

# ON THE POMFRET FISHERY OF INDIA WITH SPECIAL REFERENCE TO THE CATCH STATISTICS OF MAHARASHTRA AND GUJARAT COASTS

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## ABSTRACT

The pomfrets constitute about 2.32% of the total marine fish production in India. The bulk of the catch comes from Maharashtra and Gujarat States, which jointly contribute to about 61% of the total all India pomfret landings. The fishing season for pomfret fishery in the States of Maharashtra and Gujarat and the gears employed for the exploitation of the fishery in these States are given.

## 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 States. 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* (B1) 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 Alagarwamy (1970) have recorded a bumper catch of *Pampus argenteus* (Euphr) in one of the regular training voyages of the Sweden-built fishery training vessel 'Bluefin.' No detailed investigations on the recent pomfret fishery with special reference to the catch trends in the States of Maharashtra and Gujarat have been carried out so far. The present paper mainly deals with 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.

## MATERIAL AND METHODS

The Fishery Survey and Statistics Division of the Central Marine Fisheries Research Institute is estimating the total marine fish production and the fishing effort in India on the basis of suitable sampling design (Banerji and Chakra-

borty 1973). The design involves a space time stratification. Over space the entire coast line of India is divided into maritime States. In each State, the coast-line is further divided into zones. A cluster of two consecutive days forms a time stratum from which the monthly estimates are obtained. The number of fishing units landing within the time interval in a landing centre selected at random forms the count, and the catch is obtained by examining the sub sample of the units landed. The precision of the estimates is decided on the sample size of the primary unit. Monthly estimates are made for each stratum, from the primary sampling units. The basic survey data and the estimated figures available with the Institute formed the material for the present investigation.

Maharashtra has got a coast line of approximately 600 km and there are about 179 fish landing centres from where regular survey data are collected for the estimation of marine fish production (Banerji and Chakraborty 1973). The entire coastline has been divided into space strata (zones) taking into consideration the topography and the fishing intensity for the purpose of collection of data. The zones are Mh1 (Dandi landing centre to Redikerwada landing centre), Mh2 (Rameswar wadi landing centre to Dhriwada landing centre), Mh3 (Kasarveli - Kalbadevi landing centre to Vijayadurg landing centre), Mh4 (Dhabol landing centre to Kurla landing centre), Mh5 (Karanja landing centre to Boorondi landing centre) Mh6 (Worli landing centre to Arnala killa landing centre), Mh7 (Rangaon landing centre to Sasson Dock landing centre) and Mh8 (Zayi landing centre to Dativari landing centre).

Gujarat has got a coast line of 1500 km (approx) and comprises 79 fish landing centres from where survey data are collected and estimates of marine fish production are made on the basis of those data. The entire coast line has been stratified into 6 zones on the basis of the topography and fishing practices. The zones are G1 (Umbergaon to Bilimora), G2 (Cambay to Movasa), G3 I (Rajpara, Jafrabad & Navabander), G3II (Porbander to Bhavanagar), G4 (Malia to Miani) and G5 (Layja to Bambdai).

#### CATCH TRENDS

Table 1 shows State-wise landings of pomfrets during the years 1962 to 1976. From the average landings for the period 1962-76 it is observed that Maharashtra landed about 8,300 tonnes (36%), closely followed by Gujarat (about 5,900 tonnes - 26%) and Andhra (about 3,300 tonnes - 15%). Maharashtra and Gujarat jointly contribute to about 62% of the total all India pomfret landings. Kerala, Tamil Nadu (including Pondicherry), West Bengal and Orissa and Karnataka also land small quantities of pomfrets, their percentage to the total all India catch being about 8, 7, 6 and 3 in the order of abundance. The landings in Goa and Andamans are not appreciable. During 1976, however, West Bengal and Orissa landed 11,285 tonnes which is a bumper catch and the highest recorded ever in that state.

TABLE 1. *Statewise landings of pomfrets in India during 1962 to 1976 (in tonnes)*  
(including mechanised landings)

Nos.		West Bengal & Orissa	Andhra	TamilNadu and Pondicherry	Kerala	Karnataka	Goa	Maharashtra	Gujarat	Andamans	Total
1	1962	158	3,759	2,499	9,551	137	—	4,049	5,521	4	25,678
2	1963	225	2,294	2,026	1,251	310	—	3,883	7,265	2	17,256
3	1964	197	3,339	1,530	1,077	289	—	5,983	7,165	—	19,580
4	1965	392	2,334	1,203	435	90	185	6,573	6,680	—	17,892
5	1966	192	1,847	1,107	562	150	89	7,816	6,081	1	17,845
6	1967	604	2,355	2,130	1,661	180	74	15,023	5,670	1	27,698
7	1968	478	4,308	2,272	973	3,902	25	10,492	5,781	4	28,235
8	1969	423	2,205	1,774	1,177	341	8	12,776	5,468	4	24,176
9	1970	426	2,017	1,891	693	354	15	4,210	7,978	5	17,589
10	1971	643	3,591	882	2,416	866	24	5,787	6,781	10	21,000
11	1972	634	4,165	528	1,932	618	31	6,858	4,234	7	19,007
12	1973	728	4,087	1,787	1,809	1,153	24	8,209	4,249	6	22,052
13	1974	1,110	3,945	744	1,500	303	96	6,683	8,029	11	22,421
14	1975	2,501	5,697	1,316	1,181	213	102	8,351	5,612	14	24,987
15	1976	11,285	4,088	866	799	438	100	17,979	2,116	30	37,701
Average		1333.06	3335.40	1503.67	1801.13	622.93	51.54	8311.47	5908.66	6.60	22874.46
Percentage to all India		5.83	14.58	6.57	7.87	2.72	0.23	36.34	25.83	0.03	

The all India landings of pomfrets have shown steady increase from 1972 to 1976, after an erratic trend during 1962 to 1971. During 1976, the highest landings of 37,701 tonnes were recorded mainly due to higher landings in the State of Maharashtra and West Bengal and Orissa. An interesting feature is that, while in Gujarat, the landings declined to the lowest level in 1976, in West Bengal and Orissa, however, the landings were the highest recorded so far.

Since the landings of pomfrets both at the all India level and in the States of Maharashtra and Gujarat, have been fluctuating very much particularly in the earlier years, the actual catch trend in these States and at the all India level was studied by employing a second degree curve of the form  $Y = a + bt + ct^2$ , where  $y$  is the production figure in tonnes and  $t$ , the time in unit of year. The data for the years 1962 to 1976 were used for this purpose. The equations for the curves are

$$\begin{aligned} \text{All India} & \quad - \quad Y = 20689.4833 + 502.9857 t + 117.0527 t^2 \\ \text{Maharashtra} & \quad - \quad Y = 8421.1710 + 381.1929 t - 5.877 t^2 \\ \text{Gujarat} & \quad - \quad Y = 6386.1765 - 143.8536 t - 25.5809 t^2 \end{aligned}$$

The trend curves are shown in figure 1.

The secular trend in respect of all India pomfret landings shows a steady decline from 1962 to 1967 and then a progressive increase from 1968 to 1976. In Maharashtra, the secular trend shows a steady increase from 1962 to 1976. The same in Gujarat shows a steady increase from 1962 to 1965 and then a decline from 1966 to 1976. From the trends it can be deduced that at the

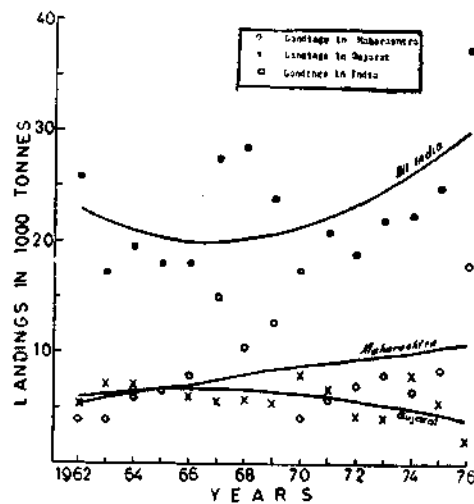


FIG. 1. Pomfret landings in Maharashtra, Gujarat and India (in tonnes).

present rate of exploitation, the all India landings will show an increasing trend while no appreciable increase could be expected in the States of Maharashtra and Gujarat in the coming years.

FISHING SEASON AND ZONE-WISE DISTRIBUTION OF POMFRET FISHERY  
IN MAHARASHTRA AND GUJARAT

*Maharashtra*

Table 2 shows the quarter-wise landings of pomfrets in Maharashtra. Maximum landings of pomfrets are recorded during the fourth quarter of the year (October to December) and the minimum during the third quarter (July to September). In Maharashtra, October to December is the peak fishing season when pomfrets are landed along with other demersal fishes. During the lean fishing season (July to September) the fishing is generally poor due to monsoon.

The detailed zone-wise analysis of catch of pomfrets in Maharashtra shows that the area extending from the zone Mh5 to Mh8 are more productive than the area from the zones Mh1 to Mh4. While Mh6 records the highest landings of pomfrets, Mh3 accounts the lowest.

TABLE 2. *Quarterwise landings of pomfrets in Maharashtra during 1962 to 1976. (in tonnes) (including mechanised landings)*

	I Quarter	II Quarter	III Quarter	IV Quarter	Total
1962	454	805	506	2,241	4,006 + 43*
1963	624	747	266	2,215	3,852 + 31*
1964	431	868	342	4,342	5,983
1965	1,165	1,227	969	3,212	6,573
1966	1,161	837	443	5,375	7,816
1967	1,898	4,184	301	8,640	15,023
1968	1,520	672	178	8,122	10,492
1969	2,258	981	68	9,469	12,776
1970	910	311	125	2,844	4,210
1971	1,026	802	341	3,618	5,787
1972	1,341	962	720	3,829	6,858
1973	2,123	1,967	762	3,357	8,209
1974	1,206	2,445	578	2,454	6,683
1975	1,336	2,445	411	4,159	8,351
1976	3,371	5,502	2,221	6,885	17,979

\* Figures refer to annual mechanised landings. Quarterwise landings are not available.

Different gears are employed in different zones for the exploitation of the pomfret fishery in this State. In Mh1 zone, shoreseine and gill nets are predominantly employed. In Mh2 zone both gill net and shoreseines (Rampan) are used for the exploitation of pomfret. In addition to gill nets, trawl nets are also employed in Mh3 zone for the fishery. In Mh4 zone, however, hooks and lines are utilized in addition to gill nets and trawl nets. Dol nets and gill nets are the main gears employed in Mh5 and Mh6 zones. But trawl nets are also operated in some area in Mh6 zone. In Mh7 and Mh8 zones dol nets and gill nets are the principal gears used.

There is no proper record of the distribution of the various species of pomfret in different zones of Maharashtra. From the survey data and the annual reports of the C.M.F.R. Institute it is seen that in Maharashtra *Stromateus* species are predominantly landed in the Mh1, Mh2, Mh6, Mh7 and Mh8 zones. In Mh3 zone *Parastromateus niger* is caught in abundant quantities. *Pampus argenteus* is the major species found in the catch of Mh4 zone. In Mh5 zone, however, both *Pampus argenteus* and *Parastromateus niger* are the dominant species.

#### Gujarat

Table 3 shows the quarterwise landings of pomfrets in Gujarat. The pomfret fishing season is in second and fourth quarters (April to June and October to December). In some years (1962 to 1964, 1969, 1972, 1974 & 1975) the maximum catch was recorded during the fourth quarter while in the other years, the highest landings were obtained in the second quarter. Similarly the lean fishing season for the pomfret fishery is seen in the first and third quarters (January to March and July to September). During 1975, however, the highest landings of pomfrets were recorded in the third quarter. The monsoon did not seem to affect the catch of pomfrets in Gujarat during 1975.

The detailed zone-wise analysis of catch of pomfrets in Gujarat reveals that G3 (I & II) zone, contributes the highest catch of pomfrets, while G1 and G4 zones come next in order of abundance in respect of landings of pomfrets. The landings of pomfrets in G2 zone are negligible.

In this State there is no specific gear which is employed for pomfrets exclusively. Various types of gears are used for the exploitation of pomfret fishery. In G1 zone, mostly gill nets and dol nets are utilized while in G3 (I & II) zone gill nets, dol nets and trawl nets are used. In G4 zone, however, in addition to gill nets, drift nets are also operated for pomfret fishery.

In Gujarat *Stromateus* species are predominately caught in G1 zone. In G2 zone, the landings of pomfrets are negligible. *Pampus argenteus* is the dominant species in G3 (I & II) zone. *Parastromateus niger* is also caught in small quantities in certain seasons in this zone. An interesting phenomenon is that

TABLE 3. *Quarterwise landings of pomfrets in Gujarat during 1962 to 1976 (in tonnes) (including mechanised landings)*

	I Quarter	II Quarter	III Quarter	IV Quarter	Total
1962	463	173	231	4,652	5,519 + 2*
1963	1,628	375	774	4,487	7,264 + 1*
1964	837	1,797	164	4,367	7,165
1965	991	3,322	703	1,664	6,680
1966	1,075	3,280	705	1,021	6,081
1967	806	3,313	695	856	5,670
1968	867	3,288	704	922	5,781
1969	837	434	699	3,498	5,468
1970	1,370	5,513	56	1,039	7,978
1971	1,001	3,825	1,755	200	6,781
1972	753	1,133	1,088	1,260	4,234
1973	763	2,069	213	1,204	4,249
1974	1,673	1,325	2,037	2,994	8,029
1975	395	1,501	2,121	1,595	5,612
1976	726	312	179	899	2,116

\* Figures refer to annual mechanised landings. Quarterwise landings are not available.

while in G3 I zone the size of *Pampus argenteus* is in the range 201 to 335 millimeter with the dominant species being in the range of 311-315 millimeter, in G3 II zone, however, the size of *Pampus argenteus* in the range of 77-165 millimeter. Also during the peak season (October to December) Pomfret landings in G3 zone constitute above 8 to 10% of the total catches of the zone. In G4 zone, the dominating species of pomfrets are *Pampus argenteus*, *Pampus chinensis* and *Parastromateus niger*.

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