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GROWTH AND TRADE PERFORMANCE OF INDIAN FISHERIES: TRENDS AND CONSTRAINTS

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Growth and Trade Performance of Indian Fisheries: Trends and Constraints

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ABSTRACT

Marine and Inland Fisheries, together with aquaculture, remains an important source of food, nutrition, employment and income in India. The sector provides livelihood to about 16 million fishers and fish farmers at the primary level and almost twice the number along the value chain. India is the second largest fish producing and second largest aquaculture nation in the world after China. The total fish production during 2018-19 is estimated to be 13.76 million metric tonnes (MMT) with a contribution of 9.58 MMT (69.65%) from inland fisheries and 4.18 MMT (30.35%) from marine fisheries. The total fisheries potential of India has been estimated at 22.31 MMT in 2018. Of this, the marine fisheries potential stands at an estimated 5.31 MMT and the inland fisheries potential has been estimated at 17 MMT. During 2018-19, 71 per cent of marine fisheries potential and 58 per cent of the inland fisheries potential have been harnessed. The fish production in the country has increased from 3.84 MMT in 1990-91 to 13.76 MMT during 2018-19, registering an annual growth rate of 4.05 per cent. The growth in fish production has shown a cyclic pattern with an increasing long-term trend. Fish and fish products during 2019-20 emerged as the largest group in agricultural exports from India, with 1328991 MT in terms of quantity and Rs.47618 crore in value terms. This accounts for around 2.06 per cent of the total exports and 17.34 per cent of the agricultural exports, and contributes 7.28 per cent to the Agriculture Gross Value Added (GVA) and 1.24 per cent to the National GVA at current prices of the country during 2018-19. The ratio of fisheries (marine) export to fisheries GVA was 22.37 per cent at current prices during 2018-19. USA and South East Asia are the major export markets for Indian seafood with a share of 34.81 per cent and 22.67 per cent,

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respectively in value terms during 2018-19. Frozen shrimp remained the major export item (68%) followed by frozen fish (11%). Total fish production in the world is estimated to have reached 178.5 MMT in 2018, which include 115.2 MMT marine fisheries (64.54%) and 63.3 MMT inland fisheries (35.46%). Over 90 per cent of the quantity of trade in fish and fish products consisted of processed products (excluding live & fresh whole fish) in 2018, with frozen products representing the highest share. About 78 per cent of the quantity exported consisted of products destined for human consumption. In 2018, 67 MMT of fish were traded internationally, equating to almost 38 per cent of all fish caught or farmed worldwide. The total export value of USD 164 billion recorded in 2018 represented almost 11 per cent of the export value of agricultural products. At present India is contributing about 7.73 per cent of the global fish production and 4 per cent of the global fish trade. Major fish producing States should work out Action Plans for expansion of Shrimp/prawn farming in inland saline/alkaline and freshwater areas under scientific guidance for enhancing the share of seafood exports in global trade. Culture of identified exotic species with high production and profit potential should be introduced with adequate bio-security protocols adopting Best Management Practices/Good Aquaculture Practices. Efforts should be made by States to enhance fish production and productivity through application of technology and formation of Farmers Producer Organizations (FPOs) to cater small pond holder's needs. There is a need to promote market, trade and export of globally competitive fish and value-added fish products benchmarking with global standards. Further, post-harvest infrastructure including cold chain for reduction of post-harvest fisheries losses (Rs.61000 crore including Rs.46000 crore inland fisheries and Rs.15000 crore marine fisheries annually) needs to be developed and strengthened. Requisite infrastructure such as processing plants, cold storages, ice plants, freezing and packing plants, value addition, fish and fisheries products transportation vehicles including refrigerated and insulated vehicles, ice flaking and ice crushing units, ice/fish holding boxes, warehouses, etc. should be established and modernised. The outbreak of COVID-19 is expected to have a negative impact on fisheries trade among key exporters and importers in 2020.

Introduction

Fishing is one of the oldest occupations in India. The fishing sector has a place of pride in the national economy. The significance of this sector is of two dimensional, i.e., employment potential and export potential. The sector provides livelihood to about 16 million fishers and fish farmers at the primary level and almost twice the number along the value chain. Apart from the direct employment to fishermen, this sector is responsible for generation of employment for several millions in seafood and ancillary industries. Fisheries sector has been an important source for foreign resources over a period of time in the country. Although fishing has been a traditional occupation in the coastal villages of India, the recognition that the activity has gained in the economic front is largely due to remarkable achievement on the export front. Global fish production is estimated to have reached 178.5 million metric tonnes (MMT) in 2018 (FAO, 2020). In 2018, 67 MMT of fish were traded internationally, equating to almost 38 per cent of all fish caught or farmed worldwide. The total export value of USD 164 billion recorded in 2018 represented almost 11 per cent of the export value of agricultural products. At present India is contributing about 7.73 per cent of the global fish production and 4 per cent of the global fish trade. The export of marine products increased from 0.296 MMT in 1995-96 to 1.33 MMT in 2019-20 registering an annual growth rate of 6.82 per cent (APEDA, 2020). In terms of value, export increased to Rs.47618 crore in 2019-20 from Rs.3501.11 crore in 1995-96 showing an annual growth rate of 11.90 per cent. The rapid increase in the growth of marine/seafood exports has been mainly due to boom in brackish water aquaculture. USA and South East Asia are the major export markets for Indian seafood with a share of 34.81 per cent and 22.67 per cent, respectively. Frozen shrimp remained the major export item (68%) followed by frozen fish (11%). India has rich and diverse fisheries resources. The marine fisheries resources are spread along the country's vast coastline and 2.02 million square km Exclusive Economic Zone (EEZ) and 0.53 million square km continental shelf area. The inland resources are in the form of rivers and canals (1.95 lakh km), floodplain lakes (8.12 lakh hectares), ponds and tanks (24.1 lakh hectares), reservoirs (31.5 lakh hectares), brackish water (12.4 lakh hectares), saline/ alkaline affected areas (12 lakh hectares), etc. The unutilized and underutilized vast and varied inland resources offer

great opportunities for livelihood development and ushering economic prosperity (National Fisheries Policy, 2020).

The total fisheries potential of India has been estimated at 22.31 MMT in 2018, of this, the marine fisheries potential stands at an estimated 5.31 MMT and the inland fisheries potential has been estimated at 17 MMT. During 2018-19, 71 per cent of marine fisheries potential and 58 per cent of the inland fisheries potential have been harnessed. The total fish production in the country increased from 0.75 MMT in 1950-51 to 13.76 MMT in 2018-19. Of this, the marine fisheries contributed 4.18 MMT and the inland fisheries contributed 9.58 MMT. In recent years, the fish production in India has registered an average annual growth rate of more than 7 per cent. Considering the increase in production and better performance of fishery sector, the present study has been taken up with the specific objectives to estimate growth of fish production in India and to study the growth pattern in exports and trade direction of fish and fish products export from India.

Data and Methodology

The data used in this paper was collected from various secondary sources-MPEDA-Agri-exchange website; Handbook on Fisheries Statistics; National Account Statistics 2020,MoSPI; Pocket Book of Agricultural Statistics; Annual Reports of Department of Commerce; Basic Animal Husbandry and Fisheries Statistics; The State of World Fisheries and Aquaculture, FAO (2020); National Fisheries Development Board; NABARD Annual Reports; Agricultural and Processed Food Products Export Development Authority (APEDA); Economic Survey, GoI; National Fisheries Policy (2020) and other related websites, published research papers, etc. The growth rate tool was used in the study.

Results and Discussion

Global fish production is estimated to have reached about 179 MMT in 2018. Of the overall total, 156 MMT were used for human consumption, equivalent to an estimated annual supply of 20.5 kg per capita. The remaining 22 million metric tonnes (MMT) were destined for non-food uses, mainly to produce fishmeal and fish oil. Capture fish

accounted for 54 per cent of the global fish production. Aquaculture accounted for 46 per cent of the total production and 52 percent of fish for human consumption. China has remained a major fish producer, accounting for 35 per cent of global fish production in 2018 (FAO, 2020). Table 1 depicts the contribution of India to the world fish production from 1950 to 2018. The total fish production in the world which was 19.31 MMT in 1950 increased to 178.50 MMT in 2018, recording an annual growth rate of 4.11 per cent during the period. The share of inland and marine fisheries increased from 2.24 MMT and 17.08 MMT in 1950 to 63.30 MMT and 115.20 MMT in 2018, registering an annual growth rate of 8.24 per cent and 2.98 per cent, respectively. India's contribution in total world fish production increased from 3.83 per cent in 1950 to 7.71 per cent in 2018. The share of inland fisheries in the total world inland fish production increased from 9.40 per cent 1950 to 15.13 per cent during 2018. During 1950 to 2018, India's fish production including marine and inland fish production was growing at a much faster rate than the world. It may be concluded that inland fisheries is playing a very important role in the fish production in the country as also in the world.

Table 1: Contribution of India to World Fish Production in Selected Years

(In MMT)

	World Production			Contribution of India		
Year	**Total**	**Marine**	**Inland**	**Total**	**Marine**	**Inland**
1950	19.31	17.08	2.24	0.74	0.53	0.21
1955	27.96	24.30	3.66	0.84	0.60	0.24
1960	35.54	31.49	4.05	1.16	0.88	0.28
1965	49.67	44.55	5.13	1.33	0.82	0.51
1970	65.38	59.31	6.07	1.76	1.09	0.67
1975	65.47	58.51	6.96	2.27	1.48	0.79
1980	71.94	64.19	7.76	2.45	1.55	0.90
1985	86.28	75.48	10.80	2.84	1.73	1.11
1990	97.74	82.57	15.17	3.80	2.19	1.61
1991	97.41	82.07	15.35	4.05	2.35	1.70
1992	100.61	84.35	16.26	4.24	2.47	1.77
1993	104.39	86.57	17.83	4.48	2.49	1.99
1994	112.97	93.27	19.70	4.78	2.71	2.07
1995	116.75	94.60	22.14	4.92	2.66	2.27
1996	120.42	96.28	24.13	5.21	2.82	2.39

1997	120.41	95.45	24.96	5.39	2.88	2.51
1998	114.14	88.28	25.87	5.28	2.68	2.60
1999	122.32	94.61	27.71	5.61	2.78	2.83
2000	125.94	96.88	29.06	5.61	2.76	2.85
2001	125.36	95.00	30.36	5.90	2.80	3.09
2002	127.83	96.17	31.67	5.93	2.96	2.96
2003	127.20	93.69	33.51	6.03	2.96	3.07
2004	134.65	98.77	35.88	6.19	2.88	3.31
2005	136.78	98.25	38.53	6.66	2.87	3.79
2006	137.51	96.43	41.08	7.03	3.04	3.99
2007	140.69	97.26	43.42	6.97	3.09	3.88
2008	143.02	96.78	46.24	7.95	3.36	4.60
2009	145.74	97.19	48.55	7.86	3.29	4.57
2010	147.99	95.87	52.13	8.48	3.28	5.19
2011	154.00	104.70	49.30	8.88	3.27	5.61
2012	156.00	102.80	53.20	9.24	3.32	5.92
2013	160.80	104.80	56.00	9.78	3.44	6.34
2014	164.90	106.70	58.20	10.46	3.57	6.89
2015	168.70	108.70	60.00	10.82	3.64	7.18
2016	166.20	106.80	59.40	11.43	3.63	7.81
2017	172.70	111.20	61.50	12.59	3.69	8.90
2018	178.50	115.20	63.30	13.76	4.18	9.58
CAGR (%)	**4.11**	**2.98**	**8.24**	**6.52**	**4.09**	**9.04**

Source: Handbook on Fisheries Statistics, 2018 and FAO (2020) Report on "The State of World Fisheries and Aquaculture 2020

Marine Capture Production

Global total marine catches increased from 79.71 MMT in 2012 to 84.41 MMT in 2018, but were still below the peak catches of 86.4 MMT in 1996. In 2018, the top 7 producers were responsible for over 50 percent of the total marine captures, of which China accounted for 15 percent of the world total (Table 2), followed by Peru (8%), Indonesia (8%), the Russian Federation (6 %), the USA (6%), India (4%), and Vietnam (4%). While China remains the world's top producer of marine captures, its catches declined from an average 13.8 MMT per year between 2015 and 2017 to 12.7 MMT in 2018. A continuation of a catch reduction policy beyond its Thirteenth Five-Year Plan (2016-2020) is expected to result in further decreases in coming years.

Table 2: Major Countries for Marine Capture Fisheries during 2012 to 2018

(In MMT)

Sr .No.	Country	2012	2013	2014	2015	2016	2017	2018
1	China	13.87	13.97	14.81	15.31	15.25	13.19	12.68
2	Indonesia	5.42	5.62	6.02	6.22	6.11	6.31	6.71
3	USA	5.11	5.12	4.95	5.02	4.90	5.02	4.72
4	Russian Federation	4.07	4.09	4.00	4.17	4.47	4.59	4.84
5	Peru	4.81	5.83	3.55	4.79	3.77	0.83	0.96
6	India	3.40	3.42	3.42	3.50	3.60	3.94	3.62
7	Japan	3.61	3.62	3.63	3.42	3.17	3.18	3.1
8	Vietnam	2.42	2.61	2.71	2.61	2.68	3.15	3.19
9	Norway	2.15	2.08	2.30	2.29	2.03	2.38	2.49
10	Phillippines	2.13	2.13	2.14	1.95	1.87	1.72	1.89
11	Malaysia	1.47	1.48	1.46	1.49	1.57	1.47	1.45
12	Chile	2.57	1.77	2.18	1.79	1.50	1.92	2.12
13	Morocco	1.16	1.24	1.35	1.35	1.43	1.36	1.36
14	Korea	1.66	1.59	1.72	1.64	1.38	1.35	1.33
15	Thailand	1.61	1.61	1.56	1.32	1.34	1.31	1.51
16	Mexico	1.47	1.50	1.40	1.32	1.31	1.46	1.47
17	Myanmar	2.33	2.48	2.70	1.11	1.19	1.27	1.14
18	Iceland	1.45	1.37	1.08	1.32	1.07	1.18	1.26
19	Spain	-	0.98	1.10	0.97	0.91	0.94	0.92
20	Canada	-	0.82	0.84	0.82	0.83	0.81	0.78
21	Taiwan	-	0.93	1.07	0.99	0.75	0.75	0.81
22	Argentina	-	0.86	0.82	0.80	0.74	0.81	0.82
23	Ecuador	-	0.51	0.66	0.64	0.72	0.69	0.72
24	UK	-	0.63	0.75	0.65	0.70	-	-
25	Denmark	-	0.67	0.75	0.87	0.67	-	-
26	Iran	-	-	-	-	-	0.78	0.95
27	Mauritania	-	-	-	-	-	0.9	0.79
28	**Total of the above country**	60.71	66.92	66.95	66.34	63.94	64.6	67.83
29	**Total Other Countries**	19.00	14.04	14.60	14.91	15.34	16.61	16.58
30	**World Total**	79.71	80.96	81.55	81.25	79.28	81.21	84.41

Source: Handbook on Fisheries Statistics, 2018 and FAO (2020) Report on "The State of World Fisheries and Aquaculture 2020

Role of Fisheries Sector in Agriculture

The role of fisheries sector in agricultural economy of almost all the states has been increasing as is evident from its enhancing share of value of fishing in total value of output from agriculture and allied sectors (Table 3). As expected, the share has increased more prominently in the coastal states/union territories like West Bengal, Andhra Pradesh, Goa, Kerala, Odisha, Gujarat, A&N Islands, Daman & Diu, Lakshadweep and Puducherry, etc. The share of value of output of fishing from agriculture and allied sectors was highest for Goa (40.73%) followed by Andhra Pradesh (21.13%), Tripura (15.18%) and Kerala (14.63%). The value of output from fishing is continuously increasing at the CAGR of 17.91 per cent during 2011-12 to 2016-17. The highest annual growth (CAGR) among the major fishing states was estimated in case of Tripura (31.89%) followed by Andhra Pradesh (29.47%), Jharkhand (22.14%), Odisha (20.78%), Kerala (19.35%), Gujarat (17.94%), Tamil Nadu (15.97%) and West Bengal (12.38%) during the same period.

Table 3: State-wise Value of Output from Fishing (at Current Prices)

(Rs. Lakh)

State/ UT	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	CAGR (%)	Share of value of fishing in total value of output from agriculture and allied sectors (%)
Andhra Pradesh	1420837	1687753	2210663	2701529	3826513	5093591	29.47	21.13
Arunachal Pradesh	4972	5951	6084	9006	11376	12720	22.25	1.44
Assam	441662	521294	561653	595903	633275	720764	9.24	12.37
Bihar	356526	434402	568220	717901	747025	790346	18.16	6.26
Chhattisgarh	258054	309524	355708	423651	469740	529632	15.43	7.53
Goa	82284	100622	172873	149819	177433	178578	16.79	40.73
Gujarat	421358	476027	566823	766727	825421	905156	17.94	4.28
Haryana	95400	111480	133220	138491	153566	180665	12.73	1.54
Himachal Pradesh	5684	6545	9065	10955	12354	13636	20.31	0.55
Jammu & Kashmir	35555	37992	37788	39627	43298	43942	4.37	1.50
Jharkhand	61882	86940	109668	119734	140934	184511	22.14	3.53
Karnataka	322949	372279	453166	582863	504198	480483	9.41	3.32
Kerala	474996	649519	780221	876468	1041055	1206425	19.35	14.63
Madhya Pradesh	71341	84852	104837	133288	152958	197889	22.52	0.74
Maharashtra	359918	434894	478254	590858	588681	778001	15.27	2.69
Manipur	21001	29051	37167	39070	43863	46703	16.29	7.50
Meghalaya	4512	7591	9385	10532	19780	24465	38.66	4.68
Mizoram	5334	6316	6794	7746	8587	9973	12.69	1.60
Nagaland	6968	7665	8452	9302	10167	11351	10.15	1.52
Odisha	311867	392076	421837	526897	654680	822078	20.78	9.42
Punjab	64408	74284	101347	118316	130415	151589	19.12	1.16
Rajasthan	36387	41112	46674	63782	58570	77380	15.84	0.29
Sikkim	315	496	575	649	666	710	15.58	0.31
Tamil Nadu	565798	599283	607465	880490	937339	1133443	15.97	6.79
Telangana	164363	195237	277227	296403	294906	252060	10.33	2.50
Tripura	53818	70322	137835	164244	189709	198860	31.89	15.18
Uttar Pradesh	304562	339000	376232	418426	420253	525870	10.46	1.31
Uttarakhand	3915	4193	4941	5271	5629	5975	9.14	0.28
West Bengal	1972924	2253300	2842674	3102001	3337809	3466206	12.38	15.40
A & N Islands	20971	21863	23148	24852	24890	26912	5.00	25.65
Chandigarh	258	61	191	213	244	241	11.87	1.15
Dadra&NagarHaveli	110	112	135	131	0	0	0.00	0.00
Daman & Diu	18597	27183	30076	49256	46556	32880	15.21	82.96
Delhi	908	924	1041	1076	1132	1250	6.61	0.41
Lakshadweep	14555	13371	20644	14982	17817	23384	8.67	84.43
Puducherry	25463	26194	28775	32413	38161	38609	9.98	26.40
All India	**8010453**	**9429708**	**11530858**	**13622873**	**15569000**	**18166278**	**17.91**	**5.73**

Source: National Accounts Statistics, 2019, State-wise and Item-wise Value of Output from Agriculture, Forestry and Fishing (2011-12 to 2016 -17), MOSPI, CSO, GoI, New Delhi

Trends in Fish Production in India

The total fish production in the country during 2018-19 is estimated to be 13.76 MMT with a contribution of 9.58 MMT (69.65%) from inland fisheries and 4.18 MMT (30.35%) from marine fisheries. Almost 50 per cent of inland fish production is from culture fisheries, which constitutes 6.5 per cent of global fish production. India is the second largest fish producer in the world with a total production of 13.76 MMT in 2018-19 as compared to 12.59 MMT during 2017-18, recording a growth rate of 9.28 per cent. Fish production increased from 3.84 MMT in 1990-91 to 13.76 MMT in 2018-19 with compound annual growth rate (CAGR) of 4.05 per cent (Table 4). Further, inland fish production was growing much faster growth (6.19%) than marine fish production (1.48%). Figure 1 shows that from 1990-91 to 1999-2000, the share of Inland fish production was lower than marine fish production and thereafter, its share has increased significantly. Faster growth in inland fisheries was mainly due to promotional and developmental initiatives like infrastructure development, promotion and subsidy support programmes introduced for fish farming, price realization and extension services, etc. Fish farming in India still has ample scope for improving production and productivity.

Foreseeing the vast resource potential and possibilities of export in the fisheries sector, a separate Department of Fisheries was created under the aegis of the Ministry of Fisheries, Animal Husbandry and Dairying. Various programmes and schemes have been introduced by Government of India, such as, the restructured umbrella scheme of '**Blue Revolution: Integrated Development and Management of Fisheries'** focusing on increasing fish production and productivity from aquaculture and fisheries resources, both inland and marine sector through full potential ultilisation of water resources for fisheries development in a sustainable manner, while keeping in view the bio security and environment concerns, with aims at reaching an annual production of 200 lakh metric tonnes by 2022-23 (Union Budget, 2020-21). Focus should be given for growing of algae, see-weed and cage culture; the **Pradhan Mantri Matsya Sampada Yojana** (PMMSY) with an investment of Rs.20050 crore aims to

enhance fish production to 220 lakh metric tonnes by 2024-25 from 137.58 lakh metric tonnes in 2018-19 at an average annual growth rate of about 9 per cent. The scheme will result in doubling fisheries export earnings to Rs.100000 crore and generate about 55 lakh direct and indirect employment opportunities in fisheries sector over a period of next five years (2024-25). The main thrust will be given towards enhancement of fish production and productivity, quality, sustainability, technology infusion, post-harvest infrastructure, modernisation and strengthening of value chain, standards and traceability in fisheries sector from 'catch to consumer', establishing a robust fisheries management framework, fishers' welfare, enhancement of fisheries export competitiveness. PMMSY will create a conducive environment for private sector participation, development of entrepreneurship, business models, promotion of ease of doing business, innovations and innovative project activities including start-ups, incubators, etc. in fisheries sector; **Fisheries and Aquaculture Infrastructure Development Fund** for funding infrastructure projects in fisheries sector with a corpus of Rs.7522.48 crore spreading over a period of five years was created. National Bank for Agriculture and Rural Development (NABARD), National Cooperatives Development Corporation (NCDC) and all Scheduled Banks will serve as Nodal Loaning Entities; Under **Rural Infrastructure Development Fund,** GoI has permitted NABARD to extend RIDF loans for fisheries related infrastructure such as fishing harbours/jetties and riverine fisheries; **Scheme for Agro Marine Processing and Development of Agro Processing Clusters** (SAMPADA) with an outlay of Rs.6000 crore for the period of 2016-2020 with aimed at creation of modern infrastructure from farm gate to retail outlet. **KCC facility** was extended to fish farmers to meet the working capital requirement of fisheries activities including aquaculture. Fish farmers (individual & groups/partners/share croppers/tenant farmers), self-help groups, joint liability groups are eligible for availing the KCC facilities. The interest subvention on KCC for fisheries farmers upto Rs.2.00 lakh @ 2 per cent per annum at the time of disbursal of loans and additional interest subvention @ 3 per cent per annum in case of Prompt Repayment Incentive; and **National Fisheries Policy, 2020** aims at comprehensive development of the fisheries sector through appropriate interventions to address the critical gaps with

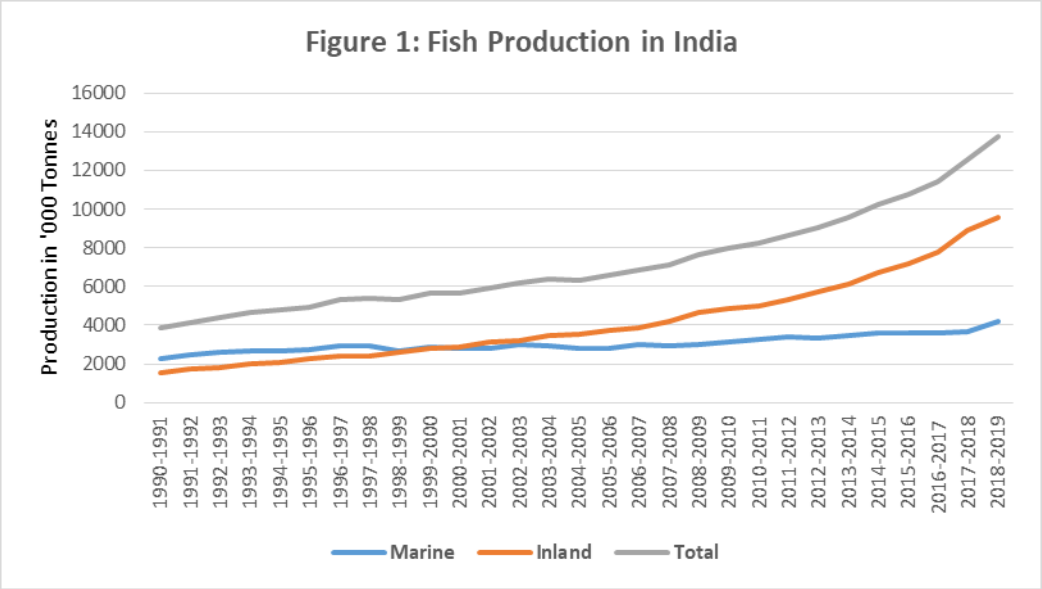
an overarching goal for growths in exports, increase in farmer's income and better choice for consumers.

Table 4: Fish Production in India

(In'000 Tonnes)

Year	Fish Production		
	Marine	Inland	Total
1990-1991	2300	1536	3836
1991-1992	2447	1710	4157
1992-1993	2576	1789	4365
1993-1994	2649	1995	4644
1994-1995	2692	2097	4789
1995-1996	2707	2242	4949
1996-1997	2967	2381	5348
1997-1998	2950	2438	5388
1998-1999	2696	2602	5298
1999-2000	2852	2823	5675
2000-2001	2811	2845	5656
2001-2002	2830	3126	5956
2002-2003	2990	3210	6200
2003-2004	2941	3458	6399
2004-2005	2779	3526	6305
2005-2006	2816	3756	6572
2006-2007	3024	3845	6869
2007-2008	2920	4207	7127
2008-2009	2978	4638	7616
2009-2010	3104	4894	7998
2010-2011	3250	4981	8231
2011-2012	3372	5294	8666
2012-2013	3321	5719	9040
2013-2014	3443	6136	9579
2014-2015	3569	6691	10260
2015-2016	3600	7162	10762
2016-2017	3625	7806	11431
2017-2018	3688	8902	12590
2018-2019	4176	9582	13758
CAGR (%)	**1.48**	**6.19**	**4.05**

Source: Handbook on Fisheries Statistics, 2018 and MPEDA website



State-wise Fish Production

State-wise fish production from 2009-10 to 2018-19 is presented in Table 5. The table shows that Andhra Pradesh accounts for about 31 per cent of the total fish production in the country during 2018-19 followed by West Bengal (12.87%), Gujarat (6.12%), Odisha (5.52%), Kerala (5.19%) and Tamil Nadu (4.91%). These six states, together, account for 65.62 per cent of the total fish production in 2018-19. The fish production in Andhra Pradesh increased more than three times from 2009-10 to 2018-19. Further, Andhra Pradesh is the highest Inland fish producing state (35.40%) followed by West Bengal (16.57%), Bihar (6.28%), Odisha (5.29%) and Chhattisgarh (5.10%). These five states, together, account for 68.64 per cent of the total Inland fish production. In case of Marine fish production, highest share was 20.95 per cent for Andhra Pradesh followed by Gujarat (16.74%), Kerala (13.15%), Tamil Nadu (12.28%) and Maharashtra (11.18%) during 2018-19. These five states, together, account for 74.30 per cent of the total marine production in the country. Among the major fish producing states Andhra Pradesh has registered the highest annual growth rate of 13.37 per cent followed by Jharkhand (12.49%), Madhya Pradesh (12.39%), Chhattisgarh (10.96%), Bihar (8.74%) and Odisha (8.62%).

Table 5: State-wise Fish Production in India

(In '000 Tonnes)

States/UTs	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CAGR	Share (%)
Andhra Pradesh	1293.86	1368.20	1603.17	1808.08	2018.42	1978.58	2352.26	2766.19	3449.56	4267.01	13.37	31.01
West Bengal	1505.00	1443.26	1472.05	1490.01	1580.65	1617.32	1671.42	1701.82	1742.09	1770.31	2.37	12.87
Odisha	370.54	386.19	381.83	410.14	413.79	469.55	521.28	608.1	684.96	759.43	8.62	5.52
Tamil Nadu	534.17	614.81	611.48	620.40	624.30	697.61	709.16	669.31	682.04	675.37	2.33	4.91
Gujarat	771.50	774.90	783.72	788.49	793.42	809.93	809.56	815.56	834.53	842.47	0.98	6.12
Kerala	663.12	681.61	693.21	679.74	708.65	726.01	727.51	592.85	562.62	714.46	-0.74	5.19
Uttar Pradesh	392.93	417.48	429.72	449.75	464.48	494.27	504.00	617.69	628.75	661.51	6.10	4.81
Bihar	297.40	299.91	344.47	400.14	432.30	479.80	506.89	509.08	587.85	602.23	8.74	4.38
Karnataka	408.05	526.58	546.43	525.56	555.31	623.24	580.57	557.49	602.52	587.41	2.91	4.27
Maharashtra	538.35	595.25	578.79	586.37	602.68	608.07	579.69	662.91	606.01	568.38	0.77	4.13
Chhattisgarh	174.25	228.21	250.69	255.61	284.96	314.16	342.30	376.8	457.17	489.21	10.96	3.56
Telangana	0	0	0.00	0.00	0.00	268.36	236.75	198.92	270.04	294.12	3.20	2.14
Assam	218.82	227.24	228.62	254.27	266.70	282.70	294.20	306.6	327.26	331.43	5.13	2.41
Haryana	100.46	96.20	106.00	111.48	116.90	111.20	121.00	144.21	190	180.42	7.39	1.31
Jharkhand	70.50	71.89	91.68	96.60	104.82	106.43	116.00	145.16	190	208.29	12.49	1.51
MP	66.12	56.45	75.41	85.17	96.26	109.12	115.02	138.69	143.42	173.19	12.39	1.26
Punjab	122.86	97.04	97.62	99.13	104.02	114.77	120.09	132.72	136.64	135.05	3.36	0.98
Goa	0	93.27	89.96	77.88	114.06	117.98	111.91	117.89	124.01	119.53	4.72	0.87
A&N Islands	33.17	33.92	35.26	36.62	36.95	37.18	37.33	38.81	39.5	41.19	2.18	0.30
Arunachal Pradesh	2.65	3.15	3.30	3.71	0.61	4.00	4.05	4.11	4.25	4.67	6.53	0.03
Chandigarh	0.24	0.24	0.09	0.05	0.11	0.12	0.13	0.13	0.14	0.16	-1.58	0.00
D & N Haveli	0.05	0.05	0.05	0.05	0.05	0.06	0.00	0	0	0	0.00	0.00
Daman & Diu	0	16.98	17.43	19.01	19.01	31.82	23.03	24.02	24.68	25.05	5.58	0.18
Delhi	0.71	0.82	0.74	0.69	0.88	0.68	0.71	0.95	0.8	0.61	-0.28	0.00
H P	7.85	7.38	8.05	8.56	9.83	10.74	11.80	12.51	12.77	13.4	7.48	0.10
J & K	19.30	19.70	19.85	19.95	19.98	20.30	20.08	20.39	20.7	21.04	0.79	0.15
Lakshadweep	12.37	12.37	12.37	12.37	18.72	13.19	15.94	29.8	20.77	21.51	8.47	0.16
Manipur	19.20	20.20	22.22	24.50	28.54	30.50	32.04	32	33	32.15	6.75	0.23
Meghalaya	4.21	4.56	4.77	5.42	5.75	6.04	11.34	12.33	11.96	13.01	15.60	0.09
Mizoram	3.04	2.90	2.93	5.43	5.94	6.39	6.83	7.63	7.64	7.23	12.97	0.05
Nagaland	6.36	6.59	6.84	7.13	7.47	7.84	8.22	8.61	8.99	9.63	4.67	0.07
Puducherry	41.95	41.95	42.40	41.07	42.08	47.40	64.04	50.25	49.92	52.18	3.38	0.38
Rajasthan	26.91	28.20	47.85	55.16	35.10	45.42	42.46	50.2	54.04	55.51	6.75	0.40
Sikkim	0.16	0.18	0.28	0.49	0.42	0.44	0.40	0.38	0.38	0.36	8.52	0.00
Tripura	42.28	49.23	53.34	57.46	61.95	65.16	69.06	72.45	76.8	76.27	6.61	0.55
Uttarakhand	3.49	3.82	3.83	3.85	3.89	3.94	4.14	4.3	4.58	5.11	3.40	0.04
India	**7997.65**	**8230.71**	**8666.45**	**9040.34**	**9578.97**	**10260.28**	**10761.76**	**11430.84**	**12590**	**13756.89**	**6.14**	**100**

Source: Handbook of Fisheries Statistics 2018 and Ministry of Fisheries, Animal Husbandry and Dairying, GoI

Share of Fisheries Sector in Agricultural Gross Value Added

Fisheries sector contributes to the national income, exports, food and nutritional security and employment generation. It is a principal source of livelihood for a large section of economically underprivileged population of the country, especially in the coastal areas. The share of agriculture and allied activities in the Gross Value Added (GVA) is constantly declining. The agriculture sector is also diversifying towards high value enterprises, including fisheries. The contribution of fisheries sector to the GDP/GVA has gone up from 0.46 per cent in 1950-51 to 1.24 per cent in 2018-19(at current prices). The share of fisheries in agricultural GDP/GVA has impressively increased during this period from a mere 0.84 per cent in 1950-51 to 7.28 per cent in 2018-19. The fisheries sector recorded a Compound Annual Growth Rate of 17.28 per cent during 2011-12 to 2018-19 which is much higher than that of agriculture, forestry and fishing (10%). The Gross Value Added of fisheries sector in the national economy during 2018-19 (at current prices) stood at Rs.212915 crore which constituted 1.24 per cent of the total National GVA (Rs.17139962 crore) and 7.28 per cent share of Agricultural GVA (Table 6). This is a clear indication that fisheries sector is booming and playing significant role in overall development of agriculture, export and doubling of farmers' income in the country.

Table 6: Gross Value Added by Economic Activity at Current Basic Prices

(Rs. Crore)

Items	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CAGR (%)
Agriculture, Forestry & Fishing	1501947 (18.53)	1675107 (18.20)	1926372 (18.59)	2093612 (18.20)	2227533 (17.71)	2518662 (18.04)	2796909 (18.03)	2922846 (17.05)	10.00
Crops	982151 (12.11)	1088814 (11.83)	1248776 (12.05)	1292874 (11.24)	1327992 (10.56)	1486044 (10.64)	1606057 (10.35)	1614938 (9.42)	7.53
Livestock	327334 (4.04)	368823 (4.01)	422733 (4.08)	510411 (4.44)	582410 (4.63)	672611 (4.82)	785180 (5.06)	871884 (5.09)	15.54
Forestry & Logging	124436 (1.53)	137558 (1.49)	156674 (1.51)	173760 (1.51)	184411 (1.47)	205364 (1.47)	219109 (1.41)	223109 (1.30)	7.78
Fishing & Aquaculture	68027 (0.84)	79911 (0.87)	98190 (0.95)	116567 (1.01)	132720 (1.06)	154643 (1.11)	186561 (1.20)	212915 (1.24)	17.28
Total GVA	**8106946**	**9202692**	**10363153**	**11504279**	**12574499**	**13965200**	**15513122**	**17139962**	**11.17**

Source: National Accounts Statistics 2020, MoSPI, GoI, Figures in parentheses are percentage

Trade Performance

The data on different indicators of fisheries trade, presented in Table 7, reveal that fisheries have been an important component of agricultural exports. The share of fisheries exports in agricultural exports varied from 8 to 19 per cent and in total exports hovered around 1 to 2.5 per cent during the period 2011-12 to 2018-19. The share of agricultural exports in total exports was 11.90 per cent in 2018-19. The ratio of fisheries exports to fisheries GVA has been substantial, varying between 22 and 31 per cent. It was agreeable to find that India has been a net exporter of fish and fish products. It may be inferred from this analysis that fisheries sector has been substantially contributing to national earnings in terms of foreign exchange. However, the trade is constrained by trade restrictions which are being imposed by the importing countries and also the high standards of hygiene and sanitation and traceability required by buyers.

Table 7: Share of Fisheries Exports in the Agricultural and Total Exports of India Along with its Share in Fisheries GDP

Year	Percentage Share of Fisheries Exports in		
	Agricultural Export	Total Export	Fisheries GDP
2011-12	9.07	1.13	24.38
2012-13	8.29	1.15	23.58
2013-14	11.66	1.61	31.19
2014-15	14.06	1.78	28.90
2015-16	14.49	1.82	23.52
2016-17	17.47	2.14	25.60
2017-18	18.94	2.44	25.54
2018-19	17.34	2.06	22.37

Source: Pocket Book of Agricultural Statistics, 2019, Ministry of Agriculture & Farmers Welfare, GoI and MPEDA Website accessed on 29 July 2020

Export of Fish and Fish Products

The trend in export of marine products from 1995-96 to 2018-19 is presented in Table 8. The quantity of marine products export from the level of 2.96 lakh tonnes in 1995-96 has increased to 13.93 lakh tonnes in 2018-19, while the value of the export quantity has increased from Rs.3501 crore to Rs.46589 crore during this period. In 1996-2019, the export has increased with a CAGR of 6.82 per cent and

11.90 per cent in quantity and value terms, respectively. The share of marine export in total marine production has increased from 10.94 per cent in 1995-96 to 34.42 per cent in 2018-19. CAGR and Coefficient of Variation (CV) clearly indicate that there has been significant growth in export of marine products in terms of quantity and value. Marine products should be one of the key focus area for increasing export revenue from the country. The volatility of export market of any commodity discourages investment in production of that commodity, alters the planning horizon and destroys the sense of security, which is necessary for any concrete measure. The instability indices indicate that a proper policy on export and investment planning can be formulated. This share is low because post-harvest fisheries losses was Rs.61000 crore including Rs.15000 crore marine fisheries losses annually (Parliamentary Standing Committee on Agriculture, 2019). This huge loss is attributed due to faulty handling practices, inordinate delay in packing & transportation and lack of proper cold storage facilities. There is a need to modernize existing harbours, establish more cold facilities and ensure availability of more refrigerated trucks/vans for transportation of fishes.

Table 8: Marine Products Exports from India

Year	Marine Production (in tonne)	Quantity Export (in tonne)	Share of Export in Marine Production (%)	Value (Rs.Crore)
1995-96	2707000	296277	10.94	3501
1996-97	2967000	378199	12.75	4121
1997-98	2950000	385818	13.08	4697
1998-99	2696000	302934	11.24	4627
1999-00	2852000	343031	12.03	5117
2000-01	2811000	440473	15.67	6444
2001-02	2830000	424470	15.00	5957
2002-03	2990000	467297	15.63	6881
2003-04	2941000	412017	14.01	6092
2004-05	2779000	461329	16.60	6647
2005-06	2816000	512164	18.19	7245
2006-07	3024000	612641	20.26	8364
2007-08	2920000	541701	18.55	7621
2008-09	2978000	602835	20.24	8608
2009-10	3104000	678436	21.86	10049
2010-11	3250000	813091	25.02	12901

2011-12	3371750	862021	25.57	16597
2012-13	3320780	928215	27.95	18856
2013-14	3443120	983756	28.57	30213
2014-15	3569480	1051243	29.45	33442
2015-16	3599690	945892	26.28	30421
2016-17	3625080	1134948	31.31	37871
2017-18	3687860	1377244	37.35	45107
2018-19	4176000	1392559	33.35	46589
CAGR	**1.47**	**6.82**	**5.27**	**11.90**
CV (%)	**12.09**	**49.28**	**37.04**	**90.75**

Source: Marine Products Export Development Authority, Cochin; APEDA and Handbook of Fisheries Statistics 2018

Port-wise Exports

The export of the Indian marine products is routed through seaways to reach the markets in various countries. In India there are 11 major ports and a large number of minor ports. The major ports are Pipavav, Vizag, Koch, Jawaharlal Nehru Port, Mangalore, Kolkatta, Tuticurin, Chennai Goa and Mumbai. The port-wise export of marine products (quantity-wise) during 1995-96 to 2018-19 is presented in Table 9. The table reveals that the share of Kochi port in the total marine export during 1995-96 was highest (26.56%), followed by Mumbai (10.54 %), Jawaharlal Nehru port (8.15%), Vizag port (6.76%), Chennai port (6.18%), Kolkatta port (4.74%), Goa port (4.70%), Tuticurin port (4.40%), etc. However, during 2018-19, the share of Pipavav port was highest (21.10%), Vizag port (15.90%), Kochi port (12.96%), Jawaharlal Nehru Port (11.36%), Mangalore port (10.20%), Kolkatta port (8.34%), Tuticurin port (3.97%), Chennai port (3.97%), Goa port (2.72%) and Mumbai port (0.19%). The table further reveals, the annual compound growth rate of quantity-wise marine product exports in different ports. The highest CAGR was registered in Mangalore port (38%), followed by Pipavav port (13%), Vizag port (10.96%), Kolkatta port (10.75%) and Goa (8.17%). Mumbai port registered a negative CAGR of 11.71 per cent.

Table 9: Port-wise Export of Indian Marine Products during 1995-96 to 2018-19 (Based on Quantity)

(Quantity in tonnes)

Port	Chennai	Kochi	J N P	Vizag	Kolkata	Tuticurin	Mumbai	Mangalore/ ICD	Goa	Pipavav	Others Ports	Total
1995-96	18302	78682	24144	20017	14044	13028	31213	137	13938	0	82772	296277
1996-97	24237	91616	29081	18560	16282	16640	42579	1123	13603	0	124478	378199
1997-98	25667	88708	29403	23314	14469	15385	49554	572	11108	0	127638	385818
1998-99	29179	69991	42664	21567	15444	15847	26528	55	7861	0	73798	302934
1999-00	25646	91543	56428	23721	16397	17818	26583	14	9658	3371	71852	343031
2000-01	35772	88355	100348	23049	18553	17233	17467	3781	8849	52219	74847	440473
2001-02	41516	72035	91483	22154	17692	16966	5803	7423	9979	78097	61322	424470
2002-03	52877	80373	107972	25571	17386	17270	4305	9996	15395	99070	37082	467297
2003-04	46894	75761	95584	24284	17473	21568	1873	8474	10212	89628	20266	412017
2004-05	48245	98905	126475	34651	20195	31618	3464	11733	11028	129819	13365	529498
2005-06	49931	109375	140920	41108	20174	31216	3716	18427	11908	141629	24061	592465
2006-07	42272	106454	137153	36594	23238	30611	2893	26723	16152	178751	11800	612641
2007-08	42947	98520	104670	35535	27666	29697	2383	26155	19297	149734	5097	541701
2008-09	39043	98537	126853	32277	33625	29354	2319	33083	21146	163866	22732	602835
2009-10	45991	104281	129318	31863	46901	27782	2349	59000	29409	182052	19490	678436
2010-11	55961	121550	155829	38217	56060	30220	1965	104821	35728	197478	15262	813091
2011-12	46184	152445	148891	62215	59151	34532	2973	86367	40432	219801	9030	862021
2012-13	53596	162109	145723	78542	63832	32989	3164	95907	41377	233738	17238	928215
2013-14	55282	160798	142073	102146	67148	39547	5338	98230	34288	248621	30285	983756
2014-15	46671	162818	149585	115672	84994	42203	2098	115470	44684	243640	43408	1051243
2015-16	39021	145193	125751	128718	91054	40591	1877	83954	31681	204799	53253	945892
2016-17	37305	155989	149914	159973	104691	42026	1837	126405	43199	232391	81218	1134948
2017-18	48442	176090	177752	200779	98861	51684	3052	144235	50571	306181	119597	1377244
2018-19	55296	180457	158213	221374	116167	55251	2633	141980	37938	293835	129415	1392559
CAGR	**3.02**	**4.00**	**7.24**	**10.96**	**10.75**	**5.86**	**-11.71**	**38.04**	**8.17**	**13.04**	**-2.23**	**6.73**

The port-wise export of marine products in terms of value are presented in Table 10. The table reveals that Kochi port has the highest share (24.39%) in total export value of marine products whereas Mangalore port has the lowest share (0.33%) during 1995-96. During 2018-19, the share of Vizag port was highest (25.57%) and lowest was from Mumbai port (0.66%) The table further reveals, the CAGR of marine product exports in terms of value in different ports. The highest CAGR was registered in Mangalore port (35.93%), followed by Pipavav port (22.51%), Goa port (15.90%), Jawaharlal Nehru port (14.45%), Vizag port (14.01%) and Kolkatta

port (12.76%). The Overall annual growth rate was 11.87 per cent during 1995-96 to 2018-19.

Table 10: Port-wise Export of Indian Marine Products during 1995-96 to 2018-19 (Based on Value)

(Rs. In crore)

Port	Chennai	Kochi	J N P	Viraz	Kolkata	Tuticurin	Mumbai	Mangalore /ICD	Goa	Pipavav	Others Ports	Total
1995-96	527.65	853.76	211.88	608.88	354.6	191.54	272.48	11.54	70.36	0	398.42	3501.11
1996-97	821.91	925.71	237.17	522.19	422.64	253.76	281.11	8.5	63.36	0	585.01	4121.36
1997-98	900.7	937.96	242.18	774.96	420.69	319.35	393.97	1.96	53.93	0	651.78	4697.48
1998-99	1052.24	807.99	368.67	876.53	476.05	326.77	287.12	0.86	36.82	0	393.81	4626.86
1999-00	1050.71	1137.08	443.78	906.5	512.07	411.98	217.03	1.7	36.55	19.66	379.61	5116.67
2000-01	1766.08	1033.65	690.69	972.72	595.4	498.71	200.73	21.98	27.92	244.72	391.29	6443.89
2001-02	1570.13	930.87	699.19	771.81	523.94	446.27	85.54	55.42	34.48	357.38	482.02	5957.05
2002-03	2071.05	1022.22	916.29	886.51	557.43	436.82	67.97	64.76	50.11	527.59	280.56	6881.31
2003-04	1505.51	1077.11	837.25	763.64	543.56	565.65	47.37	64.48	31.4	477.31	178.67	6091.95
2004-05	1432.87	1135.7	965.32	1029.06	521.13	635.19	72.39	89.58	46.96	629.54	88.95	6646.69
2005-06	1382.56	1218.97	1173.04	1153.3	537.95	613.17	69.17	123.71	55.56	776.83	141.04	7245.3
2006-07	1332.58	1476.51	1279.48	1264.75	655.65	735.48	67.54	149.49	89.45	1162.05	150.55	8363.53
2007-08	1158.5	1383.74	1120.86	1018.6	689.7	654.64	116.12	162.61	111.22	1075.31	129.62	7620.92
2008-09	1078.44	1504.98	1487.28	897.93	720.36	693.76	176.56	238.44	185.16	1408.35	216.68	8607.94
2009-10	1314.1	1576.19	1564.42	943.29	892.48	686.45	462.67	400.33	219.24	1673.74	315.62	10048.53
2010-11	1979.76	1892.14	1970.65	1300.28	1313.67	880.41	273.49	688.32	275.3	2025.72	301.73	12901.47
2011-12	1847.88	2859.02	2151.66	2652.15	1730.89	1180.84	268.51	659.41	351.17	2710.34	185.36	16597.23
2012-13	2062.72	3265.64	2399.8	3344.97	1811.21	1269.03	323.77	849.01	366.95	2808.25	354.91	18856.26
2013-14	2709.97	4491.03	3531.36	6825.64	3053.46	2163.18	454.76	1114.63	445.92	3605.77	1817.54	30213.26
2014-15	2458.2	4989.86	3939.46	7578.27	3686.35	2328.27	333.72	1363.38	569.54	3588.35	2606.21	33441.61
2015-16	1918.02	4447.05	3437.53	7161	3430.99	1999.16	235.2	1048.08	490.48	3429.91	2823.41	30420.83
2016-17	1693.87	4860.98	4084.96	9294.31	4455.19	2220.52	226.4	1584.08	641.41	4217.45	4591.73	37870.9
2017-18	2052.46	5805.11	4699.1	11442.39	4875.58	2654.96	206.87	1793.41	711.91	4876.2	5988.9	45106.89
2018-19	2040.32	5861.55	4811.12	11913.07	5227.73	2768.77	309.49	1886.43	619.67	4844.03	6307.19	46589.37
CAGR	**4.15**	**9.73**	**14.45**	**14.01**	**12.76**	**11.37**	**2.27**	**35.93**	**15.90**	**22.51**	**10.80**	**11.87**

Market-wise Exports

There are six main markets identified for the export of India's marine products in the world. They are Japan, USA, European Union, China, South East Asia, Middle East and export to remaining countries were pooled under the Other countries.

These major markets, together, account for 91 per cent of the total fish and fish products exported in 2018-19. The data relating to quantity-wise export of marine products to the markets are shown in Table 11 and Figures 2 and 3. The major share of export was to the China market during 1995-96 to 2006-07. Afterwards the European Union during 2007-08 to 2009-10 and then South East Asian emerged as a major market in term of quantity export. The share of China market in total export was 48.35 per cent in 1997-98 which declined to 3.61 per cent in 2017-18 and increased 16.19 per cent during 2018-19. The share of South East Asian market on the other hand increased from 7.98 per cent in 1997-98 to 44.78 per cent in 2017-18 and thereafter declined to 32.10 per cent in 2018-19. The quantity export of marine products to all the markets has shown a positive trend and increased from 2.96 million metric tonnes (MMT) in 1995-96 to 13.93 MMT in 2018-19, registering a compound annual growth rate (CAGR) of 6.79 per cent. During 2018-19, share of marine products export was highest in the South East Asian Countries (32%) followed by USA (20%), China (16%) and European Union (12%). Highest compound annual growth in export was observed in case of South East Asia (15.10%), followed by USA (8.78%), Middle East (8.72%), and European Union (6.04%).

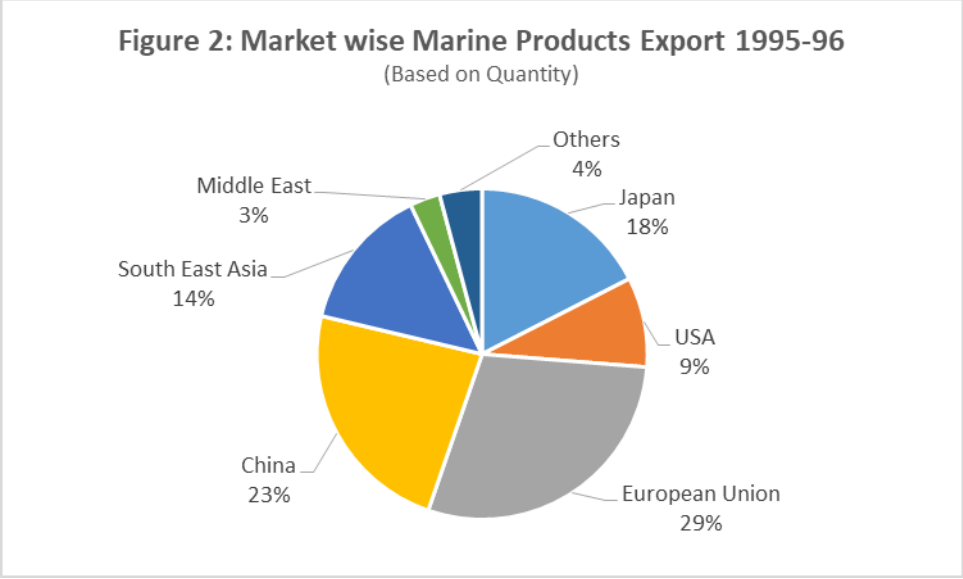
Table11: Market-wise Percentage Share of Export of Indian Marine Products (Based on Quantity)

(In Percentage)

Market	Japan	USA	European Union	China	South East Asia	Middle East	Others	Total
1995-96	17.48	8.78	29.03	23.42	14.16	2.97	4.16	100(296277)
1996-97	17.10	7.88	18.57	37.66	12.26	2.44	4.09	100(378199)
1997-98	18.39	8.53	8.84	48.35	7.98	4.49	3.43	100(385818)
1998-99	22.21	11.38	17.85	28.79	8.89	5.55	5.34	100(302934)
1999-00	19.53	10.68	19.43	31.23	11.17	3.63	4.33	100(343031)
2000-01	15.66	9.48	15.63	41.49	9.25	3.91	4.58	100(440473)
2001-02	15.29	11.55	19.53	31.75	12.35	4.51	5.01	100(424470)
2002-03	11.75	13.20	20.23	36.55	9.44	4.21	4.61	100(467297)
2003-04	12.14	12.90	23.37	30.03	12.30	3.57	5.69	100(412017)
2004-05	12.54	10.85	25.52	27.06	13.84	3.60	6.59	100(461329)
2005-06	11.67	10.90	26.72	26.76	11.74	4.35	7.86	100(512164)

2006-07	11.01	7.14	24.45	33.22	11.04	3.85	9.29	100(612641)
2007-08	12.44	6.76	27.58	25.81	11.78	4.75	10.89	100(541701)
2008-09	9.50	6.12	25.74	24.44	14.76	4.51	14.94	100(602835)
2009-10	9.24	4.93	24.29	21.27	22.01	5.15	13.11	100(678436)
2010-11	8.70	6.16	21.03	19.57	28.77	5.41	10.36	100(813091)
2011-12	9.95	7.93	17.89	9.80	39.90	4.43	10.09	100(862021)
2012-13	8.26	9.96	17.06	9.46	36.73	4.46	14.07	100(928215)
2013-14	7.27	11.27	17.76	7.70	38.63	5.90	11.47	100(983756)
2014-15	7.49	12.33	17.89	5.66	38.99	6.15	11.48	100(1051243)
2015-16	7.97	16.25	19.70	5.29	34.77	5.70	10.32	100(945892)
2016-17	6.08	16.62	16.73	4.00	42.72	4.67	9.18	100(1134948)
2017-18	6.22	17.99	13.82	3.61	44.78	4.52	9.07	100(1377244)
2018-19	6.04	20.24	11.89	16.19	32.10	4.33	9.21	100(1392559)
CAGR	**1.31**	**8.78**	**6.04**	**-2.59**	**15.10**	**8.72**	**12.49**	**6.79**

Figures in the parentheses indicate the total quantity of marine products export in tonnes
Source: Marine Products Export Development Authority, Cochin



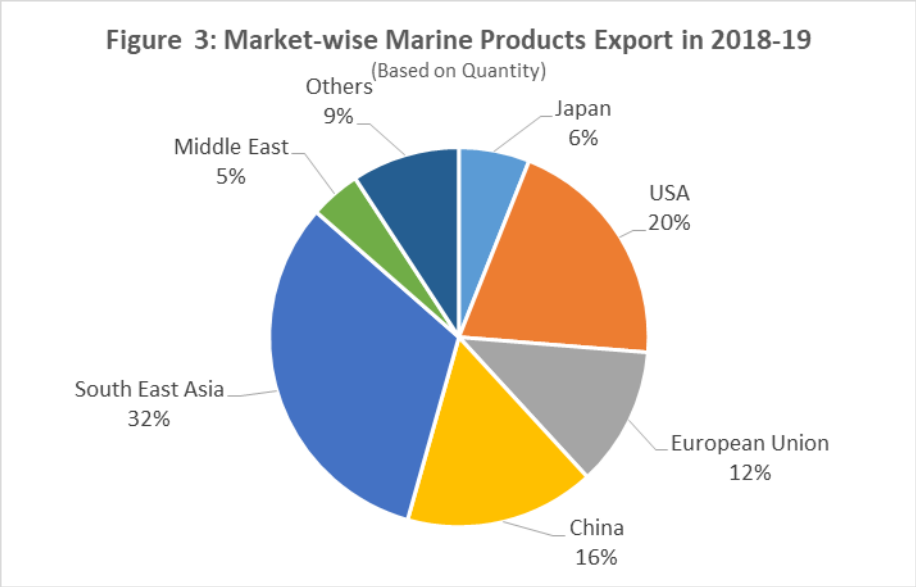


Table 12 reveals percentage value-wise data relating to export markets for marine products. It may be observed from the table that Japan was the major market for Indian marine products from 1995-96 to 2001-02 after which, its share has declined significantly from 40.73 per cent in 1995-96 to only 6.27 per cent in 2018-19. The USA and South East Asia improved their share significantly during the period. While share of USA increased from 10.46 per cent in 1995-96 to 34.81 per cent in 2018-19, South East Asia also increased its share from 7.56 per cent in 1995-96 to 31.59 per cent in 2017-18 which declined significantly during 2018-19 (22.67%), registering a CAGR of 15.72 per cent and 20.56 per cent, respectively. The export of marine products increased from Rs.3501 crore in 1995-96 to Rs.46589 crore in 2018-19, which is growing at the CAGR 11.87 per cent. The item-wise export of marine products during 2018-19 based on values is shown in Figures 4 and 5.

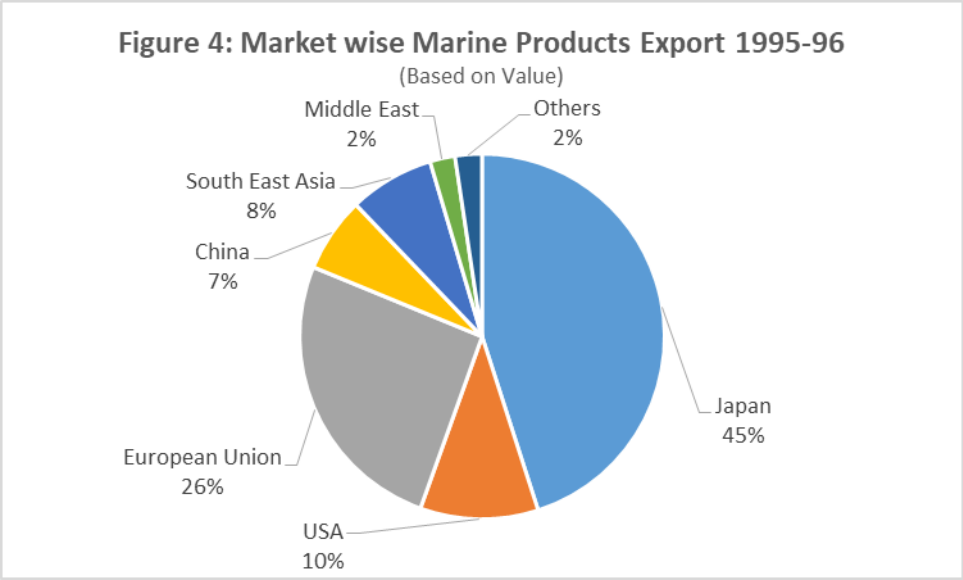
Table 12: Major Markets for Indian Marine Products (Based on Value)

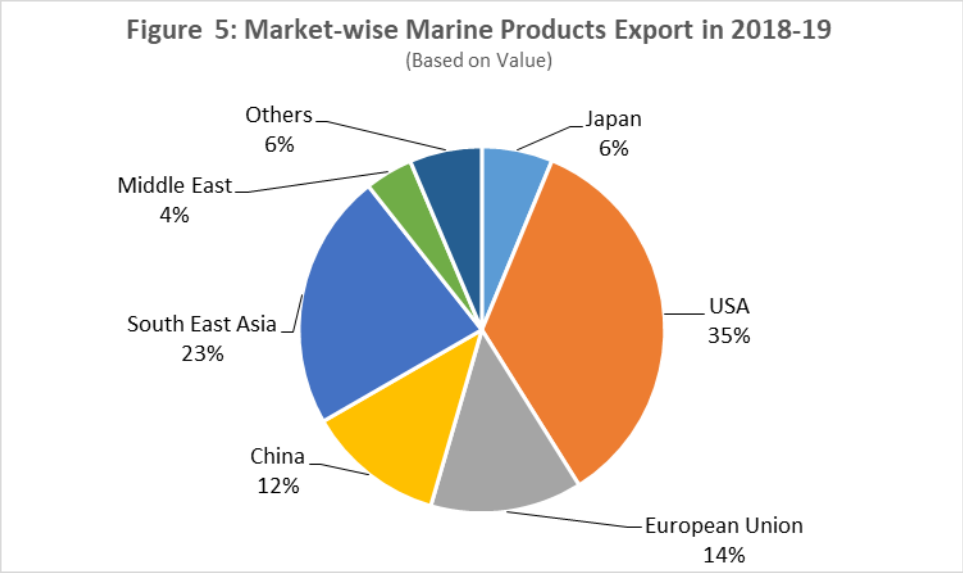
(In Percentage)

Market	Japan	USA	European Union	China	South East Asia	Middle East	Others	Total
1995-96	40.73	10.46	25.71	6.63	7.56	2.22	2.39	100(3501)
1996-97	45.77	10.58	18.95	13.19	7.49	1.47	2.56	100(4121)
1997-98	49.52	12.43	8.64	17.39	6.57	3.03	2.42	100(4697)
1998-99	49.61	13.34	14.75	10.44	5.79	3.09	2.98	100(4627)

1999-00	44.42	15.15	17.82	10.64	7.04	2.14	2.78	100(5117)
2000-01	39.73	18.07	15.91	12.84	7.18	2.92	3.34	100(6444)
2001-02	30.56	23.86	19.31	10.03	9.04	3.04	4.16	100(5957)
2002-03	22.30	29.81	20.18	11.08	9.34	2.98	4.32	100(6881)
2003-04	19.10	27.61	24.15	11.10	8.96	3.31	5.77	100(6092)
2004-05	18.09	23.41	27.37	10.43	9.46	3.68	7.56	100(6647)
2005-06	15.96	22.63	29.46	11.72	8.09	4.25	7.91	100(7245)
2006-07	16.18	16.11	33.00	13.83	7.37	4.44	9.05	100(8364)
2007-08	16.11	13.34	34.96	13.25	7.53	5.17	9.64	100(7621)
2008-09	14.34	11.87	33.16	15.06	10.14	5.53	9.91	100(8608)
2009-10	12.83	10.08	29.99	17.82	14.72	5.51	9.05	100(10049)
2010-11	13.05	15.43	26.81	15.33	16.39	5.20	7.80	100(12901)
2011-12	12.90	17.94	22.96	7.59	25.27	5.39	7.96	100(16597)
2012-13	10.60	21.35	22.15	7.66	23.11	5.90	9.22	100(18856)
2013-14	8.15	25.63	20.29	5.85	26.63	5.29	8.15	100(30213)
2014-15	9.09	26.40	20.08	4.03	25.78	6.04	8.57	100(33442)
2015-16	8.58	28.38	20.75	4.71	24.65	5.90	7.04	100(30421)
2016-17	6.92	30.32	18.20	3.54	30.27	4.83	5.92	100(37871)
2017-18	6.31	32.74	15.78	3.21	31.59	4.10	6.27	100(45107)
2018-19	6.27	34.81	13.43	12.18	22.67	4.25	6.40	100(46589)
CAGR	**1.67**	**15.72**	**12.38**	**7.82**	**20.56**	**16.76**	**17.84**	**11.87**

Figures in the parentheses indicate the total value of marine products export in Rs. crore.
Source: Marine Products Export Development Authority, Cochin





Product-wise Exports

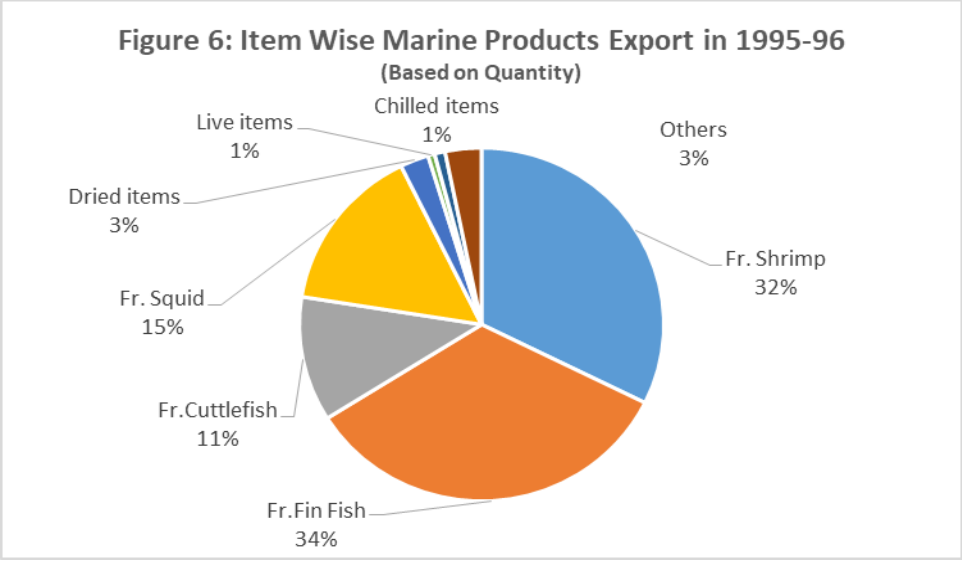
There are six major marine products exported from India. Table 13 reveals that frozen shrimp is the major export item accounting for 6.14 lakh tonnes of total quantum of marine products exported, followed by frozen fin fish, frozen squid, dried items, frozen cuttlefish, chilled items, live items, whereas the highest annual growth rate would be seen in dried fish and chilled items registering annual growth rate of 14.40 per cent and 14.12 per cent, respectively during 2018-19. India's export of marine products in quantity terms was increased from 2.96 lakh tonnes in 1995 to 13.93 lakh tonnes in 2018-19, registering an annual growth rate of 6.79 per cent. The data on quantity-wise export of marine products reveals that the frozen shrimp and frozen fin fish put together is around 69 per cent out of total export during 2018-19 and that for 1995-95 was 66 per cent (Figures 6 and 7). The share of frozen shrimp increased from 32.31 per cent in 1995-96 to 44.10 per cent in 2018-19. The share of dried fish registered a significant growth from 2.53 per cent in 1995-96 to 6.84 per cent in 2018-19.

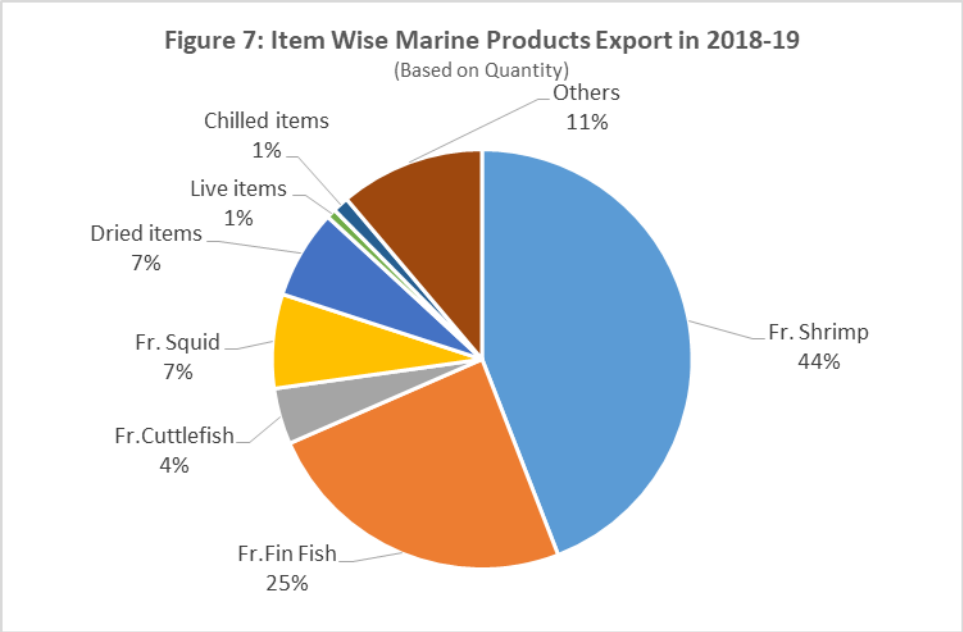
Table 13: Item-wise Export of Indian Marine Products (Based on Quantity)

(Quantity in Tonnes)

Year	Fr. Shrimp	Fr.Fin Fish	Fr.Cuttlefish	Fr. Squid	Dried items	Live items	Chilled items	Others	Total
1995-96	95724	100093	33845	45025	7506	1756	2773	9555	296277
1996-97	105427	173005	31778	40924	9893	2030	1578	13563	378199
1997-98	101318	188029	37258	35095	5840	1700	3183	13395	385818
1998-99	102484	108556	34589	32254	6320	2148	2624	13960	302934
1999-00	110275	131304	32799	34918	6853	1678	3088	22116	343031
2000-01	111874	212903	33677	37628	7532	1844	3820	31195	440473
2001-02	127709	174976	30568	39790	8307	1628	3284	38209	424470
2002-03	134815	196322	41381	37838	8178	2115	3350	43299	467297
2003-04	129768	138023	39610	37832	12574	2341	3779	48090	412017
2004-05	138085	159689	44239	48124	9692	2262	3988	55250	461329
2005-06	145180	182344	49651	52352	14167	2568	5060	60841	512164
2006-07	137397	270751	55701	47252	24293	2478	7200	67571	612641
2007-08	136223	220200	45955	34172	22414	2498	6541	73698	541701
2008-09	126039	238544	50750	57125	31688	3434	21453	73801	602835
2009-10	130553	260979	63504	61445	47053	5492	28817	80592	678436
2010-11	151465	312358	59159	87579	79059	5208	21118	97145	813091
2011-12	189125	347118	54671	77373	53721	4199	21278	114538	862021
2012-13	228620	343876	63296	75387	72953	4373	26868	112841	928215
2013-14	301435	324359	68577	87437	67901	5080	19755	109212	983756
2014-15	357505	309434	82353	69569	70544	5488	31404	124947	1051243
2015-16	373866	228749	65596	81769	43320	5493	33150	113949	945892
2016-17	434486	296762	63320	99348	61071	6703	31815	141442	1134948
2017-18	565980	353192	69183	100845	88997	7034	19501	172512	1377244
2018-19	614145 (44.10)	338933 (24.34)	60210 (4.32)	101101 (7.26)	95296 (6.84)	10179 (0.73)	17207 (1.24)	155487 (11.17)	1392559 (100)
CAGR	**7.58**	**4.63**	**3.93**	**5.12**	**14.40**	**7.55**	**14.12**	**12.38**	**6.79**

Source: Marine Products Export Development Authority, Cochin





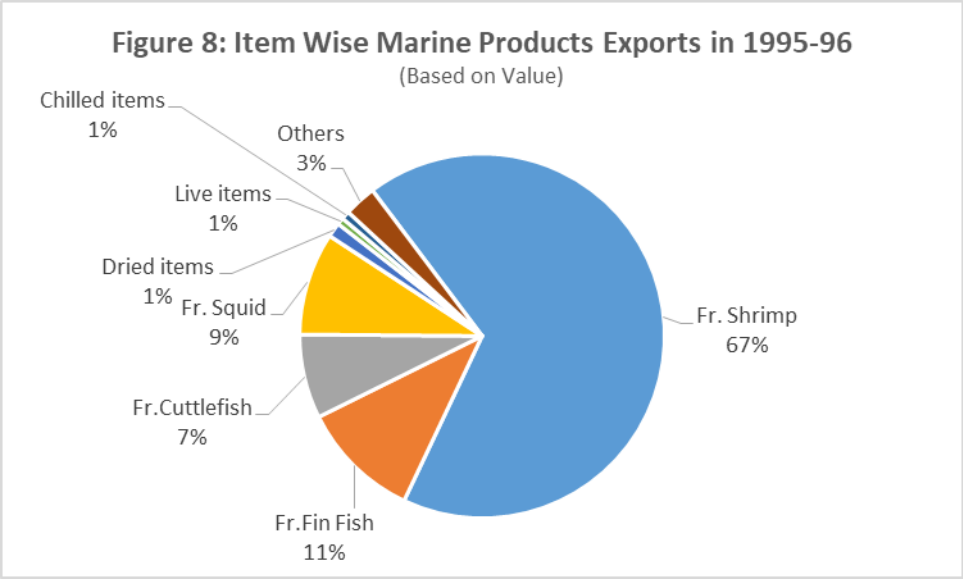
In terms of value of marine products export, the share of frozen shrimp varied between 72.29 per cent and 41.62 per cent during 1995-96 to 2018-19 (Table 14). The foreign exchange earnings by the export of frozen shrimp which was Rs.2356.81 crore in 1995-96 increased to Rs.31800.51 crore in 2018-19, registering a CAGR of 11.16 per cent. Frozen fin Fish occupies second position in contribution to the foreign exchange resource with a contribution of range from Rs.372.26 crore in 1995-96 to Rs.4916.82 crore in 2018-19. The frozen cuttlefish export increased from Rs.260.86 crore in 1995-96 to Rs.1975.97 crore in 2018-19. The contribution from frozen squid was Rs.319.58 crore in 1995-96 to Rs.2506.99 crore in 2018-19 recording a growth rate of 11.17 per cent. The contribution from other fish items increased from Rs.99.24 crore in 1995-96 to Rs.3060.53 crore in 2018-19, registering a CAGR of 15.91 per cent. The percentage share of frozen shrimp, frozen fin fish, frozen squid, chilled items in total export of marine products was 68.26 per cent, 10.55 per cent, 5.38 per cent and 1.32 per cent, respectively in 2018-19 as compared to 67.32 per cent, 10.63 per cent, 9.13 per cent and 0.74 per cent in 1995-96. The item-wise export of marine products during 1995-96 and 2018-19 based on value are shown in Figures 8 and 9, respectively.

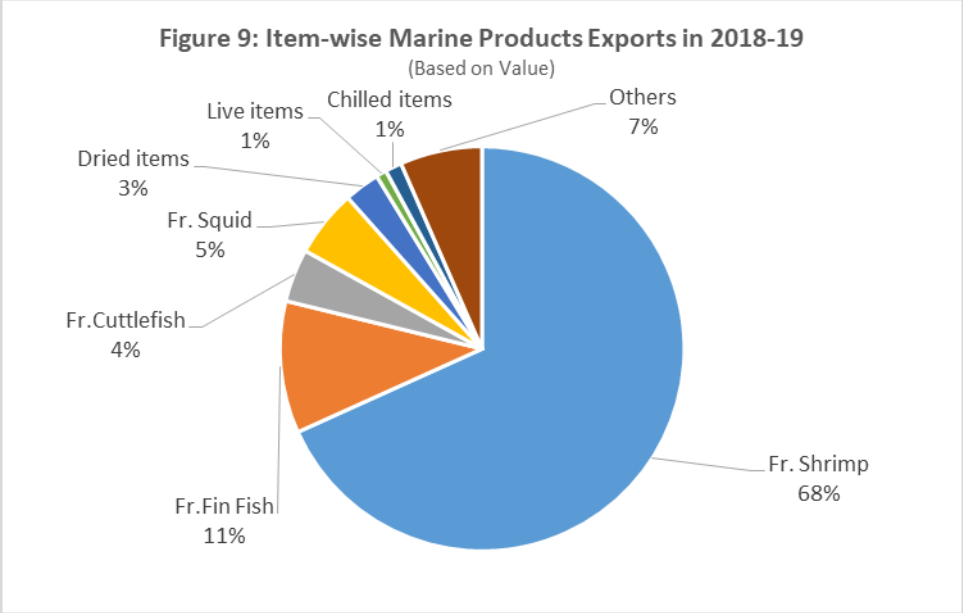
Table 14: Item-wise Export of Indian Marine Products (Based on Value)

(Rs. Crore)

Year	Fr. Shrimp	Fr.Fin Fish	Fr.Cuttlefish	Fr. Squid	Dried items	Live items	Chilled items	Others	Total
1995-96	2356.81	372.26	260.86	319.58	44.97	21.31	26.08	99.24	3501.11
1996-97	2701.76	636.92	272.37	290.45	42.67	33.97	18.74	124.48	4121.36
1997-98	3140.56	726.73	323.41	270.89	34.85	29.34	44.31	127.39	4697.48
1998-99	3344.91	495.03	273.31	268.93	40.51	47.08	29.18	127.91	4626.86
1999-00	3645.22	537.34	286.22	296.80	44.33	37.99	44.97	223.81	5116.67
2000-01	4481.51	874.68	288.99	324.43	70.22	39.88	71.63	292.54	6443.89
2001-02	4139.92	713.11	280.07	329.67	67.96	40.57	63.66	322.09	5957.05
2002-03	4608.31	841.65	417.09	384.37	84.23	53.66	59.14	432.88	6881.31
2003-04	4013.07	620.73	435.17	372.92	145.68	51.10	64.03	389.23	6091.95
2004-05	4220.67	759.27	474.01	477.26	121.01	50.75	68.14	475.58	6646.69
2005-06	4271.51	998.70	549.15	575.52	132.56	61.71	81.56	574.58	7245.30
2006-07	4506.08	1452.88	797.37	568.32	183.16	64.06	117.3	674.35	8363.53
2007-08	3941.62	1303.41	744.13	408.42	258.88	69.07	118.11	777.29	7620.92
2008-09	3779.80	1722.34	761.05	632.35	420.75	99.00	217.34	975.33	8607.94
2009-10	4182.35	2032.33	923.83	622.63	981.11	139.14	264.49	902.64	10048.53
2010-11	5718.13	2623.89	1104.57	1010.57	954.94	142.15	257.54	1089.67	12901.47
2011-12	8175.26	3284.15	1346.72	1228.19	562.65	154.61	357.42	1488.24	16597.23
2012-13	9706.36	3296.86	1354.28	1378.08	819.90	197.89	537.11	1565.78	18856.26
2013-14	19368.30	4294.81	1386.98	1731.97	998.00	281.85	527.84	1623.50	30213.26
2014-15	22468.12	3778.50	1833.21	1275.25	1010.16	301.51	635.93	2138.94	33441.61
2015-16	20045.50	3462.25	1636.11	1615.21	725.58	308.81	809.5	1817.87	30420.83
2016-17	24711.32	4460.90	1944.50	2575.29	871.74	403.75	769.81	2133.59	37870.90
2017-18	30868.17	4674.03	2356.46	2451.87	1042.37	286.11	647.41	2780.48	45106.89
2018-19	31800.51 (68.26)	4916.82 (10.55)	1975.97 (4.24)	2506.99 (5.38)	1323.45 (2.84)	388.88 (0.83)	616.22 (1.32)	3060.53 (6.57)	46589.4 (100)
CAGR(%)	**11.16**	**12.18**	**11.16**	**11.17**	**19.43**	**13.46**	**18.10**	**15.91**	**11.87**

Figures in the parentheses indicate percentage to the total
Source: Marine Products Export Development Authority, Cochin





Institutional Credit, Private Investment and Public-Private-Partnership

Union Government and State/UTs should coordinate with financial institutions like- NABARD, NCDC, and external Agencies - World Bank, ADB, JICA, etc. to ensure increased flow of institutional credit to fisheries sector. Business friendly environment to be made to attract private investment across the value chain based on demand rather than incentives or subsidies. Business models are to be developed in consultation with IIT/IIM/ICAR, etc. for replication in the sector. A robust system of public private partnership should be developed where the private

sector, industry, farmers, communities, government, research institutes and civil societies are part of it.

Presently credit to fisheries is extended by both institutional and non-institutional players. The institutional players include banks such as Commercial banks, Regional Rural banks, Small Finance Banks and Cooperative banks and also agencies like NBFCs, Microfinance Institutions, etc. As reported in the 70th round survey of National Sample Survey Organisation (NSSO), formal institutions account for 60 percent of indebtedness of farmer households in India. This estimate may hold good for fish farmers as well.

Credit Planning

NABARD has been preparing the Potential Linked Credit Plans (PLP) every year by taking district as the unit for all the districts in the country. Potential for working capital, term loan are assessed after taking into account the potential available under each sub sector, status of backward and forward linkages and other support services. The PLPs are forming the basis for arriving at the Annual Credit Plan by the banks in the district. The PLPs have projected the potential for ground level credit of Rs.15171.25 crore for the year 2020-21 (Table 15).

Table 15: State-wise Potential Linked Credit Plan Projections for Fisheries and Aquaculture Sector for the Year 2020-21

(Rs. Lakh)

States	2020-11
Andhra Pradesh	272143
West Bengal	187018
Odisha	108373
Tamil Nadu	151017
Gujarat	70533
Kerala	75636
Uttar Pradesh	66162
Bihar	111458
Karnataka	87413
Maharashtra	95700
Chhattisgarh	30486

Telangana	11740
Assam	28011
Haryana	23371
Jharkhand	20801
Madhya Pradesh	99138
Punjab	35896
Goa	4700
Arunachal Pradesh	1687
Himachal Pradesh	6311
Jammu& Kashmir	3649
Manipur	2732
Meghalaya	2455
Nagaland	1111
Rajasthan	2524
Sikkim	75
Tripura	12959
Uttarakhand	4027
India	**1517125**

Source: NABARD State Focus Papers, 2020-21

Impact of Covid-19 on Global Fish Trade

According to FAO report on 'The State of World Fisheries and Aquaculture, 2020', in 2018, 67 million metric tonnes of fish (live weight equivalent) were traded internationally, equating to almost 38 per cent of all fish caught or farmed worldwide. The total export value of USD 164 billion recorded in 2018 represented almost 11 per cent of the export value of agricultural products. At present India is contributing about 7.73 per cent of the global fish production and 4 per cent of the global fish trade. From 1976 to 2018, the value of global exports of fish and fish products increased at an annual rate of 8 per cent in nominal terms. Available estimates for 2019 suggest that total trade value contracted by about 2 per cent in both quantity and value compared with the previous year. The outbreak of coronavirus disease (COVID-19) has already negatively impacted trade among key exporters and importers in 2020. Although COVID-19 does not infect aquatic species (FAO, 2020), it has affected the fisheries and aquaculture food systems like no other shock before. The protection measures taken by governments to contain the spread of the disease, while necessary, have impacted each step of the seafood

supply chain, from fishing and aquaculture production, to processing, transport, and wholesale and retail marketing.

Fishing activities have been decreased in both artisanal and industrial sectors during the pandemic. According to Global Fishing Watch, global industrial fishing activity had fallen by about 6.5 per cent as at the end of April 2020, compared with previous years, as a result of restrictions and closures related to COVID-19 (Clavelle, 2020). Limited supplies (e.g., ice, fuel, gear and belt) due to suppliers being closed or unable to provide inputs on credit, have also constrained fishing activities. Labour shortages have also had a severe impact on fishing activities, particularly where crews are made up of migrant workers. As a consequence, their families in home countries are having to cope with the reduction or halting of remittance flows (World Bank, 2020). Recently, in some regions, signs of improvement have been evident in some fisheries (e.g. changes in target species and in marketing strategies in line with changes in demand), with some small-scale fisheries potentially adjusting more quickly to market demand. Another consequence of the COVID-19 pandemic, linked to global trade, is the cancellation of key seafood trade events across the world including India. Fish and fish products export from India, the world's fourth largest exporting nation, is likely to decline by 5-10 per cent in 2019-20 due to demand compression in the wake of COVID-19 induced pandemic (PIB, 24 May 2020).

SWOT Analysis of Fisheries Sector of India

Strengths	Weaknesses
➢ Long coast line and large number of water bodies /water sources ➢ Established fishing industry with wide variety of species ➢ Second largest aqua producer in the world and third largest fish producer in the world ➢ Higher growth rates in Aquaculture sector ➢ Support from Government for both production and post-production including harvest	**Inland:** ➢ Seasonal nature of fishing operations ➢ Depleted stocks of natural waters ➢ Issues of tenure and lease rights ➢ Use of obsolete technology for harvesting Low capital infusion ➢ Inadequate access to institutional credit ➢ Low scale operations and low yields ➢ Lack of extension services ➢ Primary Stakeholders are poverty

➢ Acceptance of Indian produce in world markets ➢ Contributing about 19.23% of national agriculture export ➢ Source of livelihood for 16 million households ➢ Contribution of nearly 1.03% of GDP ➢ Availability of unexploited potential ➢ Existing markets can be converted to meet the phytosanitary conditions of export markets with traceability ➢ Separate skill development programmes for improving the value chain are being implemented in large scale	ridden ➢ Poor access to quality seed and feed **Marine:** ➢ Limited scope for expansion due to overcapacities in territorial waters ➢ Weak regulation ➢ Inefficient and traditional fishing practices ➢ Inadequate infrastructure like fishing harbours, landing centres, cold chains and hygienic markets ➢ Poor processing facilities and lack of value addition, high wastage ➢ Issues related to traceability and certification ➢ Non-availability of skilled manpower ➢ Primary Stakeholders are poverty ridden
Opportunities	**Threats**
➢ Special focused schemes for development of fisheries sector ➢ Availability of good domestic market as consumption is low when compared to other countries ➢ Availability of financial incentives ➢ Availability of specialised institutions for development of the sector ➢ Availability of unexplainable potential in both inland and marine fisheries ➢ Specific policies for development are made by GoI/State Governments ➢ Only specific community takes up these activities and they live in clusters nearby and therefore extension services would be possible ➢ Further, this gives scope for aggregation in both forward and backward integration of value chain	➢ Deteriorating physical condition of resources (specially the water quality and quantity) ➢ Low input culture system ➢ Lack of diversity in culture practices and species ➢ Low productivity ➢ Inadequate regulatory mechanism ➢ Increased incidents of disease ➢ High cost of credit ➢ Unhygienic markets ➢ Anti-dumping duties by different export destinations ➢ Climate Change and cyclones, floods and droughts

Source: Theme Chapter on 'Blue Revolution', NABARD Annual Report-2019-20

Constraints in the Growth of Fisheries Sector

- Major constraints impacting the growth of marine capture fisheries include limited scope for expansion due to overcapacities in territorial waters, weak regulation, inefficient management and prevalence of traditional fishing practices. Inadequate infrastructure especially fishing harbours, landing

centers, cold chain and distribution systems, poor processing and value addition, wastage, traceability and certification, non-availability of skilled manpower, etc. are some of the other factors constraining the growth of the capture fisheries. In inland capture fisheries, seasonal nature of fishing operations, depleted stocks in natural waters, issues related with tenure and lease rights, use of obsolete technology for harvesting coupled with low capital infusion are some of the significant limiting factors.

- Specific problems negating the growth of culture fisheries include poor physical condition of resources (specially the water quality and quantity), low input culture system, lack of diversity in culture practices and species, lower productivity, inadequate regulatory mechanism, increased incidents of disease, low levels of investment, inadequate access to institutional credit and high cost of credit, inadequate infrastructure for pre-production, production, post-harvest and processing facilities, low adoption of technologies and shortage of skilled manpower in aquaculture and extension services.
- Fisheries sector suffers from low-scale, stagnating yields of inland and freshwater aquaculture and faulty handling practices, inordinate delay in packing and transportation and lack of proper cold storage facilities, leading to an estimated Rs.61000 crore post-harvest losses. The inland fisheries reported higher annual post-harvest losses of Rs.46000 crore as compared to marine fisheries (Rs.15000 crore).
- Processing and value addition with compliance to food safety norms is a major constraint in fishery sector, especially to enter the export and international markets.
- Presently fish productivity (2.9 MT/ha) of fresh water aquaculture is far below the potential.
- There is a huge gap in the fish seed production and its availability in the country.

Strategies to Overcome the Constraints in Fisheries Sector

- Aquaculture needs to be treated at par with agriculture in terms of water, power tariff, tax benefits, subsidy, insurance and credit.
- Strengthen and modernize value chain including creation of fisheries infrastructure to increase shelf life, reduction of post-harvest losses and production of value added products.
- Promote community partnerships, private participation and effective cooperative movement in fisheries sector.
- Modernization of fishing vessels to handle storage and quality preservation of fish.
- Fishing harbours and fish landing centres play a vital role in ensuring safe fish landing, berthing of fishing vessels, pre-processing and auctioning.
- There is a need for diversification of fish production in other areas like integrated fish farming, cold water fisheries, riverine fisheries, capture fisheries, brackish water fisheries, etc.
- Expansion of area under aquaculture has to become an important option to boost fish production.
- Promotion of cluster approach as a key strategy for focused and concentrated development of aquaculture with emphasis on creation of integrated production and processing clusters with supporting infrastructure.
- There is a need for availability of quality seed and feed for sustained growth in inland fish production in the long run.

Conclusion

Fisheries and aquaculture remain an important source of food, nutrition, employment and income for millions, especially the rural populations. In fact, the sector provides livelihood to about 16 million people at the primary level and almost twice the number along the value chain. The sector has immense potential to double the fishers and fish farmers' incomes by 2022. The fish production in the country has increased from 3.84 MMT in 1990-91 to 13.76 MMT in 2018-19, registering an annual growth rate of 4.05 per cent. West Bengal, Odisha, Tamil Nadu, Gujarat and Kerala, together, account for 65.62 per cent of the total fish

production in the country in 2018-19. The total fisheries potential of India has been estimated at 22.31 MMT in 2018, of this, the marine fisheries potential stands at an estimated 5.31 MMT and the inland fisheries potential has been estimated at 17 MMT. During 2018-19, 71 per cent of marine fisheries potential and 58 per cent of the inland fisheries potential have been harnessed. Fish and fish products during 2019-20 emerged as the largest group in agricultural exports from India, with Rs.47618 crore in value terms. This accounts for around 2.06 per cent of the total exports and 17.34 per cent of the agricultural exports, and contributes 7.28 per cent to the Agriculture Gross Value Added (GVA) and 1.24 per cent to the National GVA at current prices of the country. The ratio of fisheries (marine) export to fisheries GVA was 22.37 per cent at current prices during 2018-19. USA, South East Asia, European Union and China are the major export markets for Indian seafood with a share of 34.81 per cent, 22.67 per cent, 13.43 per cent and 12.18 per cent, respectively in value terms during 2018-19. Frozen shrimp remained the major export item (68%) followed by frozen fin fish (11%). Study revealed that the export of fish and fish products have performed well and present policies too seem to have augmented their growth. To give exports a further boost numerous sanitary and phyto-sanitary measures should be taken up robustly to ensure international hygiene standards for Indian fisheries products. Within fish and fish products, India is highly competitive in shrimps and prawns and it should try to exploit this strength. To make Indian fisheries products internationally competitive in terms of quality, domestic processing efficiency has to be streamlined on HACCP principles.

Suggestions for Enhancing the Fish Production and Export of Marine Products from the Country

(i) Diversify the culture practices into commercially important shellfish and finfish, to enhance aquaculture production and increase the varieties.

(ii) There is a need for setting up the sophisticated residue control laboratories in the maritime States for ensuring production of quality seafood.

(iii) Establishing traceability of aquaculture through enrollment of farms and hatcheries. Shrimp farms and hatcheries enrolment procedures are needed.

(iv) Setting up of protocols and standards for fish and fishery products in compliance with international food safety standards including HACCP, promoting safe food and sustainable trade.

(v) Establishing presence of Indian sea foods in major international markets by co-branding Indian products with major buyers and by giving publicity in different media abroad.

(vi) Knowledge management including use of Artificial Intelligence will be an approach to foster quick and easy dissemination and availability of information on key attributes of marine fisheries sector, such as resource abundance and distribution; real-time resource maps; productivity assessments; real-time Potential Fishing Zone (PFZ) advisories; and weather forecasts for the benefit of fishers.

(vii) Modernize and strengthen value chain including creation of adequate infrastructure to minimize post-harvest loss and increased value addition to ensure higher income for fishers and fish farmers will be needed. Greater focus should be on 'sustainable user management' of the infrastructure and services for long term viability and efficiency.

(viii) More attention may be given for product and market diversification in exports with improved infrastructure, trained human resources and support facilities to move up the value chain and meet international standards (WTO).

(ix) Increase access to institutional credit at affordable cost for financing investment in fixed and working capital in fisheries sector especially aquaculture, mariculture, post-harvest and marketing. Facilitate credit guarantee and insurance cover for fisheries sector.

(x) Aquaculture development efforts should be aligned with relevant national and global instruments, guidelines and good practices including Sustainable Development Goals (SDGs).

(xi) Post-harvest infrastructure including Cold chain for reduction of post-harvest losses need to be developed and strengthened. Requisite infrastructure such as processing plants, cold storages, ice plants, freezing and packing plants, value addition, fish and fisheries products transportation vehicles including refrigerated and insulated vehicles, ice flaking and ice crushing units, ice/fish holding boxes, warehouses, etc. should be encouraged.

(xii) Promotion of Fishers/Fish Farmers Producer Organizations, Companies, Cooperatives and Federations for enhancing the bargaining power of fishers and fish farmers in marketing of fish and fish products and empowering them to graduate into entrepreneurs.

(xiii) There is a need for creation of awareness on fish quality, safety and standards, training manpower for ensuring regulatory compliances, promoting voluntary compliances to regulatory standards.

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