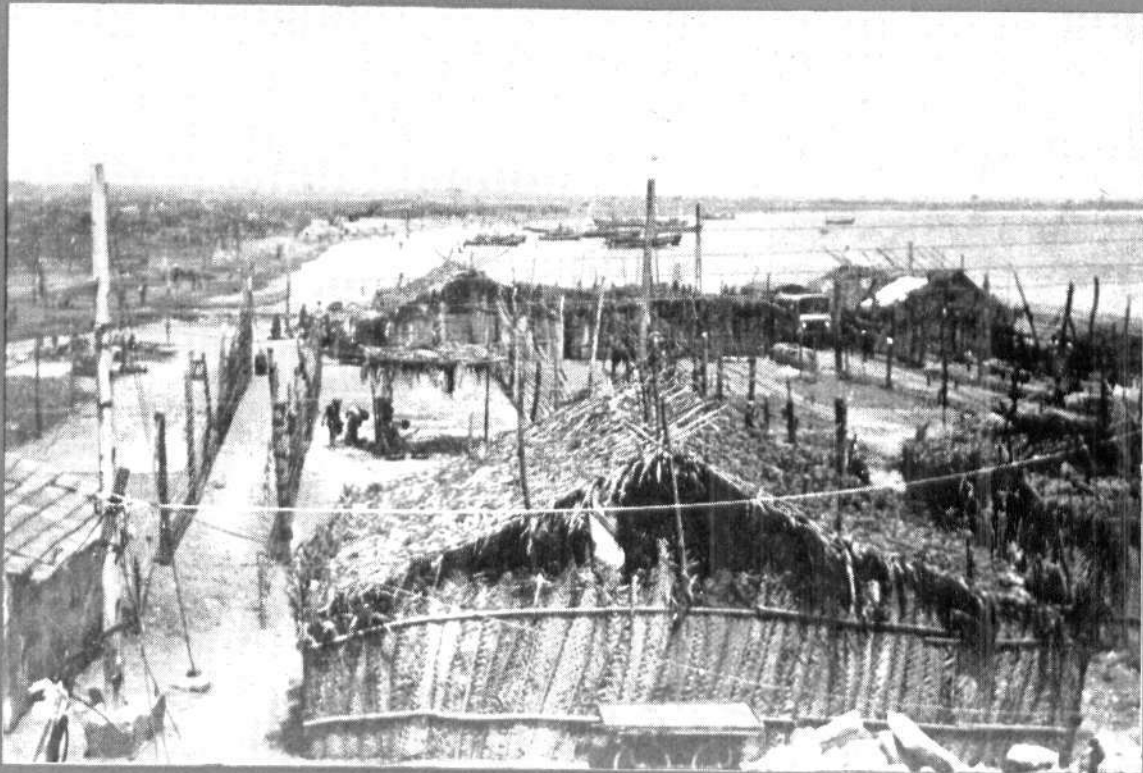




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MECHANISATION OF TRADITIONAL CRAFTS WITH OUTBOARD MOTORS AT VIZHINJAM*

Introduction

Vizhinjam, 16 km south of Trivandrum in Kerala State, is an important fish landing centre where, because of a bay protected by breakwaters, fishing goes on even during the monsoon period. Good marketing outlets are available at nearby places such as Balaramapuram, Trivandrum and adjacent towns. The fishery is artisanal, employing catamaran, dugout canoe and plank-built boat. At present eleven types of traditional gears are employed in this area, the major ones being boat seine, drift net and hooks and line (*Mar. Fish. Infor. Serv., T & E Ser.*, 38: 1982). Mechanisation came late to Vizhinjam, while in the nearby places like Sakthikulangara and Kolachal mechanised fishing had been well established even years back. Vizhinjam fishermen were rather cautiously avoiding mechanisation since they feared that favouring mechanised fishing may invite big business men into the field which may affect the traditional fishing adversely. They also shared the early fears of the traditional fishermen that mechanised trawling scared away the fish shoals from inshore waters. However, in recent years a few mechanised boats have

started operating from Vizhinjam employing the traditional drift net. But only few fishermen could afford the needed high capital investment and operational costs.

By about September, 1982, five traditional crafts fitted with 'Yamaha' outboard motors started operating from this area. The increased propulsion provided by the motor enabled the fishermen to reach distant fishing grounds, unexploited by the traditional crafts, and to bring better catches. Due to the high profit obtained by the fishermen and low capital and operational costs for the outboard motor when compared to those of mechanised boats, the mechanisation of traditional crafts with outboard motor became acceptable to the fishermen. Now in the course of one and a half years the total number of outboard motors at this centre increased to about sixty. This trend is bound to rise, in view of the prospect of the fishing harbour under construction and the additional attendant facilities, which would be an added incentive for further modernisation of the fishing fleet and fuller utilization of these facilities. Hence the present study on the mechanisation of traditional crafts with outboard motor and its prospects at Vizhinjam is an essential and timely step in assessing the impact of mechanisation on the traditional fishery.

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Fishing methods

The outboard motor fitted on the traditional crafts at Vizhinjam is Yamaha kerosene outboard motor (Model 8 B.K., 7 H.P.). Eventhough both catamaran and plank-built boats could be fitted with an outboard motor, plank-built boats are preferred because they provide more space for the gear and the catch. Though other gears are also operated from these motorised crafts, hooks and line is the principal gear operated throughout the year. Hence the data, collected from only those units, both mechanised and non-mechanised, which operated hooks and line during 1983, were considered for this study.

Fishermen, in the mechanised craft leave the shore for fishing at about 0500 hrs and return any time between 1300 and 1800 hrs, depending on the distance to the fishing grounds and the quantity of the catch obtained. Mechanised crafts generally go about 20–25 km off Vizhinjam to areas of 60–80 m depth, whereas the non-mechanised traditional crafts are confined to about 10 km from the shore and a depth range of 40–50 m. The number of actual fishing days in a month ranged from 20 to 25 for both the types of units.

Fish catch

The month-wise effort (that is the number of trips by each type of craft) and catch (kg) of hooks and line operated by non-mechanised and mechanised crafts are given in Table 1. It could be seen that both types of crafts operated all through the year and both brought in the major part of the yearly landings (55 to 80%) during July to October. The month-wise trend of the catch per trip in non-mechanised and mechanised crafts is presented in Fig. 1. It is observed that the catch per trip of powered crafts is higher during all the months.

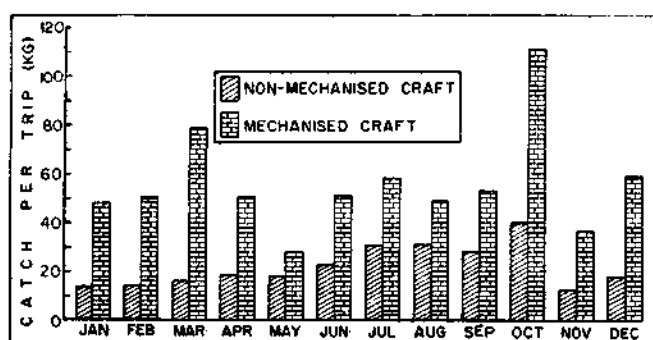


Fig. 1. Month-wise trend of catch per trip in the non-mechanised and mechanised traditional crafts.

Table 1. Month-wise effort and catch of hooks and line operated by non-mechanised and mechanised crafts during 1983

| Months | Non-mechanised crafts | | Mechanised crafts | |
|--------------|-----------------------|------------------|-------------------|-----------------|
| | Effort (trips) | Catch (kg) | Effort (trips) | Catch (kg) |
| Jan. | 6,647 | 90,022 | 100 | 4,862 |
| Feb. | 5,705 | 81,810 | 158 | 8,017 |
| Mar. | 6,716 | 1,10,469 | 62 | 4,925 |
| Apr. | 7,200 | 1,34,777 | 73 | 3,681 |
| May | 6,433 | 1,15,990 | 16 | 457 |
| Jun. | 6,066 | 1,39,040 | 153 | 7,859 |
| Jul. | 6,898 | 2,12,189 | 853 | 49,793 |
| Aug. | 9,035 | 2,80,709 | 1,174 | 58,397 |
| Sep. | 6,533 | 1,84,862 | 1,010 | 53,434 |
| Oct. | 7,828 | 3,13,469 | 899 | 99,932 |
| Nov. | 5,175 | 63,533 | 386 | 14,180 |
| Dec. | 4,822 | 84,713 | 155 | 9,172 |
| Total | 79,058 | 18,11,583 | 5,039 | 3,14,709 |

Species composition

The annual catch, catch per trip (kg) and percentage composition of dominant groups of fish landed by hooks and line operated from non-mechanised and mechanised crafts are given in Table 2. About 25 major groups of fish supported the fishery by non-mechanised units. The carangid fishery ranked foremost, with annual landings of 817.5 tonnes, forming 45% of the total fish landings by hooks and line. *Decapterus dayi* was the most dominant carangid species accounting for 73.6% followed by *Selar crumenophthalmus* (6.6%), *Selar mate* (2.8%) and other carangids (16.8%). The next important group in the order of abundance was *Nemipterus* spp. with an annual landing of 214.3 tonnes which formed 11.8% of the total catch. Tunas made up the third major group forming 141.9 tonnes which constituted 7.8% of the total landings. Among tunas, *Auxis rochei* formed 48.8%, *Euthynnus affinis* 28.4%, *Sarda orientalis* 16.5% and other tunas 6.3%. The next important group was mackerel with an annual landing of 79.6 tonnes forming 4.4% of the total catch. Among the rest were cat fish (4%), *Dussumieria* spp. (3.4%), Balistids (2.4%), cuttle fish (2.3%), squids (2.2%), *Histiophorus* spp. and *Saurida* spp. (2.1%).

In the hooks and line fishery by mechanised crafts about 19 major groups of fishes constituted the catch (Table 2). As in the case of the traditional crafts,

Table 2. Annual catch, catch per trip and percentage composition of dominant groups of fish landed by hooks and line operated from non-mechanised and mechanised crafts during 1983

| Fish groups | Non-mechanised crafts | | | Mechanised crafts | | |
|----------------------------|-----------------------|---------------------|-------|-------------------|---------------------|-------|
| | Annual catch (kg) | Catch per trip (kg) | % | Annual catch (kg) | Catch per trip (kg) | % |
| Sharks | 30,243 | 0.38 | 1.67 | 5,665 | 1.12 | 1.80 |
| Rays | 18,568 | 0.23 | 1.02 | — | — | — |
| <i>Dussumieria</i> spp. | 61,570 | 0.78 | 3.40 | 13,094 | 2.60 | 4.16 |
| <i>Decapterus</i> spp. | 6,01,933 | 7.61 | 33.23 | 1,63,542 | 32.46 | 51.97 |
| <i>Selar mate</i> | 23,007 | 0.29 | 1.27 | 2,804 | 0.56 | 0.89 |
| <i>S. crumenophthalmus</i> | 54,851 | 0.69 | 3.03 | — | — | — |
| Other carangids | 1,37,749 | 1.74 | 7.60 | 11,826 | 2.35 | 3.76 |
| Mackerel | 79,579 | 1.01 | 4.39 | 5,762 | 1.14 | 1.83 |
| <i>Euthynnus affinis</i> | 40,312 | 0.51 | 2.22 | 11,638 | 2.31 | 3.70 |
| <i>Auxis rochei</i> | 69,295 | 0.88 | 3.83 | 12,390 | 2.46 | 3.94 |
| <i>Auxis thazard</i> | — | — | — | 3,013 | 0.96 | 0.59 |
| <i>Thunnus albacares</i> | — | — | — | 3,269 | 0.65 | 1.04 |
| <i>Sarda orientalis</i> | 23,429 | 0.30 | 1.29 | — | — | — |
| Other tunas | 8,908 | 0.11 | 0.49 | 991 | 0.20 | 0.31 |
| <i>Histiophorus</i> spp. | 36,960 | 0.47 | 2.04 | — | — | — |
| <i>Elacate niger</i> | 23,088 | 0.29 | 1.27 | — | — | — |
| <i>Tylosurus</i> spp. | 18,526 | 0.23 | 1.02 | — | — | — |
| <i>Coryphaena</i> spp. | 22,410 | 0.28 | 1.24 | — | — | — |
| Cat fish | 72,443 | 0.92 | 4.00 | 8,840 | 1.75 | 2.80 |
| <i>Saurida</i> spp. | 37,611 | 0.48 | 2.08 | 6,475 | 1.28 | 2.06 |
| <i>Lethrinus</i> spp. | 13,875 | 0.18 | 0.77 | 5,757 | 1.14 | 1.83 |
| <i>Lutianus</i> spp. | 25,413 | 0.32 | 1.40 | 7,490 | 1.49 | 2.38 |
| <i>Epinephelus</i> spp. | — | — | — | 7,275 | 1.44 | 2.31 |
| <i>Nemipterus</i> spp. | 2,14,318 | 2.71 | 11.83 | 36,103 | 7.16 | 11.47 |
| <i>Therapon</i> spp. | 20,334 | 0.26 | 1.12 | — | — | — |
| Balistids | 43,993 | 0.56 | 2.43 | — | — | — |
| <i>Sepia</i> spp. | 42,351 | 0.54 | 2.34 | 1,859 | 0.37 | 0.59 |
| Loligo | 39,662 | 0.50 | 2.19 | — | — | — |
| Miscellaneous | 51,155 | 0.65 | 2.82 | 6,916 | 1.37 | 2.20 |
| Total | 18,11,583 | 22.91 | | 3,14,709 | 62.50 | |

carangids ranked first among the different fisheries by this gear. The annual carangid landing was 172.2 tonnes forming 56.6% of the total fish landings. *Decapterus dayi* was the most dominant species accounting for 91.8%, *Selar mate* (1.6%) and other carangids (6.7%). The group next in abundance was *Nemipterus* spp.

with an annual landing of 36.1 tonnes forming 11.5% of the total landings. Tunas formed the third important group with an annual landing of 31.3 tonnes which formed 10% of the total catch. Among tunas *Auxis rochei* constituted 39.6% followed by *Euthynnus affinis* (37.2%), *Thunnus albacares* (10.4%), *Auxis thazard*

(9.6%) and other tunas (3.2%). Perches were the fourth important group with an annual landing of 20.5 tonnes forming 6.6% of the total catch. *Lutianus* spp. constituted 36.5% of the perch catch followed by *Epinephelus* spp. (35.4%) and *Lethrinus* spp. (28.1%). Other important groups in the order of abundance were *Dussumieria* spp. (4.2%), cat fish (2.8%) and *Saurida* spp. (2.1%).

From the Table 2, it can be seen that the variety of species which constituted the fishery of non-mechanised units was more when compared to that of the mechanised units. Eventhough the quality fishes like carangids, tunas and perches formed the abundant groups in both the types of units, the catch per trip for these groups in mechanised crafts was much higher than that of the non-mechanised crafts (Fig. 2). The yellow-fin tuna (*Thunnus albacares*) and perches of the group *Epinephelus* were obtained only from mechanised crafts.

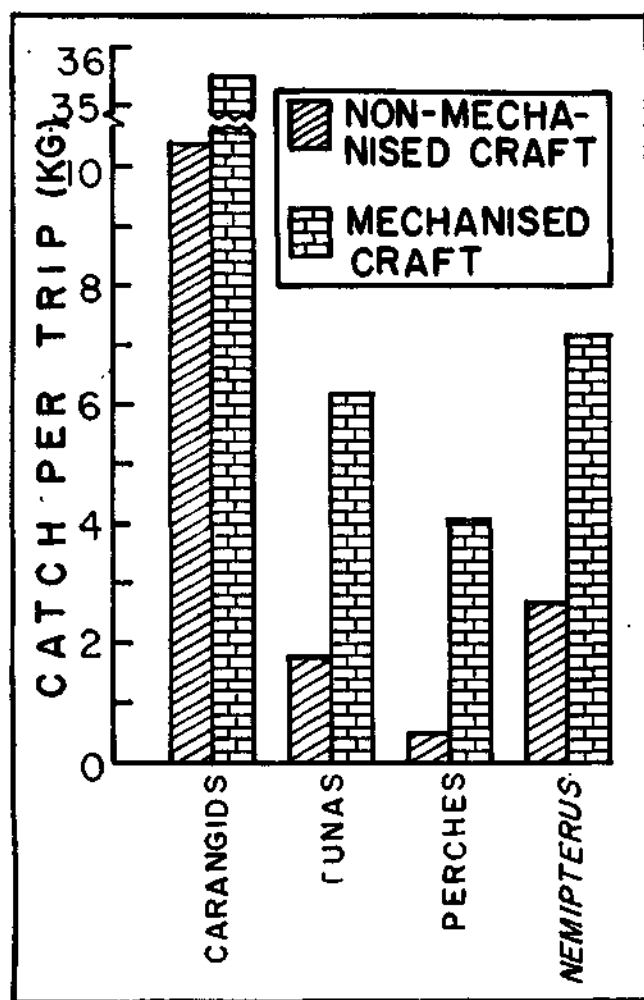


Fig. 2. Average catch per trip of four major groups of fishes landed by non-mechanised and mechanised traditional crafts.

Socio-economic aspects

A comparative idea of the operational and maintenance costs of both the types of crafts and the problems associated with these is necessary for understanding certain socio-economic aspects of the fishermen engaged in hooks and line fishing at Vizhinjam. The fuel requirements for the outboard motor per trip is 20 to 25 litres of kerosene and 1.5 to 2 litres of petrol. The average operational expenditure which includes the cost of fuel, maintenance of the motor and cost of bait would be about Rs. 100. The gross income from a mechanised craft ranges from Rs. 250 to 1,500 per trip with an average income of Rs. 600. The net income per trip would be Rs. 500. The number of crew in a mechanised unit is usually four. The profit will be divided among the owner and crew of the unit in such a way that the owner gets two shares and crew get one share each. If the owner himself is one among the crew, which is the usual practice, he gets three shares. Thus on an average the owner gets Rs. 250 and the crew Rs. 83.3 each per trip. On the otherhand the gross income by the non-mechanised crafts ranged from Rs. 60 to 200 per trip with an average income of Rs. 100. The number of crew in a non-mechanised unit is two. The income is divided into three equal shares and the owner of the unit gets two shares (Rs. 67), if he is also one among the crew as is the usual practice in Vizhinjam, and the other crew Rs. 33. Thus the profit obtained per trip by the owner of the unit from a motorised craft is about 3.7 times higher and that of the crew 2.5 times higher than their counterparts in non-mechanised crafts. The better returns of mechanised crafts is mainly because of the high price fetched by the quality fishes. The profit may naturally be high when it operates 'konchu vala' and special hooks for squids and cuttle fishes.

Now the idea of reaching extended and unexploited fishing grounds with less physical labour and the resultant increased catch obtained, has made the fishermen to take to motorisation. But they point out some difficulties they are faced with, like the high capital involved in the initial stage, nonavailability of bank loans, inadequate supply of kerosene at subsidised rate and lack of local facilities for repairs and procurement of spares. So they demand help in these respects from the government side.

General remarks

The introduction of nearly sixty outboard motors within the short period of one and a half years at Vizhinjam clearly indicates the fishermen's growing conviction



Fig. 3. Outboard motor being fitted to a catamaran.



Fig. 4. Catamaran fitted with outboard motor being launched for a fishing trip.

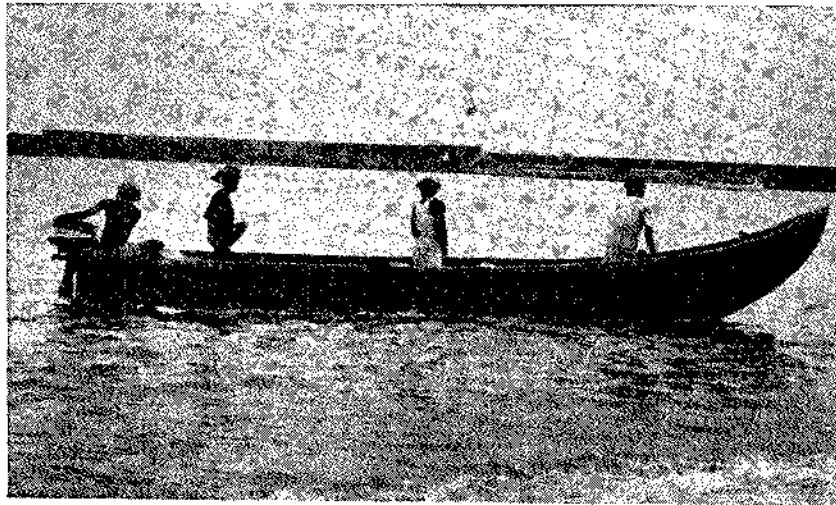


Fig. 5. Plank-built canoe suitably modified and fitted with outboard motor.

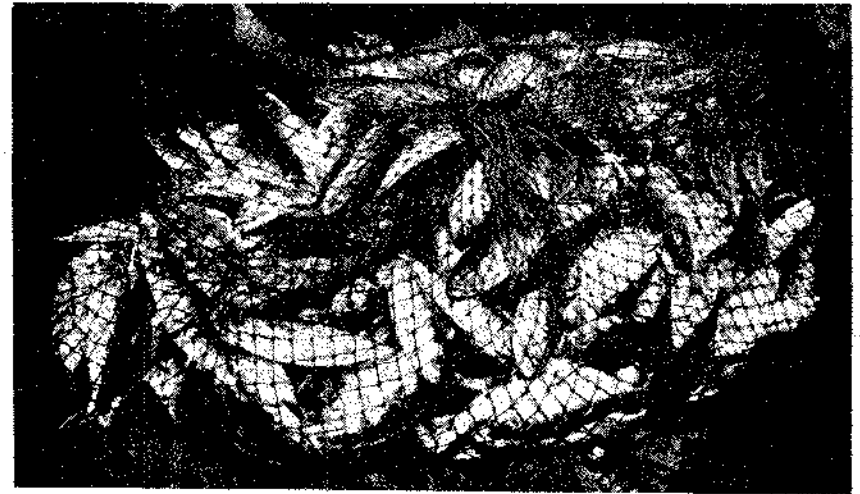


Fig. 6. Hooks and line catch ready for auction.

about the advantages of mechanisation. Also, the nearshore fishing grounds being fully exploited, any increased fishing has to be in the unexploited grounds farther off. The results of the data analysed indicated a higher catch per trip for motorised crafts. It is also observed that three major fisheries; tunas, carangids and perches could be further developed at Vizhinjam by the extensive exploitation of the distant fishing ground currently being fished by the motorised traditional crafts.

The present state of mechanisation has not led to any clash between the fishermen of mechanised and non-mechanised units. This is mainly because the mechanisation was adopted by the traditional fishermen themselves and it is used only for easy accessibility to areas beyond the fishing grounds of non-mechanised units.

As mentioned earlier, the development of the fisheries harbour at Vizhinjam, would be an added impetus

to mechanisation. As is now realised, no mechanisation of fishing activity can be successful neglecting the traditional fishermen. Hence the present attitude of the traditional fishermen showing an inclination towards mechanisation is no doubt a positive trend and fisheries developmental activities in this area could be enhanced by accelerating this trend by means of incentives from government as well as fisheries welfare agencies for the procurement of outboard motors and for provisions of auxiliary facilities.

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