopted an alternative income generation and compensation scheme for lost income during fishing bans. These bans include hilsa fishing ban and juvenile (jatka) fishing ban in the sanctuaries, marine fishing ban in the Bay of Bengal, and a freshwater fishing ban in the Kaptai Lake. Although these bans appear to be effective in achieving ecological outcomes, they have led to adverse impacts on livelihoods, including loss of income, long-term indebtedness, and less nutritional intake. Therefore, this study recommends an improved compensation scheme and logistical support, a participatory management plan, and a strengthened legal framework towards sustainable fisheries resource management and livelihood development.*

Introduction

Livelihood-focused development interventions can be categorized into three broad and overlapping categories: alternatives, compensation, and incentives (Wright et al., 2016). Alternative livelihood intervention focuses on reducing the dependency on natural resources by generating economic benefits to increase community support for conservation (Roe et al., 2015). A compensation scheme includes explicit recognition of community and individual costs of conservation, particularly access restrictions that adversely affect people's livelihoods, with the aim to reasonably compensate for losses (Clements et al., 2010). Compensation schemes could be based on social justice and human rights principles or they may be explicitly used to minimize conflicts (Springer, 2009). Incentive schemes, on the other hand, provide in-kind support, especially in case of behavioral changes that do not comply with the conditions agreed-upon under the scheme (Wunder, 2013). Payments

for ecosystem services (PES) is a classic example of an incentive scheme that directly links desired alternatives to conservation objectives.

Conservation of the national fish hilsa shad (*Tenualosa ilisha*) is a priority for the Government of Bangladesh. The government provides direct assistance in hilsa conservation efforts, although different terms have been used in literature to describe these types of assistance. These terms include alternative Income Generative Activities (AIGAs), incentives, compensation scheme, ban period allowance, and PES (Islam et al., 2018; Nahiduzzaman et al., 2018; Sunny et al., 2021). Nonetheless, the term compensation scheme seems the most appropriate based on the categorization outlined above, as the assistance is limited to in-kind supports (rice bags) and the promotion of other alternative income-generation activities. The capacity to generate a positive impact on fishers' livelihoods is a crucial aspect in relation to compensation schemes. This study reviews available literature to explore the challenges and opportunities of a compensation scheme during fishing bans towards supporting biodiversity conservation and improving fishing livelihoods.

Implementation of different fishing bans

Hilsa shad is the most important fish species in Bangladesh, both economically and socioculturally, and is highly prized in markets. Before the 1980s, hilsa was affordable across income groups, including the poorest of the society, due to abundance of hilsa in over 100 rivers in the country. However, the catch sizes declined sharply during 2001-2003 from 2,400,000 to 200,000 metric tonnes (MT) (Nishat et al., 2019). This decline attracted the attention of policymakers who promoted scientific research on hilsa fisheries to understand the causes of the decline and how the fishery can be rebuilt through better resource management. Subsequently, in 2003, the Government of Bangladesh adopted a Hilsa Fisheries Management Action Plan (HFMAP) to maximize production levels of hilsa sustainably and improve the socioeconomic status of fishers (Islam et al., 2017). Furthermore, under the Protection and Conservation of Fish Act of 1950, the government declared

six hilsa sanctuaries in Padma, Meghna, Tertulia, and Andarmanik rivers and associated tributaries that cover over 432 km in length. Fishing bans were also imposed on these sanctuaries, aiming to prevent overexploitation and conserve hilsa juvenile and breeding stocks to maintain fish biodiversity (Islam et al., 2016).

Table 1. outlines the ban periods on these hilsa sanctuaries and associated resource boundaries.

Area and boundaries of hilsa sanctuaries	Ban Period
100 km stripe in Meghna River – from Shatnol of Chandpur to Char Alaxandar of Laxmipur districts	March-April
90 km stripe of Shahbazpur Channel at Meghna estuary from Char Ilish Mosque Point to Char Pail Point in Bhola district	March-April
100 km stripe of Tentulia River from Beduria of Bholato Char Beduria in Patuakhali district	March-April
40 km stripe in Andharmanik River in KalaparaUpazilla of Patuakhali district	November- January
20 km stripe at lower Padma (Padma confluence) in Shariatpur district	March-April
83 km stripe in Meghna River (from Hizla to Mehendiganj) in Barisal district.	March-April

Juvenile hilsa (Jatka) fishing ban

An eight-month-long yearly ban is imposed on fishing, transportation, marketing, and selling *jatka* (hilsa juveniles, less than 25 cm in length) from November 1st to June across coastal, estuarine, and riverine areas of Bangladesh (7,000 km² area). The ban is expected to increase fish production and ensure free breeding (Nishat et al., 2019). To protect juvenile hilsa, fishing is banned from March and April in all sanctuaries, except the Andharmanik River, which is banned from November to January.

During these ban periods, the Government of Bangladesh provides 40 kg

of rice to all fishers with a fisher identity card (*jete* card), considered poor and most vulnerable. During the 2019–2020 financial year, only 280,963 *jatka* fishing households (the poorest) received this support out of 505,787 fisher households in total due to limited resources (Islam, 2021). In addition, the Department of Fisheries (DoF) conducted a campaign during the ban period to raise people's awareness using local, print, and electronic media (Nahiduzzaman et al., 2018). Furthermore, a special task force consisting of officials from the country's police, navy, coast guard, river police, local government administration, and fisheries officers conducts raids against illegal fishing during these ban periods. For breaching a fishing ban, a convicted person can be fined up to 5,000 Bangladeshi BDT (equivalent to USD 11.89) or sentenced to one or two years of imprisonment or both.

Fishing ban on brood hilsa

The peak breeding season of hilsa is October to November, although breeding occurs all year round. During peak periods, fishers tend to catch a huge quantity of gravid hilsa indiscriminately. Therefore, the government imposed a country-wide 22-day ban to conserve gravid hilsa. Initially, the ban was set for 11 days (five days before and after the full moon), but in 2015 the duration was extended to 15 days. Furthermore, it has been extended to 22 days since 2016 (October 14th - November 4th) based on scientific evidence to ensure a sufficient spawning period for sustainable production (Rahman et al., 2017). The DoF has been implementing this ban since 2007 with the support of different stakeholders and law enforcement agencies (Rahman et al., 2015; Sunny et al., 2017). The ban is also enforced through different means, including motivational meetings, awareness campaigns through media (television, radio, and newspaper), and closing ice-producing factories in coastal regions. In special cases, all government agencies also deploy additional workforces to coastal districts to strengthen the enforcement of this ban.

Fishing ban in the Bay of Bengal

Bangladesh has introduced a monsoonal fishery closure in the Bay of Bengal to conserve fish stocks and ensure the safer breeding of marine species. Since 2015, the government of Bangladesh imposes a 65-day annual ban from May 20th to July 23rd under the Marine Fisheries Ordinance of 1983 (Rule 19). Initially, this ban was imposed only on industrial trawling. However, since 2019, artisanal fishing was also included under the ban. Extending this ban to artisanal fishers has brought severe economic hardships on artisanal fishers due to pre-existing poverty and a lack of sufficient alternative employment opportunities. The disappointment caused among artisanal fishers even led to street protests as this new ban pushed them into an even more vulnerable conditions (Islam et al., 2021).

Fishing ban in the Kaptai Lake

Since 1961, fishing in Kaptai Lake has been prohibited from early April to mid-August under the fish act of 1950 although the ban was not effectively enforced. Since 1992, a shorter three-month (May 1st to July 31st) fishing ban has been imposed by the Bangladesh Fisheries Development Corporation (BFDC) to protect and conserve biodiversity and to facilitate fish breeding in the lake. During this period, harvesting, processing, marketing, selling, and transporting fish in the lake is illegal (Shalehin et al., 2022). In addition, a naval police team is also patrolling the lake together BFDC while constantly monitoring fish landing centers and local markets (Ahmed et al., 2006). BFDC patrolling operations are conducted through five stations: Rangamati Sadar, Kaptai, Marishya, Mahalachari, and Longadu. However, the lake's large size, remote location, and the lakeside hills that block visibility over large areas make it hard to police the entire lake effectively.

Effectiveness of fishing bans and compensation schemes

During the first stage of the ban period in hilsa sanctuaries, the government provided in-kind support, 10 kg of rice once every two months. Almost 146,000 fishing families received this support in 2007-08 across ten districts and 59 sub-districts of Bangladesh. Gradually this aid scheme increased, with 186,264 families from 15 districts receiving 30 kg of rice every month in 2011-12. Finally, In 2013-14 fiscal year, 224,102 families received 40 kg of rice for four months. These periods included one month before the ban period, two months during the ban, and finally, one month after the ban ended. Many fishers mentioned receiving an average of 30-32 kg of rice/per month instead of 40 kg. However, the fishers claimed that the leadership of the lowest tier of the three-tiered local government administration (*Union Parishad*) allocated a portion of rice intended to be distributed among families to cover the costs of transportation and other logistics.

The process of finalizing the list of recipients of rice and allocating and distributing rice is lengthy and complex. It includes 13 separate steps and involves every tier of Bangladesh's administrative hierarchy, including meetings at the *Union Parishad* to get approval from the Director General of the Department of Fisheries, with several in-between steps. Each step incurs transaction and administration costs, such as personnel time and transport. Together, administration and transaction costs account for BDT 918 for each metric ton of rice distributed, which is three percent of the total cost. According to some studies, this cost is lower compared to other similar schemes, such as the PES scheme in Costa Rica, for which the transaction cost ranges between 12-25 percent (Miranda et al., 2003). However, in Bangladesh's hilsa sanctuaries, the compensations are provided only for hilsa fishers although other fishers are also affected as fishing of other species in the sanctuaries is also hampered during ban periods. Therefore, out of dissatisfaction, non-hilsa fishers try to qualify themselves as hilsa fishers through the fisher registration scheme owing to their power and sociopolitical connections, despite the negative effect on both hilsa conservation and the compensation scheme (Bladon et al., 2016).

Although the government compensation scheme through in-kind support proved to be supportive, the fishers claimed that the compensations were poorly administered, non-inclusive, and insufficient. Further, they felt they did not receive the support they deserved due to a lack of monitoring, unfair distribution, and corruption (Islam, 2021). Additionally, the government only provided in-kind support (rice) with no financial support or any other daily needs of the families, such as oil, pulse, sugar, and salt. Oftentimes, compensation support is not provided before the start of the ban period (Islam, 2021). As a result, many fishers are bound to borrow money from various money lenders at high-interest rates throughout the fishing bans. This also increases illegal fishing as fishers must repay the debts within a given time. These challenges hinder the management of fishery resources, which, in turn, impact the effectiveness of conservation efforts (Islam, 2021). Furthermore, the exclusion of fishers from the decision-making process in the management of local fisheries leads to increased non-compliance (Mohammed et al., 2016).

Since 2009, the Hilsa Management Program has also provided support for Alternative Income Generating Activities (AIGA), including training in livestock rearing and other micro-business operations. This support included cash for buying and selling small fishing gear, interest-free credit, and sewing machines for fisherwomen, rickshaws, and livestock (sheep, goats, cows, and poultry). However, there was no follow-up or post monitoring of whether the recipients could effectively utilize the support to generate alternative income, which limits the initiative's success (Haldar & Ali, 2014). Further, the selection process of the types of AIGA assistance didn't take household preferences into consideration. For instance, some families were provided sewing machines even though they lacked the knowledge and skills to use them. Consequently, they often end up selling these sewing machines below the market price and use the cash for purposes that do not contribute to establishing alternative income sources (Haldar & Ali, 2014).

Influence of bans on fisher lives, livelihoods, and way of living

Since the fishing bans are introduced in Bangladesh, it has gradually positively impacted inland and marine fish production in various waters and sanctuaries (Bladon et al., 2016). However, in communities where dependence on fisheries resources is high and livelihood options are few, periodic or permanent closures across large fishing grounds may create significant economic hardship and may be met with resistance. The present study's findings demonstrated that small-scale fishers have lower literacy rates than the national average. Fishing skills, combined with the lower levels of education, are not easily transferable to other skilled professions. It is also difficult for them to manage temporary employment during the specific time of the year when various bans occur, as most lucrative careers demand long-term commitment. Moreover, the fishing communities live in marginal areas far from economic centers. These challenges make it hard for fishers to find alternative employment during ban periods (Islam et al., 2018), resulting in unemployment and loss of income during ban periods. These financial and economic challenges lead to non-compliance with closed-season strategies (Sunny et al., 2021). A key shortcoming of the compensation scheme is the exclusion of important stakeholders of the hilsa value chain, such as fisheries entrepreneurs. Moreover, not all hilsa fishers are supported by the scheme, while non-hilsa fishers do not receive compensation. They are sometimes forced to fish illegally to support families, sell their family properties to reduce debt or are forced to spend days without sufficient food intake. Fishers mentioned that the current management strategy should have considered community input and perceptions to improve compliance with the law.

Overall, the current hilsa management strategy should be revised, taking the community input into consideration. A need-based effective compensation package, inclusive of all stakeholders, and cash should be distributed through m-banking (mobile banking), making the compensation more effective. Permitting regular special interest-free loans for affected fishers can also help

in this regard. We also recommend proper distribution of compensation and adequate subsidy amounts to the fishers in a timely manner. It is also important to arrange alternative livelihood options considering community preferences. Without resolving the underlying financial issue, both community- and incentive-based conservation programs cannot be successful. In Bangladesh, similar to elsewhere in southern Asia, fishing communities are considered among the poorest communities (Islam et al., 2016). Therefore, to increase the success of long-term management through permanent or temporary fishing closures, the affected populations should be lifted out of poverty by developing effective alternative income-generating options.

Conclusion

This study focuses on the impact of fishing ban related compensation schemes on biodiversity conservation and livelihood development in the fisheries sectors of Bangladesh. As we have already pointed out, the compensation packages for fishers need to be upgraded and diversified to make them effective during bans. Adequate compensation such as rice, cash, and AIGA's support could be modified considering the community's needs and preferences. In addition, earning losses during ban periods and credit opportunities towards improving the welfare of fishers need to be addressed more carefully. Bangladesh also experiences frequent climate disasters, making fishers more vulnerable. Improper management, unequal compensation distribution, and avoidance of frontline stakeholders' involvement put the effectiveness of biodiversity conservation and livelihood development strategies at risk. Well-planned livelihood diversification and climate resilience assistance need to be planned and implemented in coordination with national and international agencies while also ensuring the participation of key stakeholders.

References

- Ahmed, K. K. U., Rahman, S., & Ahammed, S. U. (2006). Managing fisheries resources in Kaptai reservoir, Bangladesh. *Outlook on Agriculture*, 35(4), 281-289
- Bladon, A., Syed, M. A., Hassan, S. T., Raihan, A. T., Uddin, M. N., Ali, M. L., & Steele, P. (2016). Finding evidence for the impact of hilsa fishery management in Bangladesh. London: International Institute for Environment and Development.
- Clements, T., John, A., Nielsen, K., An, D., Tan, S., & Milner-Gulland, E. J. (2010). Payments for biodiversity conservation in the context of weak institutions: Comparison of three programs from Cambodia. *Ecological Economics*, 69(6), 1283-1291.
- Halдар, G. C., & Ali, L. (2014). *The cost of compensation: Transaction and administration costs of hilsa fish management in Bangladesh*. . London: International Institute for Environment and Development.
- Islam M.R., Cansse, T., Islam, M.S., Sunny, A.R. (2018). Climate change and its impacts: The case of coastal fishing communities of the Meghna river in south-central Bangladesh. *International Journal of Marine and Environmental Sciences*, 12(10), 368-376.
- Islam, M. M., Begum, A., Rahman, S. M. A., & Ullah, H. (2021). Seasonal fishery closure in the northern Bay of Bengal causes immediate but contrasting ecological and socioeconomic impacts. *Frontiers in Marine Science*, 8, 704056.
- Islam, M. M. (2021). Social Dimensions in Designing and Managing Marine Protected Areas in Bangladesh. *Human Ecology*, 49(2), 171-185.
- Islam, M. M., Islam, N., Sunny, A. R., Jentoft, S., Ullah, M. H., & Sharifuzzaman, S. M. (2016). Fishers' perceptions of the performance of hilsa shad (*Tenualosa ilisha*) sanctuaries in Bangladesh. *Ocean & Coastal Management*, 130, 309-316.
- Islam, M.M., Shamsuzzaman, M.M., Sunny, A.R., Islam, N. (2017). Understanding fishery conflicts in the hilsa sanctuaries of Bangladesh. In: Intersectoral governance of inland fisheries. Song, A.M., Bower, S.D., Onyango, P., Cooke, S.J., & Chuenpagdee, R. (eds.) (pp 18-31). St. John's: TBTI

Miranda, M., Porras, I. T., & Moreno, M. L. (2003). *The social impacts of payments for environmental services in Costa Rica: a quantitative field survey and analysis of the Virilla watershed* (No. 1). London: International Institute for Environment and Development.

Mohammed, E. Y., Ali, L., Ali, S., Hussein, B., Wahab, M. A., & Sage, N. (2016). Hilsa's non-consumptive value in Bangladesh: Estimating the non-consumptive value of the hilsa fishery in Bangladesh using the contingent valuation method. London: International Institute for Environment and Development.

Nahiduzzaman, M., Islam, M. M., & Wahab, M. A. (2018). Impacts of fishing bans for conservation on hilsa fishers' livelihoods: Challenges and opportunities. Academic Foundation.

Nishat, B., Mandal, S., Pangare, G. (2019). Conserving ilish, securing livelihoods: Bangladesh-India perspectives. India: Academic Foundation; International Water Association, pp 65-82

Rahman, M. A., Ahmed, T., Pramanik, M. M. H., & Alam, M. A. (2015). Impact of fifteen days fishing ban in the major spawning grounds of hilsa (*Tenualosa ilisha* Hamilton 1822) on its spawning success. *Research in Agriculture Livestock and Fisheries*, 2(3), 491-497.

Rahman, M. A., Pramanik, M. M. H., Flura, A. T., Hasan, M. M., Khan, M. H., & Mahmud, Y. (2017). Impact assessment of twenty-two days fishing ban in the major spawning grounds of *Tenualosa ilisha* (Hamilton, 1822) on its spawning success in Bangladesh. *Journal of Aquaculture Research and Development*, 8, 489.

Roe, D., Booker, F., Day, M., Zhou, W., Allebone-Webb, S., Hill, N. A., ... & Sunderland, T. C. (2015). Are alternative livelihood projects effective at reducing local threats to specified elements of biodiversity and/or improving or maintaining the conservation status of those elements? *Environmental Evidence*, 4(1), 1-22.

Shalehin, M. S., Parvez, M. T., Lucas, M. C., & Galib, S. M. (2022). A case study of illegal fishing causes during seasonal fishery closure in Kaptai Lake, Bangladesh. *Fisheries Management and Ecology*.

Springer, J. (2009). Addressing the social impacts of conservation. *Conser-*

vation and Society, 7(1), 26-29.

Sunny, A. R., Hassan, M. N., Mahashin, M., & Nahiduzzaman, M. (2017). Present status of hilsa shad (*Tenualosa ilisha*) in Bangladesh: A review. *Journal of Entomology and Zoology Studies*, 5(6), 2099-2105,

Sunny, A. R., Mithun, M. H., Prodhan, S. H., Ashrafuzzaman, M., Rahman, S. M. A., Billah, M. M., ... & Hossain, M. M. (2021). Fisheries in the context of attaining Sustainable Development Goals (SDGs) in Bangladesh: COVID-19 impacts and future prospects. *Sustainability*, 13(17), 9912, doi:10.3390/su13179912

Wright, J. H., Hill, N. A., Roe, D., Rowcliffe, J. M., Kumpel, N. F., Day, M., ... & Milner-Gulland, E. J. (2016). Reframing the concept of alternative livelihoods. *Conservation Biology*, 30(1), 7-13.

Wunder, S. (2013). When payments for environmental services will work for conservation. *Conservation Letters*, 6(4), 230-237.

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