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An Overview of Fisheries and Aquaculture in India

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Abstract

Fisheries play an important role in the world economy and food for million. All over the world, more than 30 million fishers and fish farmers and their families gain their livelihoods from fisheries. Globally, fish provide about 16 per cent of the animal protein consumed by humans, and are a valuable source of minerals and essential fatty acids. Although, wild fishery resources are in practice finite for production purposes. If they are overexploited, production declines and may even collapse. What made possible the continuing rise in overall fish production is the rapid growth of aquaculture. Global fish production has grown steadily in the last five decades with food fish supply increasing at an average annual rate of 3.2 per cent, outpacing world population growth at 1.6 per cent. Capture fisheries and aquaculture supplied the world with about 158.0 million tonnes of fish in 2012 of which 91.3 million tonnes was from capture fishery and 66.6 million tonnes from aquaculture. In the same year, total production of India was 8.66 million tonnes which included 3.372 million tonnes from capture fishery and 5.294 million tonnes from aquaculture and noticed increase at an annual rate of 5.2 percent in compare to population growth rate at 1.3%.India's export earnings increased rapidly and almost doubled within 6 years i.e. 8363.52 crores in 2006-07 to 16597.23 crores in 2011-12. In this study, statistical analysis of fish production was done against the world to estimate its growth in compare to world.

Keywords:

Fisheries play an important role in the worldeconomy and food for million. There are around 30 million fish farmers in the world which earn their livelihood from fisheries. Most of them are poor artisanal in developing countries. Globally, fish provide about 16 percent of the animal protein consumed by humans, and is a valuable source of minerals and essential fattyacids. Global fish production has grown steadily in the last five decades, with food fish supply increasing at an average annual rate of 3.2 per cent, outpacing world population growth at 1.6 per cent; with the result that theamount of fish available per person has increased. The stagnation of capturefisheries has been balanced by higher growth of aquaculture. The annual fish production increased from 65 million tonnes to 158 million tonnes between 1970 and 2012. The rapid growth of aquaculture contributed to overall fish production in the world. The global fish aquaculture production expanded from 32.4 million to 66.6 million tonnes with an average annual rate of 6.2 percent in the period 2000–2012 as compared to 9.5 percent in 1990–2000. In the same period, growth was relatively faster in Africa (11.7 percent) followed by Latin America

and the Caribbean (10 percent). The fifteen main producer countries accounted for 92.7 percent of all farmed food fish production in 2012. World per capita apparent fish consumption increased from an average of 9.9 kg in the 1960s to 19.2 kg in 2012.

The overall increase in fish production has been paralleled by a steady growth in consumption. Fish and fishery products already acquire the minds of health concerned people worldwide. Fish is rich in Omega 3 fatty acid which makes it more popular in modern markets. Year round availability of different species as well as different value-added forms is leading to fulfil the needs and wants of today's consumers. Aquaculture provides promising answers to the variety of products available in the market year round basis. Moreover, value addition helps to reduce post-harvest losses and bring the regional specialties over the national boundaries. In comparison to the world scenario, total production of India was 8.66 million tonnes which included 3.372 million tonnes from capture fishery and 5.294 million tonnes from aquaculture and noticed increase at an average annual rate of 5.2 per cent in compare to population growth rate at 1.3%. India is having potential to acquire more growth in aquaculture to harness full potential due to its vast aquatic resources. Here it is necessary to compare India against the world to estimate its growth in compare to world production and growth trend.

Methods and Material

The present study was based on secondary data. The reliable and relevant data were collected from FAO database, MPEDA publication and annual reports published by Department of Animal Husbandry Dairying & Fisheries (DADF). The data was analyzed using statistical software and different graphs (Line graph, Bar graph and Column graph) were used to reach at a meaningful conclusion.

Results and Discussion

Capture fisheries and aquaculture supplied the world with about 158.0 million tonnes of fish in 2012 of which 91.3 million tonnes was from capture fishery and 66.6 million tonnes from aquaculture. In the same year, total production of India was 8.66 million tonnes which included 3.372 million tonnes from capture fishery and 5.294 million tonnes from aquaculture (Table 1).

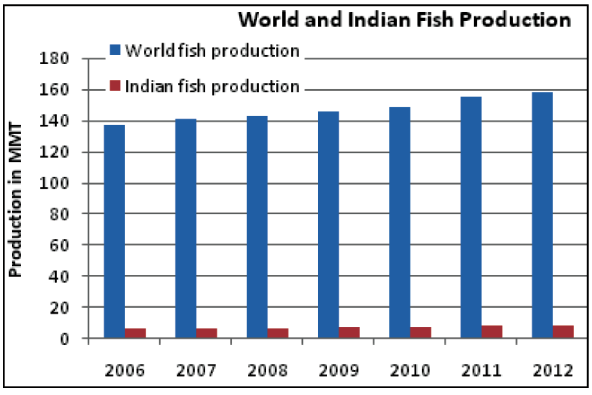
Table1: Growth rate of fish production in World and India

Year	World (MT)	Growth rate (%)	India (MT)	Growth rate (%)	India's share (%)
2006	137.30	-	6.57	-	4.79
2007	140.70	2.48	6.87	4.52	3.87
2008	143.10	1.71	7.13	3.76	3.37
2009	145.80	1.89	7.62	6.87	3.36
2010	148.10	1.58	7.80	5.02	3.92
2011	155.70	5.13	8.23	2.91	4.72
2012	158.00	1.48	8.67	5.28	5.48

The growth in fish production in India has been at a faster rate than in the world from 2006 to 2010 but left behind for one year in 2011; mainly due to increasing contribution from China. The main reason behind India growth was contribution from Inland aquaculture. Overall, the share of developing world in the total world fish production is increasing. While small gains in capture production are feasible in a limited number of regions, it is projected that any significant amount of additional fish production globally will come from aquaculture. Approximately half of the projected increase in aquaculture production, and thereby total fish production, is projected to take place in China alone, while all of Asia combined will comprise almost 90 percent of the growth in global fish production. The share of India in global fish production has grown gradually from 4.79% during the 2006 to 5.48% in 2012. In between 2007 to 2010, India share reduced to less than 4% due to slow growth. The India's share in world fish production has been depicted in Figure 1.

Capture Fishery

Global capture fishery production (Inland plus marine) of 93.7 million tonnes in 2011 was the second highest ever (93.8 million tonnes in 1996). During the year 2012, total production reduced but excluding anchoveta catches, 2012 showed a new maximum production (86.6 million tonnes). Global fishery production in marine waters was 82.6 million tonnes in 2011 and79.7 million tonnes in 2012. In these years, 18 countries (11 in Asia) caught more than an average of one million tonnes per year, accounting for more than76 percent of global marine catches. The growth of marine fish production was irregular and almost constant and there are fewer chances to achieve a great increase in the future.



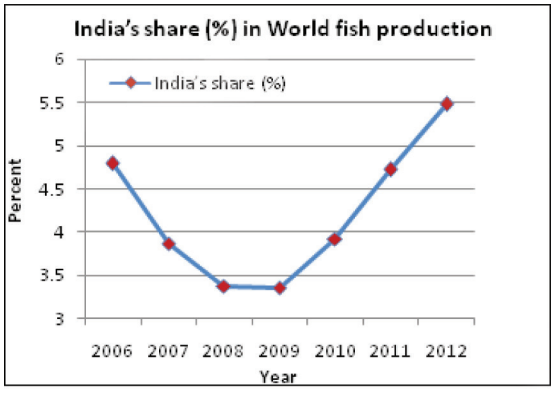
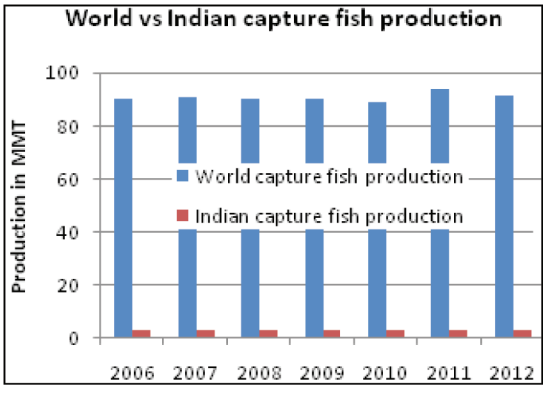


Fig. 1: Comparison of India's and world fish production

Table 2. Total Capture fish production in world and India during 7 years

Year	World (million tonnes)	India (million tonnes)	India's share (%)
2006	90.0	2.816	3.12
2007	90.8	3.024	3.33
2008	90.1	2.920	3.24
2009	90.1	2.978	3.30
2010	89.1	3.104	3.48
2011	93.7	3.250	3.46
2012	91.3	3.372	3.69



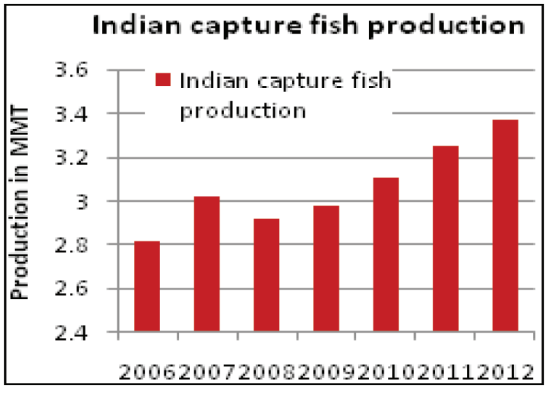


Fig. 1: Comparison of India's and world capture fish production

Indian Marine Fisheries contributes to food security and provides direct employment to over 1.5 million fisher people besides others indirectly dependent on the sector. According to the CMFRI Census 2010, there are 3,288 marine fishing villages and 1,511 marine fish landing centres in 9 maritime states and 2 union territories. The total marine fisher folk population was about 4 million comprising in 864,550 families. The capture fish production of India observed up and down in production regularly but it increased from 2.816 MMT in year 2006 to 3.372 MMT in year 2012. The India's share in the world capture fish production increased also from 3.12 per cent during year 2006 to 3.69 per cent in the year 2012. Expansion of fleet capacity, technological innovation, and increases in investment all led

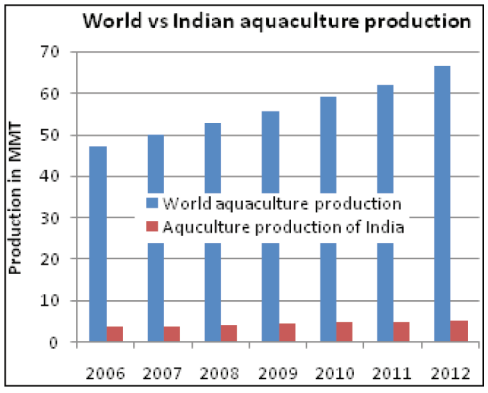
to explosive growth in the exploitation of marine fisheries through the 1960s, 1970s and 1980s. But from the late 90s onwards, the marine fisheries production reached a plateau and it seems that it can register only marginal increase in the near future. With most wild fisheries near maximum sustainable exploitation levels, capture fisheries will most likely grow slowly.

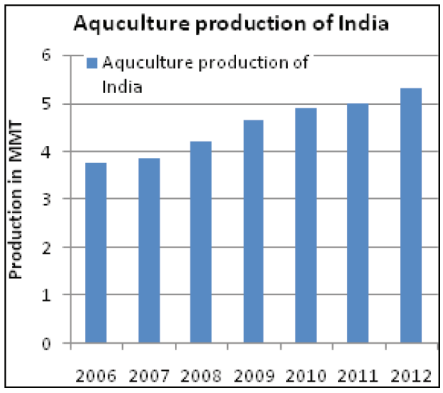
Culture Fisheries

Global aquaculture production attained another all-time high of 90.4 million tonnes (live weight equivalent) in 2012 (US$144.4 billion), including 66.6 million tonnes of food fish and 23.8 million tonnes of aquatic algae, with estimates for 2013of 70.5 million and 26.1 million tonnes, respectively. China alone produced 43.5 million tonnes of food fish and 13.5 million tonnes of aquatic algae that year. Some developed countries, e.g. the United States of America, have reduced their aquaculture output in recent years, mainly owing to competition from countries with lower production costs. World food fish aquaculture production expanded at an average annual rate of6.2 percent in the period 2000–2012 (9.5 percent in 1990–2000) from 32.4 million to 66.6 million tonnes. The fifteen main producer countries accounted for 92.7 percent of all farmed food fish production in 2012.

Table 3: Total aquaculture production in world and India

Year	World (million tonnes)	India (million tonnes)	India's share (%)
2006	47.3	3.756	7.94
2007	49.9	3.845	7.70
2008	52.9	4.207	7.95
2009	55.7	4.638	8.33
2010	59.0	4.894	8.29
2011	62.0	4.981	8.03
2012	66.6	5.294	7.95





Aquaculture in India has evolved as a viable farming practice over last three decades and has been showing an impressive annual growth rate of 6-7%. While the carp-based freshwater aquaculture, mainly constituted by the Indian major carps has been contributing over 90% of the aquaculture production satisfying the domestic need, the shrimp-based coastal aquaculture with only about 5% share contributes much of the export earnings. Almost five-folds growth in mean national pond productivity in last four decades, i.e. from about 600 kg in 1970s to 2900 kg/ha. Brackish water aquaculture in India had been concentrated around the black tiger prawn as the single most important species but now culture of exotic Pacific white shrimp, etc. attracted the farmers.

Greater use of compounded aquaculture feeds along with improvements in rearing technology and

selective breeding has the potential to significantly increase the productivity of many forms of aquaculture. The depleting resources, energy crisis and resultant high cost of fishing etc. have led to increased realization of the potential and versatility of aquaculture as a sustainable and cost-effective alternative to capture fisheries.

Prospects of Fisheries Growth and Contribution to Indian Economy

India is the second largest global fish producer after China in terms of aquaculture production. Indian aquaculture has come a long way from being a traditional subsistence-level activity to a predominantly commercial enterprise in recent years, and plays a significant role as a source of food and nutritional security, poverty alleviation and overall rural development. With diverse resources ranging from deep seas to lakes in the mountains and more than 10% of the global biodiversity in terms of fish and shellfish species, India has shown continuous and sustained increments in aquaculture production in recent years. The present scenario is that freshwater aquaculture, notably carp culture, is witnessing considerable growth with minor contributions from catfish and freshwater prawns. Similarly, the export-oriented shrimp aquaculture in coastal areas has also been growing in a rapid way.

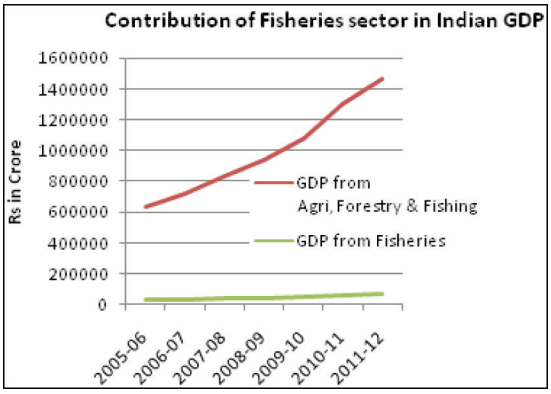
Table 4: Fish production and its growth in last seven years

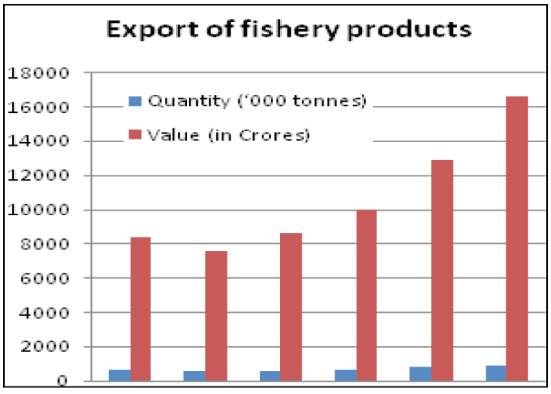
Year	Inland Fish Production		Marine Fish Production		Total Fish Production	
	Inland (lakh tonnes)	Growth rate (%)	Marine (lakh tonnes)	Growth rate (%)	Total production (lakh tonnes)	Growth rate (%)
2005-06	37.56	6.52	28.16	1.33	65.72	4.23
2006-07	38.45	2.37	30.24	7.39	68.69	4.52
2007-08	42.07	9.41	29.20	-3.44	71.27	3.76
2008-09	46.38	10.24	29.78	1.99	76.16	6.87
2009-10	48.94	5.52	31.04	4.23	79.98	5.02
2010-11	49.81	1.77	32.50	4.70	82.31	2.91
2011-12	52.95	6.30	33.75	3.85	86.66	5.28

The contribution of fishery activities to national economies is multifaceted. In addition to supplying food, capture and aquaculture production contributes to gross domestic product (GDP), provides livelihoods for fishers and processors, is a source of hard currency (from exports of fishery products),and boosts government revenues through fisheries agreements and taxes. During the year 2011-12, the contribution of fisheries sector in total GDP was 0.78% while 4.47% in Agriculture GDP (Table 5). The contribution of fisheries sector is increasing gradually and gone up from 31699 crore in 2005-06 to 65541 crore in 2011-12 (Table 5).

Table 5: Contribution of Fisheries sector

Year	Total GDP (Crore)	GDP from Agri., Forestry & Fishing (Crore)	GDP from Fisheries (Crore)	GDP from Fisheries as % of	
				Total GDP	GDP from Agri., Forestry & Fishing
2005-06	3390503	637772	31699	0.93	4.97
2006-07	3953276	722984	35182	0.89	4.87
2007-08	4582086	836518	38931	0.85	4.65
2008-09	5303567	943204	44073	0.83	4.67
2009-10	6108903	1083514	50370	0.82	4.65
2010-11	7266967	1306942	57369	0.79	4.39
2011-12	8353495	1465753	65541	0.78	4.47





Export Earnings

Developing countries export mainly raw products and only limited quantities of processed products. Exports of fishery products are still subject to many trade barriers. Tariffs play important roles in strategic business decisions on whether to export unprocessed fish products, which normally have zero tariffs in the importing country, or finished (consumer ready) processed/semi-processed products, which are burdened with prohibitive tariffs. There has been a considerable increase both in the quantum and value of export of fish and fish products. India's export earnings increased rapidly and almost doubled within 6 years i.e. 8363.52 crore in 2006-07 to 16597.23 crore in 2011-12. The export quantity had not increased in that percentage in compare to value. The reason behind rapid increase in fishery products were high demand, economic growth, rising population, shift in dietary patterns, tastes and preferences for high protein and nutritional content foods.

Table 6: Export of Fisheries Products

Year	Quantity ('000 tonnes)	Value (in Crores)
2006-07	612.641	8363.52
2007-08	541.701	7620.92
2008-09	602.835	8607.94
2009-10	678.436	10048.53
2010-11	813.091	12901.47
2011-12	862.021	16597.23

Conclusion

Fisheries sector plays an important role in the Indian economy. It contributes to the national income, exports, food and nutritional security and in employment generation. This sector is also a principal source of livelihood for a large section of economically underprivileged population of the country, especially in the coastal areas. The fisheries sector has recorded faster growth as compared to the agricultural sector in all the decades. The growing production of fish suggests that fisheries sector is booming and contributing to the economic growth of the nation. More than 6 million fishermen and fish farmers are totally dependent on fisheries for their livelihood in India.

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