



KERALA MARINE FISHERIES RESOURCES POTENTIAL AND EXPLOITATION – AN ECONOMIC ANALYSIS

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Abstract

Kerala, one of the prominent maritime States in India with a coast line of 590 Km, is blessed with the most productive portion of Arabian Sea and have a continental shelf area of 39,139 Sq Km. Kerala waters yield many commercially important fin fishes and crustaceans and 19.91% of the total catch is high value fish species and the percentage of high value species increased to 20.02% during 2013-14. Even though the fisheries sector in Kerala is suffering from over exploitation, by use of unsuitable fishing gears, there is 8.72% increase in the total fish production from Kerala from 2000-01 to 2013-14. The projected value of total fish production from Kerala comes to 706.882 MT by 2019-20. If the rich underexploited demersal and pelagic resources are utilized effectively Kerala can brag the top position in total fish production and also contribute fruitfully towards the economic development of the State. This study analyses the potential exploitation levels of marine resources in Kerala and role of fisheries sector in increasing the Gross Domestic Product of Kerala.

Key words: Marine resource potential, Gross Domestic Product, High value species, Total fish production, Fish landings.

Introduction

Kerala, the southernmost state in the Indian sub-continent, enthroned with a coastline of 590 Kilometres and a continental shelf of 39,139 sq.kms. Being endowed with the most productive area of Arabian sea, Kerala waters is natural habitat to many commercially important species of fishes. The share of the fishery sector in the Agricultural State Domestic Product of Kerala is increased from 5.18 % in the eighties to 9.36 % in nineties and thereafter maintained a stable position. The consistent increase in the share of fisheries in the agricultural and allied sectors over the years establishes the significance of this endemic sector. The State has two major fishing harbors at Cochin and Sakthikulangara and about 220 fish landing centers distributed over 335 fishing villages. During 2012-13 total fisher folk population of Kerala found to be 10.53 lakhs (Government of Kerala, 2014) Fisheries sector contributes significantly to the national economy while providing livelihood to approximately 14.49 million people in the country. (Government of Kerala, 2014). It has been recognized as a powerful income and employment generator as it stimulates growth of a number of subsidiary industries and is a source of cheap and nutritious food besides being a source of foreign exchange. Fishery being one of the promising sectors of agriculture and allied activities in India. (Government of Kerala, 2014). According to the study of Shyam.S.Salim amidst the global recession and economic meltdown, the fisheries sector performed well and the country's seafood trade grew by double digit in quantum as well as value. (Shyam.S.Salim, 2014). For the dwellers of coastal belt, fishing has been regarded as the primary livelihood option. Fisheries play a decisive strategic role in our country by its contribution to national income, foreign exchange, food and employment. The more significant contribution of fisheries worldwide is the supply of highly nutritious animal protein for human consumption and employment and income generation in the remote coastal areas. Coastal urbanization is much facilitated by development in the fisheries sector. The well guided fisheries resources can be used to finance investments within or outside the sector. The beach sides and the fishing activities (eg. ports, fishing boats, landing sites and fish markets) is attractive to many people and often has considerable aesthetic value to both those dwelling permanently in the area and tourists. Fisheries sector contributes about .8% to overall GDP and represents 4.6% of agriculture GDP (Economic survey 2013-14). In this scenario this study envisages to analyze the potential exploitation levels of marine resources in Kerala and role of fisheries sector in increasing the Gross Domestic Product of Kerala.

Objectives of the Study

- To analyze the marine fisheries potential of Kerala.
- To analyze the role of fisheries sector in contributing to GDP.
- To estimate the percentage contribution of the major species in Kerala to the total landings.

Materials and methods

The study is mainly done using the secondary data collected from the publications of Government of India, Directorate of fisheries, Government of Kerala, Central Marine Fisheries Research Institute, Marine Products Export Development Authority etc. The statistical method used was percentage analysis and trend projection method. Data relating to the period of 2000 to 2014 was used for analysis.

Results and Discussion

While analyzing the total fish production from Kerala the peak value of production noticed in year 2009-10 and the percentage increase from year 2008-09 to 2009-10 was found to be 1.88%

Table:1 Total fish production from Kerala and India[Quantity '000 tonnes]

Year	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Kerala	651.81	671.82	678.32	684.7	678.31	636.89	677.6	667.3	685.9	698.8	681.6	693.2	679.7
India	5655.3	5955.9	6199.6	6399.4	6304.7	6572	6869	7127	7616	7998	8231	8666	9040
% Contribution	11.52	11.28	10.94	10.69	10.75	9.69	9.86	9.36	9.00	8.73	8.28	7.9	7.5
Average annual growth rate % of total fish production in India	-0.33	5.30	4.10	3.21	-1.47	4.23	4.52	3.76	6.86	5.02	2.91	5.28	4.32

Source : Government of India,2014

From the above table it is clear that the contribution of Kerala's fish production to India's fish production shows a declining trend. This declining trend can be attributed to increase in fish production in other states like Gujarat, increase in the aquaculture production from Andhra Pradesh etc. During the year 2008-09, India's total fish production shows highest annual growth rate %(6.86) and least during 2004-05(-1.47). The total fish production from Kerala shows an increasing trend irrespective of the declining percentage contribution and the augmented fish production over the years can be due to the increased mechanization in the fisheries sector. The fisheries of Kerala is suffering from over exploitation, by the use of unsuitable fishing gears that result in a high level of wasteful bycatch and destruction of egg bearing and juvenile larvae.(V.Vijayan et al).

Table:2 Total Fish Production In Kerala 2000-01 to 2012-13 (Quantity '000 tonnes)

Year	Marine	Inland	Quantity	% change
2000-01	566.57	85.23	651.81	0
2001-02	593.78	78.04	671.82	2.98
2002-03	603.29	75.04	678.32	0.96
2003-04	608.52	76.18	684.7	0.93
2004-05	601.86	76.45	678.31	-0.94
2005-06	558.91	77.98	636.89	-6.5
2006-07	598.06	79.57	677.63	6.01
2007-08	586.29	81.04	667.33	-1.54
2008-09	583.15	102.84	685.99	2.72
2009-10	570.01	128.84	698.86	1.84
2010-11	560.40	121.21	681.61	-2.53
2011-12	553.18	140.03	693.21	1.70
2012-13	530.63	149.10	679.73	2.05
2013-14	522.31	186.34	708.65	-

Source : Government of India,2014

From 2011 we can see a gradual increase[15.52%] in the inland fish production, and this can be attributed to increase in aquaculture production, prevalent intensive aquaculture practices etc. Considering the total fish production from Kerala there is 8.72% increase from 2000-01 to 2013-14.

Table:3 Table showing Predicted total fish production from 2014-15 to 2019-20

Year	Predicted total fish Production('000 tonnes)	% change
2014-15	695.77	0.32
2015-16	697.998	0.318
2016-17	700.219	0.317
2017-18	702.44	0.316
2018-19	704.661	0.315
2019-20	706.882	0.314

By 2019-20 the total fish production reaches to 706.882 MT. By the wise exploitation of resources Kerala can increase the total fish production to much higher levels.

Table:4 Maximum sustainable yield[Resources in tonnes]

M. S. Y.	Depth Zones			
	0 – 20 m	21 – 80 m	81 – 200 m	Total
Demersal 60%	22761	54249	10224	87344
	26.10%	62.20%	11.70%	100%
Pelagic 60%	184786	440349	82831	707956
	26.10%	62.20%	11.70%	100%
Total	207547	494608	93055	795300

Source: Government of Kerala, 2014

As against the maximum sustainable yield of about 7.5 lakh metric tonnes, average landing by traditional crafts is about 35,000 tonnes and that by mechanised crafts is 6,00,000 tonnes based on the available data on annual landing. The actual landing efforts of the traditional crafts are virtually confined to 0 to 20 m and mechanised crafts upto 50 m.

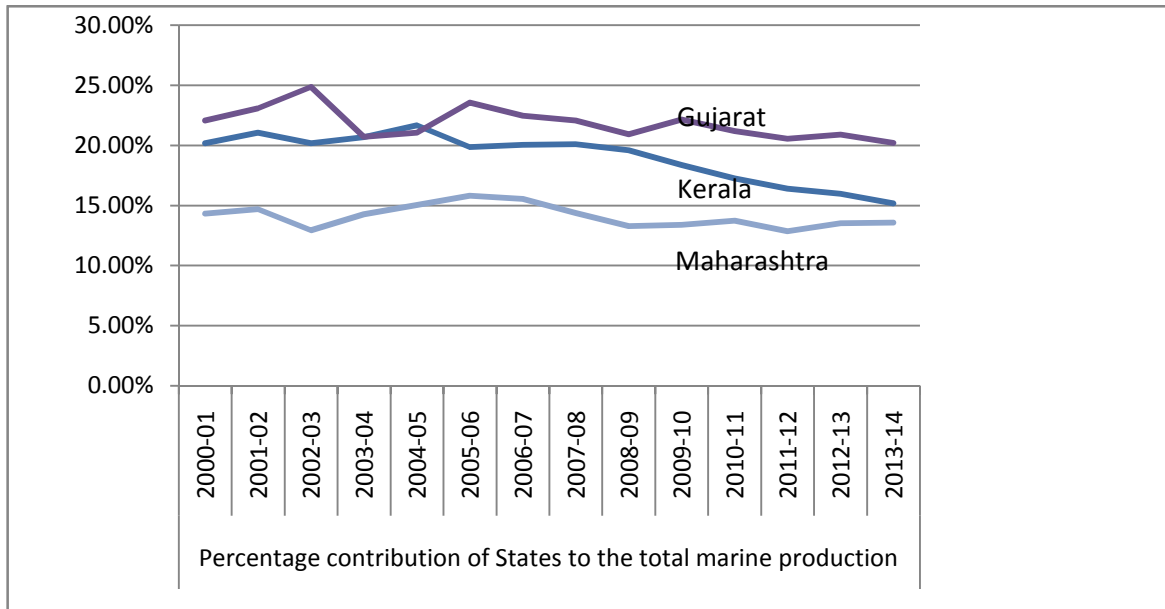
Table:5 Marine fish production from maritime states in India[Quantity in '000 tonnes]

Year States	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Andhra Pradesh	182.50	204.94	248.50	263.93	210.73	218.84	200.20	254.89	291.16	293.15	288.64	433.28	414.35	438.25
Goa	67.33	66.55	72.29	83.76	94.81	100.91	98.97	32.26	83.14	81.93	89.96	86.21	73.71	109.57
Gujarath	620.47	650.83	743.64	609.14	584.78	663.88	670.51	644.53	623.05	687.44	688.93	692.99	693.50	695.58
Karnataka	205.90	128.42	180.16	187.00	171.23	176.97	168.54	175.57	218.14	248.73	340.57	347.38	357.32	357.36
Kerala	566.57	593.78	603.29	608.52	601.86	558.91	598.06	586.29	583.15	570.01	560.40	553.18	530.64	522.31
Maharashtra	402.84	414.27	386.86	420.01	417.77	445.34	464.09	419.82	395.96	415.77	446.70	433.68	448.91	467.46
Odisha	121.09	113.89	115.01	116.88	121.93	122.21	128.14	130.77	135.49	129.33	133.48	114.30	118.31	120.02
Tamil Nadu	367.86	371.00	371.50	373.00	307.69	307.99	387.25	393.27	365.28	401.13	404.61	426.73	428.44	432.27
West Bengal	181.00	184.30	181.50	181.60	179.50	160.00	178.10	182.74	189.29	179.00	197.11	182.02	152.35	188.24
A&N Islands	27.62	27.02	28.23	31.06	32.60	12.05	28.60	28.60	32.33	33.00	33.74	35.87	36.43	36.75
Daman Diu	16.38	21.52	11.26	13.77	12.51	17.72	16.35	26.28	14.06	15.85	16.85	17.43	18.78	18.78
Lakshadweep	12.00	3.65	7.50	10.03	11.96	11.96	11.75	11.04	12.59	12.37	12.37	12.37	12.37	18.72
Puduchery	38.95	39.60	40.11	42.80	31.50	19.27	33.61	33.44	34.55	36.10	36.10	37.61	35.61	37.81
Total	2810.51	2819.77	2989.85	2941.5	2778.87	2816.05	2984.17	2886.06	2978.19	3067.71	3249.46	3373.05	3320.72	3443.12
% change	0.329	6.03	-1.61	-5.52	1.34	5.6	-3.28	3.19	3	5.92	3.8	-1.55	3.68	-

Source : Government of India, 2014

While analysing the aggregate marine production from 2000-01 to 2013-14 Gujarat occupies the prime position with 9269.27 metric tonnes production as against Kerala with an aggregate of 8036.97 metric tonnes production. This shows the colossal marine potential of Kerala and if we exploit the underexplored resources, Kerala can brag the top position in the near future.

Fig:1 Figure showing the percentage contribution of Kerala, Gujarat and Maharashtra to the total fish production



Source: Calculated from Table:3

During the year 2004-05 Kerala contributed 21.66% to the total marine production, as against 21.04% of Gujarat and 15.03% of Maharashtra. According to the report of NETFISH, fish conservation wing of MPEDA, irrespective of the constant vigil of the fisheries department the juveniles of commercially important species like ribbon fish, threadfin breams, mackerel and leather jacket are caught from harbors of Ernakulam and Kollam districts in estimated volumes of 10-20 tonnes /boat/day. The losses were considerable as juveniles grow to commercial size within a short span and fetch much higher price. While juveniles are reportedly sold for Rs.15/Kg, full grown fishes fetch not less than Rs.150/Kg. (The Hindu, 2016)

Table:6 Total fish production from Kerala, Gujarat, Andhra Pradesh and Tamil Nadu

States	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-3	2013-14
Kerala	651.81	671.82	678.32	684.7	678.31	636.89	677.63	667.33	685.99	698.86	681.61	693.21	679.74	708.65
Gujarat	660.74	701.6	777.91	654.62	635.21	733.82	747.33	721.91	765.9	771.51	774.9	783.72	788.49	793.42
Andhra Pradesh	589.69	676.11	827.9	944.64	853.05	891.09	856.93	1010.1	1252.8	1305.9	1368.2	1603.2	1808.08	2018.42
Tamil Nadu	481.42	485	473.5	474.14	459.43	463.03	542.28	559.36	534.17	582.93	614.81	611.49	620.4	624.3

Source: Government of India, 2014

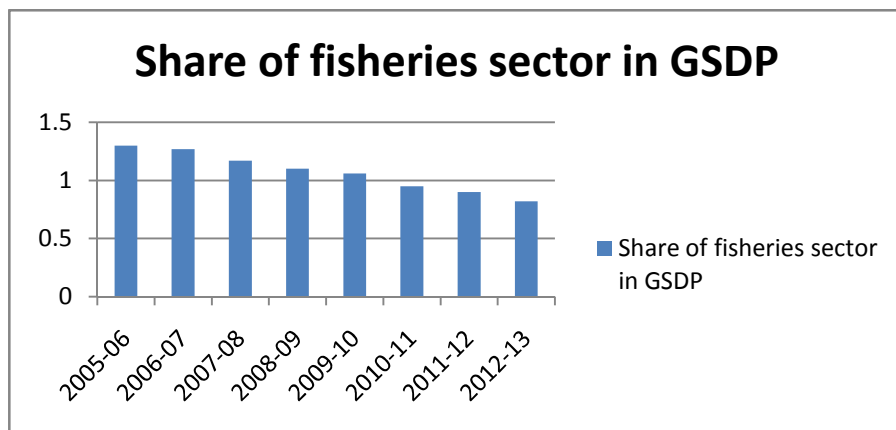
Table:7 Percentage increase of Total fish production

States	% increase of total fish production	
	From 2000-01 to 2001-02	From 2012-13 to 2013-14
Kerala	3.06	4.35
Gujarat	6.05	0.63
Andhra Pradesh	14.77	11.61
Tamil Nadu	0.83	0.64

Source: Calculated from table 4

Kerala is the only state with higher percentage increase when comparing the two time periods and Gujarat shows least percentage increase from 2012-13 to 2013-14. This can be attributed to higher exploitation rates of marine fishery resources in natural habitats of Gujarat and rich under exploited demersal and pelagic resources of Kerala.

Fig:2 Share of fisheries sector in GSDP of Kerala state



Source:Kerala Economic Review 2014,Government of Kerala

While analysing the share of fisheries sector in Kerala GSDP,it is found that the share shows a declining trend and this can be attributed to growth of tertiary sector and also the decreasing trend in capture fisheries.Although Kerala waters is home to many commercially exploitable fish species the exploitation may reach its saturation or we have to exploit the under exploited deep sea as well as pelagic resources.Being an important maritime State,Kerala having vast potential in tourism sector also and majority of tourism activities are directly or indirectly linked with fisheries resources also.The coastal districts tourism programmes make use of seafood delicacies,aesthetic view of fishing activities and sport fishing.Thus fisheries sector contributes to growth of tourism industry in Kerala,which is a top GDP contributor in the services sector.

Table:8

Species wise fish landings from Kerala from 2010-11to 2013-14

Sl.No	Name of fish	Fish landings in '000 tonnes			
		Year			
		2010-11	2011-12	2012-13	2013-14
1	Elasmobranches	3001	2906	2884	2873
2	Cat fish	167	181	179	168
3	Oil Sardine	151839	151940	143595	140383
4	Anchovilla	31949	32011	31511	30857
5	Saurida & saurus	5594	5483	5361	5337
6	Perches	30468	29945	29358	29444
7	Sciaenids	8805	8715	8613	8445
8	Ribbon Fish	15196	15175	14776	14585
9	Caranx	27166	26896	26595	26030
10	Mackerel	44991	44485	42696	43916
11	Seer fish	2537	2508	2469	2411
12	Tunnis	12062	11910	10458	10562
13	Penaeid Prawn	47620	46949	44587	42126
14	Non Penaeid prawn	1688	1674	1659	1516
15	Others	177315	172399	165897	163655
	Total	560398	553177	530638	522308
	% change	-1.28	-0.407	-1.569	-

Source:Directorate of Fisheries,Government of Kerala,2014

During the year 2010-11 to 2011-12, landings of oil sardine shows a percentage change of 0.066% , whereas landings of Elasmobranches shows -0.75% decline during the same period.The high value species among the fish catches are still few,prominent among them are Seer fish(*Scromberomorus commerson*),Prawn,Ribbon fish(*Lepturacanthus savala*) and Mackerel(*Rastrelliger kanagurta*).The major prawn species are *Penaeus indicus*,*Penaeus monodon*, *P.semisulcatus*, *P.indicus*,

Metapenaeus dobsoni, *M. monoeros*. The income of the fishermen ultimately decided by the quality and quantity of high value species in the total catch. During the year 2009-10 the high value fish species contribute about 19.91% of the total landing. The percentage decline of Oil sardine landings during 2012-13 and 2013-14 is -2.23% and for Penaeid prawns the percentage rate of decline is -5.52%. During the year 2010-11 the percentage contribution of high value species to the total landing was 19.9% and the percentage increased to 20.02% during 2013-14. The annual average landings of demersal fishery resources in India during 2009-2014 ranged from 0.86 million tonnes to 1.46 million tonnes with an average landing of 1.06 million tonnes during the period. This formed about 27% of the total landings of the country during the period. The contribution of demersal fish landings to all India marine landings reduced from 29% in 2009 to 26% in 2013. The major gear accounting for bulk of demersal fish landing was trawlers contributing 85% of the landings followed by gill netters (8%), dolnet (4%) and purse seines. In 2013, pelagic fin fishes constituted 73.27%, demersal 13.97%, crustacean 6.1% and molluscs 5% of the total landings. In 2013, Mechanized, motorized and artisanal sectors contributed 70.23%, 28.6%, and 1.17% respectively. Ring seine was the most important gear with a catch rate of 1664.8 kg/u. In trawl net the catch rate was 52.87 kg/u, while in gill net and Hooks and line the catch rate was 66.8 kg/u and 91.97 kg/u respectively. (CMFRI, 2014).

Conclusion

The marine fishery resources from Kerala being an important area for foreign exchange earning and helps in the growth of economy of India, considerable relevance should be given to this sector. Having the boon of most productive part of Arabian sea, Kerala waters yield many commercially important fin fishes and crustaceans and 19.91% of the total catch is high value fish species and the percentage of high value species increased to 20.02% during 2013-14. The percentage increase of total fish production of Kerala in the year 2010-11 to 2011-12 is 1.70%. The Key elements of the 12th plan Approach paper in the fisheries sector are launching of a comprehensive coastal area development project covering infrastructure, housing, sanitation, drinking water and livelihood, action plans for augmenting inland fish production to 2 lakh tones by the end of the plan from 1.17 lakh tones, enhancement of seed production, strengthening of post harvest infrastructure like better fish landing and handling facilities, cold chains, storage facilities as well as marketing facilities for the development of the sector and improvement in the production of value added products, micro enterprises, credit support and coverage under social security. To improve fish production from marine water bodies a comprehensive programme need to be worked out. It can be done by augmenting the mariculture production and productivity through diversification and intensive mariculture practices, ensuring conservation and management of aquatic resources through responsible and participatory approach and utilization of under utilized resources. Even though the fisheries sector in Kerala is suffering from over exploitation, by use of unsuitable fishing gears, there is 8.72% increase in the total fish production from Kerala from 2000-01 to 2013-14. If the rich underexploited demersal and pelagic resources are utilized effectively Kerala can brag the top position in total fish production and also contribute fruitfully towards the economic development of the State.

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