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General Article

Constraints and Prospects of Sustainable Fisheries Management in Bangladesh

Md. Mostafa Shamsuzzaman[1,2 *], Xu Xiangmin[1], Nusrat Jahan Tania[1] & Md. Abdullah Al-Mamun[3]

[1]Environmental & Resources Protection Law, Ocean University of China, Qingdao 266100, China
[2] Department of Coastal and Marine Fisheries, Sylhet Agricultural University, Sylhet-3100, Bangladesh
[3]Department of Fisheries, Marine Fisheries Office, Chittagong 4100, Bangladesh.

[*][Email: sakilimsf@gmail.com]

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Fisheries sector of Bangladesh plays an important role in food security, employment, foreign exchange earnings and different other facets of the economy. The findings of the present study show that the yield of the floodplain, ponds, seasonal water logging area, artisanal fisheries, estuaries, and rivers are varied; there are various limitations on expansion to their potentials. Several factors are identified as threats to the sustainability of the fisheries resources that includes over-exploitation, pollutants like agrochemicals, industrial wastes, lack of stock assessment to set MSY, underprivileged enactment of fisheries laws and regulations, the inadequate spread of fish farming technology, low financial capacities, and ineffectiveness extension practices.

[Keywords: Inland capture fisheries, Aquaculture, Coastal and marine fisheries; National fisheries policy, conservation of fish, Fish production growth]

Introduction

The Fisheries resources play a great role in meeting the demand of animal protein and socio-economic development of Bangladesh[1]. Fish is a natural complement to the staple food rice, thus, it is called *Maache-Bhate Bengali* ("a Bengali is made of fish and rice")[2]. Fish alone contribute about 60% of animal protein intake[3]. In addition to being a critical supply of nutrients, fish is likewise a major a part of Bangladeshi culture. Some 15 million people (out of an overall population of 155 million) are anticipated to be either at once or indirectly employed within the fisheries areas while approximately 73 percent of rural families are involved in aquaculture[4,5]. This accounts for 4.37% of GDP, even as presenting greater than 2% of export earnings, and affords employment to extra than 2 million people[6]. Regardless of its important role fisheries sector in Bangladesh is susceptible to over-exploitation, degradation, and overcapitalization, to mention a few stressors. These threats and stressors undermining the sustainability of the fisheries resources of Bangladesh. The main and broad objectives of this paper are to study current developments in fisheries sectors in Bangladesh and to evaluate the constraints that inhibit its fuller utilization of its potential. This analysis leads us to conclude with an assessment of some opportunities for future improvements of Bangladesh fisheries.

Materials and Methods

This study was conducted using the information from different secondary sources. Collected data were retrieved from peer-reviewed articles or periodicals and government gazettes. „Fisheries resources" „Inland fisheries" „Marine fisheries resources" „Fishery Policies, Acts and Ordinances in Bangladesh" etc. were the keywords for searching information. Further information was also collected by Bangladesh Fisheries Development Corporation, Directorate of Fisheries of Bangladesh Government. All of the gathered data were reviewed; synthesized and relevant information was used.

Results and Discussion

Bangladesh is suitable for fish production, possess one of the uppermost man water proportions in the earth, at 20 personages per ha of water area[7]. The fisheries sector in Bangladesh broadly divided into three sub-sectors such as inland open water (capture), inland closed water (culture) and marine fisheries (Table 1)[8]. Being the biggest delta in the world and brings a large volume of water of the three major river

systems, i.e. The Ganges, Brahmaputra and Meghna (GBM), freshwater fishes of Bangladesh are the third richest in biodiversity in the world, after China and India[9]. With the Bay of Bengal in the south, Bangladesh is also blessed with rich coastal and marine ecosystems, hosting a wide range of biodiversity, such as fishes, shrimps, molluscs, mammals, crabs, seaweeds, etc. The harvest of marine capture fisheries was 379,497 tons for the duration of 2000-2001 and that upraise up to 595,385 tons‟ period of 2013-2014 (Table 2).

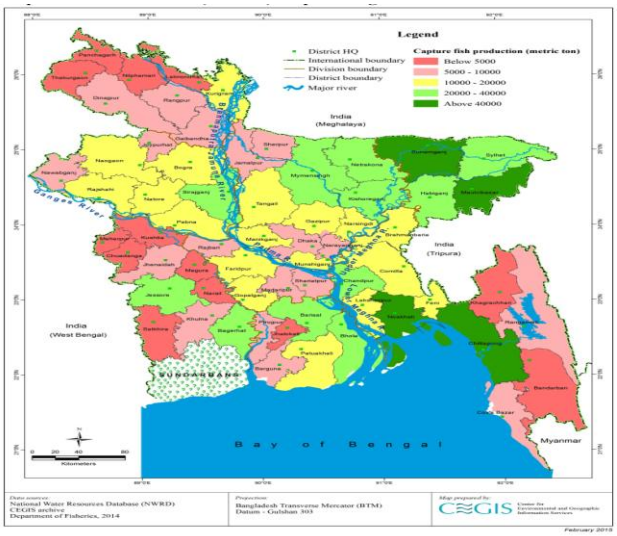

Fig. 1- District wise Inland open water (capture) fisheries map[6]

The overall area of inland open water fishery exists 4.337 million ha; of which 4.047 million ha is capture water bodies together with floodplains[10]. A complete of 260 indigenous freshwater bony fish species suitable for human consumption, belonging to 145 genera and 55 families[11], therefore, establishes an identical rich aquatic biodiversity (Table 2) and (Fig. 1). Worldwide inland capture fisheries production placed Bangladesh number fourth among the 15 leading countries[12]. The entire area of inland closed (culture) water fisheries bodies is 0.29 million ha with littoral shrimp farms[10]. In Bangladesh, the overall pond area is 1, 46,890 hectares and ox-bow lakes (baors) is 5,488 hectares[8]. Among various segments of the fisheries sub-sector, the inland aquaculture experienced the fastest growth through adoption of new technologies, species, and intensification and improvement of farming, particularly in pond aquaculture, entirely over the country[13] (Fig. 2). Among the global top 15 leading producer‟s countries, Bangladesh positioned fifth in inland aquaculture of finfish[12].

Table 1. Sector-wise Annual Fish Production in Inland and Marine Fisheries 2013-14[8]

Sector of Fisheries	Water Area (Hectare)	Production (Metric Ton)	%	Productivity
A. Inland Fisheries				
(i) Inland Open Water (Capture)				
1. River and Estuary	853863	167373	4.72%	196 Kg/ha
2. Sunderbans	177700	18366	0.52%	103 Kg/ha
3. Beel	114161	88911	2.51%	779 Kg/ha
4. Kaptai Lake	68800	8179	0.23%	119 Kg/ha
5. Floodplain	2695529	712976	20.09%	265 Kg/ha
Capture Total	3910053	995805	28.07%	
(ii) Inland Closed Water (Culture)				
6. Pond	371309	1526160	43.01%	4110 Kg/ha
7. Seasonal cultured water body	130488	193303	5.45%	1481 Kg/ha
8. Baor	5488	6514	0.18%	1187Kg/ha
9. Shrimp/Prawn Farm	275274	216447	6.10%	786 Kg/ha
10. Pen Culture	6775	13054	0.37%	1927 Kg/ha
11. Cage Culture	7	1447	0.04%	22 Kg/cum
Culture Total	789341	1956925	55.15%	
Inland Fisheries Total	4699394	2952730	83.22%	
B. Marine Fisheries				
12. Industrial (Trawl)		76885	2.17%	
13. Artisanal		518500	14.61%	
Marine Fisheries Total		595385	16.78%	
Country Total		3548115	100%	

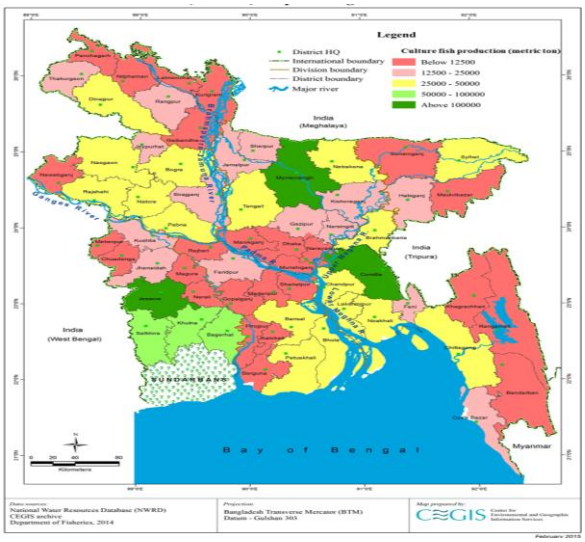

Fig. 2- District wise Inland closed water (culture) fisheries map[6]

The entire area of inland closed (culture) water fisheries bodies is 0.29 million ha with littoral shrimp farms[10]. In Bangladesh, the overall pond area is 1, 46,890 hectares and ox-bow lakes (baors) is 5,488 hectares[8]. Among various segments of the fisheries sub-sector, the inland aquaculture experienced the fastest growth through adoption of new technologies, species, and intensification and improvement of farming, particularly in pond aquaculture, entirely over the country[13] (Fig. 2). Among the global top 15 leading producer‟s countries, Bangladesh positioned fifth in inland aquaculture of finfish[12].

The coastal and marine fisheries are playing significant roles not principally within the social and economic development of the country, however conjointly within the local ecological balance[14]. Taking under consideration major river inlets and estuaries, that are collectively very much a part of the marine environment, the whole marine waters of Bangladesh stand at 121,110 sq. Km, of which coastal waters and the shallow shelf sea constitute about 20% and 35% respectively, the rest (45%) mendacity in deeper waters[15] (Fig. 3). 511 marine species, together with shrimps, are identified in Bangladesh‟s marine waters[16].

Total fish production in Bangladesh in 2013–2014 was 3548115 MT, of which 995805 MT (28%) were from inland open waters, 1956925 MT (51.15%) from inland closed waters and 595385 MT (16.78%) from marine fisheries (Table 1 and Fig. 4). The largest four contributors to total inland production (including capture and culture), during 2013-2014, are floodplains (20.09%), rivers and estuaries (4.72%), ponds (43%), and Seasonal culture (water logging area) (5.45%) (Table 2). In the 2013-2014, contribution from a marine artisanal sector that was 14.61% (Table 1). The yearly increasing rate of overall fish production in Bangladesh for the year 2000–2001 to 2013-2014 was 7.20% to 4.04% that indicated decreasing trend with highest 7.32% production in 2009-2010 (Table 2).

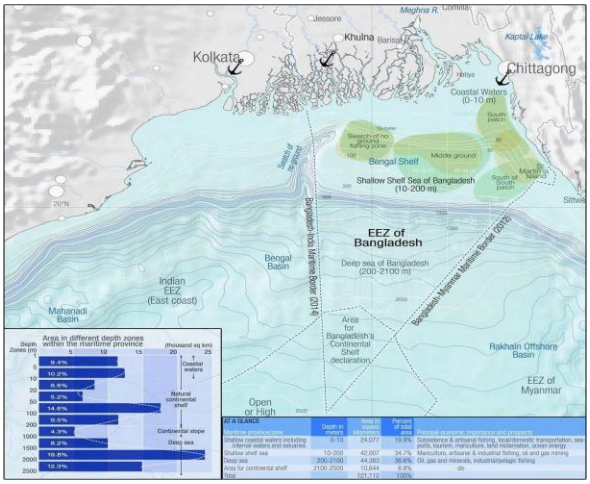

Fig. 3- Maritime area of Bangladesh (Source: Chowdhury, 2014)[15]

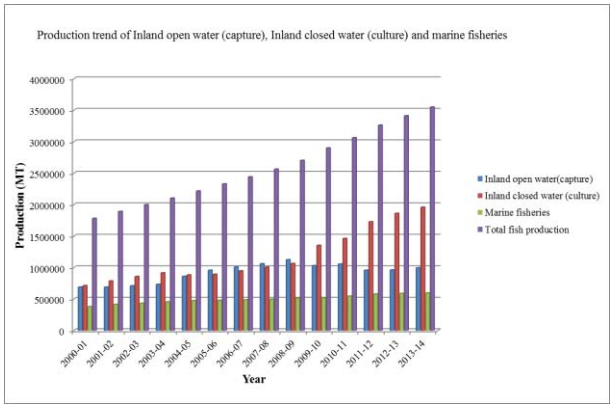

Fig. 4- The yield of Inland open water (capture), Inland closed water (culture), marine fisheries and total fish production in Bangladesh from 2000-2001 to 2013-2014[8]

The As indicated in Fig. 4, inland open water fisheries are still the major provider for the total fish production, but their contribution has been declining, from 38.68% in 2000–2001 to only 28.06% in 2013–2014, whereas inland closed water fisheries has been contributing increasingly, from 40.01% in 2000–2001

to 55.15% in 2013–2014. In the similar period, the role of marine fisheries drops from 21.30% to 16.78%. In the Bay of Bengal, production of the marine fisheries has grown steadily, but relatively slowly since 2009–2010 (Fig. 4). The average yield (annual fish harvest per hectare in MT) in open inland waters declined throughout the 2000-2001 but improved strongly afterward.

Table 2. The yield of Inland open water (capture), Inland closed water (culture) and marine fisheries, Bangladesh from 2001-2002 to 2013-2014 (MT)8

Fisheries Sector (Year)	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
A.INLAND FISHERIES	1401560	1475039	1566289	1646819	1741360	1848735	1952573	2065723	2186726	2381916	2515354	2683162	2821266	2952730
(a) Inland open water(capture)	688920	688435	709333	732067	859269	137859	136958	136812	138160	141148	144566	145613	147264	167373
1.River & Estuaries	150129	143592	137848	137337	139798	137859	136958	136812	138160	141148	144566	145613	147264	167373
2. Sunderbans	12035	12345	13884	15242	15724	16423	17751	18151	18462	20837	22451	21610	15945	18366
3. Beel (Depression)	74527	76101	75460	74328	74925	76365	75137	77524	79200	79209	81564	85208	87902	88911
4.Kaptai Lake	7051	7247	7025	7238	7379	7548	8085	8248	8590	7336	8980	8537	9017	8179
5. Flood plane	445178	449150	475116	497922	621443	718491	768830	819446	879513	781807	79704	696127	701330	712976
(b) Inland closed water (culture)	712640	786604	856956	914752	882091	892049	945812	1005542	1062801	1351979	1460769	1726067	1859808	1956925
1. Pond & Ditch	615825	685107	752054	795810	756993	759628	811954	866049	912178	1140485	1219736	1342282	1446594	1526160
2.Seasonal culture (water logging area	-	-	-	-	-	-	-	-	-	46902	51230	182293	200833	193303
3.Baor (Ox-bow Lake)	3801	3892	4098	4282	4388	4498	4698	4778	5038	8727	4864	5186	6146	6514
4. Shrimp/Prawn Farm	93014	97605	100804	114660	120710	127923	129160	134715	145585	155866	184939	196306	206235	216447
5. Pen Culture	-	-	-	-	-	-	-	-	-	-	-	-	-	13054
6. Cage Culture	-	-	-	-	-	-	-	-	-	-	-	-	-	1447
B. MARINE FISHERIES	379497	415420	431908	455207	474597	479810	487438	497573	514644	517282	546333	578620	588988	595385
1. Industrial Fisheries (Trawl)	23,901	25165	27954	32606	34114	34184	35391	34159	35429	34182	41665	73386	73030	76885
2. Artisanal Fisheries	355596	390255	403954	422601	440483	445726	452047	463424	479215	483100	504668	505234	515958	518500
Total	1781057	1890459	1998197	2102026	2215957	2328545	2440011	2563296	2701370	2899198	3061687	3261782	3410254	3548115
Annual growth rate of production	7.2.	6.14	5.7	5.2	5.42	5.08	4.79	5.05	5.39	7.32	5.6	6.54	4.55	4.04

The Bangladesh Government (GoB) took initiatives to increases fisheries production for improving nutrition, generate employment and increase export earnings for a vast population. In the 7th five-year plan, the GoB sets the goal of self-reliance in production of fish and shrimp, generate surplus for export; improving livelihoods security and revenue of fishers and fisherman with priority to the poor, improving food safety standard of fish and fish products for both export and domestic consumption; and improving conservation of aquatic biodiversity of beels, haors, floodplains, baors, rivers and other water bodies[13]. These plans or strategy objectives are thus visibly connected but the interdependency is complex and not permanently self-reinforcing. An expansion in fisheries resources exports repeatedly involves redirect products from indigenous consumption to buyers in an overseas country[17]. Entrance by the underprivileged (rural poor and even by fishers‟ households themselves to fisheries as a basis of protein to complement others is subject to the complications of direct and trade “entitlement failure”. Over and above these difficulties in background policy objects, many reasons constrain the exploitation of the full possibilities of the fisheries in Bangladesh. Numerous of these complications are known to the policy planners but cannot be overcome by individual government departments. Several of

these complications are mentioned for the three sub-sectors inland open (capture) waters, inland closed (culture) waters and marine fisheries in greater commonplace phrases.

The majority (70%) of the population of Bangladesh lives in the floodplain and coastal areas and take naturally produced fishes as well as other aquatic resources due to their easy exploitation capacity[18]. However, the fish abundance in the natural water bodies is decreasing. The causes of this reduction in abundance and consequent catch are outlined by various researchers as over-fishing and contaminating the environment with pollutants like urban sewers, industrial wastes etc. along with less implementation of existing outdated policy measures by the government[19,20,13]. Building up of huge infrastructures like roads and embankments, barrages, as well as urbanization and housing activities have blocked or reduced many water bodies. This has adversely affected natural breeding activities and performances of many indigenous fishes. Shrinkage of floodplains also resulted in decreased availability of wild fisheries resources caused by the increased irrigation-based agricultural production; siltation, flood prevention controls activities, changing water management practices, increased uses of agrochemicals etc.[1]. However, to compensate these loss various initiatives have been undertaken like stocking of farm produced fish seeds releasing in open waters and floodplains but found to be not much promising[13]. Unfortunately, despite having much importance of this sector, it has been governed by ad hoc policies. The absence of long-term sustainable regulatory framework seems to be responsible for the failure to introduce sustainable fisheries management (Table 3).

Freshwater aquaculture of Bangladesh is comprised mainly of pond aquaculture, particularly the polyculture of a variety of species, including indigenous and exotic major carps, non-native pangasius, tilapia, the climbing perch etc. Coastal aquaculture is comprised mainly of extensive shrimp farming, and a range of other aquatic organisms including fish and crabs are also produced in shrimp farms through polyculture method. At present, inland aquaculture farming practices are facing three major problems- quality seeds, cheap and nutritious feeds and proper extension service[13,10]. The main limitations to the expansion of sustainable shrimp farming and other types of coastal aqua farming practices are: (a) insufficient water management infrastructure, (b) scarcity of disease free quality shrimp and prawn postlarvae, (c) inadequate technology dissemination, (d) social conflicts on competing water and land uses and the benefits and cost sharing, (e) existing improper management system practiced in maintenance from harvest to processing, and (f) lack of proper facilities and experience in tracing out the sources of contamination[21]. It is supposed that if all types of existing water bodies including derelict ponds can be used for fish culture, and the culture method could be improved to the at least semi-intensive method, that might increase the fish production solely from ponds by 15 to 20 times of the total fish production of Bangladesh.

Capture and production of fishes and shrimps from shrimp farms, baors, and ponds amplified step by step and thus became doubled from 2000-2001 to 2013-2014[8]. Particularly, the Bangladesh Fisheries Research Institute (BFRI) and the World Fish developed new and farmer oriented beneficial technologies (farming structures involving species appropriate for polyculture, monoculture, and integrated lifestyle, e.g. fish-rice, fish-chicken-duck)[22].

The Bay of Bengal is blessed with diverse aquatic biodiversity (e.g. shrimps, molluscs, crabs, mammals, seaweeds) and enriched ecosystems etc.[23,14] (Table 4). A number of surveys were conducted to examine the status of marine fisheries resources from the 1970s to 1980s (Table 5). But unfortunately, after that, no recent and comprehensive data is available about systematics, fish stock assessments, biological and ecological features of the coastal and marine fisheries of the nation. Functionally, marine capture fisheries can be classified as artisanal and industrial fisheries. The estuarine and marine capture fisheries activities provide about 95% percent of the total national marine production, that yet rely on traditional artisanal fishing due to poor technological support[14]. Constraints on the sustainable exploitation of marine fishery resources include (a) insufficient knowledge of the species-wise current stock, location of the breeding ground and the grow out areas, and the potential maximum sustainable yields (MSY) by species, season, and location; (b) alleged over-fishing; and (c) encroachment by trawlers of neighbouring countries (Seventh-Fifth year Plan 2015; National Fisheries Policy 1998; FAO 2006). According to the

report of the World Bank[19], there is limited scope for expansion of marine fisheries as it has already reached its maximum sustainable level[8].

However, artisanal marine fisheries yet show relatively increasing production trend. It is often said that the prospect of deep-sea fishing is yet unexplored[1]. Detailed surveys have not done yet in the vast EEZ as that would be very much expensive, hence, the benefit-cost analysis might provide support regardless of thus detailed surveys[24]. Previously most of the efforts for the development of marine fisheries sector were mainly aimed at intensifying and augmenting the capabilities to harvest the resources. Of these efforts, again, the greater proportion was devoted to the introduction of industrial fishing in the deeper waters of the Bay of Bengal beyond depths of 40 meter. Most of the marine fish production comes from the artisanal fishery used to operate in the inshore areas from the shore to water in 40-meter depth contour line.

Table 3. History of open water fisheries management policy changes in Bangladesh[18]

Era	Act, Ordinance & Rules	Main aims
Pre-colonial (before 1757)	No document found on management measures	The sole goal was to exploit the resources
Colonial (1757–1971)	*Zamindars* system	The tax collection by on behalf of the colonial ruler
	The State Acquisition and Tenancy Act 1950	Expiration of the *Zamindars* system. Retreat of public water bodies to state control
	East Bengal Protection and Conservation of Fish Act 1950	Limitation of using definite gears and fishing of juvenile and brood fish in order to restock wild stock through natural recruitment
Post-colonial (1971till date)	The Marine Fisheries Ordinance, 1983	Management, conservation, and development of marine fisheries
	The local Government (Union Parishad) Ordinance, 1983	Adoption and implementation of development schemes in the fields of fisheries to increasing economic and social upliftment of people
	The Land Management Manual, 1990	To provide authority and proprietary rights for the ministry of land over state-owned water bodies over twenty acres. to maximize revenue financial gain
	Stops of leasing Jalmahals 1995	To confirm open entrée of rural and poor fishers
	Ministry of Land Memorandum of Understanding, 1997	To transfer all closed public water bodies up to a section of twenty acres to Ministry of Youths and Sports. To create more employment chance for youth
	National Fisheries Policy 1998	Enhancement production, poverty alleviation, Fulfil demand animal protein, achieve economic growth
	The National Water Policy 1999	Economic development, food security, protection of the natural environment, preserving wetlands for fish

Table 4. Coastal and marine fisheries resources of Bangladesh[12]

Category	Number of species (reviewed by)		
	Hossain 2001	Islam 2003	Ahamed et al. 2012
Bony fish	475	475	442
Cartilaginous (soft-boned) fish	50	–	–
Shrimp	25	24	56[a]
Crab	15	50	16
Lobster	5	–	3
Mollusc (Oyster)	301 (6)	301 (3)	336
Algae/Seaweed	56[b]	20-22[c]	168
Coral	13	–	66
Starfish/Echinoderms	3	–	4
Whale/Dolphin	11	–	–
Squids (Cuttlefish)	–	7 (2)	–

Table 5. Standing stock (in tons) of demersal fish, pelagic fish and shrimp of the Bay of Bengal during the1970s and 1980s[12]

Demersal fish	Pelagic fish	Shrimp	Reference
264,000-373,000	---	9,000	West (1973)
160,000	90,000-160,000	---	Saetre (1981)
200,000-250,000	160,000-200,000	4,000-6,000	Penn (1983)

The Territorial Waters and Maritime Zones Act, 1974 is the first and the only apparatus to provide for declaration of zones and bringing areas in the BoB within the country's territorial jurisdiction consistent with provisions of international agreements and laws. In 1983, The Marine Fisheries Ordinance was enacted which was the first comprehensive legal instrument to provide support for the exploitation, conservation and overall management of marine living resources including but not restricted to fishes.

As a least developed country Bangladesh, facing lots of challenges when going to designing and applying administrative policies and these types of constraints are reflected in the fisheries sector too[25]. Some issues have the character of conflicts or trade-offs, wherever troublesome decisions, usually involving a mix of potency and equity goals, or a levelling of short and long-term prices and advantages should be created. The activities of sustainable conservation and management of inland fisheries should identify a diverse set of needs on the resource. These demands come from diverse extraordinary policies which are conflicting with their objectives: maximizing brief time period harvesting or handling the aid, ensuring its potential to obviously recruit and to conserve its biodiversity and dealing with getting recruitments to for the wider community reliant on fisheries, or to generate maximum sales for the authorities through the rent of open water bodies. A concern would be the established order of a community of sanctuaries with a purpose to offer dry season refuges for brood stock so as to clearly restock the floodplains and rivers. Further the usage of fertilizers, herbicides and pesticides need to be reduced to improve the fish habitats and improvement of fish production of the floodplains. Manage of pollution from rivers in which the primary actor will be the Ministry of Environment in collaboration with different concerned companies. Such tasks should comply with the environmental regulations and policies (which include EIA, SIA, and many others.) and include good enough mitigation measures in session with the ministry of fisheries and livestock (MoFL).

Adoption of the National Fisheries Policy, Community Based Fisheries Management (CBFM), and increasingly public disapproval of environmental degradation, of the use of detrimental gears, and of the indiscriminate immediately (without permitting time for fish to grow) catching of stocked fry/fingerlings is very critical to improve the floodplain fishery. Moreover, the study is necessary into the development of fish bypasses for better movement of fish and recuperation of fish habitat, the establishment of fish sanctuaries to guard brood fish in CBFM structures. Establish and preserve fish and wetland sanctuaries and one or two months ban on fishing in eco-sensitive regions like Sunderbans, components of Kaptai Lake, and numerous sections of the river Halda, selected beels in haor areas and so on. Except for strict implementation of the Fish Act 1950; GoB will assist the fisher people having access to social safety nets like VGD and VGF and opportunity livelihoods help. The fishermen will be organized in sustainable community-based organizations and such organizations will be given management responsibility of government owned Jalmahals on a long-term basis so that they conserve rather than just exploit the resources.

Potential of aquaculture can be understood from three sites. First, the harvests of aquaculture ponds may be at least doubled by the method of adopting semi-intensive management control, or even more by way of adopting extra capital-extensive structures. Second, culturable and derelict ponds, which constitute a huge percentage of the overall pond place, may be introduced into semi-intensive or intensive fish tradition with some excavation and re-excavation. Third, in addition to 1.3 million perennial ponds, there are over hundreds of thousands of low water depth seasonal ponds and ditches, street-aspect canals, and borrow-pits which maintain water for handiest part of the year (in the main four–seven months). Those have excellent potential for culturing species like Nile

Tilapia (*Oreochromis niloticus*) and silver carp (*Puntius gonionotus*). Moreover, the establishment of carp and shrimp hatcheries for making sure a delivery of nice seeds contributed to superior production. Pen culture and Cage culture will be further promoted but guided and monitored for species selection, location, target group identification, and feed and input use etc.

According to seventh fifth-year plan government going to take some important initiative to increase the production of aquaculture that is maintain the purity of brood stock of indigenous carp and other indigenous fish species conserving the natural breeding, spawning, nursery and grow-out areas to complete the whole lifecycle and natural reproduction process. Production, import and marketing of fish and shrimp feed, feed ingredients, minerals and vitamin premix, and other inputs, in which private sector is the key player, will be constantly monitored by Government and Non-Government organizations. Most of the shrimp farms in Bangladesh use traditional or extensive cultivation methods characterized by low stocking density and zero to minimum inputs, with low yields (60-230 kg/ha, hence making suboptimal use of the land-water resources. These outdated modes of production need to be upgraded to semi-intensive methods with the introduction of healthy seed, quality feed, and good farming practices, reaching a plausible boost in production up to 6,000 kg/ha[26]. This farming practice is significant to our national economy, earning the second largest foreign exchange for the country, about US$478 million[27]. The government can outline shrimp farming zones inside the coastal area primarily based on natural benefits of shrimp and prawn farming and rehabilitate water control infrastructure in each zone to optimize production and environmental sustainability.

In the circumstance of the artisanal and industrial marine fisheries of Bangladesh, exploitation takes without any considerate of the basic functional ecological systems, which are very important for a sustainable resource management and to obtain the maximum sustainable yield (MSY)[14]. Rapid assessment of fisheries stocks by species in recently resolved Southwest waters of EEZ (19467 sq.km). New fishing grounds for both demersal or bottom and semi-pelagic fish needs to identify. Bangladesh Fisheries Development Corporation (BFDC) has been set up to create infrastructure for the marine fisheries region, however, has been challenged to inefficiencies and political disturbance. Another important area that has immense prospects but has been completely ignored is the possibility of marine stock enhancement and sea ranching. A collaborative effort for distant water fishing (beyond 200 miles of EEZ and Area Beyond National Jurisdiction (ABNJ)) to explore and exploit tuna and large pelagic fishes. Development of living marine resources would expose a new age for the fisheries sector of Bangladesh.

Restrict and control poaching of resources and illegal entry of overseas trawlers. Cooperate with the Coast Guard and Bangladesh Navy at the manipulate of encroachment and breach of law, additionally with the useful resource of nearby vessels. Promote the improvement of technology for manufacturing of seed for culturing marine fish, mollusks, and seaweed. Strict surveillance wants to persevere for fishing complying all applicable Acts and guidelines. Impose seasonal ban to take advantage of fish and shrimp to guard spawn and juveniles. A considerable amount of fish is salted and dried, mainly for human consumption. Parenthetically, the use of dry fish as sources of fishmeal is progressively increasing due to the amplification of fish and poultry farming.

Conclusion

This article gives an overview of the fisheries resources in Bangladesh. The resources for fish production are vast though biological, social and economic constraints exist; therefore, research needs to be strengthened to harness this potential. Review of the fisheries sector policy must be seen within the context of the development of an appropriate regime for the sustainable management of fisheries resources. A firm political will and suitable legislation along with appropriate plans of action to formulate necessary strategies and policies as well as development projects are indispensable. More importantly, the situation of fishers must be taken into account and special task force should be built to assess their vulnerability and strategies to tackle them.

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