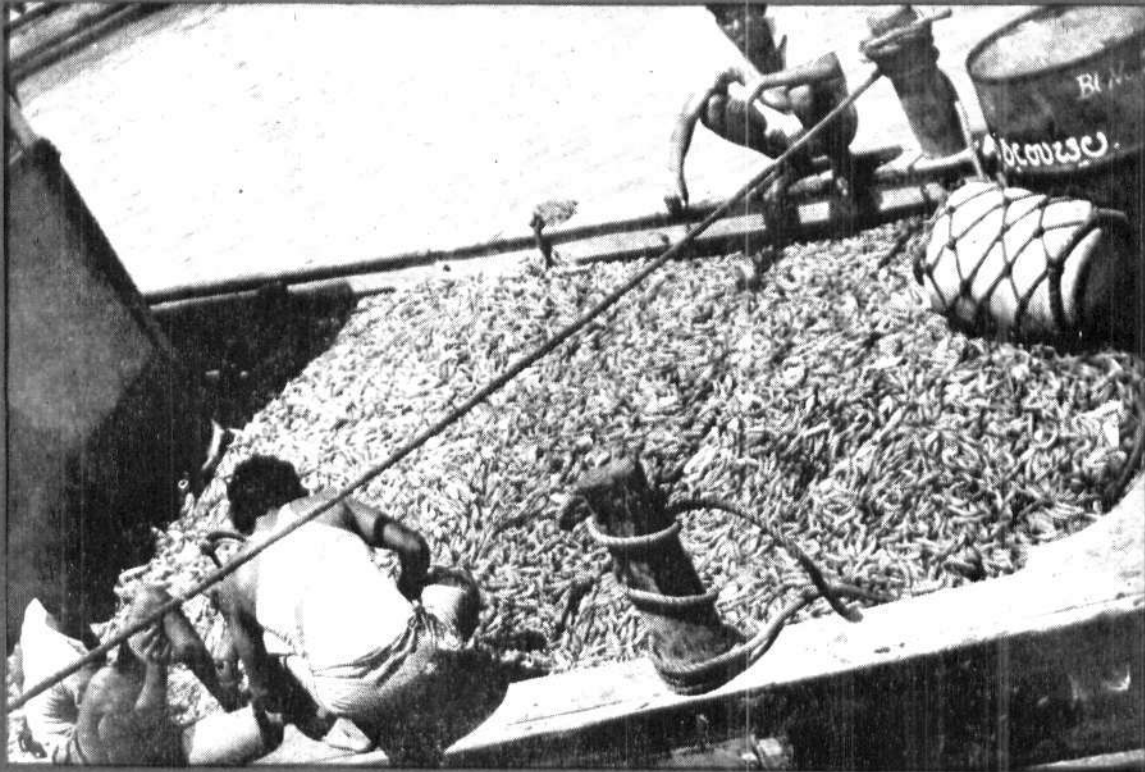




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THE MARINE FISHERIES INFORMATION SERVICE: Technical and Extension Series envisages the rapid dissemination of information on marine and brackish water fishery resources and allied data available with the National Marine Living Resources Data Centre (NMLRDC) and the Research Divisions of the Institute, results of proven researches for transfer of technology to the fish farmers and industry and of other relevant information needed for Research and Development efforts in the marine fisheries sector.

Abbreviation – *Mar. Fish. Infor. Serv. T & E Ser.*, No. 65: 1985

NIGHT TRAWLING FOR PRAWNS AT MANGALORE ENCOURAGING*

Introduction

Exploitation of prawn resources by mechanised trawling has been intensified since the beginning of seventies due to the ever-increasing demand for prawns for export. Even among prawns, there has been greater demand for larger varieties since they fetch very high price. This is prompting more and more entrepreneurs to go in for different types of fishing for catching large sized prawns. Trawl fishing during night time is one such method at present adopted by trawler owners of Mangalore area and this has been found to yield promising results. Since there is considerable disparity in effort, catch and catch composition of prawns of day and night boats, an appraisal of the trawl fishery has been attempted here with special reference to day and night fishing, based on the data collected from Mangalore during the fishing season, 1982-83.

Fishing operations

The crafts and gears employed in trawl fishery along South Kanara coast have been mentioned by Sukumaran *et al.* (*Mar. Fish. Infor. Serv. T & E Ser., No. 44: 1982*).

The trawling season generally starts in September and continues up to May end or early June. During 1982-'83, however, the fishery lasted up to the middle of June. Fishing operations will remain suspended during the southwest monsoon period.

Generally, trawlers set out for fishing in the early morning and return by afternoon, sometimes landing even up to 15 or 16 hrs. The boats engaged in day fishing are comparatively smaller in size (less than 9.75 m) and usually fish within 25 m depth zone. These units make 1 to 3 hauls per day, each lasting 2-3 hours. Apart from these vessels, there are a good number of larger boats (above 9.75 m) engaged in night fishing, upto a depth zone of 55 m. These units generally set out for fishing in the evening and return after 1-2 days' night fishing. These night units usually make 2 hauls per night, each lasting 4 to 5 hours. In order to keep the prawns and quality fishes in good condition, these boats generally carry 2-3 large ice boxes.

Around 415 trawl units are operating from Mangalore (Bunder). Not less than 40 purse seine boats were also found to engage in night trawling since the pelagic fishery failed during this season. In addition, a good number of shrimp trawlers belonging to neighbouring centres also operated from this centre during certain period of the year.

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Since there was considerable disparity in effort, catch and catch composition of prawns in day and night landings, the study was made under two broad headings namely, night fishing for prawns and day fishing for prawns.

Night fishing for prawns

Effort

Night fishing started in the middle of November and continued up to May, with a peak in April, 1983 (Fig. 1). Altogether, 9,221 units were operated for night fishing with maximum in March, 1983. The night units formed around 20% of the total trawl units operated from Mangalore during 1982-'83 (Fig. 2 A). If the efforts in actual fishing hours were taken into consideration, altogether 90,569 hours were spent in night fishing with maximum in April, 1983 (20,580 hrs). Out of the annual effort in hours (2,71,230 hrs), night fishing accounted for 33.4% (Fig. 2 B).

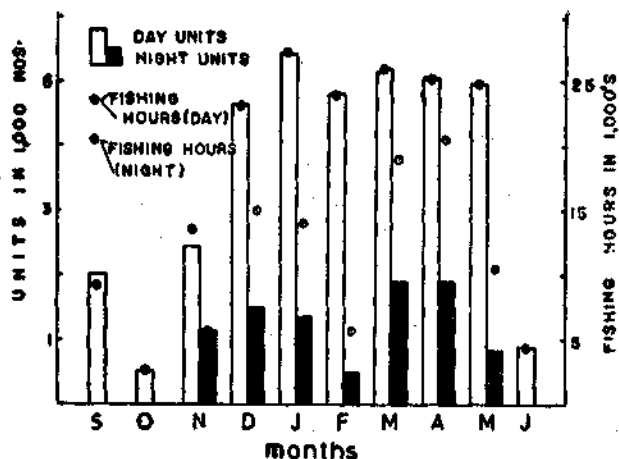


Fig. 1. The distribution of fishing effort in various months at Mangalore during 1982-'83.

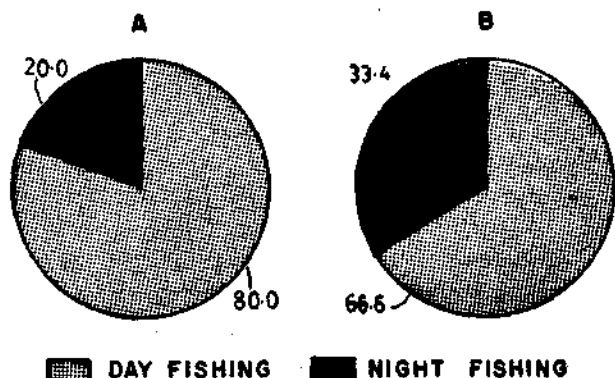


Fig. 2. The distribution pattern of annual fishing effort for day and night trawling at Mangalore during 1982-'83. A- fishing trips; B-Actual trawling hours.

Catch and catch composition

In the annual trawl landings during 1982-'83, night fishing contributed around 36% (Fig. 6 B). The trawl catch can be divided into two groups, i.e., prawns and by-catches.

The annual prawn catch amounted to 331.0 t (3.6 kg/hr) which formed 9.8% of the trawl landings by night fishing (3,389.2 t) at Mangalore during this period (Fig. 3 B). Though maximum effort was expended in March and April, 1983, the highest catch was obtained in December, 1982 (79.4 t) (Fig. 4). The prawn catch was low in November, 1982 and February, 1983.

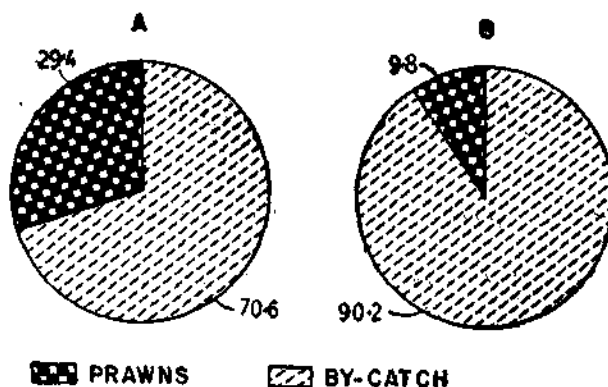


Fig. 3. Distribution pattern of prawns and by-catches in the shrimp trawlers at Mangalore during 1982-'83. A - Day catch; B-Night catch.

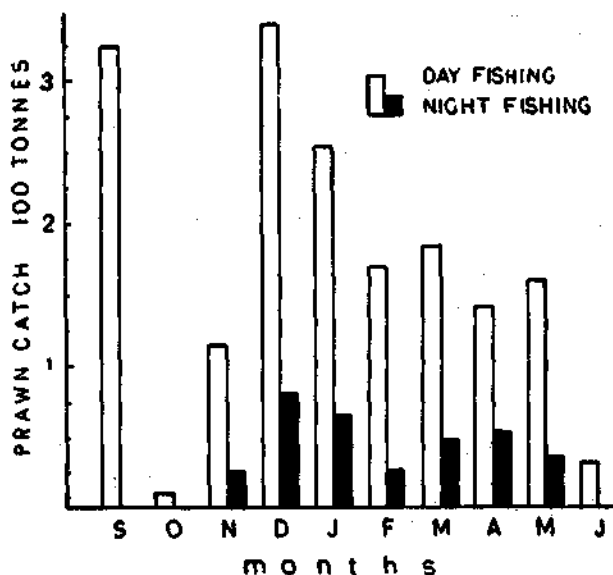


Fig. 4. Prawn landings by day and night trawling in various months at Mangalore during 1982-'83.

The prawn catch was composed of larger species, such as, *Metapenaeus monoceros*, *Penaeus indicus*, *P. monodon* and *M. affinis* in the order of their abundance. The percentage composition of different category of prawns is given in Fig. 5 A.

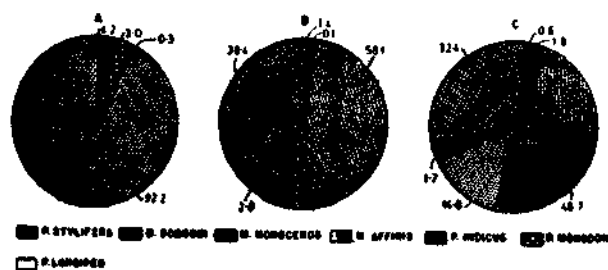


Fig. 5. Species composition of prawns landed by shrimp trawlers at Mangalore during 1982-'83. A-Night catch; B-Day catch; and C-Day and night catch combined.

M. monoceros ('brown shrimp'): This prawn formed the bulk of the prawn catch (92.2%) by night boats, and the catch amounted to 305.9 t with a catch rate of 3.4 kg/hr for the whole season. Landings of this

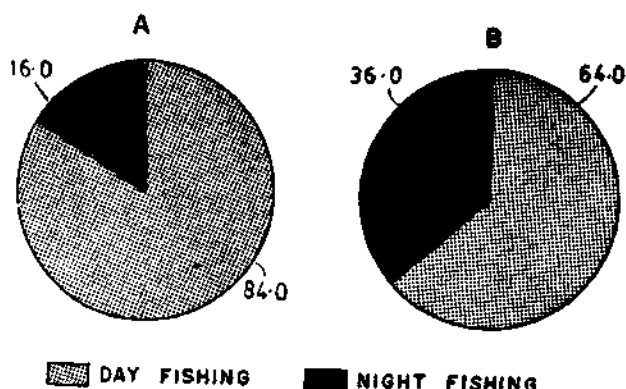


Fig. 6. Distribution pattern of prawns and total trawl landings by night fishing and day fishing at Mangalore during 1982-'83. A-Prawn landings; B-Total trawl landings.

Table 1. Estimated monthwise landings (in tonnes) of different category of prawns and by-catches by night trawlers at Mangalore during 1982-'83

Species/category	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
<i>M. monoceros</i>	24.4	75.4	61.3	23.7	43.5	46.1	31.5	305.9
<i>M. affinis</i>	0.2	—	—	0.8	—	—	—	1.0
<i>P. indicus</i>	0.2	2.5	3.5	0.7	2.1	3.5	1.5	14.0
<i>P. monodon</i>	0.3	1.5	1.0	1.0	2.0	2.5	1.8	10.1
Total prawns	25.1	79.4	65.8	26.2	47.6	52.1	34.8	331.0
Fishes	220.4	265.7	295.2	68.6	273.3	293.1	170.1	1586.4
Stomatopods	—	42.1	52.1	8.0	141.7	24.3	—	268.2
Cephalopods	17.7	12.0	5.5	6.0	13.6	18.0	2.5	75.3
Trash fish	—	179.3	174.9	90.4	266.6	301.3	115.8	1128.3
Monthly total	263.2	578.5	593.5	199.2	742.6	688.9	323.2	3389.2

prawn was fairly high during December-January (Table 1).

P. indicus ('white shrimp'): This species contributed 4.2% of the prawn landings by night fishing, and the annual catch was 14.0 t (0.2 kg/hr). Maximum landings were obtained in January and May, 1983 (Table 1).

P. monodon ('tiger prawn'): It formed 3% and the catch amounted to 10.1 t (0.1 kg/hr). Maximum catch was obtained in April, 1983 (Table 1).

M. affinis ('brown shrimp'): The catch of this prawn was low (1.0 t), and contributed only 0.3% of the annual prawn landings by night fishing. Catches were recorded in November, 1982 and February, 1983 only (Table 1).

In addition to prawns, fairly large quantities of by-catches were also landed regularly by night fishing. These mainly included fishes (of different category), stomatopods, crabs, cephalopods and trash fish. A detailed account of the different fish groups of the by-catches landed by trawls in South Kanara has been given by Sukumaran *et al.* (1982). The catch details of these fish groups during 1982-'83 are also incorporated in Table 1 which show that quality fishes and trash fish together formed the bulk of the night catch.

Day fishing for prawns

Effort

During 1982-'83, altogether 36,330 units were operated for day fishing with maximum in January, 1983

(5,473 units) (Fig. 1). The day units formed around 80% of the total effort expended for trawling during this period (Fig. 2 A). Out of the 2,71,230 hours of trawling, day fishing alone accounted for 1,80,661 hours (66.6%) (Fig. 2 B).

Catch and catch composition

In the annual trawl landings, day fishing alone contributed about 64%. The prawns formed 29.4% of the trawl landings by day fishing (Fig. 3 A), amounting to 1,736.8 t (9.6 kg/hr) (Table 2). Although maximum effort was expended in January, 1983, the best catches were obtained in December, 1982 (339.8 t) followed by September, 1982 (326.2 t) (Fig. 4). As usual, the prawn catch was low in October, 1982.

It is interesting to note that the species composition of prawns in the day catches was quite different from night catches. The percentage composition of different category of prawns in day catches is given in Fig. 5 B.

P. stylifera ('karikadi'): This was the chief species, contributing to 58.1% of the prawn landings by day fishing. The annual catch amounted to 1,004.5 t (5.1 kg/hr). This species was available throughout the season except September, and the maximum landings were recorded in December, 1982 (294.0 t) (Table 2).

M. dobsoni ('poovalan'): This prawn was the second important species forming 38.4% of the prawn

landings, and the annual catch amounted to 667.7 t (3.7 kg/hr). The highest catch was recorded in September, 1982 (310.8 t) when the season started, and nil catch in October, 1982 (Table 2).

M. affinis: The catch of this species was only 34.7 t (0.2 kg/hr) forming 2% of the annual landings by day fishing. The maximum landings were recorded in April, 1983 (11.3 kg/hr) (Table 2).

P. indicus: The annual catch amounted to 23.5 t (0.1 kg/hr) forming 1.4% of the prawn landings by day fishing for the whole season. The catches were fairly good in the first week of September, 1982 when the fishery commenced (Table 2).

P. monodon: The landings of this prawn was negligible (0.1 t).

Parapenaeus longipes: This species was caught only in May, 1983 and the catch amounted to 1.8 t (0.1%).

In addition, prawns like, *Trachypenaeus curvirostris*, *Metapenaeus moyebi*, *Parapenaeopsis acclivirostris*, *Solenocera crassicornis*, *Nematopalaemon tenuipes* and *Exhippolysmata ensirostris* also occurred in stray numbers.

By-catches included fishes, stomatopods, crabs and cephalopods, and are described by Sukumaran *et al.* (1982). Details of the by-catches are given in Table 2.

Table 2. Estimated month-wise landings (in tonnes) of different category of prawns and by-catches by day trawlers at Mangalore during 1982-'83

Species/category	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
<i>M. dobsoni</i>	320.8	—	21.5	45.8	80.8	84.4	44.2	33.2	43.0	4.0	667.7
<i>M. affinis</i>	—	0.2	0.2	—	0.1	3.0	6.5	11.3	9.6	3.8	34.7
<i>P. stylifera</i>	—	9.9	92.7	294.0	173.0	81.0	133.5	94.2	102.1	24.1	1004.5
<i>P. indicus</i>	15.4	—	0.2	—	0.2	0.9	0.4	3.9	2.3	0.2	23.5
<i>P. monodon</i>	—	—	0.1	—	—	—	—	—	—	—	0.1
<i>P. longipes</i>	—	—	—	—	—	—	—	—	1.8	—	1.8
Total prawns	326.2	10.1	114.7	339.8	254.1	169.3	184.6	142.6	158.8	32.1	1732.3
Fishes	122.1	69.4	222.2	291.9	379.4	378.6	225.0	279.2	469.1	46.6	2483.5
Stomatopods	—	—	8.2	223.9	259.1	417.1	362.9	134.3	102.5	4.6	1512.6
Crabs	—	—	—	3.6	47.3	32.6	13.4	30.3	15.6	1.5	144.3
Cephalopods	—	—	2.2	—	5.7	3.0	0.8	17.0	5.3	—	34.0
Monthly total	448.3	79.5	347.3	859.2	945.6	1000.6	786.7	603.4	751.3	84.8	5906.7

Annual prawn landings

The annual prawn landings by trawl fishery, when day and night catches were put together, amounted to 2,063.3 t (7.6 kg/hr), which formed 21.9% of the annual trawl landings during 1982-'83 (Fig. 7). It is seen that 84% of the prawn catch was contributed by day fishing and the remaining by night fishing (Fig. 6 A). Though prawns landed throughout the season, the highest catches were recorded in December, 1982 (Fig. 8). Taking an overall picture of the day and night fishing, *P. stylifera* was the most abundant species contributing 48.7% followed by *M. dobsoni* (32.4%), *M. monoceros* (14.8%), *P. indicus* (1.8%), *P. monodon* (0.6%) and *M. affinis* (1.7%) (Fig. 5 C).

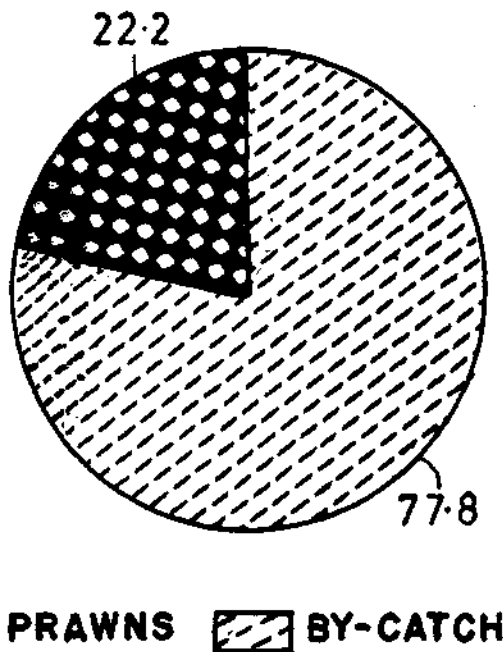


Fig. 7. Distribution pattern of prawns and by-catches in shrimp trawlers at Mangalore 1982-'83.

Annual income

Based on the auctioning rates of individual species of prawns (average) and by-catches during different months at the landing centre, the gross income for 1982-'83 has been calculated to Rs. 30.0 million, out of which Rs. 15.6 million (51.9%) was obtained from night fishing and the rest from day fishing (Fig. 9 B). Out of the gross income, prawns alone accounted for 26.3 million forming 87% of the return (Fig. 9 C) of which night fishing contributed Rs. 13.4 million (50.8%) and the rest from day fishing. Thus, although night fishing contributed only 16% of the annual prawn catch, the

income from sale proceeds was more than that obtained from day fishing (Fig. 9 A).

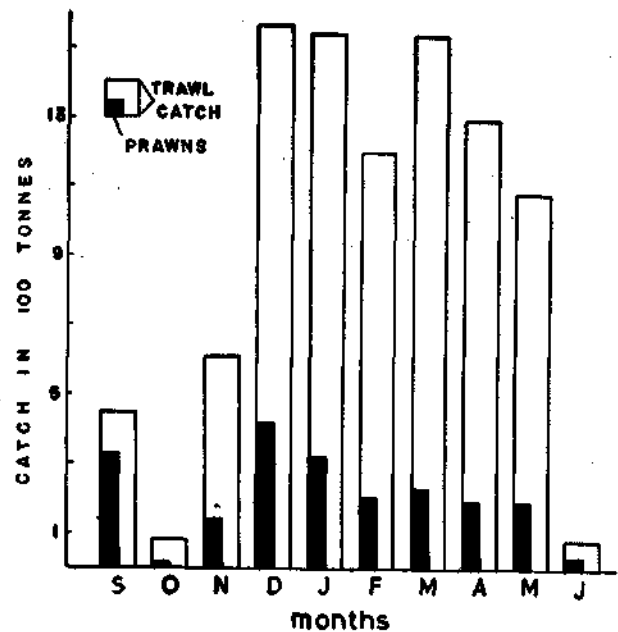


Fig. 8. Monthwise prawn catch and total trawl landings at Mangalore during 1982-'83.

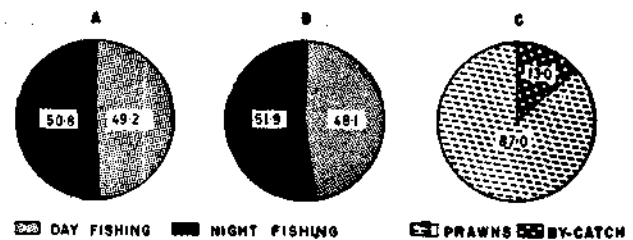


Fig. 9. Annual income of shrimp trawlers at Mangalore during 1982-'83. A-Income from prawns; B-Income from day and night catch; and C-Income from prawns and by-catches.

From this data, the average income per trip has been worked out for day and night fishing units separately for 1982-'83. It is seen that the average income per trip was Rs. 397.00 and Rs. 1,690.00 for day (average 5 hrs fishing) and night fishing boats (average 10 hrs fishing) respectively.

Discussion

Despite increased effort the mechanised prawn fishery at Mangalore declined year after year during the latter half of seventies, and the prawn catch was the lowest during 1980-'81 (675.7 t). As compared to a moderate catch of 984.6 t during 1981-'82, the following year (1982-'83) witnessed a record catch of 2,063.3 t (this is exclusive of 449.0 t of prawns landed by purse

seiners). The prawn landings increased by 110% during 1982-'83 as compared to the previous season along with substantial increase in effort during this season (effort increased by 33% in units and 76% in actual fishing hours). This is mostly brought about by the increased operation of the vessels for night fishing.

As regards income also, there has been considerable increase, The gross income has increased from Rs. 21.3 million during 1981-'82 (Sukumaran *et al.*, 1982) to Rs. 30.0 million during 1982-'83. Out of this, prawns

alone accounted for 87% of the value, although it formed only 22% of the trawl landings.

The present studies also indicated that the average income per day of night fishing boats was considerably higher than that obtained by day units, thereby suggesting that night fishing was more profitable. The addition of more and more boats for night fishing in the recent years also point to the profitability of night operations in comparison with day operations.

