

Effectiveness of Formal Institutions' Management of Marine Fisheries for Sustainable Development in Bangladesh

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Abstract: This study is designed to examine formal institutions' effectiveness in managing marine fisheries for sustainable development in Bangladesh. Formal institutional management details the structure accountable for marine fisheries management, including government agencies and other stakeholders, and examines the difficulties they face. Subsequently, it will look at fisherman's compliance with fisheries rules and the elements that influence it, as well as the viability of the Fisheries Master Plan. This study used a mixed method of qualitative and quantitative approaches for data collection. The findings of this study show that formal institutions including government agencies and other stakeholders' fisheries legislation and policies have failed to solve the concerns related to marine fisheries. The understanding of the efficacy of formal institutions as well as the elements that influence their success is critical for adapting and enhancing present marine fisheries management for sustainable development in Bangladesh.

Keywords: Effectiveness; formal institutions; marine fisheries; sustainable development; management

1.0 Introduction

This research is conducted to study the effectiveness of formal institutions in marine fisheries management for sustainable fisheries development in Bangladesh. The study provides an overview of the institutional set-up that oversees marine fisheries management, with relevant government agencies and other interested parties. Moreover, it will analyze fishermen's consent to fisheries regulations and its causes, as well as discuss the feasibility of a fisheries master plan (FMP). For natural marine fish production requires a combination of well management and technical efficiency components that sustain the lifestyles of appropriate fishermen while allowing coastal communities, fishermen, and other marine users to actively engage. Fishermen in Bangladesh rely heavily on the marine fishing sector as a major or secondary source of income, employment, and livelihood. The coastal region's first-largest source of part-time and full-time jobs comes from this industry (Hossain et al., 2015, p. 84). It is a major source of food and money for the people living around the coast of Bangladesh (Nyawade et al., 2021, p. 3). Fishers' involvement has boosted marine and coastal fish output in the last decade, placing Bangladesh in

the 12th position globally (FAO, 2020, p. 20). In 2019-20, Bangladesh's fishing sector contributed 3.52% to GDP and 26.37% to agricultural GDP, 13% of Bangladesh's 170 million people rely full- or part-time on fisheries and aquaculture (DoF, 2020, p. 2). Since the early 2000s, the amount of marine fish caught has steadily increased, showing that the country's large population can be fed without sacrificing quality. Bangladesh gained a total of about 118,813, square kilometers and more sea area in a case with Myanmar and India for the Island of St. Martin, 12 nautical miles of state-owned sea area, up to 200 nautical miles of Bangladesh, Myanmar's bilateral monopoly economic zone borders and the right to the continental shelf Bangladesh through an International Arbitration Court (IAC) ruling on March 14, 2012 (Islam & Shamsuddoha, 2018, p. 45).

There is now excess fishing in most offshore waters where most artisan fishermen concentrate (Lokina, 2000, p. 2). As a result, governmental action is required to prevent the stock from depreciating. These should include licensing, seasonal closures, alternative economic activities for fishers, and community-based conservation measures. This study examines a variety of theoretical economic principles related to fisheries exploitation management as a means of ensuring economic sustainability. Mismanagement, violation of rules by intermediaries, fishermen's ignorance of natural catastrophes, a lack of adequate boats, ignorance of ship captains, and a lack of proper enforcement of government rules are all key issues in the marine fisheries.

It is vital to study about the configuration of management for marine fisheries as well as the difficulties that this pattern faces in management of marine fisheries in order to comprehend how formal institutions operate. Government agencies and other stakeholders involved in marine fisheries formal institutional management in Bangladesh are described in this document. Furthermore, the issues that government agencies and other stakeholders confront are examined in order to gain a better understanding of their success in regulating marine fisheries.

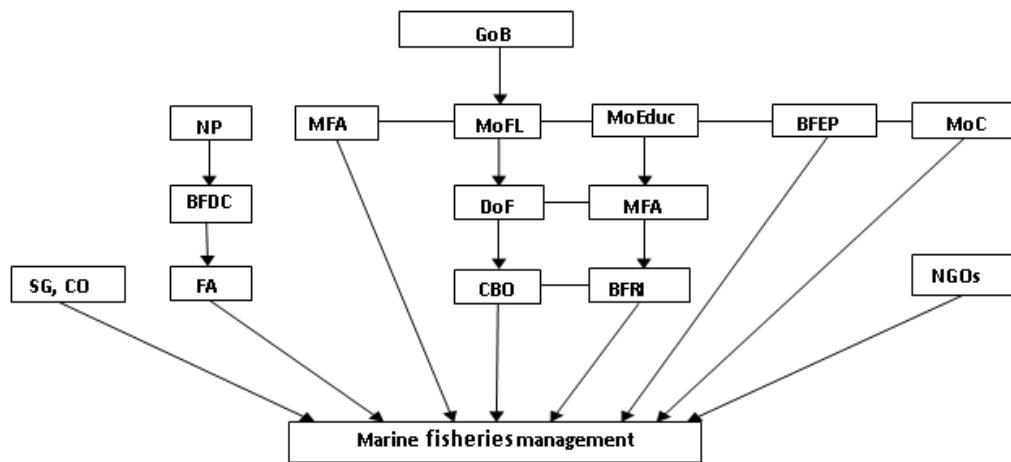
The objective of this paper is to assess the current state of marine fishery management in Bangladesh and highlight the strengths and weaknesses of the formal institutions responsible for doing so in the interest of long-term sustainability. To achieve this, using a methodologically consistent strategy based on cross-sectional data. The effectiveness of formal institutional management for marine fishing in Bangladesh has not been the subject of any written works to far. Fisher's groups, community norms, fisher expertise have all contributed significantly to local fisheries management despite the formal institutions' failure. According to this paper's findings, the depletion and decrease of marine fishing resources have been exacerbated by the inefficiencies of formal institutions.

2.0 Literature Review

2.1 The Marine Fisheries Management Institutional Structure

The formal institutional structure and the complexity of managing marine fisheries must be studied. This structure in marine fisheries management is required to explore to carry out the activities of formal institutions. This section defines the government agencies and other stakeholders in charge of Bangladesh's marine fisheries. Complex institutional and governance challenges, involving formal institutions, government, corporate, and civil society players, characterize the fisheries sector. Several organizations and institutes work in Bangladesh to improve and maintain fisheries. The Ministry of Fisheries and Livestock (MoFL) of Bangladesh is the main administrative body in responsibility of developing fisheries policy. The Department of Fisheries (DoF), Bangladesh Fisheries Research Institute (BFRI), Bangladesh Fisheries Development Corporation (BFDC), and Marine Fisheries Academy are the four agencies under MoFL. NGOs and social-political groups like Farmer's Associations (FA), Solidarity Groups (SG), and Co-management Organizations (CO) also contribute money, information, and encourage local fishers to participate in the management process.

Figure 1: Marine fisheries management in Bangladesh (Government institution and other stakeholders)



Source:(Rahman et al., 2018, p. 383; Sultana et al., 2003, p. 57)

2.2. Legal and Institutional Management for Marine Fisheries Resources

2.2.1 Institutional Activities

The DoF is an important part of the institutional environment; many other organizations are involved in or have an influence on the fisheries industry, its resource base, and associated livelihoods. Figure-1 depicts a simplified sketch of essential formal institutions; to this must be added numerous informal processes and interactions, both traditional and new that make up the institutional environment. Many formal institutions have an influence on the sector at the macro level, which may be

divided into those that have a wide impact across sectors, such as the Ministries of Finance and Planning, and those that have a more direct impact, such as the Ministries of Land and Water Resources. Many other ministries, such as those in charge of health, social welfare, and education are equally important to fishermen and their livelihoods.

2.2.2 Sanctioning a Different Coastal Law

Some laws directly influence our coastal fishing resources, yet they are ineffectual owing to irregularity with other policies, lack of inter-sectoral coordination, regulatory and institutional capacity, obsolete environmental laws, confusion about these laws, and public awareness. It is because of this that fish production is decreasing on a daily basis; a large number of fish species have been designated as endangered; and many coastal areas of Bangladesh such as Himchari, Nijhum Dwip, the Sundarbans, Sonadia and Teknaf, have already been designated protected areas due to their vulnerable status (Islam, 2004, p. 317).

Inshore fisheries of the Bay of Bengal's are overexploited, as confirmed by decreased catch per unit fishing effort and decreasing shrimp and fish populations (Hussain et al., 2010, p. 1). Destructive fishing is mostly blamed on the usage of some destructive gears such as set bag nets and monofilament gillnets, especially when fishing for small fish. The vast shrimp fry collection is another cause of overexploitation. An assessed yearly loss of 75.75 million non-target fin and shellfish larvae occurs during the wild capture of 1 million (Quader, 2010, p. 85). Fishermen in *hilsa* sanctuaries, in particular, frequently violate ban period rules and endure to employ a prohibited monofilament gillnet. As a result, disobedience with fishing laws and restrictions is leading to increased fishing pressure, the employment of damaging fishing methods and gears, and a proclivity to fish whatever is available, counting larvae and juveniles (Murshed-e-Jahan et al., 2014, p. 68). Pollutants from both point and nonpoint sources frequently end up in Bangladesh's coastal region. Ship-breaking activity in Chottagram, metropolitan trash from Khulna City (about 120-130 tons of wastes), and metropolitan wastes from Chottagram City via the Karnaphuli river are all point sources (Hossain & Islam, 2006, p. 12). Bangladesh's coastal population has doubled during the 1980s, reaching more than 16 million (about 10% of the overall population), the majority of whom are poor and vulnerable to fast experimental changes (Fernandes et al., 2016, pp. 1–2). Overfishing, indiscriminate slaughter of the young species, pollution, disease defects, and insufficient fish protection regulations, among other issues, are now plaguing marine fisheries (Planning Commission, 2015). Increased fishing pressure, usage of damaging fishing procedures and gears, and a predisposition to fish whatever is accessible, containing larvae and juveniles, come from non-compliance with fishing laws and rules and attempts by marine fishers to sustain their livelihoods by any means feasible (Murshed-e-Jahan et al., 2014, p. 66). Not only does this harm marine fisheries resources, but it also fosters friction between fishermen and other resource users (Islam, 2004, p. 317; (Hussain et al., 2010, p. 3). In Bangladesh, there is no particular policy or legislation for the management and regulation of marine fisheries; however there are certain general fisheries rules that govern the coastal fisheries. A plethora of laws, norms, and policies control

fisheries management, but their execution frequently encounters disputes as well as non-compliance by parties, resulting in bad governance (Islam et al., 2017, p. 144). Bangladesh's coastal and marine fisheries are poorly managed for a variety of reasons, one of which being a lack of adequately enforced rules (M. Rahman et al., 2003, p. 708).

2.2.3 The Main Aspects of Essential Coastal Fisheries Policies and Legislation

It is difficult to determine the presence of maritime fisheries in terms of legal identity despite the fact that they have similar characteristics. This situation also pertained to identifying regulatory difficulties in the context of having a distinct legal agreement (Ehsanul Habib, 1999, p. 112). In the implementation of inland laws in coastal regions, there is a contradiction between their jurisdiction and that of marine laws. In our nation, there are certain interior laws, marine laws, and legal authorities that are applied to coastal fishing, either directly or indirectly (Ehsanul Habib, 1999). Permanent Settlement Regulation 1, 1793; The Private Fisheries Protection Act, 1889; State Acquisition and Tenancy Act, 1950; The Protection and Conservation of Fish Act 1950 and Rules 1985; The Marine Fisheries Ordinance 1983 and Rules 1983; and National Fisheries Policy 1998 are the legal instruments in question.

Policies, laws, and ordinances appear to exist. The procedure for producing the 1983 marine fisheries policy, the 1998 fisheries policy, and related publications used a "top down" approach, giving the national development plan mechanical primacy. It was found that most policy papers contained regulatory elements such as definitions and provisions, administrative roles and responsibilities, ordinance imposition, delegations of powers, fishing and vessel license, local marine fishing operations; local vessel registration; vessel certification; and prohibited fishing. Some policy documents included a line or two about ecosystems, habitats, marine reserves, and sanctuaries. People who live off the water, estuaries, offshore islands, mangroves and their contents appear to have been disregarded in the policy-making process. The legal criteria related to coastal fisheries are discussed here, both directly and indirectly.

2.2.4 Species and Fishing Gears Influence

Despite not being expressly mentioned in contemporary fisheries and marine fisheries policies and legislation, some forms of fishing tend to substantially influence marine fisheries policy (most prominently Hilsa and black tiger shrimp). Fishing license issuance, legislation controlling fishing vessel operation, and seasonal fishing limitations all impede Bangladesh's vital shrimp and Hilsa fisheries. Increased knowledge and representative involvement among persons related to certain major fisheries may influence national policy formulation. Environment Policy-1992 urged for maintaining the status on exploitation of coastal and marine fish in one of its subsections. The 1997 Environment Conservation Rules amended numerous provisions of the 1992 Environment Policy.

2.2.5 Modernize on Marine Fisheries Policy

A five-year policy review is not realistic in Bangladesh. In the same vein, technological advancements, recent events such as the International Tribunal for the Law of the Sea (ITLOS) rulings and protection of Large Marine Ecosystem (LME) and Marine Protected Areas (MPAs) should be included. Stakeholders should agree on explicit sectoral decisions. The development of marine fisheries requires study. Other maritime nations' policies can be used to validate existing policies and determine if revisions are required. Bangladesh's Environment Department has published various outdated environmental standards. A national action plan usually addresses maritime environmental concerns. Bangladesh typically creates national action plans in response to transient situations. Some components of current fisheries and marine policies appear to be contained in a "Coastal and Marine Strategy".

2.2.6 Long-Term Policy Perspective

A long-term perspective for resource monitoring and management is lacking in present marine fisheries policy and literature. Every 10 years, marine fisheries policy should be evaluated to reflect changes in government law, climate, and international rules of behavior. To facilitate national policy improvements, all research initiatives should incorporate fisheries research. The Bangladesh Fisheries Research Institute and the DoF often improve fishing conditions. A bigger national marine development strategy and planning framework are required to include all critical components of long-term sustainability.

2.2.7 Marine Environmental Policy Process

Due to sudden understanding of climate change issues and/or periodic needs of the country's Department of Environment (DoE), Bangladesh does have some type of national environmental planning that encompasses biodiversity protection strategies. The Bangladeshi government declared a region "ecologically crucial area (ECA)" in an official gazette. However, further notice is required to avoid ECA violations. The 1992 Environment Policy promoted coastal and marine habitat conservation. Similarly, Bangladesh's Environment Protection Act of 1995 mandated an ECA. New coastal and marine policy problems addressed by the 1997. Forest-related ecological problems are normally raised by the DoE.

2.2.8 Policy Implementation on Monitoring and Evaluation

Fisheries policy implementation is largely dependent on effective monitoring of policy status as well as evaluation of the effectiveness of fisheries and marine fisheries management and mitigation approaches. This ensures the desired reduction of marine fisheries stresses as well as improvements in fish and fisheries quality on an output basis, which is a major part of the job. It indicates that fisheries and associated policies do not have enough evaluation and monitoring provisions, as well as effect evaluations based on policy implementation and interventions, at least at this point.

2.2.9 Participation of Stakeholders in Policymaking

When writing policy documents, a top down approach should be avoided, and broad involvement should be guaranteed when drafting a national development plan. The policy papers are not like sacred texts; they are alive and thriving. All aspects of coastal and marine fisheries should be included in policy documents on marine fisheries. The future design of maritime policy should involve actual and diverse players in the sector, and the policy conversation should not be limited to the capital city. The majority of stakeholders in maritime fisheries live outside the designated zones, and their views should be obtained through on-the-spot inspection and comprehensive conversation.

2.3.0 Other stakeholders

2.3.1 Problems of Social – Political Groups

In Bangladesh's general political system, socio-political groups are a formal and vital feature. These groups play a critical role in aiding government agencies with credit and extension services, as well as raising public understanding of fisheries rules. There are many socio-political groups; yet this unit only contains the most of three significant and participating groups involved in the study site's marine fisheries management.

Local farmers can join the Farmer's Association (FA) regionally and nationally. The FA's role in marine fisheries management is to help local governments. The fishing commune has a head, a vice head, and FA executive board members. Fishing enthusiasts are more inclined to observe the regulations of the water and work together as a consequence of the FA's efforts. The FA also gives information about fish markets and the prices they might anticipate to pay for their catch. To foster technical progress and transmission of innovative technologies, the FA collaborates with local governments.

The commune authority also formed six Solidarity Groups (SGs) in addition to the FA. The SG's goal is to bring together fishermen who use the same fishing gear to share their knowledge, assist one another in fishing, and raise members' understanding of the need of maintaining marine fisheries. A non-salaried executive board, consisting of a head, a vice head, and the group members, leads each organization. The commune government regulates and oversees all of these groups. The members of the group contribute to the budgets for the group's operations.

Co-management Organization's (CO) major goal is to get local fishermen to participate in approved fishing practices and conserve marine fisheries in the area. An unpaid executive board, which includes the organization's president, vice president, treasurer, clerk, and other members, also oversees the operation of the organization. The vice president of the commune also serves as the CO's head. CO is made up of the villagers' elected formals. The commune authority is also in charge of and responsible for this organization.

The first steps of co-management are critical in laying the groundwork for adaptive knowledge and allowing partners to change resource management plans and strategies, as well as decision-making norms (Berkes, 2009, p. 1692; Chuenpagdee & Jentoft, 2007, p. 658). Co-management of fisheries necessitates the creation of a new organization to bring stakeholders together for decision-making and execution. The legislation of a country can guide the establishment of a co-management structure, which can even be built on top of pre-existing committees and agreements. Depending on the size and style of the fishery, these committees may be created in landing centers, fishing communities, or on the shore.

The management of inland fisheries resources in Bangladesh has used community-based fisheries management (as a template for co-management systems) for a long time, (Firoz Khan et al., 2016, p. 1) but little research has been published on the country's estuary or coastal fisheries (Ayers et al., 2017, p. 390). According to the Bangladeshi government's National Conservation Strategy 2016, there is a need to build a legal framework that recognizes and supports community-based co-management methods in fisheries systems (Islam, 2016, p. 33). Recent policy initiatives include the decentralization of power to village-level management, promoting increased engagement of a wide range of groups and organizations. As a result, the Bangladeshi hilsa shad fishery was able to begin the implementation of a co-management approach.

2.3.2 Non-Government Organizations (NGOs)

To achieve better co-management governance and to achieve more beneficial results, such as improved compliance with the established norms, varied actors (such as communities, civil society groups and government agencies) may contribute, commit and collaborate in order (Chuenpagdee & Jentoft, 2007, p. 658; d'Armengol et al., 2018, p. 213). Donors and NGOs were given roles in open-water fisheries management under the New Fisheries Management Policy. To increase local fishermen's involvement in fisheries management, government plans to "work in partnership with NGOs and fishing communities, mobilizing NGOs' experience in human development training and organization building to create alternative or supplementary income opportunities for fishermen and thereby reduce pressure on the fisheries" (Pomeroy & Carlos, 1997, p. 448). NGOs have been involved in a variety of community-based management initiatives.

Fisheries co-management requires an appropriate allocation of power in order to achieve favorable outcomes (Cinner et al., 2012, p. 5220). To achieve both socio-economic and biological objectives, communities should be given the opportunity to participate in decision-making under co-management systems. It is imperative that implementing partners (NGOs) support communities in strengthening their own capacity by providing them with educational opportunities, raising public awareness, and creating management plans. NGOs, on the other hand, should only be participating in the process for a short period of time before they are phased out (Pomeroy et al., 2001a, p. 199). If the local political system is against the

co-management model, it is quite improbable that it will last (Pomeroy et al., 2001a, p. 200; Sultana & Thompson, 2007, p. 528). With suitable national law, local governments can utilize their authority to structure and balance their interactions with non-governmental organizations (NGOs) (Wilson et al., 2006, p. 527). This would improve the ability to adapt to new problems in aquatic resource management, such as dispute resolution (Ratner et al., 2012, p. 133).

As mentioned before, marine fisheries in Bangladesh are managed by an established institutional framework. Marine fisheries resource management has been unsuccessful because of this formal system's inefficiency. As a result, there is a pressing need to revamp Bangladesh's existing approach to marine resource management by encouraging the presence of formal institution structures dedicated to ensuring the marine sector's continued growth and sustainability. The long-term survival of the people living along the coast of Bangladesh depends on the health of the marine fisheries, which this plan seeks to protect by reducing the pace of overfishing.

3.0 Methodology

The study employs an interdepartmental holistic approach to understand organizations using a case study. Participatory observation, a family survey, and focus groups, are all employed to cross sectional data for the study, which is a combination of qualitative and quantitative methods. This article makes use of both secondary and primary sources. The Fisheries Master Plan (FMP), Fisheries Laws (FL), decrees, and circulars can help in understanding formal institutions, while annual reports from the local government can provide insight into the physical and social dynamics of the study area. The research survey is conducted on 85 households in the study area along with 10 interviews, 04 group discussions to gather primary data. The researcher interviewed three key informants to learn more about marine fisheries management and its problems, as well as the reasons for noncompliance with fisheries regulations and FMP measures.

4. Performance and factors of formal legislative framework

This section assesses the effectiveness of the formal legislative framework for managing marine fisheries, which might shade light on the efficacy of formal institutions more generally. This part begins by examining the efficacy of the Fishery Law and other supplementary documents by looking at fisherman's compliance levels with fisheries rules and the elements that influence this level of compliance. Local fisheries managers and policymakers will utilize the research results to establish plans for managing marine fisheries effectively and sustainably. The viability of the FMP is next assessed by looking at how successful it is in practice.

4.1. Fishermen's Compliance to Fisheries Rules

This section assesses fishers' adherence to fishing distance, fishing gear mesh size, and minimum aquatic species size. These are the most significant regulations for marine fisheries protection, restoration, and development. The

fishermen's adherence to these regulations can also help determine the ecological component of sustainable development.

In practice, all boats violate the fishing distance rule. The Bangladeshi maritime fisheries management plan requires industrial boats with a total engine capacity of 716-1850 hp to operate offshore routes over 40 nm, and boats with a total engine capacity of 420-600 hp to run inshore routes within 40 nm, and 1-20 hp to operate coastal routes (1 – 10 nm) (DoF, 2021, p. 6). Contrary to the results of the household survey, 78% of shrimp boats with 716-1850 hp total engine power fish along the coast and inshore routes (Table 1). Coastal fishermen most commonly use dinghi boats, with 70% breaking the law. Champagne boats come in third, breaking the rules 62% of the time. Only 20% of bamboo baskets do not meet the criterion (Table 1).

Table 1: Violation of fishing distance of Shrimp trawler, Champagne boat, Dinghi boat, and bamboo basket

Boat	Hp	Respondent and percentage	fishing distance (nm)			Compliance fishing location (nm)	% of violation
			1-10	11-40	41 - above		
Shrimp trawler	716–1850	n= 85	5	66	14	41- above	78%
		% of shrimp trawler	6%	78%	16%		
Champagne boat	420 – 600	Count (n= 18)	0	10	6	11-40	62%
		% of Champagne boat	0%	62%	38%		
Dinghi	1-20	Count (n =10)	3	7	0	1-10	70%
		% of dinghi boat	30%	70%	0%		
	21-50	Count (n = 10)	2	8	0	11-20	20%
		% of basket boat	20%	80%	0%		
Bamboo basket	Coastal area	Count(n = 15)	12	3	0	1-10	20%
		% of bamboo basket	80%	20%	0%		

Source: Household survey, 2021

All of the fishing gears on the research location have average mesh sizes that are less than the required standard. According to the Marine Fisheries Rules, 1983 (No. S.R.O. 349-2/83, Section 55, Article 14), fishermen are not authorized to use fishing gear with mesh sizes less than the prescribed specifications (MoA, 1983, p. 5798). The findings of the household survey show that the average lowest mesh size of a single trawl net employed by offshore fishermen is 16.60 mm, which is much less than the authorized size of 50 mm ($P < 0.001$) (Table 2).

Furthermore, according to the report, a large percentage of single trawl nets (78%) utilized by shrimp boats with engines with a total capacity of more than 716 hp are employed to fish in coastal sea regions (Table 3). The analyzed result clearly shows that offshore fishermen employing single trawl nets break the regulations in terms of lowest mesh sizes and fishing distance.

Table 2: Single trawl net average mesh size

Test Value = 50 (mm)								
Average mesh size (mm)	N	Mean	t	df	Sig. (2tailed)	Mean Difference	95% Confidence Interval of the Difference	
							Lower	Upper
	35	16.60	-18.530	34	.000	-21.20	-23.50	-20.80

Source: Household survey, 2021

Table 3: Violation single trawl mesh size

No.	Trawler distance (nm)	No. of single trawl net used by shrimp boat (716–1850 hp)	Percentage (%)
1	1 – 10	4	10%
2	11– 40	28	70%
3	41 –above	8	20%
Total		40	100%

Source: Household survey, 2021

Coastal fishermen that use three-layer nets, like offshore fishermen, infringe the law in two ways: the lowest mesh sizes and the fishing distance. Coastal fishermen utilize three-layer nets with a mesh size of 50 mm on average, which is less than the required size of 54 mm ($P < 0.001$) (Table 4). Furthermore, according to the report, 20% of the three layer nets utilized by bamboo baskets with motors with a total capacity of less than 20 hp are used to fish inshore rather than on the coast (Table 5).

Table 4: Average mesh size of three layer net

Test Value = 54 (mm)								
mesh size of three layer net (mm)	N	Mean	t	df	Sig. (2tailed)	Mean Difference	95% Confidence Interval of the Difference	
							Lower	Upper
	15	41	-4.70	14	.000	-3.000	-6.40	-3.50

Table 5: Violation of fishing distance three layer net

No.	Fishing distance (nm)	No. of three layer net used by bamboo basket (1 – 20 hp)	Percentage (%)
1	1 – 10	8	80%
2	11 – 40	2	20%
Total		10	100%

Source: Household survey, 2021

4.2. Reasons of Non-Compliance of Fisheries Regulations

The ability of government entities to enforce fishery restrictions is limited in the study area. First, as previously noted, ineffective enforcement has come from an unreasonable organizational structure as well as budget, human force, and facility constraints. The Divisional Fisheries Resources Surveillance Forces (DFRSF), which operates at the divisional level, is in charge of enforcement at the research site. However, due to human resource, financial, and equipment constraints, the DFRSF is unable to do so. Meanwhile, the lower levels of government, such as the district and community levels, are not permitted to enforce or monitor anything. Even if the district and community levels had the power, they would be unable to police fishing operations due to a lack of personnel, funds, and infrastructure. Furthermore, according to the fisheries authorities, the fines are not severe enough to prevent fishermen from breaching the law.

The main reason for non-compliance, according to both fisheries officials and experienced fisherman, is regulation inconsistency. Part 1 of Bangladesh's marine fisheries management plan controls boat capacity and fishing distance. To operate on offshore routes beyond 40 nm, boats with 716-1850 hp total engine capacity are necessary. Experts say vessels with less than 450 hp cannot fish offshore using bottom trawl nets. In offshore seas, thicker nets allow more fish to escape, resulting in fishing failure. This is due to the fact that the offshore fishing route currently has higher input costs than the coastal fishing route.

The household study found that local fishermen's main worries are the rise of input prices and the decrease of fish catches. Living cost increased mentioning as a problem by 90% of families questioned. Fuel costs, which account for around 80% of input costs, have climbed from 20% to 25% every year, although fish prices have only risen by 3%. Second, 90% of households questioned see a decline in fish yield. Overfishing happens due to the use of damaging fishing gear and population increase, resulting in a drop in fish productivity (Group discussion, 2021). The challenges of growing input costs and declining fish yields drive fishermen to capture as much as they can by destroying fishing gear and fishing in areas where they can catch more fish (Group discussion, 2021).

The fisheries officers state that the dramatic growth in the population and quantity of fishing boats have resulted in a slew of management challenges that far outnumber the government's capacity to address. The authorities are unable to monitor all of the operations of such a vast number of fishermen, particularly given the limited budget, facilities, and managerial team.

5. Results and Discussion

The formal institutions have failed to manage marine fisheries due to inadequate management structures, high levels of non-compliance, and a lack of fisheries policy implementation. Human resources, finances, and equipment are few in government and socio-political institutions, limiting managerial ability. Given the illogical

organizational structure, enforcement is poor. Resource management studies show that regular surveillance of a broad fishing area is impossible owing to lack of experience and funds (Dirhamsyah, 2005, pp. 264–267). A lack of severity and certainty of punishments also limits the government's ability to enforce. Normally, fishermen follow guidelines based on their own cost-benefit calculations (Pomeroy et al., 2001b, p. 204). If the costs of breaking the rules outweigh the benefits, users will break them. This is especially true when enforcement is weak (Kuperan & Jahan, 2020, p. 109). In the research area, penalties for violating fishing laws are substantially lower than fishermen's revenue.

Weak enforcement leads non-compliance with fishing laws (Boonstra & Bach Dang, 2010, p. 1266). Moreover, non-compliance by fishermen is due to incompatibility of fishing rules with reality (Raakjær Nielsen & Mathiesen, 2003, p. 411). One of the primary causes, non-compliance is the incompatibility of boat capacity, fishing distance, and fishing tactics. In addition, the rise of input costs and the expansion of population drive local fishermen to catch as much as possible regardless of the rules. Increasing input costs and degrading fisheries encourage fishermen to use harmful fishing gear and fish in illegal areas to get more fish (Boonstra & Bach Dang, 2010, p. 1266). Increasing immigration rates and population increase result in the government being unable to oversee and monitor all fishing operations. Also, population difficulties put stress on coastal resources, causing deterioration. Fish stock depletion diminishes fishing revenue and exacerbates poverty in fishing communities in developing nations (Pomeroy, 2012, p. 522). To avoid losing money, fishermen may bypass restrictions and other management measures (Pomeroy, 2012, p. 523).

In terms of policy failure, there is a clash between development and conservation goals (Cochrane, 2000, pp. 10–11). There is often a contradiction between resource protection and economic growth. In spite of its significance, resource conservation receives little attention from fisheries management. Most fisheries managers are worried about the economic advantages (Christie & White, 1997, p. 175; Cochrane, 2000, p. 6). The local administration prioritizes socio-economic goals over marine fisheries protection in the study area. While the marine fisheries are reduced, the number of vessels has grown. Also, present regulations fail due to a top-down approach that ignores local realities and environment (Acheson, 2006, p. 125). So the policies are unlikely to be generally adopted (Asafu-Adjaye, 2000, p. 924). As a result, the FMP supports non-fishing occupations. However, due to their lack of education, the fishers in the study area are unable to obtain work. Moreover, local fishermen do not want to give up fishing since they enjoy it. In terms of natural circumstances, sandy ground, lack of water storage capacity, and large waves restrict local fishers from aquaculture and farming. The FA, SG, and CO were unable to give aquaculture instruction and assistance to local fishermen due to their shortcomings. A lack of formal institutions leads to the failure of sustainable fisheries development via socio-

economic growth and conservation of marine fisheries for long-term livelihoods of coastal people. Locals continue fish despite the decline and depletion of marine fisheries (Charles, 1994, p. 202). Institutions must be successful in order to achieve ecological, socio-economic, and communal sustainability. Marine fisheries play a crucial role in regional economies and in the daily lives of local residents. But the number of fish harvested annually is diminishing because of damaging fishing practices and increased demand upon fish sources by a fast growing population. Protecting this resource requires the participation of formal institutions, such as government agencies and other stakeholders, and a legislative framework for managing maritime fisheries.

6. Recommendation

Marine fisheries of Bangladesh have more opportunities of development to enhance the national economy and in its SDG 2030, set a target to attain the goals and self-efficacy in fishing sector. To take an appropriate long-term policy Bangladesh gaining the self-sufficiency in marine fish production. In the design of marine fisheries policy, to require departmental management of inter-government, alliance between governmental and NGO's and community based participation are of vital importance. So that realized the latent, it requires to regulate the principle laws and legislation for the sustainable marine fisheries management and protection of marine fisheries resources in Bangladesh. The fisher's, boat owners, *arotders*, suppliers, fish processors, traders and consumer's overall are required to realize these staples to be involved the marine fisheries management policies for getting advantage from the whole process. The marine fisheries management procedures should consist of regulating fish intensity at an ecological level, regulate gear selectivity, mesh size, and gear type implementation of ban period, barred fish sanctuary, and distribution of marine fisheries resources for example manpower, funding, subsidy etc. Following the marine fisheries policy, the government of Bangladesh essentially to formulate a complete legal framework for the appropriate management and application of its resources for the resolve of the sustainable development of Bangladesh and prosperities of its peoples.

7. Conclusion

Apart from the FL and additional papers, the FMP is significant in the formal legal framework since it directs the development of the fisheries industry not only for the present but also for the future. As a result, this paper investigates the FMP's capacity to clarify the efficiency of the formal legal framework, as well as whether the FMP's goals of sustainable fisheries development in terms of socio-economic growth and marine fisheries conservation can be met. Furthermore, this study is necessary to comprehend the elements that contribute to the FMP's infeasibility. The FMP promotes sensible offshore fishing development in order to decrease strain on coastal marine fisheries. This concept, however, appears to be hard to implement by local fishermen since offshore fishing necessitates a substantial financial commitment that surpasses their capabilities. To manage marine fisheries

in Bangladesh, formal institutions, including government agencies and other stakeholders, have been developed and structured from the national to the local level. Despite this, formal institutions have failed to manage marine fisheries owing to lack of capacity, non-compliance with rules, and policy failure. Formal institutions' inefficiency leads to the failure of sustainable fisheries development via socio-economic growth and conservation of marine fisheries for long-term livelihoods of coastal people. Finally, the study concludes with a discussion of the issues that affect the performance of formal institutions in marine fisheries management. For sustainable fisheries development, it is important to understand the factors that affect the effectiveness and efficiency of formal institutions in adjusting and improving the current management of marine fisheries resources.

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