

# Pomfret fishery of Thane district: A case study of Naigaon and Satpati landing centres

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## ABSTRACT

Pomfret is one of the elite table fish in coastal regions of India and has a high demand in international markets. The main areas of its abundance are Gujarat, Maharashtra coasts on the west coast and Orissa, lower West Bengal on east coast. This study was conducted in Thane District of Maharashtra to explore the trends in pomfret catch, and its specie wise composition. Silver, Black and Chinese pomfrets are the three species found. Among them, Silver pomfret (93%) is most abundant found here, followed by Black pomfret (near to 5%) and Chinese pomfret (1-1.3%). Out of the five coastal districts in Maharashtra, Thane district forms the major portion of pomfret catch (10,342 t) with 78.6% contribution to the fishery. The data of average landings for the period 2006-07 to 2010-11 further complimented by use of trend lines showed that Satpati landed about 1,194.2 tonnes (16.9 %), which is almost double of Naigaon i.e. 608.56 tonnes (8.61%). Satpati and Naigaon jointly contribute to about 25.51% of the total all Thane District pomfret landings. Specie wise trend lines also revealed that silver pomfret catch showed multiple fluctuations in both Naigaon and Satpati landing centers as compared to other two species but none of them showed a tangible rise during the past few years. From this study we concluded that the pomfret fishery is being over exploited along the Thane district so timely decision regarding the saving of pomfret fishery is necessary as it is a profitable venture. The government should take a co-operative decision to re-build the stock of Pomfret.

**Key words :** Pomfret, Fishery, Trends, Gears, Catch Fluctuation, Over-exploitaion.

## Introduction

Among the demersal fishes, Pomfrets belonging to the family *Stromateidae* are found in the catches all along the coast of India, particularly in Maharashtra and Gujarat (Prasanna kumari and Dharmaraja, 1978). The Pomfret fishery is mainly formed by three species i.e. Silver pomfret (*Pampus argentius*), Black pomfret (*Parastromateus niger*) and Chinese pomfret (*Pampus chinensis*). The pomfrets constitutes about 1.62% of the total marine fish production in India. The production of pomfrets in India during 2011 was 62,170 tonnes (CMFRI, 2012). The landing recorded during 2011 in the Maharashtra state was

13,152 tonnes with 2.9 % contribution to the total marine fish landing of state (DoF, 2011). The pomfret fishery in Maharashtra state is mainly formed by five coastal districts namely, Thane, Mumbai, Raigad, Ratnagiri and Sidhudurg which lay on the 720 km coast line of state. When contribution to the pomfret fishery has seen from these five districts, Thane found to be a major contributor with 78.6% (10,342 t) as compared to the Mumbai (1,324 t), Raigad (1,017 t), Ratnagiri (340 t) and Sindhudurg (129 t) (DoF, 2011). Nearly, 44% pomfret catch was exploited by dol nets. In the total fish catch, pomfrets contributed 0.9% in trawl, 4.88% in gillnet and 2.85 % in dol nets. Among the pomfrets, *Pampus*

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*argenteus* was the most dominant species in trawl (51.8%), gillnet (80%) and dol net (90.7%). The size range of silver pomfret in dol net was 50-330 mm (mean size 169 mm), in gillnets 120-310 mm (202.6 mm) and in trawl 60-320 mm (154.2 mm) (CMFRI, 2012). The pomfret fishery of Thane district is mainly formed by 7 villages/landing centres namely, Dahanu, Popharan-Dandi, Satpati, Kelwa, Uttan, Bassain and Naigaon. Out of these Naigaon and Satpati are of the most important fishing villages in Thane district. In Naigaon there are total 93 motorized vessels, wherein Satpati region total 295 crafts are there out of which, 167 mechanized boats, 102 motorized boats and 26 non-motorized crafts (CMFRI, 2010).

The preliminary observations like, Rao (1973) has studied the pomfret fishery in his account on the distribution pattern of the major exploited marine fishery resources of India. Sivaprakasam (1963) has studied the food and feeding habits of *Parastromateus niger* of the Saurashtra coast. Some work on the biology of the pomfrets was also done by Chidambaram and Venkataraman (1946), Moses (1947), Devanesan and Chidambaram (1948), Rege (1958) and Kuthalingam (1963). Gopalan (1970) has given a detailed account of the pomfret fishery and its export potential. Gopalan (1967) has also studied the spawning season of *Parastromateus argenteus*. Perumal and Alagaraswamy (1970) have recorded a bumper catch of *Pampus argenteus* in one of the regular training voyages of the Sweden-built fishery training vessel 'Bluefin.' Prasannakumari and Dharmaraja (1978) has studied the fishing season and the gears employed for pomfret fishery in Maharashtra and Gujarat coast in addition to the study on the trends in the catch of pomfrets in those States. The detailed investigations regarding present status of pomfret fisheries and catch trends in the Maharashtra state are not carried out so far and the micro-level studies regarding this are almost scanty. So the present study will help to bring out the recent pomfret fisheries dynamics, fishing seasons, gear employed and the catch trends at the Naigaon and Satpati Landing centres of Thane district.

## Material and methods

The present study is mainly based on the secondary data collected from the Department of Fisheries Maharashtra state, Central Marine Fisheries Research Institute, Mumbai Centre, Naigaon

Machhimaar Vividh Karyakari Society Limited, Naigaon and Satpati Machhimaar Vividh Karyakari Society Limited, Satpati etc. Thane district constitutes total 7 major pomfret landing points namely, Dahanu, Popharan-Dandi, Satpati, Kelwa, Uttan, Bassain and Naigaon. So to carry out the study in the systematic way the Thane district was divided into two major zone i.e. North-west and South-west coast and according to that one major landing point from each zone was selected. Likewise Satpati landing centre was selected from the North-west zone, whereas Naigaon landing centre was selected from South-west zone, according to this the trends in the pomfret fishery were studied.

## Results and Discussion

### Fishing area and Species diversity

The fishing is mostly done from Dahanu to Jaffarabad region which is the nursery ground for the commercially valuable species Pomfrets. This area is also abundant for other species like, Bombay duck, Ribbon Fish, Palona, Mackerels, Paga, Suramai, Eel, Croackers, *Coilia* spp., Prawns etc.

### Fishing seasons

There are two different seasons for pomfret fishing on the Thane coast i.e. August to December is the main season of fishing because it starts just after the end of Monsoon Fishing ban, which provides the bulk of catch to the fishers. The fishes found in the main season are of bigger size and fetch best prices in the National as well as International market. The second season is January to May which is called as lean season for fishing which satisfy only the daily needs of fishers. Because during this season the catch is mostly of small size fishes means the surplus, which remained after the bulk catch during the main season.

### Catch trends

Table 1 shows pomfrets landings at Naigaon and Satpati during the years 2006-07 to 2010-11. From the average landings for the period 2006-07 to 2010-11 it is observed that Satpati landed about 1,194.2 tonnes (16.9 %), which is almost double of Naigaon i.e. 608.56 tonnes (8.61%). Satpati and Naigaon jointly contribute to about 25.51% of the total all Thane District pomfret landings. Since 2006-07 there was gradual decrease in pomfret catch over the pe-

riod at Naigaon Landing centre except year 2008-09 which has shown abrupt increase with 825.9 tonnes, wherein Satpati landing centre, pomfret landings have shown gradual decrease over the period except the year 2009-10 which has shown drastic decrease of 549 tonnes and considered as the lowest record of pomfret landing at Satpati during last five year, after this the pomfret landing recovered again during the year 2010-11 with 1266 tonnes.

**Table 1.** Pomfret landing at Naigaon and Satpati landing centres (2006-07 to 2010-11) (All catches in Tonnes)

Year	Naigaon	Satpati	All Thane
2006-07	800.4	1411	4214
2007-08	436.6	1723	7454
2008-09	825.9	1022	5020
2009-10	380.3	549	8310
2010-11	599.6	1266	10342
Average	608.56	1194.2	7068
Percentage to all Thane	8.61	16.9	

Source: DoF, 2011 and CMFRI, 2012, NMVKSL and SMVKSL Annual Reports 2012

The all Thane district landings of pomfrets have shown steady increase over the period from 2006-07 to 2010-11, except an erratic trend during 2008-10 otherwise there was a tremendous increase in the pomfret landings and it reached to the maximum of 10,342 tonnes till 2010-11. Since the landings of pomfrets both at the all Thane District level and in the Naigaon and Satpati, have been fluctuating very much particularly in the earlier years, the actual catch trend in these landing centres and at the all Thane district level was studied by employing a second degree curve of the form  $Y = ax^2 + bx + c$ , where y is the production figure in tonnes and b, the time in unit of year. The data for the years 2006-07 to 2010-11 were used for this purpose. The equations for the curves are

$$\text{All Thane} - Y = 236.29x^2 - 106.51x + 4788.4$$

$$\text{Naigaon} - Y = 23.664x^2 - 187.78x + 911.58$$

$$\text{Satpati} - Y = 74.143x^2 - 591.26x - 2152.4$$

The trend curves are shown in figure 2.

Figure 2 shows that the secular trend in respect of all Thane district pomfret landings shows a steady increase over the period from 2006-07 to 2010-11, except year 2008-09 which has shown an abrupt de-

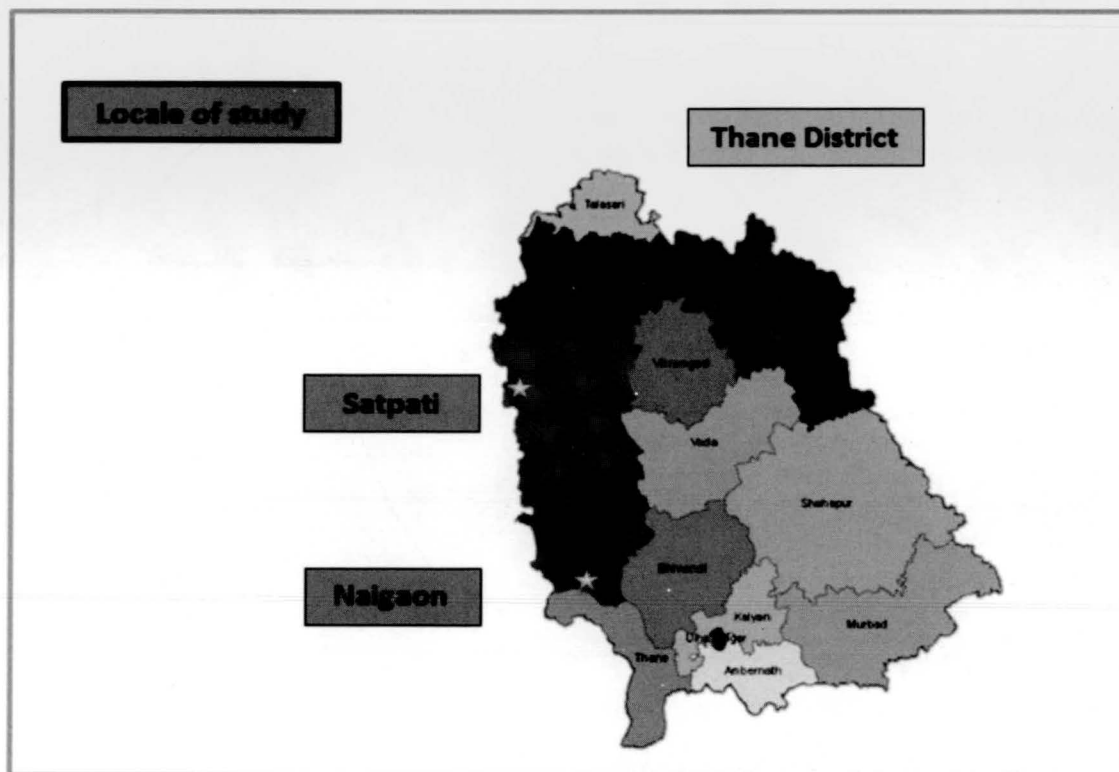
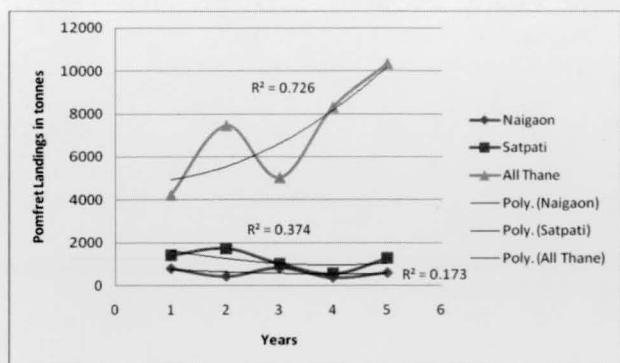


Fig. 1. Showing the location of Naigaon and Satpati Landing Centres

Pomfret	Naigaon	Satpati	All Thane
Silver	$Y=22.071x^2 - 175.53x + 854.8$	$Y=166.7x^3 - 1440.6x^2 + 3424.9x - 822.14$	$Y= 219.48x^2 - 89.041x + 4484.2$
Black	$Y= 1.1429x^2 - 9.0771x + 44.28$	$Y= 3.5814x^2 - 28.623x + 104.55$	$Y= 11.664x^2 - 6.0757x + 233.02$
Chinese	$Y= 0.45x^2 - 3.17x + 12.5$	$Y= 0.71x^2 - 6.79x + 27.174$	$Y= 0.2621x^2 + 10.102x + 51.564$

cline; otherwise the overall trend in pomfret landing was appreciable. In Satpati, the secular trend shows a gradual decrease over the period with slight recovery during last year 2010-11. The same in Naigaon shows a steady decrease over the period with gradual recovery during last year 2010-11. From the trends it can be assumed that at the present rate of exploitation, the all Thane district landings will show an increasing trend while no appreciable increase could be expected in Naigaon and Satpati in the coming years.



(Note: 1- 2006-07, 2- 2007-08, 3- 2008-09, 4- 2009-10, 5- 2010-11)

Fig. 2. Pomfret landings in Naigaon, Satpati and Thane (In tonnes) specie-wise distribution of pomfret fishery in Naigaon and Satpati

The pomfret fishery is mainly formed by three species namely Silver pomfret (*Pampus argenteus*), Black pomfret (*Parastromateus niger*) and Chinese pomfret (*Pampus chinensis*). Among these species Silver pomfret is the most abundant on the coast of Maharashtra state followed by Black pomfret and Chinese pomfret with very little contribution to the fishery. When the species-wise distribution of pomfret fishery is concerned Table 2 shows that Silver pomfret was dominant overall period with almost 93% contribution to the pomfret landings at Naigaon, Satpati and All Thane district, followed by Black pomfret (near to 5%) and Chinese pomfret (1-1.3%) with very little contribution to the pomfret fishery. The species-wise landings of pomfret at Naigaon, Satpati and All Thane district have been fluctuating, so the actual catch trends in these land-

ing centres and All Thane district landings was studied with the help of second degree curve which has mentioned above. The equations for the curves are:

Fig 3 indicates that the overall landings of all the 3 species of pomfrets show different trends with none of them showing a tangible rise. As shown in the Fig 3 the silver pomfret landings show multiple fluctuations as revealed by the low R<sup>2</sup> value i.e. only 17 % of variation in silver pomfret landings is explained by the time. Similarly for black and Chinese pomfrets the R<sup>2</sup> values are also less but trend is showing that no appreciable rise can be expected from black and chinese pomfret landings. This can be attributed to the fact that there is less number of fishing fleets operating in Naigaon area as compared to Satpati.

Fig 4 shows that silver pomfret landings are showing much fluctuation as compared to black and Chinese pomfrets. Silver pomfret landings are

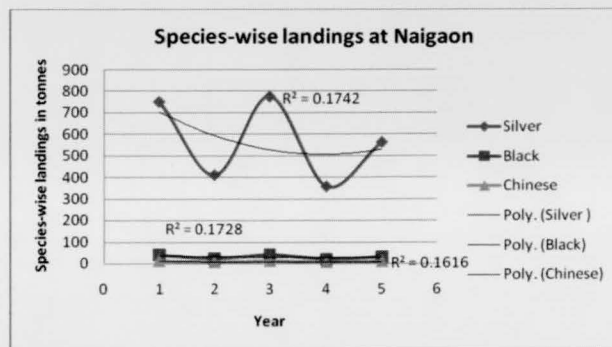


Fig. 3. Species-wise pomfret landings at Naigaon

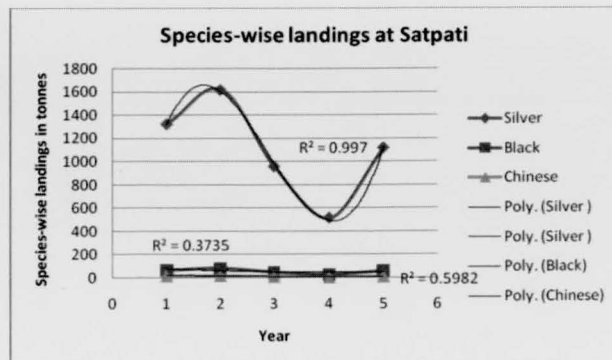


Fig. 4. Species-wise pomfret landings at Satpati

showing a rise after 2009-10, but black and Chinese landings are stagnant over years. This can be attributed to the fact that the silver pomfret is in abundance along Maharashtra coast as compared to black and Chinese species.

Fig 5 indicates that in Thane districts the silver pomfret landings are showing an increasing trend as shown by the polynomial trend line with  $R^2 = 0.724$ , while as black and Chinese pomfret landings are showing a constant trend and are not expected to increase in future also.

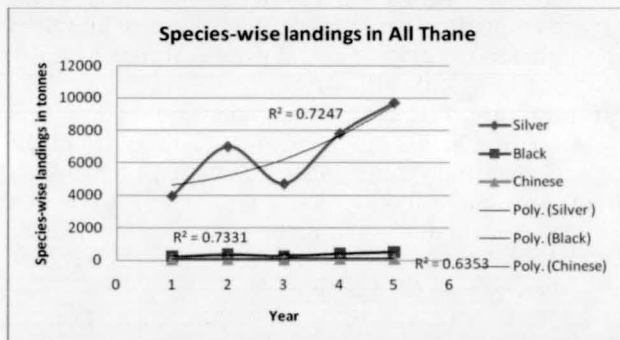


Fig. 5. Species-wise pomfret landings in all Thane District

**Gear-wise distribution of pomfret fishery in Naigaon and Satpati**

Pomfrets support a lucrative fishery along the coast

of Thane district and are exploited by a variety of gears such as Trawl net, Gill net, Dol net, Shoreseine and Hook and Lines. Among these Dol net and Gill net are the principal gears used for fishery followed by Trawl net. The local names for gill net in the region are "WaghraJaal" and "ShehanshahJaal". When gear-wise distribution of pomfrets was concerned table no. 3 depicts that the dol net was the major contributor with 61% to the pomfret landings of Naigaon, Satpati and All Thane district over the period, followed by Gill net (24%) and Trawl net (15%).

**Fishing season and zone-wise distribution of pomfret fishery in Naigaon and Satpati**

Table 4 shows the season-wise landings of pomfrets in Naigaon, Satpati and all Thane district. Maximum 59% landings of pomfrets are recorded during the August to December months of the year and which is considered as a Main Season for pomfret fishing on Thane coast and the minimum 41% during the months of January to May and considered as a lean season for pomfret fishing. Though 41% of pomfret catch is exploited during lean season, almost all catches consists of small size fishes, which fetches very less price in the market and also cause overfishing.

**Table 2.** Specie-wise catch trend for pomfret at Naigaon landing centre during 2006-07 – 2010-11 (All catches in Tonnes)

Year	Species								
	Silver Pomfret			Black Pomfret			Chinese Pomfret		
	Naigaon	Satpati	All Thane	Naigaon	Satpati	All Thane	Naigaon	Satpati	All Thane
2006-07	751	1324	3954	38.9	68.57	205	10.5	18.91	56.48
2007-08	410	1617.9	6999.3	21.3	83.9	360	5.3	20.8	90.19
2008-09	775	958.9	4710.2	40.2	49.7	244	10.7	13.2	64.8
2009-10	357	515.3	7800.6	18.5	26.7	403.9	4.8	7	104.7

Source: DoF, 2011 and CMFRI, 2012, NMVKSL and SMVKSL Annual Reports 2012

**Table 3.** Gear-wise contribution for pomfret catches at Naigaon and Satpati landing centres 2006-07–2010-11 (All catches in Tonnes)

Year	Gears								
	Trawl net			Gill net			Dol net		
	Naigaon	Satpati	All Thane	Naigaon	Satpati	All Thane	Naigaon	Satpati	All Thane
2006-07	120.6	211.65	632.1	192.1	338.64	1011.36	488.24	860.71	2570.54
2007-08	65.49	258.45	1118.1	104.78	413.52	1788.96	266.32	1051.03	4546.94
2008-09	123.9	153.3	753	198.22	245.28	1204.8	503.79	623.42	3062.2
2009-10	57.04	82.35	1246.5	91.27	131.76	1994.4	231.98	334.89	5069.1

Source: DoF, 2011 and CMFRI, 2012, NMVKSL and SMVKSL Annual Reports 2012

**Table 4.** Season-wise catch for Pomfret at Naigaon and Satpati Landing Centre (2010-11) (All catches in Tonnes)

Species	Main Season (Aug to Dec, 2010)			Lean Season (Jan to May, 2011)		
	Naigaon	Satpati	All Thane	Naigaon	Satpati	All Thane
Silver Pomfret	329.5	655.9	5679.8	233	463.6	4014.6
Black Pomfret	20.5	43.3	353.8	8.7	18.2	148.8
Chinese Pomfret	7.1	11.05	90.31	1.3	2.04	16.7
Total	357.1	710.25	6123.91	243	483.84	4180.1
% to Total catch	59.6	56.1	59.21	40.4	43.9	40.79

Source: CMFRI, 2012

## Conclusion

Pomfret fishery is one of the major fishing occupations of Naigaon and Satpati Fishers. This is the major source of livelihood for all the fishers. The pomfret fishery is showing multiple fluctuations along the thane district landing centres which may be attributed to the over fishing of the existing stock. Mostly recruitment over fishing occurs there during the lean season i.e. Jan – May. The proper implementation of rules for mesh size regulation of the nets is the need of the hour. This will lead to recruitment of new stock to the existing ones. So timely decision regarding the saving of pomfret fishery is necessary as it is a profitable venture. The government should take a co-operative decision to re-build the stock of Pomfret.

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