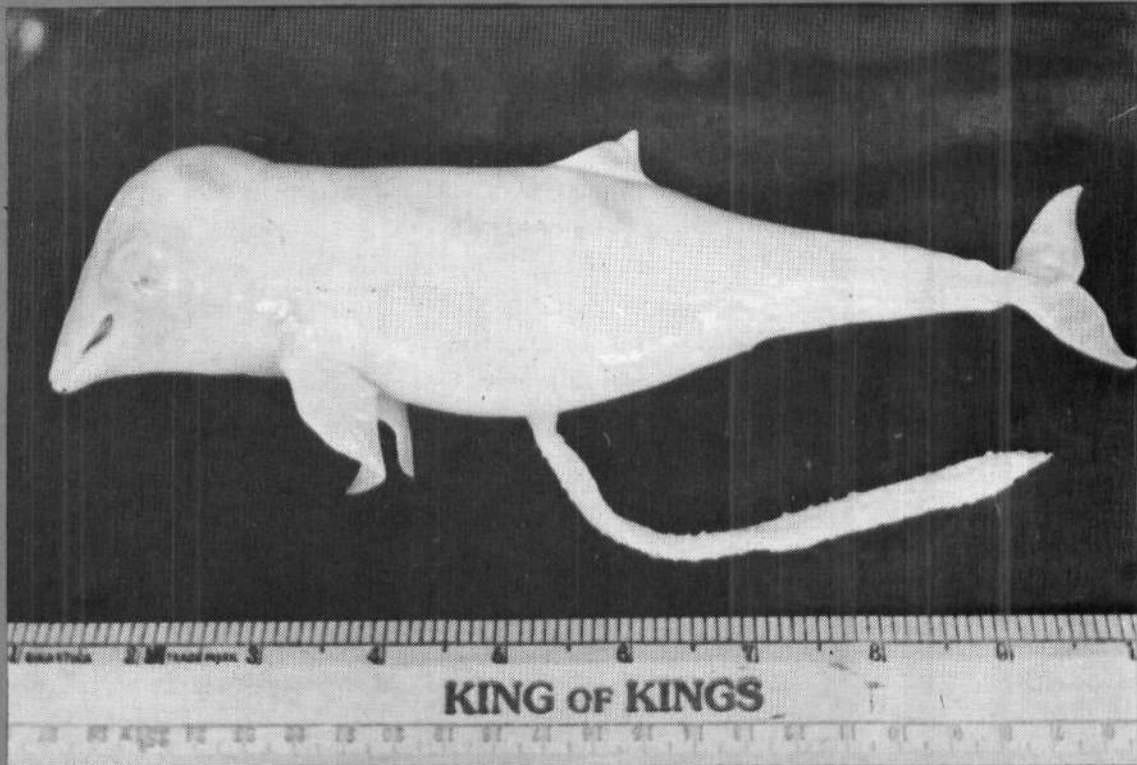




समुद्री मात्स्यकी सूचना सेवा MARINE FISHERIES INFORMATION SERVICE

No. 138

JUNE - JULY 1995



तकनीकी एवं TECHNICAL AND
विस्तार अंकावली EXTENSION SERIES

केन्द्रीय समुद्री मात्स्यकी CENTRAL MARINE FISHERIES
अनुसंधान संस्थान RESEARCH INSTITUTE
कोचिन, भारत COCHIN, INDIA

भारतीय कृषि अनुसंधान परिषद
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

A COMPARATIVE ASSESSMENT OF THE IMPACT OF MOTORISATION ON THE ARTISANAL FISHERIES AT VIZHINJAM

**G. Gopakumar, P.S. Sadasiva Sarma, A.K. Velayudhan, K. T. Thomas,
T.A. Omana and K. Sasidharan Pillai**

Vizhinjam Research Centre of CMFRI, Vizhinjam - 695 521

Introduction

The mechanisation of traditional crafts with outboard motors in the early eighties can be considered as one of the milestones in the development of artisanal fisheries of Kerala State. Eventhough this trend was initiated in central Kerala by 1981, it spread to northern and southern areas by about 1983 only. At Vizhinjam, which is one of the most important artisanal fish landing centres of southern Kerala, the motorisation programme was initiated during the middle of 1982 and since then it has become very popular and resulted in the replacement of non-motorised crafts by motorised ones to a large extent. The breakwater facility at Vizhinjam is an added advantage for berthing and launching the crafts even during the monsoon months. Hence during these months, fishermen from all over the nearby

coastal areas migrate to Vizhinjam for fishing. A detailed account of the traditional fishery in the area was given by Luther *et al.* (*Mar. Fish. Infor. Serv.*, T & E Ser., 1982, No. 38 : 1-17) and a marine fish calendar from the area was published by Nair *et al.* (*Mar. Fish. Infor. Serv.*, T & E Ser., 1988, No.87 : 1-15). But in recent years the pattern of fishery has undergone considerable changes mainly due to the motorisation of traditional crafts and hence it is felt necessary to present a comparative assessment of the impact of motorisation on the artisanal fisheries in the area.

Data source

The fishery statistics collected from Vizhinjam fish landing centre for seven years from 1986 to 1992 was utilised as the data for the motorisation

hooks and line and *Konchu vala* (Disco net) increased considerably due to motorisation. Eventhough the effort of boat seine declined, the catch and catch per unit effort had improved. On the other hand, there is a substantial reduction in the effort with a resultant decline in the catch of *Chala vala*, *Netholi vala* and shore seine. The peak fishery seasons of drift gill net, hooks and line and *Konchu vala* also changed due to motorisation. The operation of all these gears were intensified during the monsoon months and consequently these months became one of the peak fishing seasons for these gears.

Gearwise catch composition

Drift net

The annual average catch of all the major species of tunas viz. *Euthynnus affinis*, *Auxis thazard*, *A. rochet* and *Sarda orientalis* showed considerable increase due to motorisation. The annual average catch of these species increased from 284 t during the pre-motorisation period to 993 t during the motorisation period. The annual average mackerel catch increased from 27 t during the pre-motorisation period to 384 t during the motorisation period. The other groups whose catch substantially improved due to motorisation were *Decapterus* sp., *Selar crumenophthalmus*, other carangids, *Sphyræna* sp. and perches. On the other hand, the annual average catch of sharks, *Megalaspis* sp., catfish and *Chirocentrus* sp. declined in the drift net catches during the motorisation period.

Hooks and line

The most significant increase in the annual landing by hooks and line due to motorisation was in the catch of bullet tuna, *Auxis rochet* which formed only an insignificant component of tuna landing during the pre-motorisation period but increased to an average annual landing of 771 t during the motorisation period. The other tunas which increased in hooks and line catch due to motorisation were *E. affinis*, *Thunnus albacares* and *Katsuwonus pelamis*. The average annual catch of the species of *Nemipterus*, *Decapterus*, *Selar crumenophthalmus*, lethrinids, mackerel, *Pristipomoides*, *Epinephelus*, *Trichiurus* and *Loligo* also improved in hooks and line due to motorisation. The catch of *Megalaspis*, catfish, balistids, sharks, *Saurida* and *Coryphaena* declined in hooks and line catch due to motorisation.

Boat seine

The catch of species of *Loligo* and *Decapterus*

markedly increased in boat seine landings during the motorisation period. The catch of *Trichiurus* and *Stolephorus* also marginally improved during the period. On the other hand, the catch of silver bellies, other carangids, *Acetes*, catfish, *Dussumieria*, sciaenids, lesser sardines, goatfish and *Lactarius* declined in boat seine landings during the motorisation period.

Shore seine

The annual average catch of all the major groups caught by this gear viz. whitebaits, silverbellies, lesser sardines, *Decapterus*, other carangids and *Dussumieria* declined considerably during the motorisation period.

Chala vala

The catch of lesser sardines by this gear drastically declined during the motorisation period. However, the oil sardine and silverbelly catch by the gear improved during the period.

Konchu vala (Disco net)

The catch of flatfish, sciaenids, rays and crabs showed marked increase during the motorisation period.

Netholi vala

The catch of whitebaits by this gear considerably declined during the motorisation period.

Kolachi vala

The *Hemirhamphus* and *Cypselurus* catch by this gear became insignificant during the motorisation period.

The resource pattern

The annual average catch of the major fishery resources of Vizhinjam area during the pre-motorisation and motorisation periods are given in Table 2. It could be seen that the catch of *A. rochet*, *S. orientalis*, *Selar crumenophthalmus*, *Eptenephelus*, *Pristipomoides* and flatfishes which were insignificant in the fishery prior to motorisation contributed substantially in the catch during the motorisation period. Apart from this, the groups which markedly increased the catch during the motorisation period were mackerel, *E. affinis*, *A. thazard* and species of *Sphyræna*, *Decapterus*, *Lethrinus*, *Nemipterus* and *Loligo*. The groups which marginally increased their landing were *Stolephorus* spp., other carangids, seerfish and ribbonfish.

In contrast to the above, it could be seen that certain groups of fishes which contributed significantly to the fishery during the pre-motorisation

TABLE 2. The annual average landings (in tonnes) of the major resources at Vizhinjam during the pre-motorisation and motorisation periods

Resource	Pre-motorisation period (catch in tonnes)	Motorisation period (catch in tonnes)
Lesser sardines	219.3	81.1
<i>Dussumieria</i> spp.	78.9	53.5
<i>Stolephorus</i> spp.	264.0	318.4
<i>Sphyraena</i> spp.	47.6	82.8
<i>Decapterus</i> sp.	158.5	519.4
Other carangids	290.3	324.0
<i>Selar crumenophthalmus</i>	t*	193.4
<i>Euthynnus affinis</i>	221.0	656.8
<i>Auxis thazard</i>	144.5	342.0
<i>Auxis rochet</i>	t*	962.8
<i>Sarda orientalis</i>	t*	183.3
<i>Scomberomorus</i> spp.	111.6	137.9
Mackerel	75.1	458.4
<i>Trichurus</i> spp.	1,021.3	1,363.2
<i>Epinephelus</i> sp.	t*	75.1
<i>Lutjanus</i> sp.	47.0	43.6
<i>Lethrinus</i> sp.	61.9	109.6
<i>Nemipterus</i> sp.	114.1	233.4
<i>Pristipomoides</i> sp.	t*	55.6
Silverbellies	187.5	135.5
Sciaenids	66.4	59.8
Flatfishes	t*	42.2
<i>Loligo</i> sp.	137.0	311.2
Cuttlefish	96.6	91.1
Sharks	70.8	*
Rays	32.9	*
Oil sardine	33.0	*
<i>Saurida</i> sp.	39.7	*
Catfish	173.8	*
<i>Tylosurus</i> sp.	28.6	*
<i>Lactarius</i> sp.	35.2	*
<i>Megalaspis</i> sp.	152.3	*
<i>Coryphaena</i> sp.	31.6	*
<i>Upeneus</i> sp.	51.2	*
<i>Istiophorus</i> sp.	32.2	*
Balistids	160.3	*
<i>Acetes</i> sp.	48.6	*

* Below 1% of the total catch.

period had become insignificant during the motorisation period. These include sharks, rays, oil sardine, balistids, catfish and species of *Saurida*, *Tylosurus*, *Lactarius*, *Megalaspis*, *Coryphaena*, *Upeneus*, *Istiophorus* and *Acetes*. In addition to this, the magnitude of the catch of lesser sardines, rainbow sardines and silverbellies were reduced considerably. The catch of *Lutjanus*, sciaenids and cuttlefish were reduced marginally during the motorisation period.

General remarks

An increase in the total fish catch as well as in the catch per unit effort is evident during the

motorisation period. The fast accessibility to the distant fishing grounds by the motorised crafts, the increased number of fishing hands employed in the motorised units and the availability of more time for actual fishing due to the time saved for rowing seem to be the major reasons for the higher catch and catch rate in the motorised units. The motorisation programme has also helped to increase the fishing activities during the monsoon months. The breakwater facility at Vizhinjam is being fully utilised at present by the fishermen employing the motorised crafts. During the peak monsoon months, many fishermen from Anchengo to Colachel migrate to Vizhinjam along with their craft and gear for fishing from Vizhinjam.

The better exploitation of certain hitherto underexploited and unexploited species can be considered as one of the most significant aspects of motorisation of traditional crafts. Since the chief gears employed by the motorised units are hooks and line and drift net and the area of fishing is relatively distant ground, there has been an increase in the yield of certain resources of high unit value like tunas, carangids and perches. On the other hand, as more and more traditional crafts were motorised, there is a reduction in the effort of non-motorised crafts which operate gears like *Chala vala*, *Netholi vala* etc. This shifting of effort together with the change in the fishing ground of motorised crafts led to the decline in the catch of certain nearshore resources like sardines and silverbellies. It is likely that considerable quantities of nearshore resources which were exploited during the pre-motorisation period are now lost to the fishery. Hence, it is felt that diversification of effort by motorised crafts is highly essential to avoid underexploitation of these resources.

Vizhinjam is a pioneering fishing centre in Southern Kerala which initiated the motorisation of traditional crafts. The expansion of this programme is still in the ascending phase and a growth stagnancy has not yet reached. Hence it is too early to predict its future impact on the fishery. However, the effect of motorisation on different resources will vary according to the change of gear and fishing ground, as is seen from the present study. Hence it is felt that regular resource-wise monitoring and assessment should be done at this centre to get an overall picture of the impact of motorisation on various resources in future years.