



Livelihood Challenges of the River Fishermen in Bangladesh: A Systematic Review and Recommendations for the Policy and Practice

Md. Abdul Mazid¹; Dr. Md. Golam Azam^{1*}; Umme Habiba Mst. Zakia²

¹ Institute of Social Welfare and Research, Faculty of Social Sciences, University of Dhaka, Dhaka, Bangladesh

² Department of Agriculture, Rajabari College, Tangail, Bangladesh

*Corresponding author's Email address: g.azam2011@gmail.com

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Abstract

Fishing in rivers is one of the major occupations of fisher communities of Bangladesh who live near the river banks across the country. The objectives of this qualitative review are to identify the key livelihood challenges experienced by the river fishermen (fishers) and to recommend some policies in light of the previous studies available for review. The researchers used a systematic review guided by the PRISMA method/guidelines. Boolean search strings were used to identify the literature from databases like PubMed, MDPI, ScienceDirect, and Google Scholar. The findings show that the fishers' communities are excluded from mainstream society and deprived of enjoyment of basic human rights and needs. Also, they are suffering from extreme levels of economic hardships and vulnerabilities, climate change-related natural catastrophes, diseases, and poor communication systems. The fisher communities were also found to experience social stigma, social exclusion, and isolation. Moreover, family pressure linked to demographic change, financial constraints, poor market facilities, reduction of fishing areas for territorial conflicts, political unrest, and pressure from the musclemen and socially miscreants or deviant persons is observed in the study. The fishers were also found to suffer from a shortage of fishing gear, boats, nets, and resources. Based on the systematic review of literature related to the study, several policy recommendations have been made that contribute to promoting the quality of lives of fishermen (fishers) through socio-economic, cultural, physical-infrastructure, and environmental development.

Keywords: *Coastal Rivers; Environmental Challenges; Inland Rivers; Livelihood Challenges; Livelihood Conditions; River Fishermen*

Introduction

Bangladesh is a riverine country and almost 700 rivers exist here including tributaries. The rivers originate from India and Myanmar from the Northern and North-Eastern parts of the country (Hasan et al., 2019; Uddin & Jeong, 2021). The country has 238 major rivers and most of the rivers are the major tributaries of the large transboundary rivers (Riaduzzaman et al., 2023). The Ganges, Padma, Jamuna,

Meghna, Teesta, Dharla, Atrai, Mohananda, Dhaleswari, Karatoya, Sitalakhya, Dudhkumar, Rupsa, and Pasur are some of the prominent rivers of Bangladesh (Ranjan, 2020; Riaduzzaman et al., 2023; Uddin & Jeong, 2021). Rivers are considered the primary source of fish (Uddin & Jeong, 2021; A. R. M. T. Islam et al., 2020). Bangladesh is the habitat of 169.8 million people, 68.34% live in the rural countryside, and 31.66% live in urban areas (Bangladesh Bureau of Statistics (BBS), 2023). According to Banglapedia, about 1.4 million people are directly involved in fishing and 14 million are indirectly involved in fishing in Bangladesh (M. Hossain, 2021). In the 2018-19 Fiscal year, among the 12,35,709 Metric Tons of fish captured from inland open water, 3,25,478 Metric Tons were captured from the rivers and Estuaries, which is 26.34% of the total capture (Department of Fisheries Bangladesh (DoF), 2020). The fishermen and fisheries sector are tremendously experiencing diverse challenges stemming from natural and anthropogenic (human-induced) sources such as changes in climate, natural disasters, deranged urbanization, unplanned industrialization, overfishing, and pollution of the environment (Bishwajit, 2014). Numerous social, economic, demographic, political, environmental, and other causes pose a threat to the livelihood of the fishermen in Bangladesh. So far as knowledge goes, studies on this issue fully reveal the challenges and constraints of fishing in Bangladesh rivers, so a systematic review is pertinent to know the nature and types of challenges in the river fishing.

Objectives

The study (qualitative review) is designed to identify the livelihood challenges the river fishermen (fishers) encountered in Bangladesh, and suggest some pragmatic recommendations in line with the existing policies for the policy practice.

Methods of the Study

The methodology used in the study is a systematic review. The study is carried out by using the “Preferred Reporting Items for Systematic Reviews and Meta-Analyses-PRISMA” statement (Moher et al., 2009). The systematic review was carried out based on the available open-access research-based papers available in PubMed, Science Direct, MDPI, and Google Scholar published between 01 January 2015 to 30 November 2023. The search keywords of the study for PubMed were [(fishermen) AND (Bangladesh)], for MDPI were [(fishermen) AND (Bangladesh)], for Google Scholar were [fishermen AND Bangladesh AND livelihood Challenges AND (river fishermen OR river fishers OR livelihood status OR livelihood conditions OR challenges) -COVID -"Covid 19" -Urban -Sea], and for Science Direct were (fishermen) AND (Bangladesh) AND (livelihood) AND (challenges)]. Boolean search strings were used to identify the literature from these databases. A total of 2091 records were found and after title, objectives, keywords, and abstracts screening a total of 2057 studies were excluded and a total of 34 studies were selected for the qualitative synthesis. After qualitative synthesis, a total of 19 research-based articles were selected for the review. The findings of the review are presented in a narrative way. The process of literature search is shown in the PRISMA flow diagram (Figure-1):

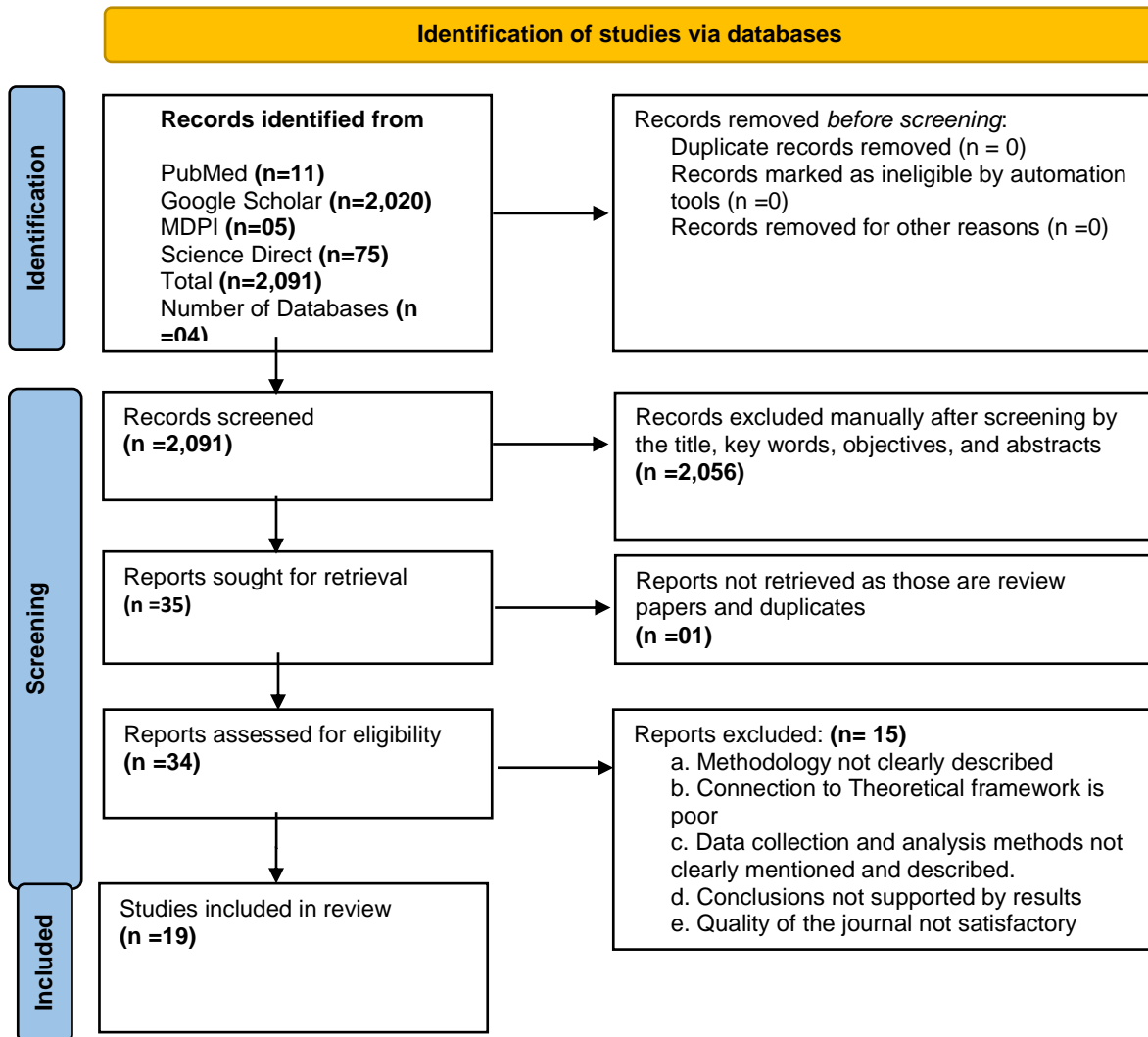


Figure 1. PRISMA flow diagram of the review of literature (Systematic review)
[Source of PRISMA flow diagram: (Page et al., 2021)]

Concepts related to the study

- ***River fishermen (fishers) of Bangladesh***

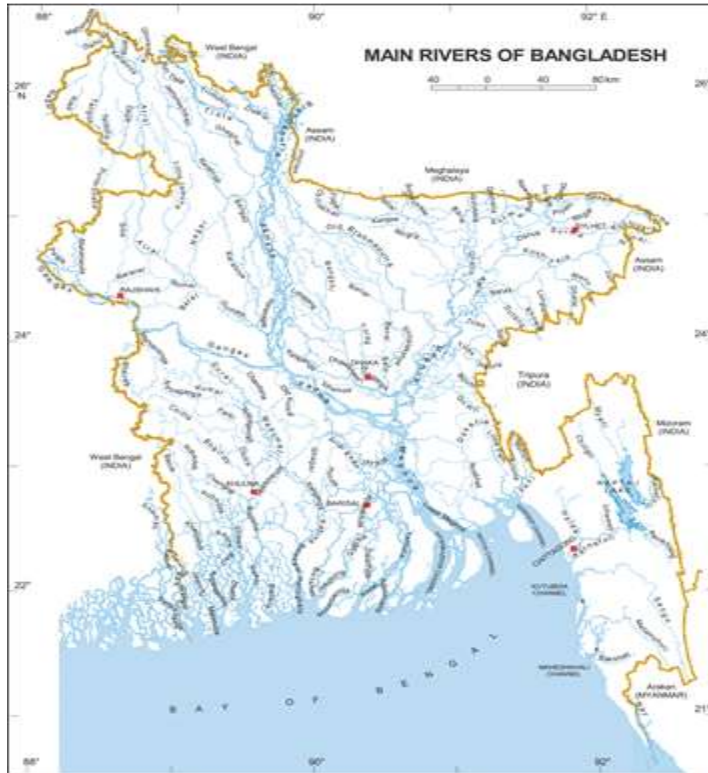


Figure 2. Major rivers of Bangladesh [Source: (Government of the People’s Republic of Bangladesh (GoB), 2021)]

River fishermen, fishers, or anglers are a community who live near the banks of the river and catch fish for the livelihoods of their families, and fully or partially depend on the natural fish resources of rivers of the inland river areas of Bangladesh. River fishers catch fish with nets and fishing gear with their fishing boats or other traditional and modern equipment. The major rivers of Bangladesh are illustrated in the figure 2:

- ***Livelihood challenges of the fishers***

Livelihood challenges of the fishers mean the scarcity, barriers, and constraints in the livelihood options or unavailability of resources and opportunities that make living difficult. Livelihood options of the fishermen/ fishers include those areas that directly and indirectly influence their living patterns such as economic, social, demographic, environmental, cultural, security, and rights-based factors.

Review of literature

Research scholars have studied the livelihood status and livelihood challenges of the riverside fishers/fishermen in Bangladesh. Focusing on the objectives of the current study, the researchers of this

study tried their best to portray the challenges and obstacles faced by the fishermen/fishers of Bangladesh. The articles were reviewed and arranged by the name of the rivers where fishermen depend for their livelihoods.

A mixed-method study on the fishermen of Jamuna River of Sariakandi, Bogra (Bogura) by Kumar Mondal et al., (2016) found that the fishers faced a wide variety of challenges. They observed that the causes of poor conditions for most of the fishers/fishermen were scarcity of alternate employment opportunities, low education facilities, lack of marketing knowledge and marketplace for selling fish, and lack of sanitation and health facilities (Kumar Mondal et al., 2016). Electricity facilities were not found in the fishermen's communities of the study area. Kumar Mondal et al., (2016) also indicated that lack of credit facilities, extreme poverty, non-availability of fishing nets, and insufficient government support are also responsible for their poor condition. Besides, pressure from 'mohajon', lack of appropriate nets and gears, and disturbances of the robbers and thieves were also working as obstacles in their lives (Kumar Mondal et al., 2016).

Subrin et al., (2022) in their study on the fishermen of the Padma River of the Rajshahi City area intended to know their socioeconomic status on the basis of their personal lives. The study employed a mixed-method research approach and used a questionnaire survey and focus group discussions. The study revealed that the fishers were totally dependent on fishing and had no alternative income sources. They were indifferent about their health, education, family, and children's lives because of their socioeconomic conditions (Subrin et al., 2022). M. A. Haque et al., (2017) in their study on the Hilsa fishermen of Padma River in Rajshahi district found that fishers were suffering from some sorts of restraints/challenges such as population pressure, low income, lack of alternative income opportunities, extortion by the local extortionists, loan problems, robbery and theft (M. A. Haque et al., 2017). Besides, they were in a position of not sending their children to school due to poverty and did not have proper healthcare facilities (M. A. Haque et al., 2017).

Another study by Akther et al., (2017) explored the livelihood strategies of the fishers/fishers of Padma River and some major constraints of the fishers of Rajshahi. Some of the challenges impacting day-to-day lives are declining the depth of the river Padma, drying up the river in late winter and near summer, overfishing, catching of broods and fingerlings, spread of fish diseases caused by environmental pollution (Akther et al., 2017). Akther et al., (2017) also explained that some socioeconomic factors like common (shared) ownership of fishing nets and gear, lack of fish preservation and marketing facilities, and difficulties in getting loans from GOs and NGOs are also making the livelihood conditions of the fishers difficult (Akther et al., 2017). Shill et al., (2016) in their study on the fishermen's livelihood status of the Padma River showed that most of the fishermen of the Munshiganj region of Padma River Bank face various types of problems during the time of fishing and marketing the goods in the local markets (Shill et al., 2016). They also identified several problems during the fishing periods such as insufficient fishing crafts, lack of fishing gears, natural calamities and disasters (floods, cyclones, storms, etc.), pollution of water, an increase of char lands, lack of credit facilities, use of "current jal", disturbances by the local dacoits and thieves and so on (Shill et al., 2016). Buying fishing nets and other types of equipment was a challenge associated with poverty. Also, they cannot send their children to school because of financial hardship (Shill et al., 2016). Sunny et al., (2019) studied the Hilsa fishers of Padma River and the livelihood challenges, constraints, and vulnerability circumstances of the fishermen. The fishers of Padma River are found to face some challenges linked to the natural and anthropogenic (human-caused) sources. (Sunny et al., 2019). The main constraints identified from the study were natural calamities, reduction of the amount of fish catches, frequent ban periods, the burden of "dadon" (rented money), underdeveloped and poor market facilities, and losses of fishing equipment (Sunny et al., 2019). Fishermen faced some specific constraints of fishing like illness, shocks of floods and droughts, growing population size, reduction in access to water resources, political crises, and environmental changes (Sunny et al., 2019).

A study conducted by Haque et al., (2019) on the fishermen of Atrai River in the Naogoan District of Bangladesh revealed that the fishers community of Atrai River are leading their life through challenges such as extortion and threats, shortage of fishing gear, insufficient credit supply and facilities, and ineffective market system for the fish sale (W. Haque et al., 2019).

A study by Khan, (2019) on the Karatoya River in Bogura district showed that fishermen are facing some problems in their daily lives like the decline of fish catch, insufficient credit, and cash, non-availability of ice, unstable price of fish, social exclusion, over-the-generation illiteracy and social neglects (Khan, 2019).

Hossen et al., (2020) in their study on the fishermen of the Kirtankhola River in Barisal district found some constraints in their daily life. Some of the constraints are lack of sufficient fishing crafts, lack of fishing gear, household pressure due to large sized family, climate change-related challenges, river erosion, poor housing conditions, unbalanced diet due to poverty, and lack of proper training and credit facilities. The study also revealed that the fishers cannot afford for their children to the school (Hossen et al., 2020).

A study on the fishermen of the Tetulia River in the Bhola district by Hossen et al., (2018) found that shortage of sufficient fishing crafts, climate change-related problems, lack of credit facilities, the intensity of river bank erosion, lack of education due to poverty, poor housing condition, and the lack of electricity were critical in the studied area. They also revealed that lack of fishing gear and household pressure for the large family size are not in a critical situation in the study area (Hossen et al., 2018).

Islam et al., (2022) in their study on the fishermen of the Old Brahmaputra River in Jamalpur found that the majority of the fishermen face a variety of challenges. Among the challenges are lack of education due to poverty, generation-to-generation illiteracy, neglect in society, and inadequate money to purchase nets and other fishing equipment (Md. F. Islam et al., 2022).

Fatema & Nur, (2020) in a case study on the Tangon River in Thakurgoan fishermen in Bangladesh identified several problems such as lack of employment during prohibition, lack of training facilities, lack of technical know-how, shortage of credit facilities, economic hardship, use of jhar/katha materials to catch fish by the political/ influential persons, an increase of char land, and lack of modern fishing gears (Fatema & Nur, 2020).

Kamruzzaman & Hakim, (2016) in their study on the fishermen of the Dhaleshwari River in central Bangladesh revealed that the fishermen of the Dhaleshwari River are mostly illiterate. They lack training exposure and limited training about their health, and sanitation (Kamruzzaman & Hakim, 2016).

A study by Hossain et al., (2015) on the Punorvaba River in Dinajpur revealed some problems with fishing in the Punorvaba River like shortage of fishing boats, insufficient fishing gear, marketing of fish, Influence of the local political leaders and muscle men, regular flooding of the river, inadequate of credit facilities and use of destructive, and destructive and illegal fishing gears (F. I. Hossain et al., 2015).

Afrad et al., (2019) conducted a study on the fish biodiversity and livelihood status of the fishermen living around the Titas River in Brahmanbaria district of Bangladesh and identified four major problems in the lives of the fishermen of the study area. Some problems identified were the low annual catch of fish, shortage of sufficient and appropriate fishing gear, overfishing, and conflicts in fishing areas (Afrad et al., 2019). Afrad et al., (2019) also revealed that the fishermen of the Titas River area were leading a very poor life and earning little money than the minimum wage fixed by the Government of the country (Afrad et al., 2019).

A study on fishermen of Turag and Buriganga River by Baki et al., (2015) in Dhaka revealed that fishermen communities were facing manifold constraints such as illiteracy, large family size, living from hand to mouth, and living below the poverty line. They were also found to struggle to survive with their

health, nutrition, and housebuilding materials in their day-to-day life (Baki et al., 2015). The study also revealed that most of the fishermen get healthcare from the village doctors and the rest is from various hospitals (Baki et al., 2015).

Hafijur et al., (2017) in their study on the fishers of Payra River in Patuakhali district found that the literacy rate among the fishermen was zero and children did not go to school. Fishers were found to face economic and other constraints. They generally have no alternative income sources during the ban periods (Hafijur et al., 2017). Mahmud et al., (2015) found some constraints in fishing in their study on the Payra River in the Southern part of Bangladesh. They found that the key challenges were extortion by the local extortionist, insufficient credit facilities, lack of marketing facilities for fish, lack of fishing knowledge, lack of appropriate gears and nets, and disturbances by dacoits and thieves. They were found to suffer from resource crisis and live in extreme poverty (Mahmud et al., 2015).

A study on the fishermen of Talma River in the Northern part of Bangladesh by Rahman et al., (2015) revealed that the fishermen were facing varied challenges like degradation of natural habitats of fish, excess exploitation, and fishing using illegal fishing gear and fishing methods, over toxication of the agricultural lands, lower level of water in river and construction of rubber dam for irrigation.

Findings and Discussion of the Study

From the intensive review of selected research-based articles, the authors identified some key challenges, problems, and constraints experienced by the fishing communities (fishers) of riverine Bangladesh. The key restraints and challenges faced by the fishermen of various small, medium, and large rivers are presented in Table 1 below:

Table 1. Key findings from the review of literature on river fishers in Bangladesh

Serial No. and Citation	Methodology (Methods & Data Collection Methods)	Sample Size and Sampling Procedure	Key Findings (Challenges)	Key Recommendations (Policy Interventions)
01. Kumar Mondal et al., (2016)	Mixed Method Study 1. Questionnaire Survey 2. Focus Group Discussion (FGD)	Sample Size: 40 Fishermen Sampling: Unknown	<ul style="list-style-type: none"> • Extreme Poverty • Scarcity of alternate employment opportunities • Low education facilities • Lack of sanitation, health, electricity, and credit facilities • Insufficient Govt. support • Pressures from ‘Mohajon’, robbers, and thieves • Lack of fish market 	<ul style="list-style-type: none"> • Establishment of suitable fish market • Formulate proper management policy • Facilitate alternative income-generating activities • Provide VGF cards • Facilitate NGO-based loan system
02. Subrin et al., (2022)	Mixed Method Study 1. Questionnaire Survey 2. FGD	Sample Size: 120 Fishermen Sampling: Unknown	<ul style="list-style-type: none"> • Have no alternative income source • Reluctant to the children’s education • Have limited healthcare and sanitation facilities • Careless about nutritious food 	<ul style="list-style-type: none"> • Steps to be taken to enhance and develop social and economic conditions • Increase living standards, income generation, nutrition, and health facilities

<p>03. W. Haque et al., (2019)</p>	<p>Mixed Method Study 1. Questionnaire Survey 2. FGD</p>	<p>Sample Size: 50 Fishermen Sampling: Random Sampling</p>	<ul style="list-style-type: none"> • Victim of extortions • Shortage of fishing gear • Insufficient credit facilities • In-effective market system 	<ul style="list-style-type: none"> • Provide sufficient credit facilities • Reorganize a less effective marketing system • Upgrade socio-economic condition
<p>04. Khan, (2019)</p>	<p>Mixed Method Study 1. Field Survey 2. FGD</p>	<p>Sample Size: 50 Fishermen Sampling: Random Sampling</p>	<ul style="list-style-type: none"> • Declining the fish catch • Insufficient credit supply • Non-availability of ice • Unstable price of fishes • Social exclusion • Illiteracy over the generations • Social neglects 	<ul style="list-style-type: none"> • No policy recommendation addressed
<p>05. Hossen et al., (2020)</p>	<p>Multimethod Participatory Research Approach 1. Face to face Interviews. 2. FGD 3. Crosscheck Interviews (CIs).</p>	<p>Sample Size: 120 Fishermen Sampling: Unknown</p>	<ul style="list-style-type: none"> • Lack of sufficient fishing crafts • Lack of fishing gears • Household pressure due to large-sized family • Climate change-related challenges • River erosion • Poor housing conditions • Unbalanced diet due to poverty, lack of proper training, and credit facilities 	<ul style="list-style-type: none"> • Proper Administrative Guidelines • Provide VGF cards • Ensure NGO-based interventions
<p>06. Hossen et al., (2018)</p>	<p>Mixed Method Study 1. Sample Survey 2. FGDs, 3. CIs</p>	<p>Sample Size: 200 Fishermen Sampling: Simple Random Sampling</p>	<ul style="list-style-type: none"> • Shortage of sufficient fishing crafts • Climate change-related problems • Lack of credit facilities • Intensity of river bank erosion • Lack of education due to poverty • Poor housing conditions • Lack of electricity • Shortage of fishing gear and • Household pressure due to the large family size 	<ul style="list-style-type: none"> • Ensure Alternate occupation • Develop the fishing equipment • Provide adequate mitigation strategies • Take a holistic approach to the fish mitigation program
<p>07. M. A. Haque et al., (2017)</p>	<p>Mixed Method Study 1. Sample Survey (Questionnaire Survey) 2. FGDs 3. CIs 4. Observation</p>	<p>Sample Size: 186 Fishermen Sampling: Simple Random Sampling</p>	<ul style="list-style-type: none"> • Population pressure • Low income • Lack of alternative income opportunities • Extortion by the local extortionists • Shortage of credit and capital and loan problems • Robbery and theft 	<ul style="list-style-type: none"> • Provision for alternative livelihood during the ban period
<p>08. (Md. F. Islam et al., (2022)</p>	<p>Mixed Method Study 1. Questionnaire Survey 2. FGDs 3. CIs</p>	<p>Sample Size: 118 Fishermen Sampling: Unknown</p>	<ul style="list-style-type: none"> • Lack of education • Poverty situation • Illiteracy over generations • Neglect in the society • Shortage of resources for pursuing fishing nets 	<ul style="list-style-type: none"> • No policy recommendation addressed

09. Akther et al., (2017)	Mixed Method Study 1. Questionnaire Survey 2. Participatory Rural Appraisal (PRA) Tools 3. Direct Observation	Sample Size: 100 Fishermen Sampling: Unknown	<ul style="list-style-type: none"> • Declining the depth of the river Padma • Drying up the river in late winter and near summer • Overfishing, catching broods and fingerlings • Spread of fish diseases due to environmental pollution • Multi ownership of the fishing gears • Difficulties in getting loans 	<ul style="list-style-type: none"> • No policy recommendation addressed
10. Fatema & Nur, (2020)	Case Study 1. Structured Interview Schedule 2. FGDs 3. CIs	Sample Size: 75 Fishermen Sampling: Random Sampling	<ul style="list-style-type: none"> • Lack of employment during prohibition • Lack of training facilities • Lack of technical know-how • Shortage of credit facilities • Economic hardship • Use of “jhar”/“katha” materials to catch fish by the political/influential persons • Increase of char land, and lack of modern fishing gears 	<ul style="list-style-type: none"> • Ensure basic human rights • Ensure education, health, and nutrition facilities • Ensure sanitation and fishing laws • Ensure credit facilities and alternative livelihood opportunities
11. Kamruzzaman & Hakim, (2016)	Cross-Sectional Study 1. Questionnaire Survey	Sample Size: 70 Fishermen Sampling: Random Sampling	<ul style="list-style-type: none"> • Illiteracy • Lack of training exposure • Inadequate training in health, and sanitation • Extreme poverty • Shortage of fishing boats • Shortage of fishing gears • Less-developed marketing of fishes • Influence of the local political leaders and musclemen • Regular flooding of the river • Shortage of credit facilities • Use of destructive, and banned/illegal fishing gears 	<ul style="list-style-type: none"> • NGO intervention is essential
12. F. I. Hossain et al., (2015)	Mixed Method Study 1. Questionnaire Survey 2. FGDs 3. CIs	Sample Size: Unknown Sampling: Unknown	<ul style="list-style-type: none"> • Shortage of fishing boats • Shortage of fishing gears • Less-developed marketing of fishes • Influence of the local political leaders and musclemen • Regular flooding of the river • Shortage of credit facilities • Use of destructive, and banned/illegal fishing gears 	<ul style="list-style-type: none"> • Stop catching brood fish • Control of destructive and illegal fishing gear • Establish the fish sanctuary and reservoir in the river • Fishing Acts and regulations should be strictly implemented • Regular release of fish fry • Surveying the river basins • Proper management plan
13. Shill et al., (2016)	Mixed Method Study 1. Survey 2. Observation 3. FGDs 4. CIs	Sample Size: 50 Fishermen Sampling: Unknown	<ul style="list-style-type: none"> • Insufficient fishing crafts • Lack of fishing gears • Natural calamities and disasters (floods, cyclones, storms, etc.) • Pollution of water • Increase of char lands • Lack of credit facilities • Use of “current jal” • Disturbances by the local dacoits and thieves and so on 	<ul style="list-style-type: none"> • Proper management policies by the Govt. are essential • Provide assistance during the fishing ban

14. Afrad et al., (2019)	Mixed Method Study 1. Questionnaire Survey (Interview Schedule) 2. FGDs	Sample Size: 80 Fishermen Sampling: Random Sampling	<ul style="list-style-type: none"> • Low annual catch of fish • Insufficiencies of appropriate fishing gears • Overfishing • Fishing area-related conflicts • Lower level of income 	<ul style="list-style-type: none"> • Stop catching brood fish • Prohibition of catching juvenile fish • Impose a ban on destructive fishing gears • Establish the fish sanctuaries • Strict enforcement of fish acts/laws
15. Baki et al., (2015)	Mixed Method Study 1. Observation 2. Survey 3. FGDs 4. CIs	Sample Size: 50 Fishermen Sampling: Unknown	<ul style="list-style-type: none"> • Illiteracy • The pressure of large family size • Living from hand to mouth • Living under the poverty line • Struggle to survive with health, nutrition, and housebuilding materials 	<ul style="list-style-type: none"> • Provide alternate jobs during the dry season • Control water pollution • Create a safe environment for the children
16. Sunny et al., (2019)	1. Survey 2. FGDs 3. Key Informant's interview (KII) 4. Direct Observation	Sample Size: 288 Households Sampling: Unknown	<ul style="list-style-type: none"> • Natural disasters and calamities • Reduction of fish catches • Survive during the ban periods • Burden of 'dadon' (rented money) • Underdeveloped market facilities • Losses of fishing equipment • Illness • Shocks of floods and droughts • Increasing population size • Reduction to individual access to water resources • Political crisis and, • Environmental changes 	<ul style="list-style-type: none"> • Support during the ban period • Training and motivation programs for sustainable resource uses • Effective management
17. Hafijur et al., (2017)	Mixed Method Study 1. Observation 2. Survey 3. FGDs 4. CIs	Sample Size: Unknown Sampling: Unknown	<ul style="list-style-type: none"> • Illiteracy is very high • Children do not go to school • No alternative income sources during ban periods 	<ul style="list-style-type: none"> • Needs more support • Make alternative income sources • Impose rules and regulations for sustainable development
18. M. A. Rahman et al., (2015)	1. Survey Method 2. Interview Schedule	Sample Size: 50 Fishermen Sampling: Random Sampling	<ul style="list-style-type: none"> • Degradation and reduction of natural habitats of fish • Over-exploitation using illegal and banned fishing gear, techniques and methods • Use of toxins in agricultural land • The lower level of water in the river • Construction of rubber dams in the river 	<ul style="list-style-type: none"> • Provide loan facilities • Provide harvesting nets and equipment • Ensure education and health facilities • Develop infrastructure
19. Mahmud et al., (2015)	Mixed Method Study 1. Survey 2. FGDs 3. CIs	Sample Size: 50 Fishermen Sampling: Unknown	<ul style="list-style-type: none"> • Extortion by the local extortionist • Insufficient credit facilities • Lack of marketing facilities for fishes • Lack of fishing knowledge • Lack of appropriate gears and nets • Disturbances by dacoits and thieves 	<ul style="list-style-type: none"> • Provide loans • Administrative tools for the proper use of resources • Enhance better health facilities

The review of literature covered 19 studies on 14 different rivers related to the livelihood challenges and constraints faced by the river fishermen in Bangladesh. The reviewed research articles on different rivers are shown in the figure 3:

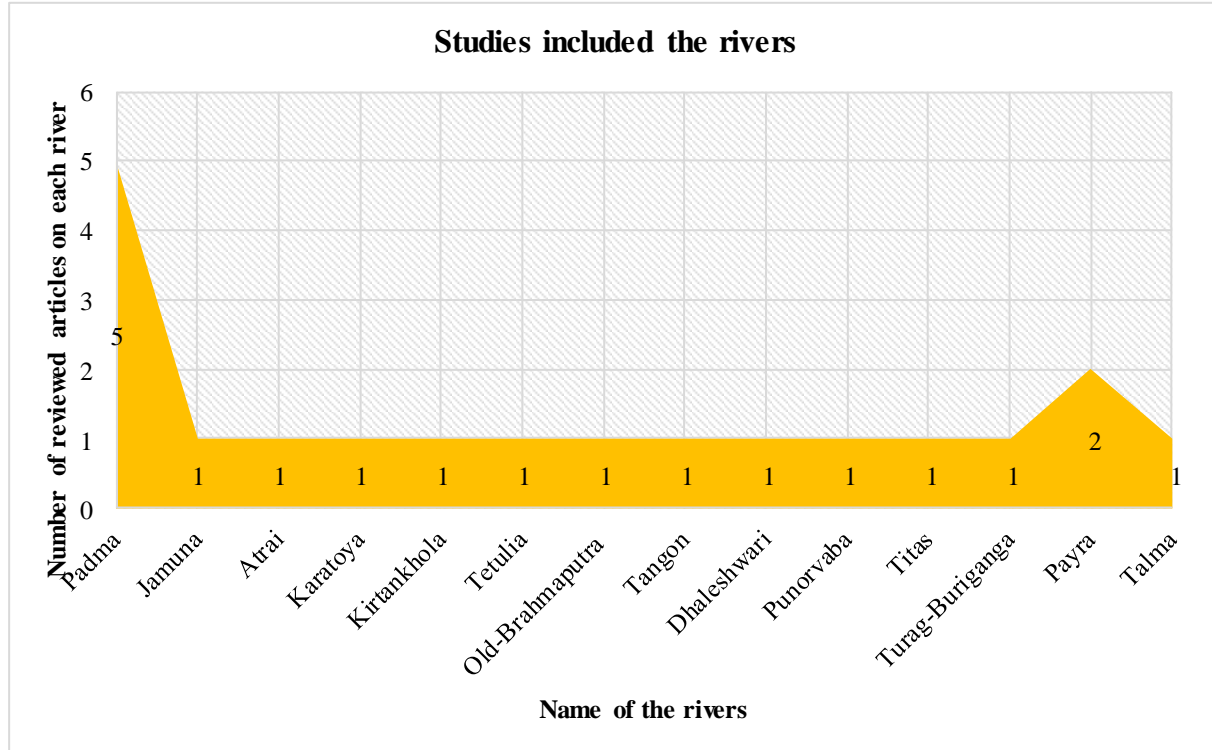


Figure 3. Number of reviewed articles on each river

The reviewed articles cover 16 of the 64 administrative districts of Bangladesh. The geographic coverage of the reviewed studies are shown in the figure 4:

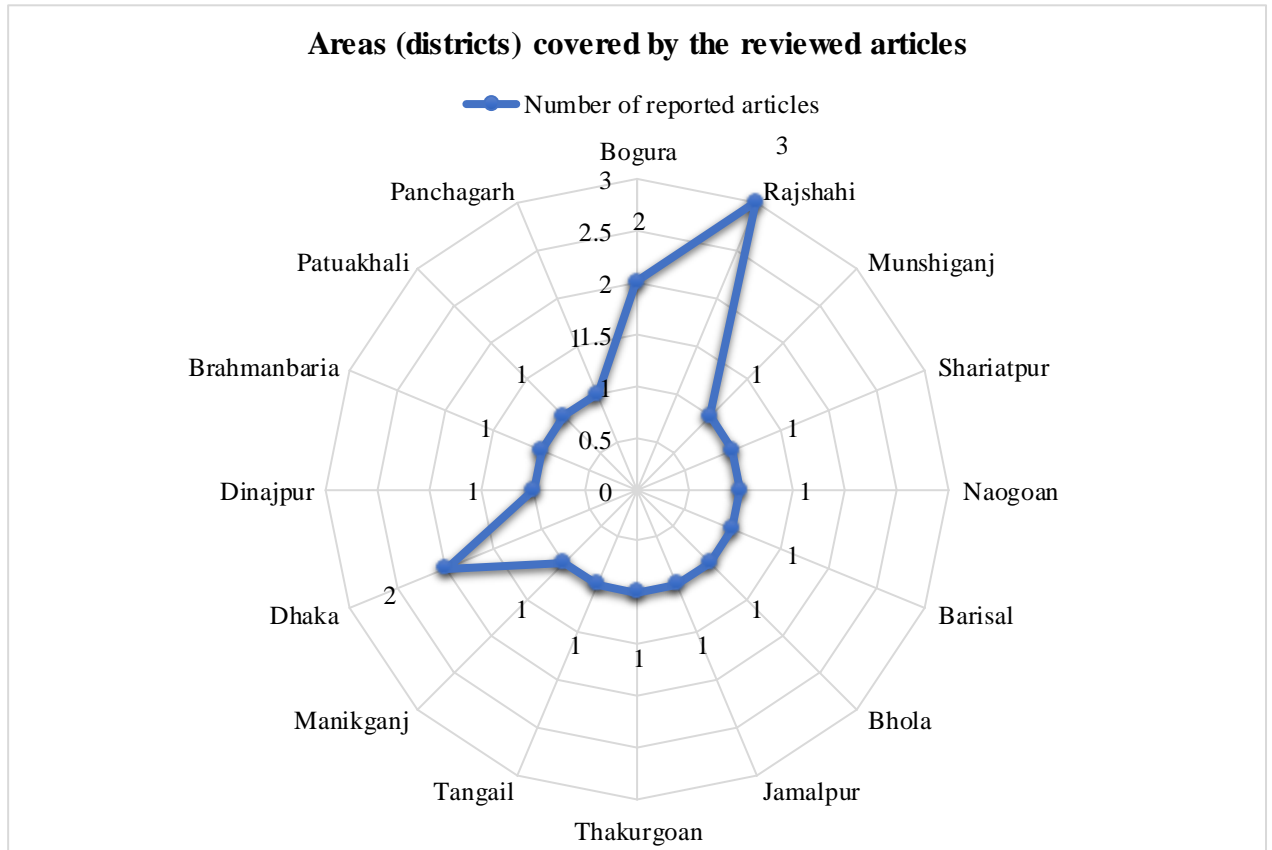


Figure 4. Areas (Districts) covered by the reviewed articles

- ***Livelihood challenges of the river fishermen in Bangladesh***

The analysis of the findings of 19 reviewed research-based study articles on 14 rivers of Bangladesh revealed a list of livelihood challenges and constraints for the fishermen of Bangladesh. The challenges and constraints of the fishing life of the fishermen of Bangladesh can be discussed and grouped in the following headings:

Demographic challenges

An increase in the size of the family and family members, large family size, and population pressure on livelihood was found in five (05) of the 19 research studies (Baki et al., 2015; M. A. Haque et al., 2017; Hossen et al., 2018, 2020; Sunny et al., 2019). These factors are working as constraints in fishing and creating pressure on livelihood options and biodiversity. Population density is also creating extra pressure on fish diversity and the amount of fish in the rivers.

Social challenges

Fishing communities and fishermen are generally victims of social neglect. They become socially isolated and excluded from mainstream society. Among 19 reviewed articles, only two mentioned the social isolation and neglect faced by the fishermen of Bangladesh (Md. F. Islam et al., 2022; Khan, 2019).

Economic challenges

From the review it was found that almost all the research studies identified a lack of credit facilities and resources were the challenge for the fishermen (Fatema & Nur, 2020; M. A. Haque et al., 2017; W. Haque et al., 2019; Hossen et al., 2018; Khan, 2019; Kumar Mondal et al., 2016; Mahmud et al., 2015; Shill et al., 2016). Extreme poverty, living below the poverty line, economic hardship, scarcity of alternative sources of income, lower level of income, shortage of resources for buying fishing nets, and no alternative employment during the ban and dry seasons are also identified in the review of the research studies (Afrad et al., 2019; Fatema & Nur, 2020; Hafijur et al., 2017; M. A. Haque et al., 2017; Md. F. Islam et al., 2022; Kumar Mondal et al., 2016; Subrin et al., 2022). Insufficient marketing facilities, poor market facilities, marketing problems, and unstable fish markets also work as a challenging situation for the fishermen of various rivers (Mahmud et al., 2015; F. I. Hossain et al., 2015). Besides, the burden of “dadon” also worked as an economic pressure for them (Sunny et al., 2019).

Environmental challenges

Most of the reviewed studies (10 among 19) found environmental causes as the key challenges in the livelihood of the river fishermen. River erosion, natural calamities like floods, cyclones, and storms, declining the depth of the river, environmental changes, pollution of water, spread of fish diseases resulting from the environmental pollution, intoxication of water, drying up the river, lower level of water are creating challenges in the lives of the fishermen (Akther et al., 2017; Fatema & Nur, 2020; Hafijur et al., 2017; Hossen et al., 2018; M. A. Rahman et al., 2015; Shill et al., 2016; Sunny et al., 2019). The findings of the study by (Dey et al., 2021) also support the findings of the review that disaster-related food insecurity and challenges are common among the fishermen community. (H. M. T. Rahman et al., 2018) also supported that flash floods and droughts mostly affect the livelihood of the farmers and fishers.

Challenges related to infrastructure

Poor housing conditions, lack of electricity facilities, poor roads and communication systems, poor marketplaces, nonavailability of ice, and construction of rubber dams were found to create challenges in the lives of the fishermen (Hossen et al., 2018, 2020; Khan, 2019; Kumar Mondal et al., 2016).

Political challenges

The findings of the review showed that local politics, influential persons, and muscle power created challenges to the lives of the fishermen. Political crises, fishing area-related conflicts, the influence of the local politicians and muscle man, use of jar/katha methods to catch fish by politically influential persons create barriers to normal fishing by the fishermen (Afrad et al., 2019; Fatema & Nur, 2020; M. A. Haque et al., 2017; W. Haque et al., 2019; Reza et al., 2015; Sunny et al., 2019).

Education, health, and sanitation problems

Most of the reviewed studies found that education, health, and sanitation are the key challenges in the lives of the fishermen. The illiteracy rate is very high in the fishing communities, and they cannot send their children to school. Moreover, the fishermen have limited training in fishing and have limited idea about technical know-how. Exposure to diseases and illness, less food intake, poor nutritious foods, lack of training and knowledge on health and sanitation were found to make them vulnerable (Baki et al., 2015; Fatema & Nur, 2020; Hafijur et al., 2017; Kamruzzaman & Hakim, 2016; Kumar Mondal et al., 2016; Mahmud et al., 2015; Subrin et al., 2022; Sunny et al., 2019). Md. T. Hossain et al., (2022) showed that the fishermen were incapable of seeking medical assistance from trained doctors and other healthcare

service providers basically due to their financial hardships and struggle (Md. T. Hossain et al., 2022). Financial crises have pushed fishermen to take traditional healing in terms of modern treatment (Md. T. Hossain et al., 2022).

Fishing instruments-related challenges

Fishermen were also found to struggle with their fishing equipment such as lack of fishing gear, lack of fishing crafts, shortage of fishing boats, multi-ownership of the fishing gear, shortage of appropriate gears and nets, loss of fishing equipment, and so on (Afrad et al., 2019; Akther et al., 2017; Fatema & Nur, 2020; W. Haque et al., 2019; F. I. Hossain et al., 2015; Hossen et al., 2018, 2020; Mahmud et al., 2015; Sunny et al., 2019).

Fishing frequencies

Studies also revealed that overfishing, excess fishing using illegal fishing gears and techniques, catching fish during ban periods, catching of broods and fingerlings, fishing with “current jal”, excessive fishing with banned fishing gears, and declining fish catch are also creating great challenges to the livelihood of the fishermen (F. I. Hossain et al., 2015; M. A. Rahman et al., 2015; Shill et al., 2016; Sunny et al., 2019).

Crises of security and human rights

River fishermen have to face some security and human rights-related challenges such as disturbances by dacoits and thieves, robbery and theft, extortions by local extortionists, and so on (M. A. Haque et al., 2017; W. Haque et al., 2019; Mahmud et al., 2015; Shill et al., 2016).

Challenges regarding Government and Non-Governmental support

Insufficient government support, insufficient credit supply, lack of training facilities, and difficulties in getting loans are also creating challenges found in the review of the literature (W. Haque et al., 2019; Hossen et al., 2020; Kamruzzaman & Hakim, 2016; Mahmud et al., 2015).

Overall, the findings of the current study (livelihood challenges/constraints) are more or less supported by other studies conducted in Bangladesh and neighboring countries (M. A. Hossain et al., 2020) with some exceptions. The study by D. Roy et al., (2022) also stressed that unfair fishing practices and environmental volatilities such as reduction of water volume, increase the sedimentation, water abstraction from rivers, and pollution of water and soil have destroyed fish habitats and reduced the fish diversities over time. P. Roy et al., (2020) also identified four key areas of livelihood challenges such as four major reasons declined fish catch, activities of the middleman, natural calamities, and lack of financial support resulting in low income. The findings by (Ahmed et al., 2013; Celestine & Xavier, 2023; Dahal et al., 2013; Md. T. Hossain et al., 2022; Radford & Lamb, 2020; P. Roy et al., 2020; Sunny et al., 2019) also support the findings of the current study without some exception.

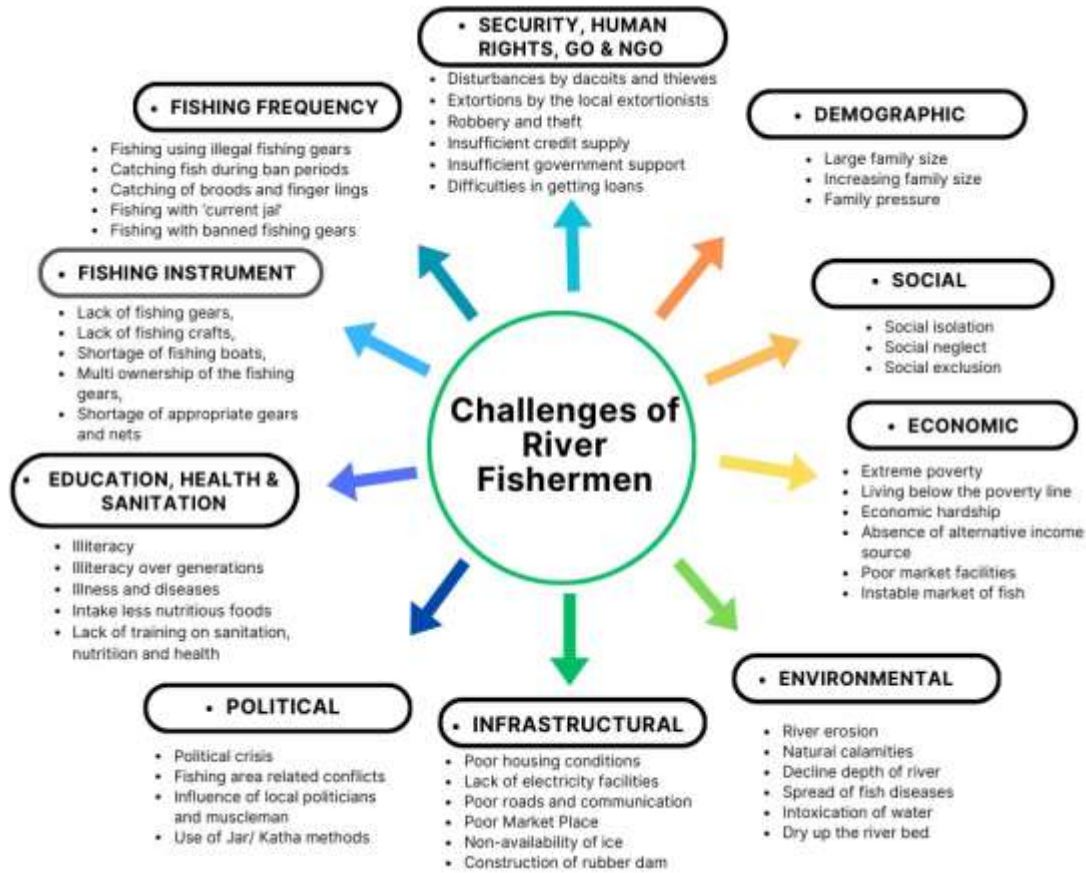


Figure 5. Livelihood challenges of the river fishermen in Bangladesh

Existing policies for the fishermen and fisheries in Bangladesh

The government of Bangladesh has made some laws, rules, policies, and ordinances, circular from time to time for regulating the capture of water fisheries and allocating the fixed time for the fishing rights of the fishermen of Bangladesh. The existing policies, rules, ordinances, and circulars are shown in the following table:

Table 2. Fisheries and fishermen-related policies, laws, ordinances, rules, and circulars

Type	Name of the acts, rules, ordinances, plans, policies, and circulars
Acts	<ul style="list-style-type: none"> The Private Fisheries Protection Act, 1889 The Protection and Conservation of Fish Act, 1950 Pond Development Act, 1939 Territorial Water and Maritime Zone Act, 1974 Marine Fisheries Act, 2020
Ordinances	<ul style="list-style-type: none"> The Fish and Fish Product (Inspection and Quality Control) Ordinance, 1983 Marine Fisheries Ordinance, 1983 Marine Fisheries Ordinance, 2023
Rules	<ul style="list-style-type: none"> The Protection and Conservation Fish Rules, 1985 The Fish and Fish Products (Inspection & Quality Control) Rules, 1997 Marine Fisheries Rules, 1983

	<ul style="list-style-type: none"> ▪ Territorial Water and Maritime Zone Rules, 1977 ▪ SRO Fixed Engine (China Duary), 2023
Plans	<ul style="list-style-type: none"> ▪ Marine Fisheries Management Plan, 2021 ▪ National Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported, and Unregulated (IUU) Fishing, Bangladesh, 2021
Policies	<ul style="list-style-type: none"> ▪ National Fisheries Policy, 1998 ▪ National Shrimp Policy, 2014 ▪ The Ramsar Convention on Wetlands, 1971 ▪ Marine Fisheries Policy-2022
Guidelines	<ul style="list-style-type: none"> ▪ Fishermen Registration and Identity Card Guidelines, 2019

In Bangladesh, the Ministry of Fisheries and Livestock, and the Department of Fisheries (DoF) are working to prevent and control fish diseases. They also control, manage, and develop the Government fisheries, fishing, and fisheries beyond territorial waters (including deep sea fishing), fish harbor, quality-testing, laboratories, and other ancillary organizations. The Department of Fisheries (DoF) is working for the extension, management of fishing, project implementation, training, and human resource development; enforcement of laws and regulations; conservation, quality control, registration and certification, and fishing licenses. They are also working on awareness building, motivation, and policy administration (M. A. Rahman et al., 2018; Shamsuzzaman et al., 2017).

Recommendations for the policy and practice

Although the govt of Bangladesh is providing 1.6 million ID cards for the fishermen especially the fishermen of coastal areas, the inland fishermen are sometimes more or less deprived of the facilities. In light of the findings of the above-reviewed studies, some possible actions can be taken to enrich the fish diversity and enhance the socio-economic and health status of the fishing communities of Bangladesh:

- To protect the biodiversity by deepening the inland water bodies like rivers, lakes, “haor”, “beel” and other water bodies by regular dredging of rivers, getting right based water share of common rivers of Bangladesh and India for enough flow of water in the large river basins of Bangladesh.
- To protect the rivers from land grabbers, stop pollution of water from industrial wastes and chemicals, plastic materials, and oils, and use fewer chemicals and insecticides in crops.
- To establish permanent fish sanctuaries, stop making unplanned infrastructure on the rivers, impose seasonal banning on fishing in the rivers, ban illegal fishing nets and gear, and impose the banning strictly by the officials.
- To make alternative income sources for the fishermen during the ban, educating and training them to learn the proper way of fishing, conservation, and sustainable fishing.
- To establish educational institutions for the children of the fishermen and provide scholarships for a smooth education, ensuring better healthcare, sanitation, and electricity facilities.
- To make the fish market place nearby to the rivers so that fishermen can easily sell their fish, get better prices, stop middlemen from making profits, develop the roads and infrastructure, and establish ice factories for them.
- To ensure the fishing rights of the actual fishermen and protect them from robbers, political musclemen, thieves, and influential persons.
- To establish a fear, torture, and violence-free environment for the fishermen of all communities, ensuring their basic human rights and protecting them against all social evils.
- To provide GO and NGO-based loan facilities, assistance, allowance, and support during the ban periods, illness, disasters, and other natural calamities.

Moreover, an integrated approach is essential. In this case, the Ecosystem Approach to Fisheries Management (EAFM) can be applied in Bangladesh. And bio-psycho-social challenges of the fishermen can be reduced by applying the Person-in-Environment (PIE) of social work interventions. In this regard, macro social work interventions can be helpful as macro practice creates the empowerment of clients (persons) by concerning them with systemic and continuous changes (Azam & Mazid, 2022).

Conclusions

From the analysis of the findings of systematic reviews, it can be concluded that the fishermen of Bangladesh are excluded from mainstream society and are deprived of varied types of rights like education, better healthcare facilities, electricity, nutritious food, and sanitation. Besides, they are facing some sorts of challenges like insecurity, economic vulnerability, extreme poverty, less access to alternative sources of income, vulnerability to climate change and natural calamities, exposure to lots of diseases, and less access to modern housing and communication systems. The fishermen of river basins from 14 different rivers are suffering from large family pressure, social stigma, social exclusion, and social isolation well as they are suffering from poor access to market facilities, affected by the middlemen, less access to river fishing due to the territorial conflicts, political influence of the local politicians and musclemen. The fishermen are facing challenges like disturbances of dacoits, robbers, and thieves, political unrest, and insufficient credit supply from the GOs and NGOs. ‘Mohajon’ and ‘Dadon’ businessmen create pressure on the fishers and buy fish at a very cheap rate and fishers never get the real price of the fish. The fishermen are also found to suffer from insufficient fishing gear, boats, nets, and resources for fishing. In this regard, the government and concerned authorities should come forward to stand beside the fishers of the inland rivers of Bangladesh by providing training, education, resources, loans, security, and proper management. Pragmatic policies should be formulated in light of the macro social work interventions and the Person-in-Environment (PIE) approach. Ecosystem Approach to Fisheries Management (EAFM) can be applied to deal with the constraints and challenges of fishing in a pragmatic way. The paper suggests that some areas of the fishermen's community such as social status and dignity, health, and nutritional status, social safety issues and needs, security and human rights, and economic, climatic, and environmental vulnerabilities in the lives of the fishers can be studied in the future.

Notes

“Mohajon” means money lender

“Dadon” refers to rented money from moneylenders

“Jhar”/ “Katha” means a fishing technique using bamboo, tree branches and nets

“Current Jal” means fishing net made with nylon strings

“Haor” means marshy wetland ecosystem caused by large tectonic depression

“Beel” means lake like wetland

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