

# **An Economic Analysis of the Fisheries Sector of Bangladesh: Challenges and Development Strategies**

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*This research presents an economic analysis of the Bangladesh fisheries sector for the last two decades. Secondary data is used for the economic analysis and literature review type methodology is used to analyze the future challenges and development strategies. Fish production and exports gradually increasing, but the growth rate is showing instable. Inland aquaculture is found increasing rapidly in compare to marine aquaculture. Along with several challenges, this article also proposes developmental strategies for authorities to develop fisheries sector, which could create opportunities to flourish other potential sectors to increase employment as well as contribute to the GDP of Bangladesh.*

*Keywords: fisheries, production, export, economic analysis, Bangladesh*

## **INTRODUCTION**

One of the most productive and dynamic sub-sector of Bangladesh agriculture is the fishing sector which has enormous potential for future growth (Shamsuzzaman et al., 2020). This has also played a significant role to provide nutrition, livelihoods and employments of millions of people in Bangladesh. In general fish is highly nutritious and so this fisheries sector can effectively address nutritional deficiencies by providing essential nutrients for masses (Shah et al., 2018).

According to FAO (2022), total fisheries and aquaculture production in 2020 reached at 214 million metric tons globally, in which capture fisheries accounted for 90 million metric tons, or 51 percent, while aquaculture provided 88 million metric tons, making up 49 percent. Out of the entire production, 63 percent (equivalent to 112 million metric tons) was obtained from maritime waters, with 70 percent coming from capture fisheries and 30 percent from aquaculture. The remaining 37 percent (equivalent to 66 million metric tons) was collected from inland waters, with 83 percent coming from aquaculture and 17 percent from capture fisheries. The global production's first sales value was predicted to be US\$ 406 billion, with US\$ 141 billion attributed to capture fisheries and US\$ 265 billion to aquaculture. China continued the largest share around 35 percent of total fisheries production globally (FAO, 2022). However, Bangladesh is also one of the major countries producing significant amount of fish product in the world. According to FAO (2022), Bangladesh achieved the 3rd position in inland open water capture production, the 5th position in global aquaculture production. She has also achieved the second highest place in terms of the average growth rate of fish output during the past decade.

Fish production of Bangladesh are mainly classified under two groups, one is Inland and the other one is Marine. Inland fisheries is also divided into two sub-groups as Capture and Culture fisheries. Inland capture fisheries encompasses capture from different open water bodies (rivers, estuaries, beels, floodplains, the Sundarbans, and lakes) whereas inland culture fisheries involves the rearing of fish in captivity. Similarly, marine fisheries also divided into two parts as Industrial and Artisanal fisheries (DOF, 2022) The entire fisheries sector supports the livelihoods of people more than 18 million in the country directly and indirectly (FRSS, 2017). Moreover, about 1.4 million women depend on the fisheries sector for their livelihoods through fishing, farming, fish handling & processing (BFTI, 2016).

The rest of the paper is structured into five sections. Next section is the literature review where relevant literature related to this research are discussed. Section three discusses the objectives of this research. Data and methodology to achieve the objectives are discussed next. Findings of this research are reported and discussed in section five in accordance with the objectives of this research. Finally, concluding remarks of this research are given in the last section.

## LITERATURE REVIEW

Reviewing the literature related to fisheries sector, several dimensions of the research are found here. Most of the cases, economic analysis is undertaken on a particular period for a specific country like Portugal (Bjørndal, et al., 2015), Spain (Miret-Pastor et al., 2014), Pakistan (Shah et al., 2018), Ghana (Eriksen, et al., 2018), Haryana, India (Garg & Gupta, 2019), Turkey (Künili et al., 2019) and so on. In these researches, the production, trade scenario and the importance of fisheries sector as a provider of animal protein, job creation for both men and women, and the overall contributions in the economy are analyzed. However, some researches are analyzing specific sub-sector of fisheries. For instances, Lokina (2000) particularly concentrated on marine fisheries in Tanzania, Miar et al. (2020) on fish processing industries in Indonesia, and Le Floc'h et al. (2008) on commercial fishing fleet of French region.

Overall, increase in fish production has found by the most of the researches. On the contrary the trade situation is showing different trends in different countries. In case of Portugal both import and export quantity as well as the values shows an upward trend but the import increased much more than the export (Bjørndal et al., 2015). Similarly, Shah et al. (2018) found that fish export gradually increased year by year but not the imports in Pakistan. Akpalu et al. (2018) argued that fishery sector not only provides animal protein to the masses but also creates jobs for 20 percent of the active labour force in Ghana. Similarly, the gross domestic product (GDP) from fisheries sector is found increasing much higher than the growth rate of agriculture and overall GDP in Haryana state in India (Garg & Gupta, 2019). However, using location quotient analysis Febrisya et al. (2021) found that the growth rate of the fisheries sector in a particular district named Bogor in Indonesia from 2015 to 2019 has a slow growth rate. This research concluded that the increase in fish feed prices and increase in rainfall causes flooding were the reasons that influenced the slow rate of economic growth in the fisheries sector there.

Apart from these another group of literature are trying to estimate the impact of fisheries on the economy considering either computable general equilibrium (CGE) method or input-output (IO) methods for assessing the impacts. Systematic review on the impact of fisheries on the economy done by Akbari et al. (2023) found that IO models is the most popular method among the researcher compared to the CGE modeling. Even some research also uses social accounting matrix (SAM) to quantify and compare the economic contribution of fisheries to the economy (Kim and Seung, 2019). Fisheries impact as an economic base industry, has a vast number of secondary economic activities - from boat building to international transport, is huge. However, the impact of fisheries has a great deal of variation between regions and countries in terms of fishing output multiplier at the global level. For example- Dyck and Sumaila (2010) estimated that indirect and induced effects of marine fisheries sector to the world output nearly three times larger than the value of landings at first sale, at between US \$225 and 240 billion per year. Hutajulu et al. (2019) estimated that the skipjack tuna's impact on the backward and forward linkages are 1.32% and 1.37%, respectively in the city of Jayapura in Indonesia.

In case of Bangladesh, several literatures are there focused on biology (Islam et al., 2017) and biodiversity (Suravi et al., 2017) of fisheries sector. Apart from these, some other researches are also there that are reviewing fisheries sector from different angle. For example, some analyzed the performance of fisheries sector (Ghose, 2014; Shamsuzzaman et al., 2017), some presented on overview of fisheries sector (Islam et al., 2017; Shamsuzzaman et al., 2017), and some analyzed the management and governance of fisheries sectors (Rahman et al., 2018). To the best of our knowledge no studies have been carried out on the economic contribution of fisheries sector. Therefore, this study is an attempt to bridge the gaps and making useful suggestions for improving fisheries sector with economic perspective of Bangladesh.

## OBJECTIVES OF THIS RESEARCH

The main objectives of this study is to analyze the importance of fisheries sector in Bangladesh and making useful suggestions for improving fisheries sector with economic perspective. To achieve that the specific objectives we worked upon are:

1. To examine the state and growth of fisheries sector in terms of:
  - quantity of fish production,
  - growth of fish production, and
  - export and import of fish production;
2. To investigate the contribution of fisheries sector in the terms of:
  - contribution of fisheries in agriculture,
  - contribution of fisheries in overall GDP;
3. To identify challenges and strategies related to development of fisheries sector in Bangladesh.

## DATA AND METHODOLOGY

Secondary data are mainly used for this research. Annual time series from different sources covering different periods of time based on the availability of the data are used here. Data on fish landings are used from 2002-2022 which are aggregate quantities collected from varies issues of fisheries statistical yearbook of Bangladesh (GoB, 2002 to 2022). The trade statistics, in terms of import and export values as well as quantities form 2006-2022 are used here collected from various issues of statistical yearbook of Bangladesh (BBS, 2011 to 2023). Moreover, GDP related data, covers the time period from 2000 to 2022, are collected from various issues of Bangladesh economic review (MoF, 2006 to 2023). All values (monetary and quantity) are nominal and data related to fiscal year (FY) is considered the end year of that FY, for example- data on FY 2020-2021 is considered here as 2021.

First objective is analyzed by using descriptive statistics and some results are presented graphically by using Microsoft Excel 2007. Annual growth rates were calculated as:

$$GR = \left( \frac{Pre\ V - Pas\ V}{Pas\ V} \right) \times 100 \quad (1)$$

where,  $GR$ = Growth Rate,  $Pre\ V$ = Present Year Value, and  $Pas\ V$ = Past Year Value.

In response to second objective, the contribution of fisheries in agriculture and overall GDP, log linear regression model is used as follows:

$$\ln Agri_t = \alpha + \beta \ln Fish_t + U_t \quad (2)$$

$$\ln GDP_t = \alpha + \beta \ln Fish_t + U_t \quad (3)$$

where  $Agri$ = agricultural contribution to GDP,  $Fish$ =Fisheries contribution to GDP and  $GDP$ =Overall GDP.

However, for using time series data it needs to be stationary. After checking the stationarity using Dickey-Fuller test we found that first differences of each series are stationary. Therefore, in the above regression model the first difference series is used.

For the third objective findings from this research as well as literature review methodology are used. For reviewing the literature peer-reviewed journals and grey literature are used.

## FINDINGS AND DISCUSSION

### The State of Fisheries

Bangladesh's fisheries sector consists of inland fisheries and marine fisheries. Both of them has two subsectors for each: inland capture and aquaculture are for inland, whereas marine consists of artisanal or small-scale and industrial fishing. Countries total production was reported as 1.89 million MT in the year 2002, which has rose to 4.76 million in the year 2022 (Table 1).

**TABLE 1**  
**FISHERIES PRODUCTION IN BANGLADESH (2002-2022)**

Year	Inland Total		Marine Total		Country Total (%)
	Capture (%)	Culture (%)	Industrial (%)	Artisanal (%)	
2002	0.69(36.51)	0.79(41.8)	0.03 (1.33)	0.39(20.65)	1.89(100)
2003	0.71(35.50)	0.86(43)	0.03(1.40)	0.4(20.20)	2(100)
2004	0.73(34.76)	0.91(43.33)	0.03(1.55)	0.42(20.12)	2.1(100)
2005	0.86(38.74)	0.88(39.64)	0.03(1.54)	0.44(19.84)	2.22(100)
2006	0.96(41.2)	0.89(38.2)	0.03(1.46)	0.45(19.13)	2.33(100)
2007	1.01(41.39)	0.95(38.93)	0.04(1.45)	0.45(18.53)	2.44(100)
2008	1.06(41.41)	1.01(39.45)	0.03(1.33)	0.46(18.10)	2.56(100)
2009	1.12(41.48)	1.06(39.26)	0.04(1.31)	0.48(17.75)	2.7(100)
2010	1.03(35.52)	1.35(46.55)	0.03(1.18)	0.48(16.66)	2.9(100)
2011	1.05(34.31)	1.46(47.71)	0.04(1.36)	0.5(16.49)	3.06(100)
2012	0.96(29.45)	1.73(53.07)	0.07(2.25)	0.51(15.50)	3.26(100)
2013	0.96(28.15)	1.86(54.55)	0.07(2.14)	0.52(15.13)	3.41(100)
2014	1(28.17)	1.96(55.21)	0.08(2.17)	0.52(14.61)	3.55(100)
2015	1.02(27.72)	2.06(55.98)	0.08(2.31)	0.52(13.99)	3.68(100)
2016	1.05(27.06)	2.2(56.7)	0.11(2.72)	0.52(13.43)	3.88(100)
2017	1.16(28.09)	2.33(56.42)	0.11(2.63)	0.53(12.81)	4.13(100)
2018	1.22 (28.5)	2.41(56.31)	0.12(2.81)	0.53(12.49)	4.28(100)
2019	1.24(28.31)	2.49(56.85)	0.11(2.45)	0.55(12.62)	4.38(100)
2020	1.25(27.78)	2.58(57.33)	0.12(2.56)	0.56(12.35)	4.5(100)
2021	1.3(28.14)	2.64(57.14)	0.12(2.58)	0.56(12.17)	4.62(100)
2022	1.32(27.72)	2.73(57.35)	0.14(2.88)	0.57(11.95)	4.76(100)

Note: The production data sources are from various issue of Yearbook of Fisheries Statistics of Bangladesh (GoB, 2002 to 2022). All production data are in million metric tons. Percentage share is shown in parentheses calculated by researcher.

Percentage of inland marine fisheries in total fish production was around 78% and 22% respectively in 2002 (Table 1). It becomes to around 85% and 15% respectively in 2022. It does not mean that the production of marine fisheries is being reduced. It is mainly because of more production of inland fisheries due to rapid production in inland aquaculture in Bangladesh. However, in terms of percentage share in total fish production, inland capture and marine artisanal has decreased whereas inland culture and marine industrial production has increased in our study period. Moreover, the share of inland culture production has increased from around 42% to 57%, whereas the share of marine industrial production has increased around double, 1.33% to 2.88% in our study period. Overall, from the total production perspective, fisheries production has increased in Bangladesh and all four components are contributing for this increase. However, the patterns of contributions are same. At the beginning of our study period, the major contribution was from inland culture, then inland capture, marine artisanal and finally from marine industrial production. After 20 years, the contributions of fisheries are coming from the same sequence in 2022. The inland culture was the main contributor now and then. Similarly, marine industrial was the least contributor now and also then. This finding directed us to investigate the growth situation of these sub-sectors in Bangladesh which is shown in Table 2.

**TABLE 2**  
**YEAR WISE GROWTH RATE OF FISHERIES PRODUCTION IN BANGLADESH (2002-2022)**

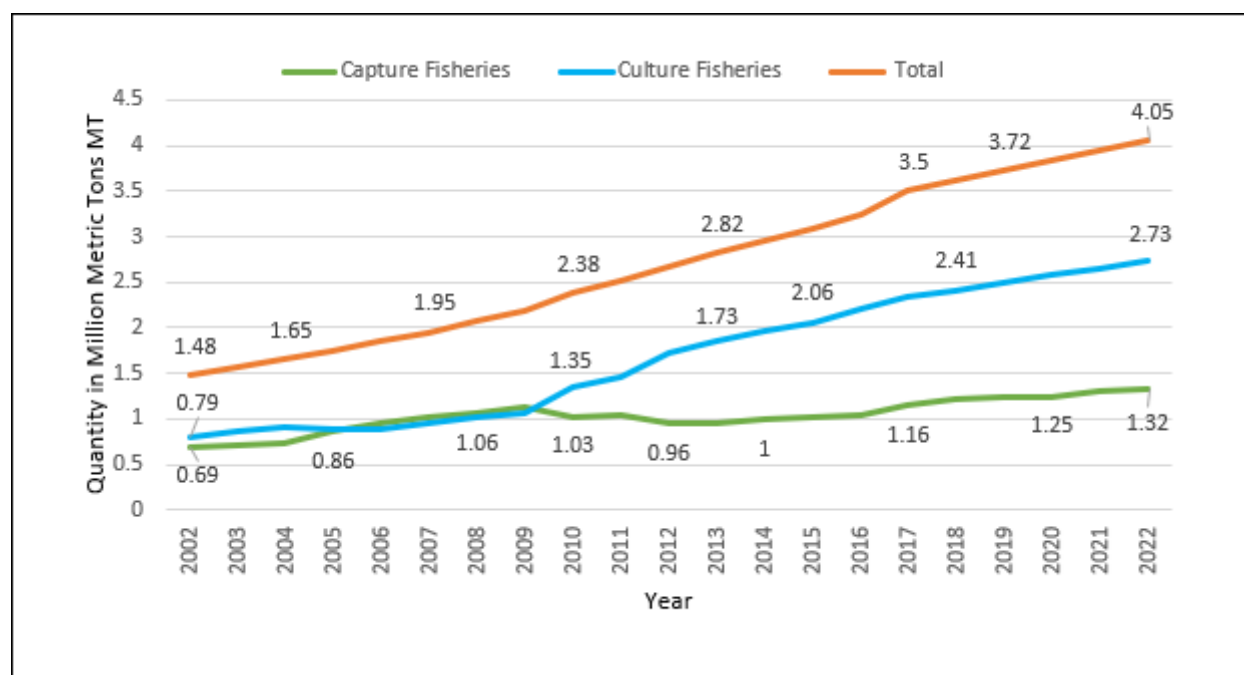
Year	Inland Capture	Inland Culture	Inland Total	Marine Industrial	Marine Artisanal	Marine Total	Country Total
2002	-	-	-	-	-	-	-
2003	2.90	8.86	6.08	0	2.56	2.38	5.82
2004	2.82	5.81	5.10	0	5	6.98	5.00
2005	17.81	-3.30	5.45	0	4.76	2.17	5.71
2006	11.63	1.14	6.32	0	2.27	2.13	4.95
2007	5.21	6.74	5.41	33.33	0	2.08	4.72
2008	4.95	6.32	6.15	-25	2.22	2.04	4.92
2009	5.66	4.95	5.80	33.33	4.35	2	5.47
2010	-8.04	27.36	8.68	-25	0	1.96	7.41
2011	1.94	8.15	5.88	33.33	4.17	5.77	5.52
2012	-8.57	18.49	6.35	75	2	5.45	6.54
2013	0	7.51	5.22	0	1.96	1.72	4.60
2014	4.17	5.38	4.61	14.29	0	1.69	4.11
2015	2.00	5.10	4.41	0	0	0	3.66
2016	2.94	6.80	5.52	37.5	0	5	5.43
2017	10.48	5.91	7.69	0	1.92	1.59	6.44
2018	5.17	3.43	3.43	9.09	0	1.56	3.63
2019	1.64	3.32	2.76	-8.33	3.77	1.54	2.34
2020	0.81	3.61	2.96	9.09	1.82	1.52	2.74
2021	4	2.33	2.87	0	0	1.49	2.67
2022	1.54	3.41	2.79	16.67	1.79	4.41	3.03
Average	3.45	6.57	5.17	10.17	1.93	2.67	4.74

Note: Data calculated by researcher from the total production data of Table 1. Average is the simple average.

Growth of fisheries production are shown in Table 2. Interestingly, it is seen that the growth rates are not very steady. There are frequent ups and down as well as abnormal growths as well as negative growth. Among all the sub-sectors, growth of marine industrial production is much higher than the others, average around 10 percent. However, one serious issue found here that in some years (2007, 2009, 2011, 2012 etc.) abnormal growth occurs and then in the subsequent year (2008, 2010, 2013, 2015, 2017 etc.) either negative growth or no growth occurred. On the contrary, growth of small-scale marine fisheries production is the lowest, average around 2 percent. Similar to the marine industrial, in some years (2007, 2010, 2014 etc.) there are also abnormalities here. In case of inland capture and culture the similar abnormalities are also seen. Specially, the inland culture segment which contributes most to country's fish production has abnormal growth in some years (2010 and 2012). However, growth in this segment is showing a decreasing trend for the recent years. Moreover, overall the country's growth is also showing a decreasing trends with some abnormalities. The reasons of instability in the growth of fisheries production need to be seriously taken into consider in policy to have a sustained growth in this sector.

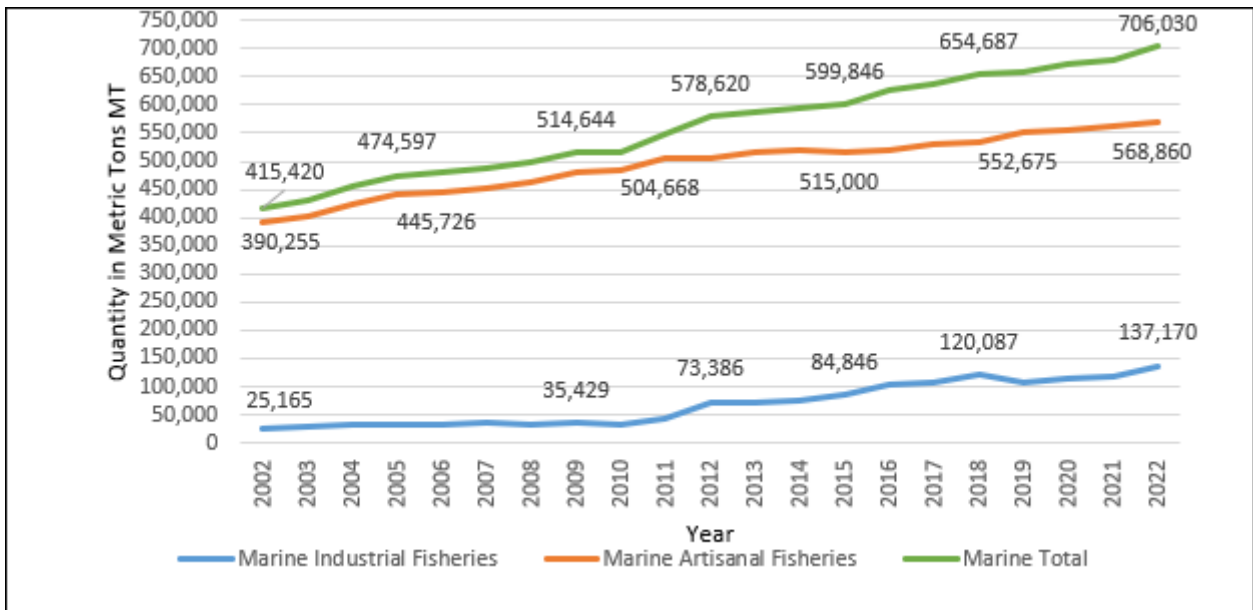
Overall, the total production of fisheries sector showing an increasing trend. However, to understand the reason behind this increase, we need to look into the production of different segment of fisheries sector. Figure 1 & 2 shows that inland and marine fisheries production status respectively.

**FIGURE 1**  
**INLAND FISHERIES PRODUCTION (2002-2022)**



Note: Researcher's own creation

**FIGURE 2**  
**MARINE FISHERIES PRODUCTION (2002-2022)**



Note: Researcher’s own creation

In the initial period of our study 2002, the inland fisheries production was around 1.48 million MT which rises more than 2.5 times to 4.05 in the year 2022. Therefore, it can be understood that the Bangladesh fish production mostly comes from the inland capture fishery. It is seen here that both the inland capture as well as culture was increasing steadily from 2002 to 2009 (Figure 1). Then suddenly the inland aquaculture increased in year 2010. Since then, it continues increasing and rises to double within 10 years’ time. Similarly, in marine fish production artisanal production has increased at a slow pace, whereas the industrial production has increased more than 6 times from 25 thousand MT to 137 thousand MT within our study period (Figure 2). Overall, from the findings, instability in the production need to be taken care of. Increase in fish production must be kept stable.

**Export and Import of Fisheries Product**

Table 3 presenting the export and import of fish and fish product in Bangladesh for the period of 2002-2022. Like the production of fisheries, both import and export are increasing for our study period. Export increases from 41.48 thousand MT in 2002 to 74.04 thousand MT in 2022, around 80 percent increase from the initial period. In terms of the value of export this increase is more than 3 times during our study period. Like the same, the value of import increases from 26.78 thousand crore taka in 2006 to 3438.37 thousand crore taka in 2022. Therefore, it is seen that import increase is much more than the export increase. However, export quantity as percentage of country total is decreasing during our study periods from around 2 percent to 1.5 percent. Moreover, import of fish and fish products are much more as compare to the export these days. The total value of export was 5.19 thousand crore Taka, whereas import value of fish and fish products was 3438.37 thousand crore Taka in 2022.

**TABLE 3**  
**EXPORT AND IMPORT OF FISH AND FISH PRODUCT**

Year	Export ('000)		Import ('000)	Export (%) of Country Total
	Quantity (MT)	Value (Cr. Tk.)	Value (Cr. Tk.)	Quantity
2002	41.48	1.64	-	2.19
2003	47.37	1.94	-	2.37
2004	54.14	2.36	-	2.58
2005	63.38	2.57	-	2.86
2006	68.83	3.03	26.78	2.96
2007	73.70	3.35	130.78	3.02
2008	75.30	3.40	120.53	2.94
2009	72.89	3.24	83.61	2.70
2010	77.64	3.41	38.61	2.68
2011	96.47	4.60	97.18	3.15
2012	92.48	4.70	306.42	2.84
2013	84.91	4.16	213.00	2.49
2014	77.33	4.78	216.99	2.18
2015	83.52	4.66	525.89	2.27
2016	75.34	4.28	1184.86	1.94
2017	68.31	4.29	2425.98	1.65
2018	68.94	4.31	2353.10	1.61
2019	73.17	4.07	2735.07	1.67
2020	70.95	3.99	3010.12	1.58
2021	76.59	4.09	3050.35	1.66
2022	74.04	5.19	3438.37	1.56

Note: Export and Import data are collected from various issues of Statistical Yearbook of Bangladesh (BBS, 2011 to 2023). Export percentage of country total are calculated by researcher using the export import data.

### Contribution of Fisheries Sector

Table 4 demonstrates the overall GDP, agricultural GDP and fisheries GDP during the period 2000-2022. It is found that the gross domestic product (GDP) from fisheries sector has increased from taka 13674 crores in 2002 to taka 99020 crores in 2022 at the year-to-year average growth rate (AGR) of 9.52 percent. However, year to year AGR in fisheries sector is lower than the agricultural GDP (10.23 percent) and overall GDP (10.80 percent). Moreover, percentage share of fisheries sector in agriculture as well as overall GDP was 22.54 percent and 5.77 percent respectively in 2000 but in 2022 this share has decreased to 19.63 percent and 2.49 percent respectively. For the same time period, percentage share of fisheries in agriculture as well as overall GDP has decreased at year-to-year AGR of 0.57 percent and 3.65 percent respectively.



**TABLE 4**  
**SHARE OF FISHERIES SECTOR IN GDP OF BANGLADESH (2000-2022)**

Year	GDP (In Crore Taka)			% Share of Fisheries in	
	Fisheries	Agriculture	Overall	Agriculture	Overall
2000	13674	60677	237086	22.54	5.77
2001	13406	61677	253546	21.73582	5.287403
2002	13897	62897	273201	22.09485	5.086731
2003	14259	66366	300580	21.4854	4.743829
2004	14783	70845	332973	20.86668	4.439699
2005	15456	75664	370707	20.42715	4.16933
2006	16317	83183	415728	19.61579	3.924922
2007	17783	92550	472477	19.21448	3.763781
2008	19790	106143	545822	18.64466	3.625724
2009	21806	118323	614795	18.42921	3.546873
2010	24223	132925	694324	18.22306	3.488717
2011	28482	168159	915829	16.93754	3.109969
2012	31827	187356	1055204	16.98745	3.016194
2013	36995	205214	1198923	18.02752	3.085686
2014	42308	227356	1343674	18.6087	3.14868
2015	47581	247957	1515802	19.18921	3.138998
2016	53076	271969	1732864	19.51546	3.062906
2017	59627	299152	1975815	19.93201	3.017843
2018	66882	333119	2250479	20.07751	2.971901
2019	74275	366358	2542483	20.27389	2.921357
2020	83091	400389	2739332	20.75257	3.033258
2021	91822	479764	3530185	19.13899	2.601053
2022	99020	504448	3971716	19.63	2.49
Mean	39146.96	200977.9	1273198	19.66709	3.628066
SD ( $\sigma$ )	26993.81	136454.6	1072847	1.464836	0.872577
CV (%)	64.34	68.96	68.96	92.42	67.90
AGR (%)	9.52	10.23	13.80	-0.57	-3.65

Note: The GDP data sources are various issues of Bangladesh Economic Review (MoF, 2006 to 2023). However, percentage share is calculated by researcher.

The regression results to analyze the contribution of fisheries in agriculture as well as in overall GDP are shown in Table 5. The F-statistics is sufficiently high to be significant at 1 percent level of significance which indicates that both the regression models are overall significant. The slope coefficient ( $\beta$ ) shows that 1 percent increase of fisheries contribution would leads to rise of around 0.77 percent in agricultural contribution and around 0.62 percent increase overall GDP. As it is showing the elasticity with respect to fisheries contribution, it means both agricultural as well as overall GDP is very much sensitive to fisheries contribution. Therefore, fisheries production has very much important for the overall economy of Bangladesh.

**TABLE 5**  
**RESULTS OF SIMPLE LINEAR REGRESSION MODEL**

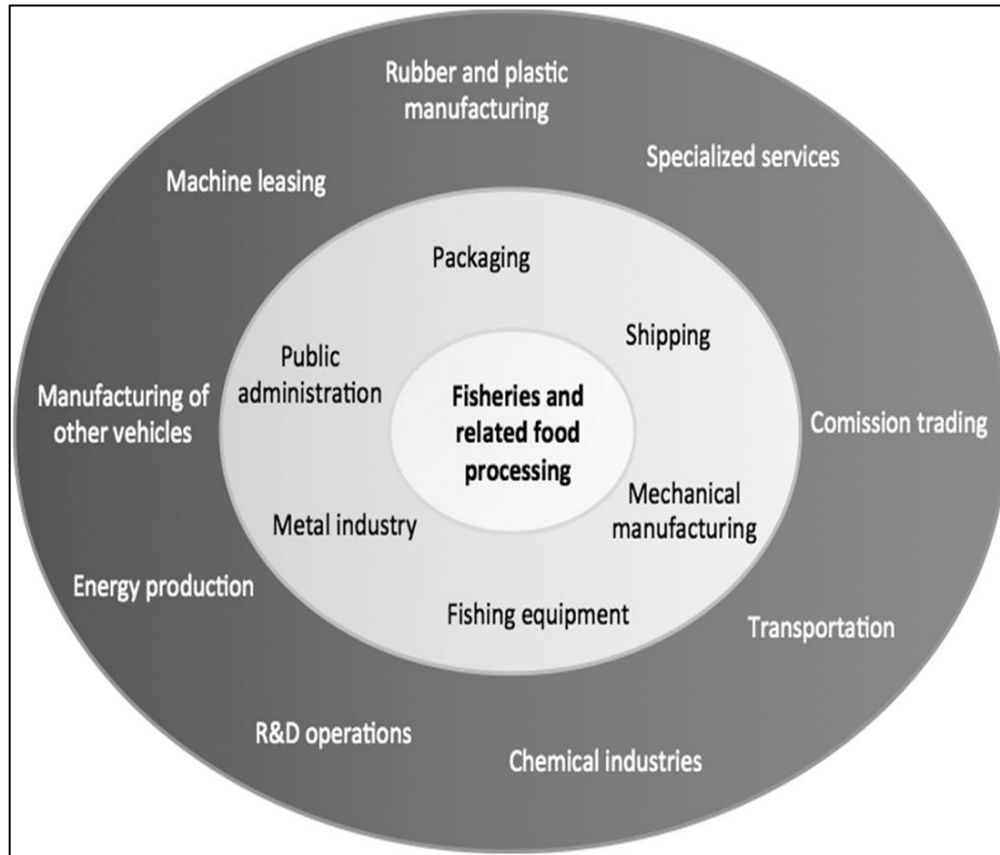
Dependent Variable	$\hat{\alpha}$ (Intercept)	$\hat{\beta}$ (Slope)	$R$	$R^2$	F-statistics
Ln (agriculture)	0.0270 (SE=0.0168) (t=1.60) (Sig.=0.125)	0.7690 (SE=0.1694) (t=4.54) (Sig.=0.000)	0.9948	0.5075	20.61 (SE=0.000)
Ln (GDP)	0.0725 (SE=0.0207) (t=3.49) (Sig.=0.002)	0.6178 (SE=0.2080) (t=2.97) (Sig.=0.008)	0.9934	0.2713	8.82 (SE=0.007)

### Challenges for Fisheries Sector

- (1) Production as well as both imports and exports of fish has also increased in Bangladesh. However, in percentage of total export the contribution of fisheries is decreasing as well as very less. Therefore, our challenge is to reduce the import and to increase the export.
- (2) Negative impact of green revolution through the extensive use of agrochemicals has a serious impact on fisheries production especially open water or floodplain fisheries which is a part of inland capture (Rahman et al., 2018). Though fish production has increased through aquaculture, but there are opportunities to increase production in open water or floodplain fisheries. Therefore, another challenges is to increase in inland capture.
- (3) For the fish production private sector playing an important role in the input business and suppliers of seed and feed (Belton et al., 2011). However, quality is the major concern for both the inputs. To provide adequate and quality feed is the present challenges for Bangladesh fishery.
- (4) With the increase in production, fish consumption is also increased in Bangladesh. However, Low value wild fish and cultured carps are most common. Moreover, more than 140 freshwater species of the 260 species found in Bangladesh are classified as small indigenous species (SIS) (Belton et al., 2011). These fishes are a rich source of essential vitamins and minerals, and increasingly scarce these days. Therefore, the challenge is to increase the production of SIS which is part of inland capture.
- (5) Growth of fisheries product has great potential to feed and nourish the growing population of Bangladesh. However, growth of this sector is very unstable and there are ups and down. Moreover, we have seen that the overall growth of this sector decreases from the initial period of our study here. Sustainable growth in this sector is very much critical to supply growing demand for aquatic food. Therefore, the challenge is to maintain a stable and sustain level of growth of this sector.
- (6) Water pollution is another growing problem for the fisheries sector and could be a serious public health issue as well as fisheries production (Ghose, 2014). Several causes like industrial effluent, fertilizer and pesticides run-off, poor sewerage and sedimentation are behind it. As a result, the inland capture fishery's breeding ground and habitat is becoming degraded (Islam et al., 2017). Therefore, the challenge is to reduce the water pollution considering those causes to maintain both quality and quantity of inland fisheries production in Bangladesh.
- (7) Most of the fishers in rural Bangladesh operates on a small-scale basis and there are problems in use of aquatic resources (Ghose, 2014). The challenge here is to optimal utilization of the aquatic resources to ensure maximum contribution from this sector to the economy.
- (8) The development of the fisheries sector could provide economic opportunities for other related activities which could contribute overall economic development of the country. The core of fisheries industries may consist of production, processing and marketing in any country. However,

there could be several forward and backward linkage industries that could form the overall industries. An overview of the fisheries sector could be like the Figure 3 (Sigfusson et al., 2013).

**FIGURE 3**  
**DIFFERENT CONNECTED INDUSTRIES RELATED TO FISHERIES SECTOR**



Note: Adopted from Sigfusson et al. (2013)

During the early stages of the development the core mainly form the industries. The industries around the core are the collection of industries that provides resources and services to this sector as: the packaging industries, fishing gear manufacture, transport operations, diverse mechanical manufacture, the metal industry and public administration. Apart from these, number of industries which are not directly but somehow connected with fisheries are: the manufacture of rubber and plastic goods, machine leasing, energy production and utilities, R&D operations, chemical industries, commission trading and various specialized services which range from technical consultancy services to auditing, management consultancy services and financial services of various types. That is why they placed outer circle in Figure 3. In case of Bangladesh only the core industries and very few related to the other two layers are developed to some extent. There is huge potential for these industries here which could contribute manifold to the economy in terms of employment and national income. The challenge here now is to develop the related industries (other two layers around the core, Figure 3) of this fisheries sector.

#### **Development Strategies for Fisheries Sector**

- (1) The fisheries sector is having a networks of input supply, market and distribution, and post-harvest value addition for both domestic and export market. These involve substantial economic activities of a country. From input to post-harvest, all these sub-sectors need to be grown simultaneously to

realize the optimal benefits of this sector. A range of public and private sector investments and initiatives (in the form of both technical and financial assistance) will be needed to realize the potential for change, growth and expanding economic output of this sector. In this respect, government should give attention for the overall development of this sector especially for investment and research infrastructure.

- (2) A more efficient and sustainable management of the aquatic resources will contribute greatly to health and economy of the country. Therefore, policy makers must ensure the functioning of this sector in full swing. 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.
- (3) The government or the authorities should provide policies and measures that facilitate the development and growth of other ancillary industries related to this sector (shown in Figure 3). In many cases, this is a question of merely removing barriers or very low cost supports. In this respect, some countries (Like Iceland and Norway) have developed policies to aid sectors related to fishery (Sigfusson et al., 2013). Bangladesh may take help from them to formulate comprehensive policies in this field.

## CONCLUSION

The fisheries sector in Bangladesh economy has undergone tremendous changes in the last two decades. Overall, the supply of fish has shown substantial change over the past 20 years. There are indications of a declining trend in the year-to-year growth of fisheries production. As for trade, import increased more than the export. Moreover, export of fish and fish products as percentage of total exports are decreasing over the year. Similarly, the contributions to GDP from fisheries to agriculture as well as overall GDP is also increasing in gross terms but the share in percentage term is showing a decreasing trend. There is substantial potential for this sector in both production of fish as well as fish processing to contribute in the economy. Government should take initiative for overall development of this sector including ancillary industries. Proper policies and management can foster growth of the economy by providing protein for the growing local population as well as for the export market.

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