AN INQUIRY IN TO THE TRENDS IN LANDINGS AND MARKETING EFFICIENCY OF THREADFIN BREAMS, A TRAWL BY CATCH RESOURCE ALONG KERALA COAST

G. B. Sreekanth[1*], P. U. Zacharia[2*], Praveen, K. V.[3*], N. Manju Lekshmi[1] and N. P. Singh[1]

[1] ICAR Research complex for Goa, Ela, Old Goa
[2] Central Marine Fisheries Research Institute, Kochi, Kerala
[3] Indian Agricultural Research Institute, Pusa, New Delhi

Abstract

The threadfin breams are emerging as an important commercial fishery resource along the Kerala coast. An attempt is made to understand the trends in landings, price behaviour and the marketing efficiency for threadfin breams along the Kerala coast. Secondary data from various published sources were used in this study. Graphical and tabular analysis, coefficient of variation, price spread, fishermen's share in consumer's rupee, total gross margin and total mark-up were the tools used to meet the objectives. The landing pattern depicted a fluctuating trend over the years. The price stability was found to be higher at the landing centre when compared to the retail level. The marketing efficiency was found to be on the lower side along the Kerala coast in comparison with the national level. All the marketing efficiency indicators except the fishermen's share in the consumer's rupee showed an upward trend. This point to the fact that suitable actions need to be taken in the management, utilisation and marketing systems for threadfin bream resource along Kerala coast.

Keywords: *Kerala, Landing price, Marketing efficiency, Percentage Share of Fishermen in Consumer Rupee, Price spread, Retail Price, Threadfin breams*

INTRODUCTION

The threadfin breams or nemipterids under the family *Nemipteridae* is an important demersal group which contributes to about 17.4 per cent of the total demersal fish landings and 4.6 per cent of the total marine landings (TML) along Indian coast (CMFRI, 2012). The major species in this group are *Nemipterus japonicus* and *N. Randalli* (Murty *et al.*, 2003).These species are abundant in the west coast of India, especially along the coasts of Kerala and Maharashtra. All the important landing centres along Indian coast - Cochin, Mumbai, Veraval, Chennai, Visakhapatnam, Mangalore and Kakinada land this resource in varying quantities. Though landed as a major by-catch by shrimp trawls, it is now utilized as an excellent food fish and considered as a candidate species for surimi industry as well as for processed fillets. They are marketed mainly fresh, however, frozen, steamed, dried-salted, dry-smoked, fermented and value added forms such as fish balls and fish meal are also in trade. The increasing export demand for making fish paste helps this group to fetch premium price, both at landing centres and retail markets.

With the introduction of multiday trawlers in late 90's and extension of the grounds of operation to 150 m depth, the landing of threadfin breams have increased steadily over time. The landing of 20,000 t in 1980 rose to 1, 16, 000 t by 2000 and further to 1, 74, 079 t by 2011. This significant hike in landings is also reflected in its contribution to the total demersal and total marine landings. Their contribution increased from 15.0 per cent to 17.5 per cent to the total demersal fish landings and 3.9 per cent to in 4.5 per cent to all India marine fish landings from 2010 to 2011 (CMFRI, 2012).

Kerala is the southernmost state of India with considerable coastal length. Over the years threadfin breams landings along Kerala coast has grown continuously. Between1985 and 2011 it increased from 24, 150 t to 66, 513 t. The average share of Kerala to all India landings of threadfin breams amounted to 42 per cent during the period 2001-2011. The annual average contributions of *N. japonicus* and *N. randalli* to total threadfin bream landings along Kerala coast are 44.5 per cent and 53 per cent respectively. In the year 2011, all India landings witnessed an increase of about 44, 540 t in comparison with 2010, which is attributed to the tremendous rise in landings from Kerala. The contribution of Kerala to the hike in all India threadfin bream landings was about 73 per cent then (CMFRI, 2012). Recently, it has become an important resource group in Kerala's marine fish landings. There are some reports regarding the gross resource value of this species along Kerala coast at first and last points in the marketing chain, and price dynamics. But all these studies are inadequate to provide a complete picture regarding the status of the resource utilization along Kerala coast.

In this context, we made an attempt to critically analyse the landings, their distribution and utilization, value and price dynamics along Kerala coast from published sources of information. The study was planned with the following objectives

1) To study the trends in landings of threadfin breams along Kerala coast.
2) To assess the landing and retail price behaviour of threadfin breams along Kerala coast.
3) To evaluate the trends in marketing efficiency indicators.

METHODOLOGY

Secondary data on fish landings, gross value of landings, price patterns, marketing indicators etc. for threadfin breams were collected. The following methodology is used to meet the objectives. Graphical analysis and the compound annual growth rates were used to study the trends in the landings of threadfin breams along Kerala and all India. Tabular analysis and the coefficient of variation (CV) were used for studying its price behaviour over the years. An efficient marketing system is the one in which the marketing cost is minimum and the primary producer gets maximum benefit.

The marketing efficiency was assessed using various indicators. These are:

i. Price spread (Rs per kg)

Price spread = RP-LP

ii. Per cent share of fishermen in consumer rupee

PSFCR = (LP/RP)*100

iii. Total gross margin (per cent)

Total gross margin (per cent)= ((RP-LP) / RP)*100

iv. Total mark-up (per cent)

Total mark-up (per cent) = ((RP-LP)/LP)*100

Where RP = retail price, LP = Landing centre price

RESULTS AND DISCUSSION

LANDING TRENDS OF THREADFIN BREAMS ALONG THE COAST OF KERALA AND INDIA

The plot of Kerala and national threadfin breams landings during 1985-2011 depicted a growth curve which is highly fluctuating .The landings along Kerala grew from 24, 150 t to 66, 513 t during the total period considered, while the country's landing increased from 38, 571 t to 17, 4079 t (Fig. 1). Kerala contributed an average share of 42 per cent during 2001-2011 in total national landings of threadfin breams (Fig. 2).

The threadfin breams landing scenario at the national level as well as along the Kerala coast during 1985-2011 constitutes of three distinct growth stages. These are; (i) the period between 1985-1995, (ii) between1995-2005, and (iii) from 2005 till 2011. The period between 1985 and 1995 followed a continuous rise and fall in landings at both Kerala and the national level. In this phase the maximum landing for both were observed in the year 1993 and were 55, 078 t and 86, 926 t in Kerala and the national level respectively. This supports the fact that the landings along the coast of Kerala significantly contributes to the national level landings. This particular period experienced healthy growth rate at both the scenarios. The growth rate of landings along Kerala was about 4.27 per cent and that at the national level was about 5.97 (Table 1).

Even though the landings at the national level followed a positive trend in the second phase, that along the Kerala coast didn't followed any specific trend. The landings along Kerala can rather be said to follow a slight negative trend with a growth rate of -0.81 per cent during the period. It showed a decline after 1996 which revived in 2000 with a production of 37, 437 t. It further dipped to an all-time low of 20, 773 t in 2003, which again showed a sharp hike to 46, 466 t in the very next year. The national level landings however still showed a steady growth rate of 4.11 per cent in the second stage. The negative trend in landing along Kerala witnessed a reversal in the third growth stage. The revived growth rate was about 12.59 per cent. The absence of year to year fluctuation and a continuous rising trend added to this growth rate. It has also contributed to the improvement in growth rate at the national level, which reached 10 per cent level during the third growth stage.

The year 2011 witnessed an all-time high in threadfin bream landings along Kerala coast which amounted up to 66, 513 t. Moreover, the country's landings also increased from 2008 to 2010. The overall growth rate of threadfin bream landings along Kerala and the national level were 0.13 and 3.99 per cent respectively. The percentage share of Kerala in threadfin bream landings of the country showed a continuously declining trend since 1985 till 2010. The year 2011 has however shown signals of improvement in this status (Fig. 2).

PRICE BEHAVIOUR OF THREADFIN BREAMS IN KERALA

The cognisance about the nutritive value of fish in the recent years has made a shift in the dietary pattern of the consumers favourably towards fish in the domestic market (Vasileska and Rechkoska, 2012). The introduction of refrigerated containers and development of infrastructural facilities like roads has refined the internal domestic marketing system for fish and has made the availability of fresh fish products for the consumers. Prior to the introduction of these improvements in the marketing system fish was transported from different states after washing with water and icing. Plastic containers of nearly 35-50 kg are used for packing and are then transported in ordinary or refrigerated trucks. The quantity of ice varies with the type of species and size. Fish is mainly sold through auction lots at the harbours and sale by weighing is rare**.** However some of the large fish lots are sold by weighing.

The rapid economic growth and expansion of domestic wholesale and retail fish markets in Kerala has resulted in the improvement of fish price at the retail markets (Sathiadhas *et al.*, 2000). The domestic fish prices are shooting up especially for the high value fishes. Fish which was available for the common man in the recent past has become dearer to the common man. The fish which were only used for fishmeal and silage are presently diverted for human consumption with an appreciation in price. Threadfin breams are also not dissimilar in this front. The resource has found a place in the dining table of common man and its price increased in the last decade owing to the multiplicity of uses that it has.

The details on the landing price (LP) and retail price (RP) of threadfin breams in Kerala and India and that of marine fish in Kerala is presented in the Table 2.The analysis of LP and the RP for threadfin breams between Kerala and India during 2000-2010 revealed that there exist a significant difference ($\alpha = 0.05$) in the LP (t- test assuming equal variances, $P = 0.03$) while the RP (t- test assuming equal variances) didn't differed significantly ($P=0.08$). The average annual LP for threadfin breams (LPT) along Kerala (LPTK) has shown higher values in comparison with the average annual LPT along Indian coast (LPTI). This is due to heavy demand for the multiple uses of this group along Kerala coast. Similarly, the average RP for threadfin breams (RPT) along Kerala (RPTK) has shown higher values in comparison with

the all India average (RPTI). The LPTI increased from Rs. 13 to Rs. 27 while LPTK shifted from Rs. 17 to Rs. 32.5 along Kerala during 2000-2010. RPTI also showed a similar trend of increase from Rs. 24.4 to Rs. 53 and RPTK from Rs. 29 to Rs. 62.1. Both the LPT and RPT have shown an increasing trend from 2000-2010 along Kerala as well as Indian coast. There was an evident upward and downward shift in the LPT and RPT along Kerala coast during 2006 and 2007 respectively which were not observed in all India average values for threadfin breams.

The analysis of the LPTK and annual average marine fish LP (LPM) along Kerala has shown a significant difference (t-test for samples showing unequal variances, P = <0.001) between them and the LPM was significantly higher than that of threadfin breams during 2000-2010. The RPTK and annual average marine fish retail price (RPM) along Kerala has shown a significant difference (t-test for samples showing unequal variances, P = <0.001) among them and the RPM was significantly higher than that of threadfin breams during 2000-2010. The mean values for the LPTK and LPM were Rs. 23.9 and Rs. 47.4 respectively and that of RPTK and RPM were Rs. 42 and Rs. 74.8 respectively along Kerala. There is decline in the LPM as well as RPM in 2010 while the threadfin breams showed an increase in its unit value (both LPTK and RPTK) during this year along Kerala coast.

The comparison of LP and RP for threadfin breams along Kerala coast showed that there is an increase in both the prices in the last decade from 2000 to 2010. The price increase is a common phenomenon in this group and the difference between landing centre price and retail price is on the rise because of lack of efficiency in the marketing system. The landing centre price has increased by 94.1 per cent in the last decade while the retail price has expanded by 117.2 per cent. This shows the extent of influence by the intermediaries in the marketing chain. A proper marketing system development is an important concern as this group is going to be a significant resource in future.

PRICE STABILITY

The stability in landing and retail prices of threadfin breams along Kerala as well as India is measured using CV. The CV was found to be higher in the retail prices than the landing prices signalling its higher variation over the years (Table 3). This may also be attributed to the marginal difference in the Price hike at retail market in comparison to the price at the landing centre. The CV of the landing price of threadfin breams in Kerala was 19.5 per cent which is lower than its value at all India level (23.6 per cent). Similarly the CV of retail price of threadfin breams in Kerala was 23.6 per cent and that at the all India level was 25.1 per cent. Thus the price stability can be said to be higher at the state level (Kerala) in comparison with the national level, and at the landing stage compared to that at the retail stage. The higher variation or dispersion in the retail prices may be due to the involvement of large number of middlemen, intending to make profit, between the landing and retail markets. The extent of dispersion will be higher when the middlemen realises more profit.

DEGREE OF ASSOCIATION BETWEEN LANDING AND RETAIL STAGES

The price of threadfin breams at the point of first and last sales were found to be correlated positively. The high correlation value of 0.99 (P<0.01) also indicates the prevalence of high level of market integration. Since the lot is supposed to come from the landing centre to the nearest wholesale or retail market the increase in price at the landing centre will mark a proportional increase in the price of fish at the point of last sales.

The increase in prices was very prominent for the threadfin breams in the last decade along Kerala (Fig. 1Fig. 3). The inelastic supply of threadfin breams due to its highly perishable nature and the stagnation in catches made the prices to rise. The pricing mechanism for the group is also entirely based on the cartels formed by intermediaries and traders. The price for fish at the landing centre (LP) has shown a substantial increase from Rs.17 to Rs.32. with a hike of 91 per cent during 2000-2010 periods along Kerala. On the other hand, the retail price (RP) has drastically increased from Rs.29 to Rs. 62 with a growth rate of 115 per cent in the same period. A significant hike in price for the group from 2005 to 2010 is clearly observed for both the first and last points which would have contributed to the significant rise in the gross value during 2009.

EFFICIENCY IN MARKETING OF THREADFIN BREAMS IN KERALA

Several marketing channels exist in the domestic or internal marketing of fish in Kerala. There are 3-6 major marketing channels. All the market intermediaries except the auctioneers of the primary market (wholesale) and the commission agents of the secondary market (retail) take possession of fish in the marketing process. In each channel, the number of intermediaries between the primary producer or fishermen and the ultimate consumer varies depending upon the quantum of landings, and the effort involved in carrying out the marketing functions like assembling, storing, grading and transportation. The threadfin bream is marketed in Kerala through two major marketing channels as shown in the Fig. 4.

The losses at different stages of marketing of threadfin breams in Kerala, landing centre level, wholesale and retail levels, were estimated for both the surimi/processed and the fresh fish marketing channels. The post-harvest losses were found to be higher in the fresh fish marketing channel compared to the surimi marketing channel. It was as high as 22.50 per cent in the fresh fish channel; comprising 7.5 per cent at the landing centre level, 5 per cent at the wholesale level and 10 per cent at the retail level. These losses in the surimi marketing channel were 7.5, 5 and 10 per cent at the corresponding stages of marketing. The comparison of the marketing losses in the two channels indicated that except at the retail level, where the loss in the fresh fish channel is higher, at all other levels the marketing losses were more or less similar. In the fresh fish channel, the share of loss at the retail level were higher than at any other stage and this contributed almost 45 per cent of the total marketing loss. The share of loss at landing centre level was also as high as 33 per cent. In the surimi channel, the share of loss at the landing centre level contributed the highest, which was 42.86 per cent. The whole analysis revealed the necessity for improved and efficient handling, storage and transit facilities at the assembly level and the retail level. Along with better landing, storage, transit and packing facilities, the fishermen should also be given awareness regarding the necessity to reduce the post-harvest losses.

The two important points in marketing and distribution of fish are the point of first sale (Landing site) and the point of last sale (retail markets, auctioneers etc.). The difference between these two will reflect the price spread of the species/ group. The difference between the price at the point of first and last sales for threadfin breams was constant during the commencement of this decade while it started expanding after 2005. This is attributed to the hike in fish prices at the point of distribution to the consumers and the increased demand for the fish food. This is a real concern to the fishermen as they are really loosing major chunk due to the middlemen and commission agents. The benefit of increase in price of the fish at

the retail level is not reaching the fishermen which show the inefficiency in the marketing channel which is a concern to be addressed.

The analysis of year wise Price spread (Rs. /kg)) of threadfin breams along Kerala coast revealed that there is a continuous increase in the price spread (Table 5). This is an indicator of the fact that the rate of rise in the price at the point of first sale is not as high as the rise in price at the point of last sales. The price spread showed an increase of 147 per cent from Rs.12 to Rs.30 during the decade of 2000 to 2010. The year 2005 witnessed a slight decline in the price spread which may be attributed to the demand depletion from the part of consumers due to Tsunami of 2004 and subsequent decrease in the retail prices (Sathiadhas and Prathap, 2005). After 2005 and 2006, it started rising slowly and shoot up from 2008 to 2010 to a record figure of Rs.30. There is a definite lack of integration in the different stages of threadfin bream marketing chain which is reflected by the increase in the price spread for the fish along Kerala coast.

Percentage share of fishermen in consumer's rupee (PSFCR) for threadfin bream revealed that the value in Kerala (52.39 per cent) is less than the national average of 59.22 per cent. This value also indicated the existence of only a moderate marketing system for the fish along Kerala in comparison with other states. Several studies suggested the prevalence of lower PSFCR and exploitation by middlemen in the fishery marketing system (Panikkar and Sathiadhas, 1989; Sathiadhas and Panikkar, 1992; Sathiadhas *et al.*, 2000; Sathiadhas *et al.*, 2005; Sathiadhas *et al.*, 2012). The commission agents between wholesalers and small scale retailers are the major middlemen involved in the marketing chain. The value is significantly different from 100 per cent and the overall analysis gives an impression that there is a significant involvement of middlemen in the marketing chain of the group and an effective marketing system must be developed considering the wellbeing of the fishermen.

The increasing values of the Total gross margin and the Total mark-up for threadfin bream marketing in Kerala over the years reemphasises the fact that the fishermen are on the losing side compared to the retailers. The efficiency of a marketing system is dependent on the values of price spread, PSFCR, total gross margin and total mark-up. The increase in price spread, total gross margin and total mark-up will lead to the decrease in the PSFCR keeping the fishermen (producer) at loss or lower levels of income. This is an indicator of decreasing or less efficiency in marketing. If the PFSCR for a fishery group is on the higher side (>70 per cent), then the marketing efficiency is assumed to be high. The medium priced groups like threadfin breams are channelled through inefficient intermediaries and agents. Thus the cost of marketing, price spread, total gross margin and total mark-up are high and the PSFCR and the marketing efficiency is on the lower side.

The major constraint in the marketing system is the intrinsic characteristics of the resource like perishability, seasonality and low marketable surplus. Moreover, all these complexities in the marketing system, will keep the marine fish marketing as a supply driven system which will not give the fishermen any command on dictating the fish price. Domestic fish marketing in India has received no attention in the main stream trade. Fish marketing generally comes under monopsony or oligopsony categories (Sathiadhas *et al.*, 2005). Fishery resources are highly perishable in comparison with other agricultural products. The different procedures involved in the marketing system like catching, storing and grading will create the ramified process of marketing. The unfortunate fact is that, the domestic marketing system is not yet efficient to handle the growing fish produce. Out of the total fish produce, about 85 per cent of the catch is distributed through the domestic markets. The co-operative marketing system is currently playing only a minor role by handling a mere 5 per cent of domestic trade. The

rest of the produce is supplied in the domestic market through private agencies and traders. Thus the Gross marketing margin is high in the domestic marketing system (Sathiadhas *et al.*, 2003).

The present study points to scope of improvement in the marketing system for threadfin bream resources along the Kerala coast, where they normally land in huge quantities. The concerns which need to be addressed are the losses of the resource in each link of the marketing chain and lower share of PSFCR. Innovation in the marketing system in the lines of co-operative marketing can be a viable option to reduce the losses in marketing channel and to improve the PSFCR. The fishermen can be effectively linked to the evolving urban market through these co-operatives. It can do away with some of the profit oriented middlemen if the co-operatives take up the tasks of marketing. The co-operative marketing system has the potential to reduce the time of auction and handling. This will in turn help in distribution of good quality fish that fetch optimum price for the fishermen and distributors. This marketing innovation if introduced must be supplemented with better infrastructure facilities at the landing centre and Ice plants. The investments for establishing cold storages and efforts to tap the potential of retail markets in the vicinity of the landing centre will add to these efforts.

CONCLUSION

The threadfin breams are emerging as an important commercial fishery resource along Kerala coast with annual average landings of about 35, 700 t in the last decade. The resource is utilised in both, fresh and processed forms. It is heavily exploited and hence there is a need for definite management interventions along the coast. The huge landing of the resource coupled with overexploitation resulted in the larger price spread and losses in the marketing chain. The Share of fishermen in consumer rupee is low and they are incurring losses. Strategy in the lines of co-operative marketing can be effectively implemented to improve the marketing system as a whole. It will help to reduce the losses and improve the PSFCR along with assuring a stable and profitable price. The bargaining power of the fishermen will be higher in the co-operative marketing system and they can take up the grading to ensure the diversion of large specimens for direct fresh consumption and other medium and small sized groups for value addition and processing. This will help in improving the quality of marketed fish and fish products. It is high time recognise the potential of threadfin breams as a source of protein for consumers and employment for fishermen, so that it can be effectively marketed and distributed for the benefit of both the fishermen and the consumers.

FIGURES AND TABLES

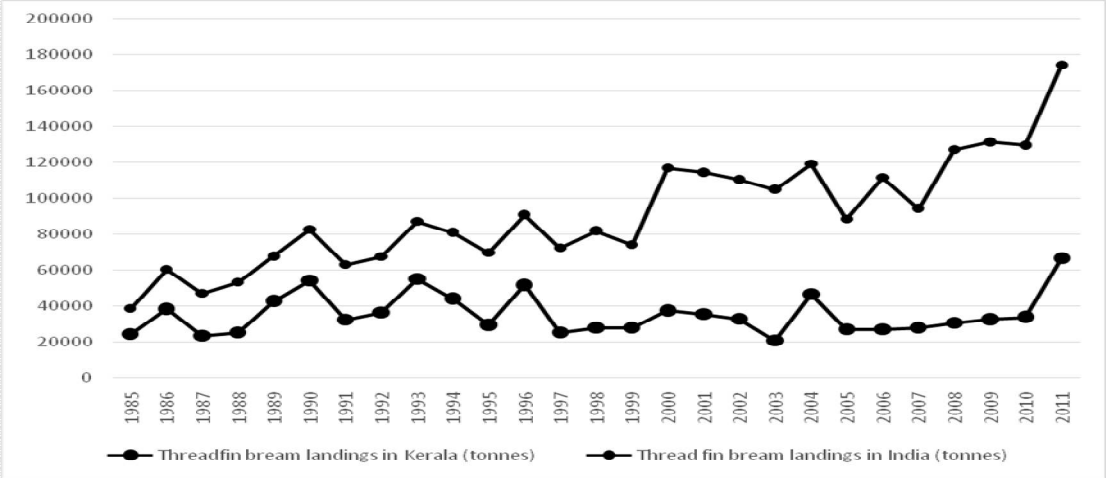

Fig. 1. Comparison of threadfin breams landings of Kerala with national scenario during 1985-2011

Source: Srinath et al. 2006; CMFRI, 2006; CMFRI, 2007; CMFRI, 2008, CMFRI, 2009; CMFRI, 2010

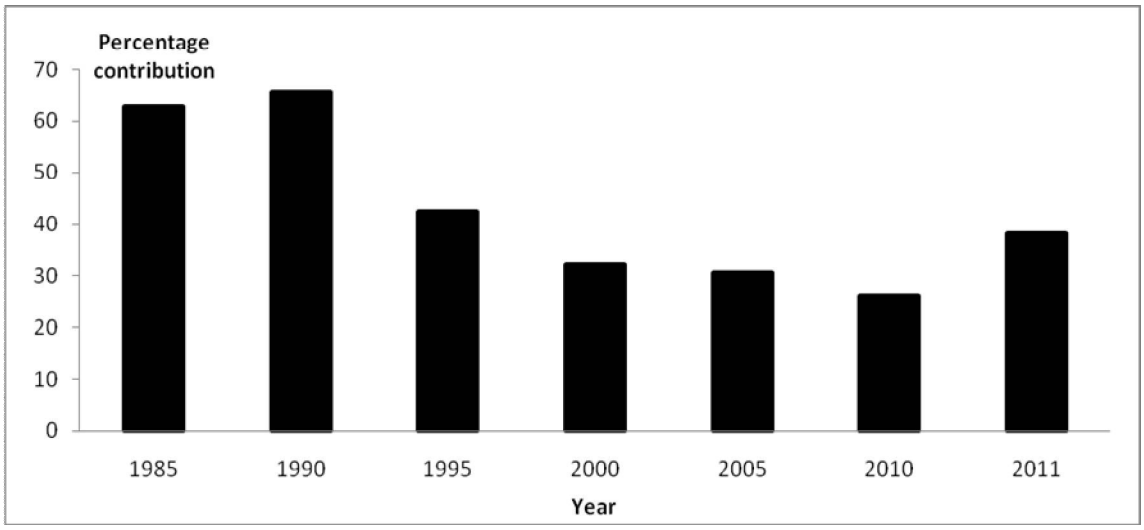

Fig. 2. Share (per cent) of Kerala in total threadfin breams landings of the country from 1985-2011

Source: Srinath et al. 2006; CMFRI, 2006; CMFRI, 2007; CMFRI, 2008, CMFRI, 2009; CMFRI, 2010.

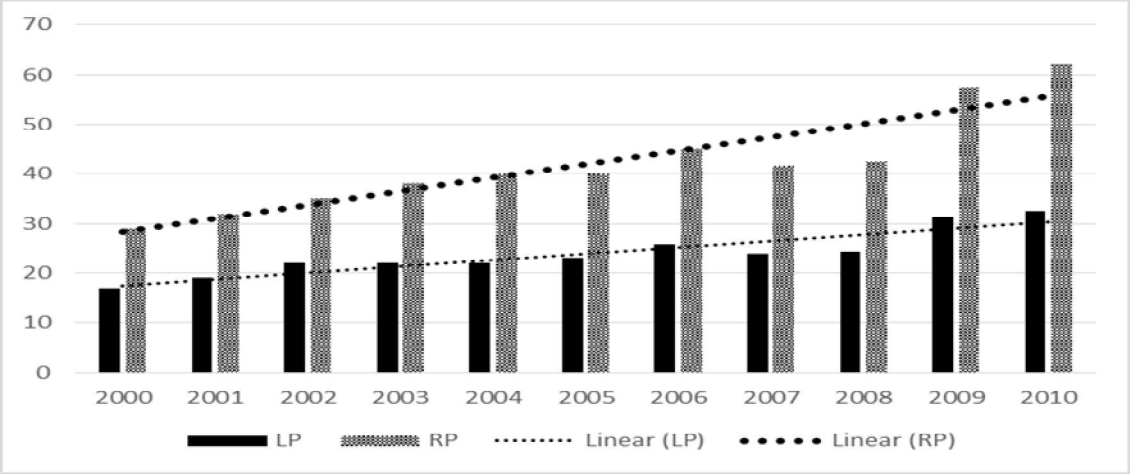

Fig. 3. Trend in the landing price and retail price of threadfin breams in Kerala
Source: Sathiadhas et al., 2012

Surimi/Processed

Fishermen or boat owner → Agents →Wholesale fish merchants → Agents→ dealers→ processing plants→ Export → Retail shops abroad.

Fresh fish

Fishermen or boat owner → Agents →Whole sale fish merchants → small scale vendors/ domestic retailers → consumers

Fig. 4. Major marketing channels in the marketing of threadfin breams in Kerala

Table 1. Growth rates of threadfin bream landings along Kerala coast and at national level

Growth stage	CAGR* of landings in Kerala	CAGR of landings in India
1985-1995 (Stage I)	4.27	5.97
1996-2005 (Stage II)	-0.81	4.11
2006-2011 (Stage III)	12.59	10
1985-2011 (Overall)	0.13	3.99

**Compound Annual Growth Rate*

Source: Srinath et al. 2006; CMFRI, 2006; CMFRI, 2007; CMFRI, 2008, CMFRI, 2009; CMFRI, 2010.

Table 2. Landing and retail prices of threadfin breams and marine fish

Year	Landing price of threadfin breams (Rs per kg)		Retail price of threadfin breams (Rs per kg)		Price of marine fish in Kerala (Rs per kg)	
	Kerala	India	Kerala	India	Landing	Retail

					price	price
2000	17.00	13.01	29.00	24.43	40.36	70.72
2001	19.00	14.31	32.00	26.57	42.18	72.87
2002	22.00	15.90	35.00	28.68	39.06	67.69
2003	22.00	16.48	38.00	28.89	40.05	69.13
2004	22.00	18.86	40.00	33.23	38.68	63.01
2005	23.00	19.64	40.00	33.15	40.41	65.97
2006	25.86	19.55	44.98	33.68	49.26	73.93
2007	23.93	20.11	41.62	35.24	48.83	73.14
2008	24.41	21.31	42.45	37.83	51.48	77.18
2009	31.39	26.11	57.20	47.67	68.21	98.52
2010	32.53	27.44	62.09	52.97	62.52	90.75

Source: Sathiadhas et al., 2012

Table 3. Descriptive statistics on the landing and retail prices of threadfin breams

Particulars	LPTK	LPTI	RPTK	RPTI
Mean	23.9	19.3	42.0	34.8
Standard Deviation	4.7	4.5	9.9	8.7
Maximum	32.5	27.4	62.1	53.0
Minimum	17.0	13.0	29.0	24.4
Coefficient of variation	19.5	23.2	23.6	25.1

Source: Author's calculation based on Sathiadhas et al., 2012

Table 4. Postharvest loss in different stages of marketing of threadfin breams in Kerala

Stages of marketing	Processing channel		Fresh fish channel	
	Loss in marketing (per cent)	Share to total (per cent)	Loss in marketing (per cent)	Share to total(per cent)
Landing centre and assembly level	7.50	42.86	7.50	33.33
Wholesale level	5.00	28.57	5.00	22.22
Retail level	5.00	28.57	10.00	44.44
Total	17.50	100	22.50	100

Table 5. Marketing efficiency indicators for threadfin bream marketing in Kerala

Year	Price spread (Rs)	Fishermen' share in consumer rupee (Per cent)	Total Gross margin (per cent)	Total mark-up (per cent)
2000	12.00	58.62	41.38	70.59
2001	13.00	59.38	40.63	68.42
2002	13.00	62.86	37.14	59.09
2003	16.00	57.89	42.11	72.73

2004	18.00	55.00	45.00	81.82
2005	17.00	57.50	42.50	73.91
2006	19.11	57.50	42.50	73.91
2007	17.69	57.50	42.50	73.91
2008	18.04	57.50	42.50	73.91
2009	25.80	54.89	45.11	82.19
2010	29.56	52.39	47.61	90.87

Source: Author's calculation based on Sathiadhas et al., 2012

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ACKNOWLEDGEMENT

The study was carried out with scientific and technical support from CMFRI, Kochi, India. We extend our sincere gratitude towards the Director and faculty of CMFRI, especially the technical and scientific staff of Demersal Fisheries Division for the timely support and guidance.