PRICE STABILITY OF COMMERCIALLY TRADED FISHES IN ERNAKULAM MARKETS, KERALA

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The fish consumption of Kerala is four times the national average, as 85 per cent of the Keralites eat fish, which accounts for over three quarter of the animal protein intake of an average Keralite. Though the fish demand-supply gap is ironed up by the arrivals from the neighboring states and even from the fish landing centres further north, huge fluctuations are visible in the retail prices of fish. In this backdrop, the present study was conducted at Ernakulam district, the commercial capital of the state, which abodes around 2.1 million metropolitan population with an average monthly fish consumption of 9.34 kg. The study analyzed the trends in price volatility of the major commercially traded fishes in selected Ernakulam markets, identified the species which exhibit stability in prices and also deduced the relationship between marine landings vis-à-vis price realized in the district. The study revealed that high value species are found to be having better stable prices compared to the low value species. Also, the retail prices are found independent over the quantity landed in the district.

INTRODUCTION:

Fisheries sector, being an integral part of the Kerala economy, provides food security and protein nutrition along with employment generation, contributing to 1.58 per cent of the state GDP. The southwest coast of India comprising Kerala, Karnataka, and Goa contributed 29.2 per cent of the total fish production, out of which 49 per cent contribution was from Kerala. Of the nine maritime states and two union territories of the country, Kerala stands third in landings, following Gujarat and Tamil Nadu, with a landings of 4.82 lakh tons (14.2 per cent). According to the valuation of marine fish landings in India estimates Kerala topped in contributing to the landing centre level (21.70 per cent) and retail market level (20.38 per cent), followed by Gujarat and Tamil Nadu. The analysis of the comparative landing centre as well as the retail centre valuation across the coastal states of India indicated that Kerala has a 36.42 per cent increase in valuation at landing centre level and a 33.50 per cent increase in valuation at retail centre level over 2014.

According to the estimates, 85 per cent of the Keralites eat fish, which accounts for over three quarter of the animal protein intake of an average Keralite. The fish consumption of Kerala is four times the national average and is inelastic in the case of both price and income[5]. Even though there is a huge fluctuation in the prices of fish, still it is considered as poor man's protein which is being consumed, by a large number of middle-income groups, in

addition to poor people. Also, the changing lifestyle due to increase in income, improved health consciousness, increase in the cost of meat, etc had made fish dearer.

The district of Ernakulam, being the commercial capital of the state of Kerala, is a major financial and commercial hub of the state. The city of Ernakulam, popularly known as Kochi or Cochin, abodes around 2.1 million metropolitan population and hence have a significantly spiraling demand for fish. The district has a total coastline of 46 km, 20 landing centres, and 198 fish markets (24 wholesale markets and 134 retail markets)[3]. The average monthly fish consumption in Cochin is 9.34 kg, out of which 68 per cent is low value fishes and 32 per cent is high value fishes[8]. The fish demand and supply of Kerala, including Ernakulam, is met by huge quantities of fish arriving at Ernakulam from Tamil Nadu, Karnataka, Andhra Pradesh and even from the fish landing centres further north. Though catered with 20 landing centers[3] and numerous retails markets along with the demand-supply gap ironed up by the arrivals from the neighboring districts and states, still huge fluctuations are visible in the retail prices of fish in the district. Meanwhile the retail markets are also of immense importance in the international trade, as according to Shyam *et al* (2015) integration of domestic and international markets are necessary to ensure sustainability of fisheries trade.

In this backdrop, the present study was conducted with the following objectives;

- To analyze the trends in price volatility of the major commercially traded fishes in selected Ernakulam markets
- To identify species which exhibits stability in prices
- To deduce the relationship, if any, between marine landings vis-à-vis price realized in Ernakulam.

MATERIALS AND METHODS:

Ernakulam is one of the leading coastal districts of the state of Kerala with a total number of 20 landing centers and 198 fish markets, out of which 134 are retail markets. The study is conducted at the two major retail markets of Ernakulam, *viz,* Thevara retail market and Broadway retail market, situated in the heart of the city. Being the major urban markets dealing an average quantity of two tonnes of fish daily, the study area has its own relevance.

Primary data includes the retail prices of the major species for three years during 2014-16. The weekly retail price details of the major species traded in these markets including sardine, mackerel, threadfin breams, seer fish, prawns, crabs, pomfrets, tuna, cod, mullets, surgeon fish, barramundi, squid, anchovies, red snapper, rohu, etc were collected from the markets. Care was taken to ensure that the price relates to uniform fish counts (number / kg) across the period.

Coppock instability index, the widely used measure of instability is used in the study to evaluate the price instability and thereby categorize the fishes according to their instability. Coppock index can be used to compare any fluctuating variables.

$$V\ Log = \frac{\sum_{i=1}^{n}(\frac{\log Xt+1}{Xt} - m)^2}{N} \quad \ldots\ldots\ldots\ldots (1)$$

The instability index = (antilog $\sqrt{V \log}$ g – 1) x 100 ..... (2)

Where, Xt = Price of fish in week t , N = Number of weeks – 1

m =The arithmetic mean of the difference between the logs of Xt and Xt+1 etc

V log = Logarithmic variance of the series

In addition the data related to the marine fish landings from Central Marine Fisheries Research Institute (CMFRI) were also considered for comparative analysis and to arrive at meaningful estimates on the relationship between marine fish landings in Ernakulam and price realized in the markets. The linear relationship between the quantity landed and retail price of various species were explained by deriving the Pearson's correlation coefficient (r).

$$r = \frac{n\sum xy - \sum x \sum y}{\sqrt{n(\sum x^2) - (\sum x)^2}\sqrt{n(\sum y^2) - (\sum y)^2}}$$

RESULTS AND DISCUSSION:

The study found that the major species dealt in the retail markets of the district of Ernakulam are sardine, mackerel, threadfin breams, seer fish, prawns, crabs, pomfrets, tuna, cod, mullets, surgeon fish, barramundi, squid, anchovies, red snapper and rohu, which are in line with the findings of the study conducted at the markets of Ernakulam by Shyam *et al.*, in 2014. The collected data were analyzed and the results drawn are discussed under the following heads:

A) Trends in price behavior over the triennium

B) Degree of price instability

C) Variation in price and catch

Trends in Price Behavior over the Triennium:

From the analysis of price details of the major species traded in the retail markets of Ernakulam, the price behavior or the price trend for various high value and low value species are drawn. The price behavior of the major high value species such as the seer fish (Fig 1) and prawns (Fig 2) are considered while sardine (fig 3), mackerel (fig 4) and anchovies (fig 5) are chosen from the low value category. The average price of these major species over the years are calculated which shows that the average price of seer fish is Rs 335 per kg, ranged between Rs 270 and Rs 500, whereas the average price of prawns is found to be Rs 386, ranged between Rs 300 and Rs 500. Among the low value fishes, sardine has got a average price of Rs 107, ranged between Rs 63 and Rs 150, while the average price of mackerel is found to be Rs 141, ranged between Rs 90 and Rs 200. Anchovy is having a mean price of Rs 136, ranged between Rs 45 and Rs 200. According to the study, the price trend of the high value species are showing relatively less fluctuations compared to the low value fishes.

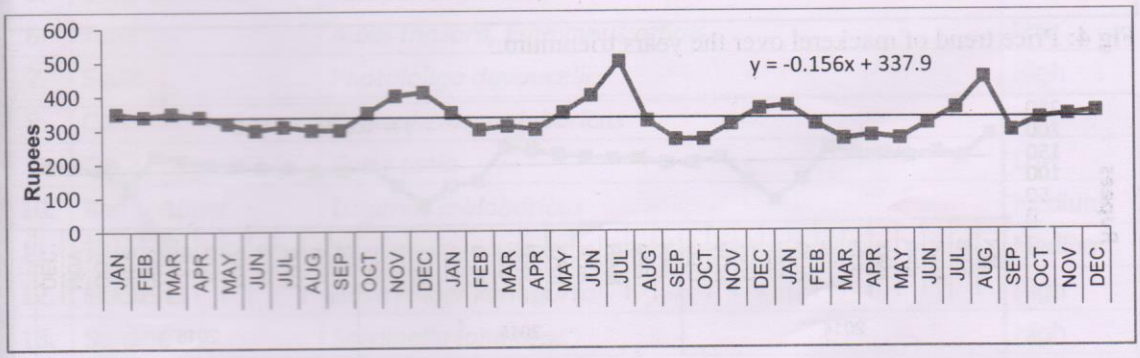

Fig. 1: Price trend of seer fish over the triennium.

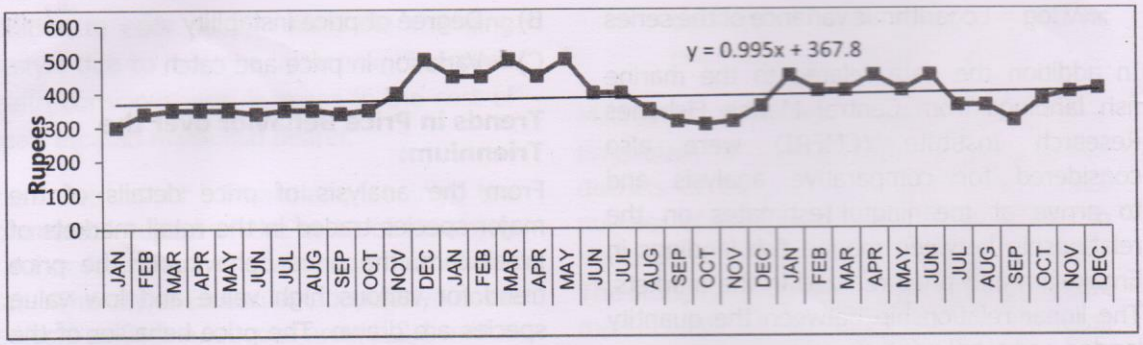

Fig 2: Price trend of prawns over the triennium.

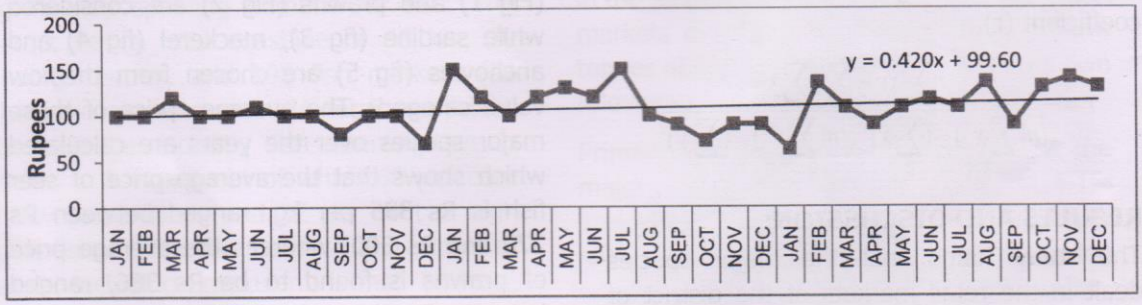

Fig 3: Price trend of sardine over the triennium.

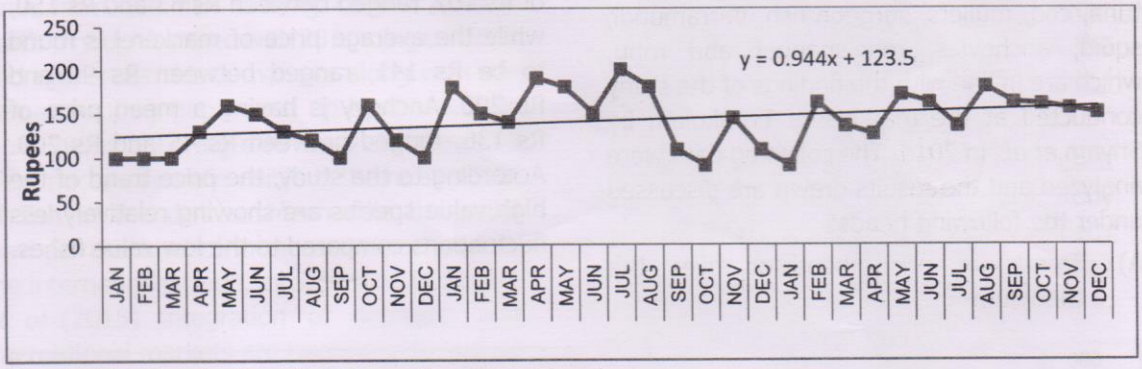

Fig 4: Price trend of mackerel over the years triennium.

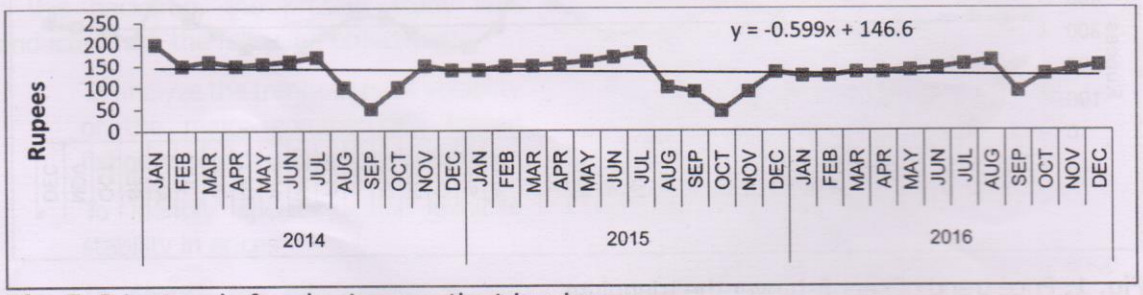

Fig. 5: Price trend of anchovies over the triennium.

From the figures it can clearly be noted that a very low fluctuation is found in the price behavior of seer fish and prawn while comparatively a higher fluctuation is visible in the case of sardine, mackerel and anchovies.

Degree of Price Instability:

The instability of prices of the major species in the Ernakulam markets is calculated using Coppock instability indices and is presented in Table 1. From the average weekly retail price details the indices of volatility in the prices were developed and the species were categorized in to three accordingly. The computed indices were normalized to develop an index ranging from 0 to 1 (0-0.33 being low instability, 0.34-0.67 medium and 0.67 to 1 high).

According to the study the high value fishes such as seer fish, prawns, pomfrets, squid etc are found to be having low instability index value and hence comparatively stable prices in the market, where as the low value fishes such as mackerel, sardine, anchovy etc are having high instability indices and hence having a tendency to show high price instability in the retail market.

Variation in Price and Catch:

In order to estimate the relationship between landings and retail prices, the quantity landed and retail price of the major species dealt in the Ernakulam markets are elaborated. The relationship between the quantity landed and the retail centre price which is illustrated in the Figures 6-13. The Pearson's correlation coefficients between the quantity landed and retail price of the major species *viz,* seerfish (-0.147), prawn (-0.125), black pomfrets (-0.109), sardine (-0.046), mackerel (-0.212), anchovy (0.220), threadfin bream (-0.162), red snapper (-0.166), were also worked out which indicate the weak relationship between the landings and retail price.

Table - 1
Degree of Price Volatility

Sl. No.	Species	Scientific name	Indices
1.	Seer fish	*Scomberomorus commerson,Scomberomorus guttatus*	Low
2.	Prawns	*Fenneropenaeus sp.,Metapenaeus sp, Penaeus sp*	Low
4.	Black pomfret	*Parastromateus niger*	Low
5.	Silver pomfret	*Pampus argenteus*	Low
6.	Tuna	*Auxis thazard, Euthynnus affinis*	Low
7.	Squid	*Photololigo duvaucelii*	High
8.	Cod	*Epinephelus malabaricus*	Low
9.	Catla	*Catla catla*	Low
10.	Red snapper	*Lutjanus malabaricus*	Medium
11.	Threadfin breams	*Nemipterus japonicas . Nemipterus randalli*	Medium
12.	Mackerel	*Rastrelliger kanagurta*	High
13.	Sardine	*Sardinella longiceps*	High
14.	Anchovy	*Stolephorus commersoni*	High

The details of the high value fishes such as the seer fish, prawns and pomfrets are depicted in figure 6, 7 and 8 respectively. According to the study, all these three species come under the category of low degree of price volatility and thus show comparatively stable prices over the years. Figure 1 illustrates that the variations in retails price of seer fish is in line with the landings over the years, and the same mode is seen in the case of prawns and pomfrets too.

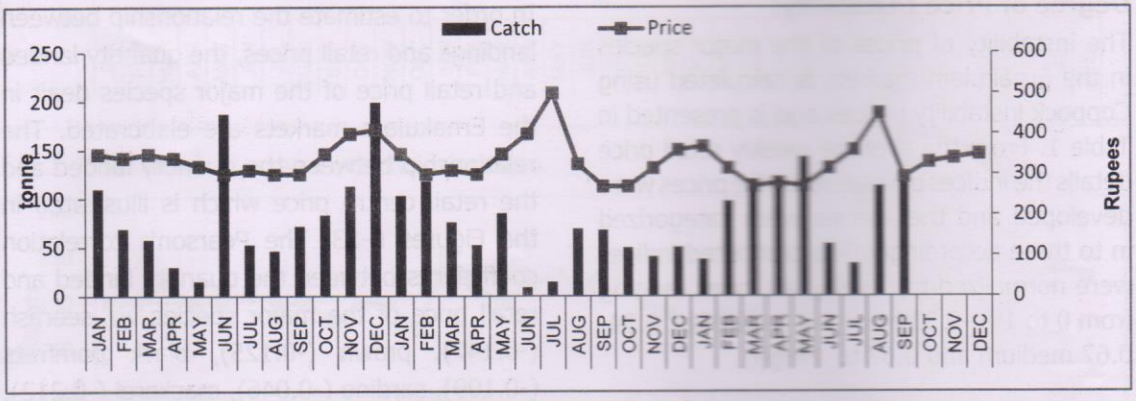

Fig 6: Landings in Ernakulam and Average prices of Seer fish.

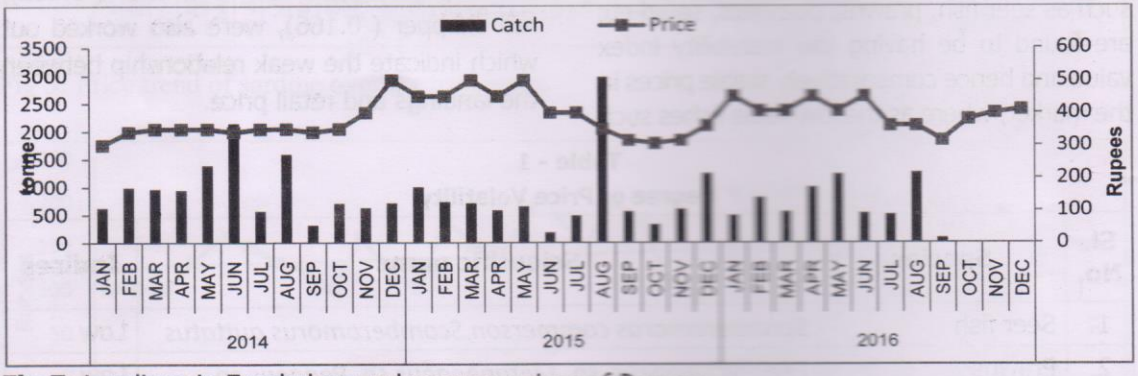

Fig 7: Landings in Ernakulam and average prices of Prawns

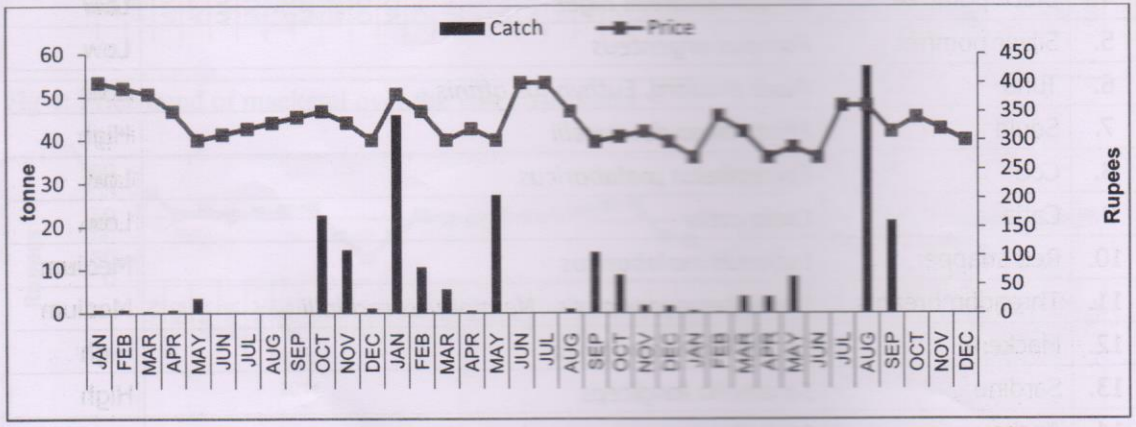

Fig 8: Landings in Ernakulam and Average prices of Black Pomfret.

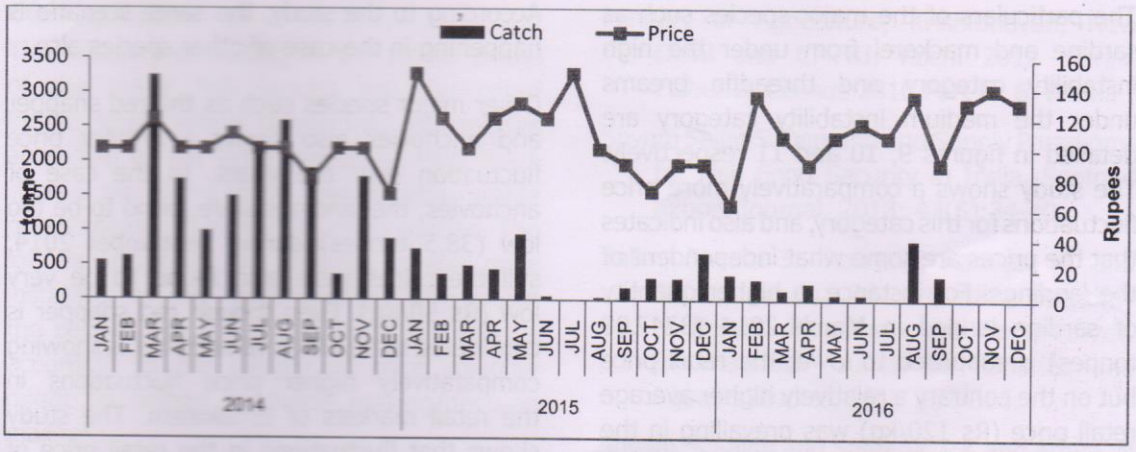

Fig 9: Landings in Ernakulam and Average prices of Sardine.

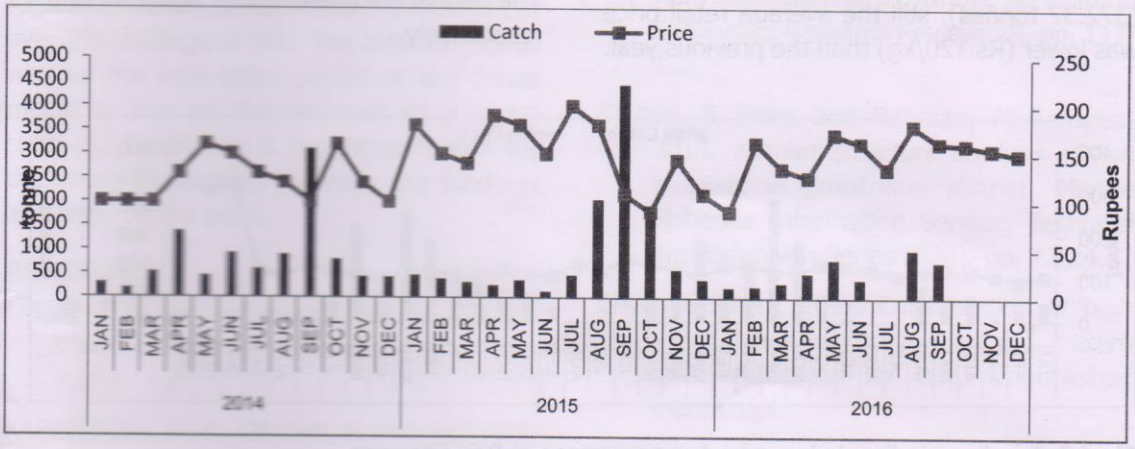

Fig 10: Landings in Ernakulam and Average prices of Mackerel.

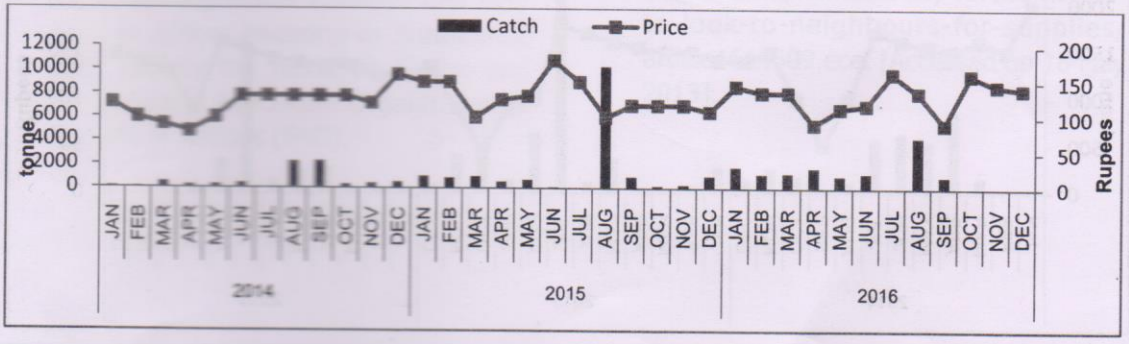

Fig 11: Landings in Ernakulam and Average prices of Threadfin Breams.

The particulars of the major species such as sardine and mackerel from under the high instability category and threadfin breams under the medium instability category are detailed in figures 9, 10 and 11 respectively. The study shows a comparatively more price fluctuations for this category, and also indicates that the prices are some what independent of the landings. For instance, a higher quantity of sardine landed in March 2014 (3247.08 tonnes) is supposed to lower the retail price but on the contrary a relatively higher average retail price (Rs 120/kg) was prevailing in the market. Similarly, a comparatively less quantity of landings were reported in February 2015 (372.37 tonnes), still the average retail price was lower (Rs 120/kg) than the previous year. According to the study, the same scenario is happening in the case of other species also.

Other major species such as the red snapper and anchovies also shows a greater price fluctuation over the years. In the case of anchovies, the landings were found to be too low (38.5 tonnes) during September 2014, still the prices were also found to be very low (Rs 50/Kg). Even though red snapper is considered to be a high value fish, it is showing comparatively higher price fluctuations in the retail markets of Ernakulam. The study shows that fluctuations in the retail price of red snapper are not in tune with its landings. The details are presented in figure 12 and 13 respectively.

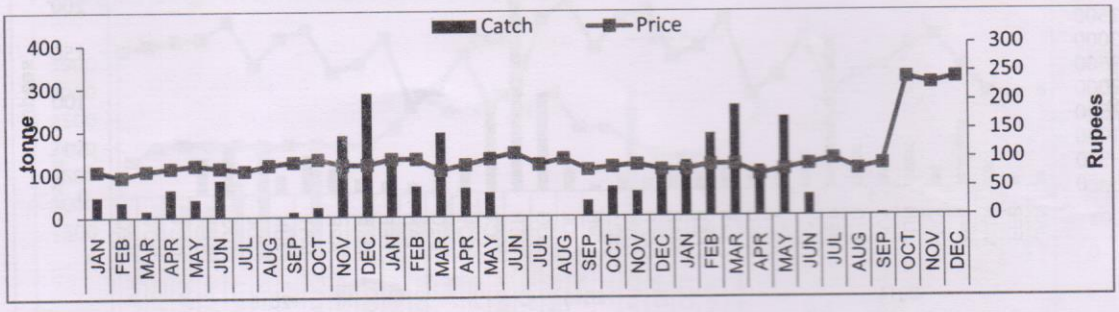

Fig 12: Landings in Ernakulam and Average prices of Red Snapper.

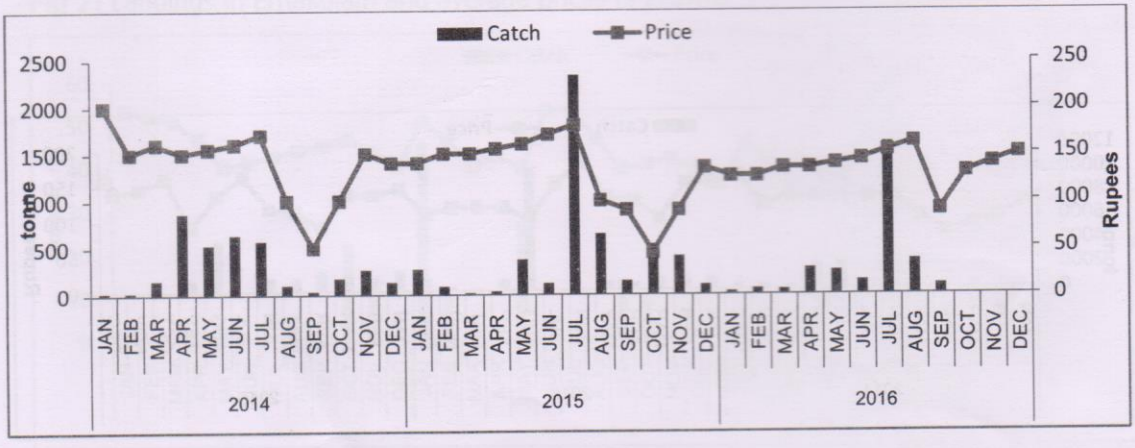

Fig 13: Landings in Ernakulam and Average prices of Anchovies.

CONCLUSION:

The volatility prevailing in the retails prices of the major fish species are elaborated in the study which categorizes the species according to the price instability. High value species are found to be having better stable prices compared to the low value species. The low value species are showing greater price instability in the retail markets throughout the period. The categorization of the species according to the degree of price volatility might be helpful in choice making/decision making.

One of the major findings of the study is regarding the independence of the retail prices over the landings of fish. The inter-district as well as the inter-state import of the fishes meant to iron up the demands of a metro town like Ernakulam is the major reason for the weak relationship between the landings and retail centre price.

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