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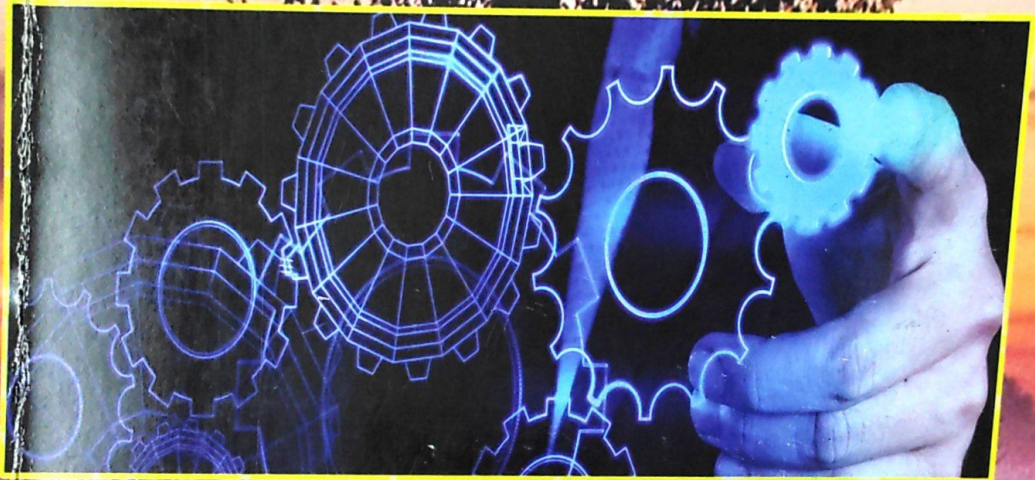
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**Abstract:** The present paper is an attempt to explore and analyze the production trends of cultured shrimp in India between 2006-07 and 2015-16 i.e., for a decade. In the process, the global scenario in relation to shrimp culture expansion and production was discussed at the outset, followed by the presentation of statistical data for the area under each major species of shrimp culture and its production. Further, the state-wise statistics of shrimp production in India was tabulated and analyzed with the help of column and line charts. Towards the end, the paper discussed the future drivers of growth in the sector.

**Key words:** cultured shrimp, production trends, major species, future drivers)

## Introduction

Shrimp is considered as one of the best nourishing seafoods the world over. It has been a potential foreign exchange earner for many countries. The principal regions in the world that take up shrimp culture extensively and intensively are: South-East Asia, China, India, Americas, and Middle East/North Africa. Shrimp culture spurs the growth of a number of subsidiary industries. A positive production trend is observed in major regions for its huge demand in the global market.

### Objectives of the study

- To study the growing trends of farmed shrimp production in India;
- To analyze the reasons behind the growth; and
- To envision the drivers of future growth in the sector.

### Source of data

As the present study is an attempt to explore and analyze the production trends of cultured shrimp in India from 2006-07 to 2015-16 i.e., for a decade, it solely depends on secondary sources such as MPEDA, FAO, and Globefish.

### Global Scenario

Shrimp culture registered enormous growth in the last three decades and established itself as an important economic activity across the continents. Shrimp farming on commercial-scale started in the early 1970s. By 1984, only 29 countries were listed by FAO as shrimp producing countries. But by 1997, 63 countries producing shrimp at one time or other, figured in FAO aquaculture statistics. Today, one third of the world's shrimp production is from farmed shrimp. Shrimp culture sector in the world has been rapidly expanding, with stellar growth recorded for some years and steady growth observed for some more years. The South-East-Asia region which includes Thailand, Vietnam, Indonesia, Bangladesh, Malaysia, Philippines, Myanmar, and Taiwan, had an unchallenging production quantity in 1995 with above 0.5 million metric tons (MT), and it continued its remarkable production even in 2017 with around 1.5 million MT. China, though began slowly with an insignificant production quantity in 1995, recorded an exceptional growth and produced around 1.5 million MT in 2017.

India also had a minor production quantity in 1995, but it has been picking up fast. Its production quantity was around 0.5 million MT in 2017. America was in the second position, next to South-East Asia in the world aquaculture shrimp production by 1995, but by 2017, it is in the third position preceded by South-East Asia and China. However, the growth of production in America has been slow but steady. Middle East, Northern Africa and other countries also contribute to the world shrimp production but on small scale.

**Indian Scenario**

India, by virtue of its 8,118 km long coastline, 2.02 million sq. km of Exclusive Economic Zone (EEZ) and extensive geographical stretch with varied terrain and climate, supports a wide diversity of inland and coastal wetland habitats. It is estimated that there is 3.9 million ha of estuaries and 3.5 million ha of brackish water areas in the country (WWF). Brackish water areas are more suitable for shrimp production. If sustainable practices are applied, these regions can yield maximum production of shrimp and other shell fish species.

Traditional shrimp farming in India was prevalent in West Bengal and Kerala where *trap-and-collect* system was practiced with low production levels. Eventually, the farmers and scientists recognized the contribution of scientific farming techniques in increasing production and productivity of shrimp. As a step in the direction of scientific farming, the Indian Council of Agricultural Research (ICAR) implemented an All India Co-Ordinated Research Project on Brackish Water Fish Farming during 1973-1984 to encourage and test various farming technologies in different agro-climatic conditions of the country. Simultaneously, shrimp hatchery technology was also introduced into the country. Marine Products and Exports Development Authority (MPEDA) supported the establishment of commercial hatcheries in the late 1980s. Once these initiatives were materialized, shrimp farming in India progressed, especially between 1990 and 1994.

Shrimp farming in India is mostly concentrated in the coastal states such as Andhra Pradesh, West Bengal, Kerala, Orissa, Tamil Nadu, Karnataka, Maharashtra, Gujarat and Goa. *P. Monodon* (tiger shrimp) was extensively cultured for many years. However, today, *L. Vannamei* was favored by farmers for its suitability for high stocking of seed and its demand in international markets. The details of species-wise shrimp production (only culture fisheries) in India are provided in Table 1.

**Table 1. Species-wise (Decadal) Shrimp Production in India**

Species		2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
P Monodon	AUC	149632	122079	108788.7	102259	113953	114370	93110.43	72177	71400	68848
	EP	144347	106165	75996.54	95919	118575	135466	123302.7	76798	73155	81451
L Vannamei	AUC	0	0	0	283	2931	7837	22715.71	57267	59240	59116
	EP	0	0	0	1731	18247	30717	147516.2	250507	353413	406013
Scampi	AUC	30042	50206	18421.14	8154	5511.72	6244	3432	9175	9307.49	12796
	EP	30115	27262	12806.25	6568	3721	4269	3625	3545	7989	10152
Total	AUC	179674	172285	127209.84	110696	122295.72	128451	119258.14	130619	130947.49	140669
	EP	174462	133427	85802.79	104218	140543	220452	274443.9	330850	434557	497422

AUC: Area Under Culture (in hectares); EP: Estimated Production (in tons)  
(MPEDA)

The data in Table 1 shows that farmers began L. Vannamei culture only during 2009-10, but it exhibited exponential growth rate in seven years. By 2015-16, it superseded P. Monodon and reached a stage of 4,06,018 MT production. The production of scampi has reduced gradually for various reasons. The area under P. monodon culture is larger with 68,846 hectares than the area under L. Vannamei with 59,116 hectares. Nevertheless, the output of L. Vannamei is far greater than that of P. Monodon. The predominating trend of L. Vannamei production can be witnessed in Figure 1.

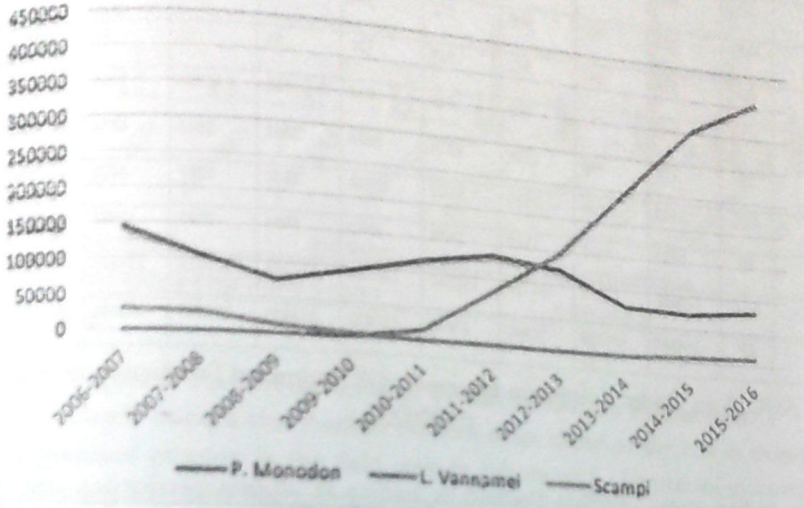


Figure 1. Production Trends of Three Species of Shrimp

As mentioned earlier, shrimp farming became a buzzing economic activity in the coastal states of the country. Table 2 provides state-wise area under shrimp culture in hectares and production in MTs.

Table 2. State-wise Shrimp Production in India

States		2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
West Bengal	AUC	50915	48236	47488	47488	47588	48558	48410	48860	53947	58285
	EP	42006	28000	27418	35885	40725	45999	52581	53528	57369.77	72554
Odisha	AUC	11453	6286	5362	4769	5324	8622	6302	6008	9297	10778
	EP	9726	5410	3544	6149	7520	11001	35294	13982	22539	29936
Andhra Pradesh	AUC	65234	5396	36395	3415	44794	42402	35218	52286	40445	42462
	EP	75414	56557	29706	41192	65943	126466	159083	213522	279727	300278
Tamil Nadu	AUC	3712	2730	4673	2381	2265	5757	7804	5430	5199.94	8263
Pondicherry	EP	5307	3438	4133	2702	4129	14960	25815	27197	32785.72	45642
Kerala	AUC	11691	7598	8290	9545	11788	12809	12917	12719	15385.44	12622
	EP	5151	5903	4309	7096	8075	8138	5175	3360	3840.18	3827

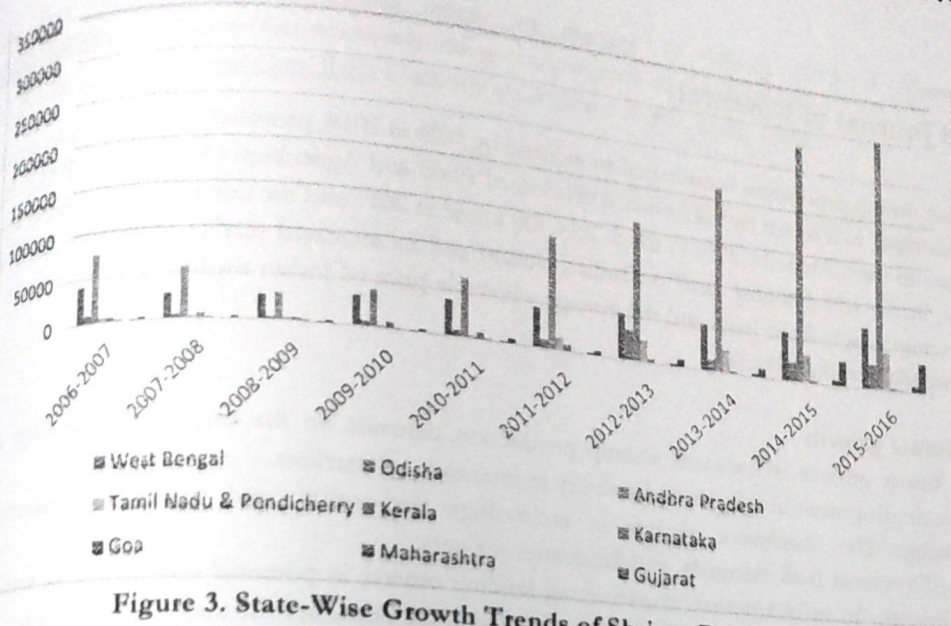
Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
India	100	105	110	115	120	125	130	135	140	145	150	155
USA	100	102	104	106	108	110	112	114	116	118	120	122
China	100	103	106	109	112	115	118	121	124	127	130	133
Japan	100	101	102	103	104	105	106	107	108	109	110	111
UK	100	100	100	100	100	100	100	100	100	100	100	100
Germany	100	100	100	100	100	100	100	100	100	100	100	100
France	100	100	100	100	100	100	100	100	100	100	100	100
Italy	100	100	100	100	100	100	100	100	100	100	100	100
Spain	100	100	100	100	100	100	100	100	100	100	100	100
South Korea	100	100	100	100	100	100	100	100	100	100	100	100
Canada	100	100	100	100	100	100	100	100	100	100	100	100
Brazil	100	100	100	100	100	100	100	100	100	100	100	100
India	100	105	110	115	120	125	130	135	140	145	150	155
USA	100	102	104	106	108	110	112	114	116	118	120	122
China	100	103	106	109	112	115	118	121	124	127	130	133
Japan	100	101	102	103	104	105	106	107	108	109	110	111
UK	100	100	100	100	100	100	100	100	100	100	100	100
Germany	100	100	100	100	100	100	100	100	100	100	100	100
France	100	100	100	100	100	100	100	100	100	100	100	100
Italy	100	100	100	100	100	100	100	100	100	100	100	100
Spain	100	100	100	100	100	100	100	100	100	100	100	100
South Korea	100	100	100	100	100	100	100	100	100	100	100	100
Canada	100	100	100	100	100	100	100	100	100	100	100	100
Brazil	100	100	100	100	100	100	100	100	100	100	100	100

AGC Area Under Culture (in hectares) EP Estimated Production (in tons) (2011-22)

Among the Indian states, Andhra Pradesh is leading in sheep production with 2,80,270 MT of AGC because of area under culture by 2023-24. It is followed by West Bengal with its growth of 72,324 MTs. In the following Figure 2 and 3, both overall positive growth trend and state wise increase of sheep production in India can be observed.



Figure 2. Overall Growth Trend of Sheep Production in India



**Figure 3. State-Wise Growth Trends of Shrimp Production**

In Figure 3, it is clearly noticed that Andhra Pradesh is far ahead of the rest in shrimp production. The reasons for its dominant position in the field include culture of *L. Vannamei* in most of the area under shrimp culture and adopting scientific management practices. Thus, India has grown to be one of the major producers of shrimp in the world. In 2016-17, the overall shrimp production reached 600,000 tons. India targets 1 million MT of shrimp production by 2020 (Harkell).

#### Reasons for the growth

*L. Vannamei* is extensively cultured in Andhra Pradesh which is a major producer of shrimp in India.

High stocking density with *L. Vannamei* culture leads to high production quantities.

SPF (specific pathogen free) *Vannamei* brood stock is imported from the United States for cultivation. Pacific white shrimp takes less time to grow to market size, is more resistant to disease than black tigers, and is more affordable (Wright).

Entry of corporate companies and business people into the sector boosts its vertical as well as horizontal expansion.

Adoption of scientific management practices from digging to harvesting.

Preference to producing high quality shrimp which is in demand in global market.

Growth of processing and packaging facilities across the coastal states.

Initiatives of the governments to encourage farmers (Recently, the Government of Andhra Pradesh has

reduced power tariffs to aqua farmers from Rs. 3.75 to 2.00 per unit for one year with effect from 1 August 2018, which slightly decreases the farmers' burdens).

Appreciation of Indian rupee has made its seafood products more attractive.

Quality of Indian seafood products.





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