

SOCIO-ECONOMIC ASPECTS OF THE MONSOON FISHERIES OF THE WEST COAST OF INDIA

D. B. S. SEHARA, K. K. P. PANIKKAR AND J. P. KARBHARI

Central Marine Fisheries Research Institute, Cochin - 682 031

ABSTRACT

Along the west coast, fishing operation during monsoon period (June - August) as a family occupation, is only at a subsistence level except for trawlers and gillnetters at a few centres. The number of mechanised units under operation during monsoon is reduced to about 10% of the total units and non-mechanised including motorised crafts to 25%. The household income during monsoon is very low and consequently fishermen become permanent debtors. During monsoon the level of employment is reduced to about 20%. Consumer has to pay very high price for fish and the producer (fisherman) does not get his due share in consumer's rupee. Socio-economic studies conducted in a number of villages along the west coast indicate that in the present coastal rural set-up it is rather difficult to impose a complete ban on the monsoon fishery. It would further aggravate the poor economic situation in fishing villages. To overcome the problems faced by fishermen, especially of artisanal sector, it is suggested to (1) constitute a public agency to purchase fish at a minimum price whenever there is glut at the landing centre and distribute throughout the year and at interior places, (2) provide adequate finance at reasonable terms and conditions through co-operatives and (3) extend all facilities for developing prawn farming as well as integrated fish-crop-livestock farming.

INTRODUCTION

Of the average annual marine fish production of 1.6 million tonnes in India about 70% is landed along the west coast. However, the fishery of the west coast is characterised by distinct seasonality. Southwest monsoon period (June - August) is a lean season for fishing and allied activities, throughout the west coast. Postmonsoon season (September - January) is generally more productive and more than 60% of the total catch along the west coast is landed during this period. Due to the seasonal nature of the fishery, major portion of the annual income of a fisherman household is earned within a period of 3 to 5 months. This situation not only affects the living condition of fisherfolk, but also the fishery developmental schemes. The poverty of the artisanal fishermen is mainly attributed to this seasonality. Since there is not much fishing activity during monsoon and in the absence of any alternate employment opportunity, the artisanal fishermen have to depend on money lenders or fish traders to tide over this lean season which ultimately keeps them under perpetual indebtedness and consequently under poverty. Hence, it is essential to investigate the problems of monsoon fishery especially its social and economic implications. In this

report an attempt has been made to analyse these problems on the basis of the socio-economic studies conducted by the Central Marine Fisheries Research Institute (CMFRI) at a number of villages along the west coast.

DATA BASE

The data available in the reports of the socio-economic studies conducted by the CMFRI at selected fishing villages along the west coast since 1985, have been used for the preparation of this paper. Information has also been collected from the State fishery departments, certain fishery organisations and in some cases, through direct observation at the landing centres.

OBSERVATIONS AND DISCUSSION

Socio-economic aspects

Gujarat and Maharashtra

Majority of the fishermen population is illiterate in Maharashtra. Among the literates most of them have only primary education. Literacy position is better in the villages located near the towns. Literacy is more among males than females. In Gujarat, coastal villages, literacy is slightly higher than in Maharashtra.

Both in Maharashtra and Gujarat the family size in fishermen villages is about 7. The difference in family size is significant between the villages in Maharashtra and non-significant in Gujarat. It is because some of the tribal villages in Maharashtra Coast are very backward and others are advanced.

About 55% of fishermen population is found to be working in Maharashtra. About 44% of the population has fishing and allied activities as main occupation. Earning population in Gujarat fishermen villages is 52%. About 47% of the fishermen has fishery as main occupation.

Fishing is traditionally conducted by *Mahadev Kolis* (Scheduled Tribe) and *Kolis* (Backward community) in the most of the fishing villages of Maharashtra and by *Machhi* and *Kharwas* (Backward communities) in Gujarat. Women participation in fishery is more in Maharashtra as compared to Gujarat. In many fishermen villages cooperatives are working successfully. The Cooperative societies are providing fishing tackle, loan and diesel and also helping fishermen in marketing the catch.

Goa

There are 61 fishing villages and 54 landing centres in Goa. There are about 8000 fishermen households in the State with a population of about 48,000. The average size of the fishermen family is 6.

About 26% of the fishermen population is literate. 22% of the population is engaged in actual fishing.

About 700 trawlers, 120 purse seiners and 400 gillnetters are under operation in the State.

Karnataka

Along Karnataka Coast there are 147 fishing villages, 77 in South Kanara and 70 in North Kanara Districts. There are about 20,000 fishermen households in the State with a population of about 1.35 lakhs.

The average size of the fishermen family is 7.2. About one-fourth of the population is literate.

22% of the fishermen in the State is engaged in actual fishing activities.

Fishing activities along Karnataka Coast is now dominated by mechanised fishing units which include fishing craft fitted with inboard and outboard engines. More than 80% of the catch is accounted for by mechanised fishing. Recently the number of small trawlers and gillnetters has been very much increased. The traditional Rampani gear has almost disappeared due to the large scale introduction of purse seiners. In the indigenous sector a remarkable development is the large scale introduction of outboard motors which resulted in the emergence of comparatively efficient gears such as *Mattubala* and ring seine.

Along Karnataka Coast a fisherman who works in a purse seine unit for wages, on an average gets Rs. 65 per day of operation, in trawlers Rs. 50 and in gillnetters Rs. 45. The worker of *Mattubala* and ring seine operation earns about Rs. 55 per day of operation.

Kerala

Total fishermen population in Kerala is about 8 lakhs. The average size of the family is 6. Literates constitute 30% of the fishermen population. About 20% of the total fishermen is engaged in fishing in the sea. For 80% of them, fishing is a full time occupation.

There are about 4500 mechanised fishing craft fitted with more than 30 HP engines. About 50% of them is owned by fishermen families. Trawlers constitute 75% of these crafts. Others are gillnetters with the exception of about 20 purse seiners.

Besides these mechanised units about 30,000 non-mechanised craft are under operation in this State. The recent major development in the artisanal sector of marine fishery of the State is the large scale motorisation of country craft using outboard engines. At present more than 50% of the country craft are fitted with outboard engines mostly 12 HP motors. Maximum catches of the motorised craft are found during monsoon (June-August) and postmonsoon (September-December) seasons. Net operating income of a fisherman family owning motorised craft with boat seine, per day of operation works out at Rs. 350/- which includes imputed family labour also; in respect of gillnet, it is Rs. 90 and Hook and line, Rs. 250/-. A fisherman who is engaged in fishing in other's

boats for wages, gets an average amount of Rs. 75 in catamaran - hook and line unit, Rs. 50 in canoe - hook and line unit, Rs. 35 in boat seine and Rs. 40 in gillnet units. A worker in small trawler gets about Rs. 60 and purse seine about Rs. 80 per day of operation.

Fishing activities and employment pattern during monsoon

Gujarat : Gujarat has the longest coastline of about 1260 Km covering mainly 9 coastal districts. It has the widest continental shelf area covering about 1.6 lakhs sq. km. There are about 180 fishing villages with a marine fishermen population of about 1.65 lakhs. About 3,000 mechanised and 4,000 non-mechanised craft are in operation in the State. Trawl net, gillnet, bagnet and longlines are the important gears used for fishing.

Plank-built boats (*Hodi*) numbering 250-300 are operated for catching the penaeid prawn *Metapenaeus kutchensis*. Besides the bagnet, dragnet locally known as *Gheti* which is dragged by two fishermen is also used for capturing prawns in Surajbari area. In certain years the production of prawns used to touch 2000 tonnes. An involvement of 2000-3000 fishermen was noted in monsoon fishing in Little Rann of Kutch in an area of about 1200 sq. km. In July the prawn catch decreases, but a good fishing for *Hilsa* spp. is observed for about a fortnight. When the intensity of monsoon decreases, it becomes an ideal estuarine environment for juveniles of prawns to migrate into the area.

In Jamnagar District, the plank-built boat (*Hodi*) and dugout canoe (*Eklakadi*) are operated during monsoon. Small mesh size gillnets (*Jali*) are employed to entangle mainly *Mugil cephalus* and *Sillago sihama*. About 20% of fishermen are engaged in monsoon fishing. Landings of 60-80 t of fish per year is recorded. The fishing is confined to creeks, marshy lands and nearshore areas. The fish is in good demand locally and also transported to Ahmedabad, Baroda and Surat for marketing.

Bhavanagar District has two centres : Machuva and Katput where fishermen collect gobiids from the exposed mudbeds in low tide period. No craft or gear is used as the practice is only hand picking. Sometimes traps (*Phans*) are used as contrivance for the capture of big sized gobiids. About 150 persons including men, women

and children are engaged during monsoon and 8-10 t of fish is landed every year. It is considered as only a subsistence fishery.

In Kheda (or Kaira) District the main centres are Cambay (Khambhat) and Dahewan where plank-built boats are operated during monsoon season. The stake net (*Gholwa*) is operated at the opening of Mahisagar River and gillnet (*Jal*) at the upper reaches of the river. Nearly 50-60 fishermen go for fishing and catch is limited to 8-10 t. The monsoon fishery is mainly of subsistence nature.

In Bharuch (or Broach) District, at the centres, Kavi and Sarod on the bank of Mahisagar River and Bhadhbhut and Mansot on the bank of Narmada, 200-300 fishermen conduct fishing during monsoon. Stake nets and gillnets are operated and the craft used is plank-built boat. The catch is estimated at 30-50 t. The fishing is only at subsistence level and almost similar to that of Kheda District. At Kavi and Sarod centres, bagnets (*Gholwa*) are also used.

In Surat District moderate fishing activities are observed during monsoon. Mainly gillnets and stake nets (*Gholwa*) are operated. *Gholwa* fishing is mainly a subsistence type, but gillnet fishing for *Hilsa ilisha* (Chakshi) is on commercial basis fetching good returns to fishermen. A production of about 80 t of fish is estimated during monsoon and 700-800 fishermen are engaged in fishing. In Valsad District mechanised plank-built boats (*Machwa*) and non-mechanised dugout canoes (*Hodi*) operate stake nets (*Gholwa* or *Kadhia*). About 2000 fishermen are involved in monsoon fishing and the catch is estimated at about 80 t. The fishing is carried out in creek regions only. Some of the fishermen fish with their mechanised plank-built boats upto Hansot village in the mouth of major river Narmada and carry out *Hilsa ilisha* fishing during monsoon period. The fishing is carried out by gillnet and is highly rewarding for fishermen.

There is no report of monsoon fishing in Junagadh and Amreli Districts. Generally boats are not operated during rough weather. Fishing is poor and confined to creek areas. Nowhere commercial fishing has been noticed in these districts.

Maharashtra

Maharashtra with coastline of about 720 km, ranks second among the maritime States of India in

respect of marine fish landings. The State has 5 coastal districts and 2.32 lakhs marine fishermen. There are about 4,560 mechanised boats mainly operating bagnet, trawlnet, gillnet, long-line and purse seine. Non-mechanised boats numbering about 7,900 include both plank-built and dugout canoes (tonys).

In Thane District, generally, non-mechanised boats operate stake nets, called "Bokshi" and gillnets called "Jali" for fishing in creeks and nearshore waters. About 1,000 fishermen in this district go for fishing in monsoon and 40 - 50 t of catch having 15 - 20% of *ghol* (*Pseudoscianea diacanthus*) is available during the period of three months.

In Greater Bombay District, about 2,000 fishermen are engaged in fishing during monsoon and the catch availability is 150 - 200 t. The operation of the stake net and the gillnet is restricted to the creek regions. The trawlers (80 - 100 in number) operate in open sea, but return daily to the landing centres. Trawlers have good income at some of the centres though a great risk is involved in operation in rough waters.

In Raigad District 180-200 fishermen are fishing during monsoon and the estimated output of 15-20 t of fish is observed. Dugout canoes, tony and plank-built boat (*Machwa* or *Hodi*), all non-mechanised, are operating stake nets (Bokshi) and gill nets in the creek. It is mainly a subsistence level of fishery.

In Ratnagiri District the stake nets (Bokshi) operate in creek region, whereas, gill nets (Jali) operate in nearshore waters. The monsoon fishing is in existence at Bankot, Kelshi, Veldur, Navanagar, Dhopave, Anjanvel, Jambhari, Raigad, Sakhar-Jaigad, Golap-pawas and Ratnagiri centres either at subsistence or at commercial level. Tony and out-riggered plank-built boats (*Machwa*) are used for fishing. Total number of fishermen is about 500 and about 30 t of fish is landed during monsoon. The fishing is carried-out in creek and inshore region only.

In Sindhudurg District, monsoon fishing is generally observed in creek regions. Catfish, mullets, non-penaeid prawns and clupeoids form the catch. Out-riggered plank-built boats, both motorised (IBM and OBM) and non-motorised operate stake net and gillnet (*Nahichi Jaal*) and the

catch is about 25 t of fish and equal quantity of prawns in monsoon season.

Goa

Goa has a coastline of about 110 km and shelf area of about 10,000 sq. km. There are 46 landing centres scattered all over the coast and equal number of fishing villages. The marine fishermen population of Goa is about 20,000. The number of mechanised boats exceeds 300 whereas non-mechanised boats are about 6 times of mechanised boats. Trawlnet, gillnets, purse seines, hook & line and shore seine are important gears used for fishing in the State.

At some of the centres like Panaji, Cartalni, Ribander, Aldona, Vascodagama, Mopusa and Bethem there is trawl fishing during monsoon. There are about 150 trawlers in Goa and some of them operate during monsoon. Other nets operated in creek and nearshore waters include gillnet operated with out-riggered OBM boats and Rampani. Some stake nets (*Gholwa*) also operated with non-motorised boats.

In the northwest coast of India during fair season, generally, contracted labourers form crew on mechanised boats and each labourer is paid Rs. 400-700 per month excluding food and other personal expenses on-board. The contract labourers go back to their native place during monsoon season. Only local persons including owners of the boats are engaged in monsoon fishing and share the catch and operating expenditure since a few boats are under operation. Sometimes, even 50% of the required strength of crew is forced to operate a unit since the fishing is very occasional during monsoon. In non-monsoon season 6-9 persons on trawlers, mechanised gillnetters and dolnetters and 3 - 5 persons on OBM units and non-mechanised units form the crew. Generally, on mechanised units during postmonsoon, a fishing trip consists of 3-6 days duration whereas it is only one day during monsoon season for all types of units. In northwest coast, 50-60% of total fishermen form working population, of which 10-20% has non-fishery occupation. Those men and women who are engaged in fishing and allied activities, are found fully engaged during non-monsoon season. Of working population 30-40% are active fishermen. Fishery allied activities include fish trading, processing/curing, transportation, loading/unloading, net

splicing/repairing, boat building/repairing, etc. Fisherwomen have important role in fish trading and curing in northwest coast. During monsoon hardly 10% of the working population is able to get employment in fishing and fishery related work. Repair and maintenance of craft, gear and engine and net making are the major fishery related activities prevailing in monsoon. Some fisherwomen are engaged in making mats and baskets, especially in tribal fishing villages. Finding it difficult to get even non-fishery work for subsistence during monsoon, fishermen take loan either from the fish traders or from the money lenders.

Based on the socio-economic survey in northwest, it was found that the number of fishing days in a year ranged from 200 to 244 for different types of units. During monsoon the number of fishing days ranged from 20 to 40 for different types of units at different centres. The number of fishing days was more for the category of gear owners as compared to mechanised and non-mechanised units. Of the annual catch, 12% is landed during monsoon at the centres where there is monsoon fishing obtaining 15% of annual gross revenue. Of the annual recurring expenditure, 15% is incurred during monsoon period. For mechanised units the net annual income was found to be about Rs. 12,000 and the contribution of monsoon was about 5%. Of net annual income for non-mechanised units (Rs. 4000 - 5000) 7% was obtained during monsoon. For other groups, the monsoon accounted for about 4% of annual net fishing income.

At a few centres in northwest coast the trawl nets operate during monsoon season usually with one trip a day. Trawl fishery is not regular in this season. About 600 kg of catch was obtained per trip for a trawler during monsoon. On an average an amount of Rs. 2,200 is incurred as recurring expenditure per trip. The gross returns averaged at Rs. 4,700/- per trip resulting in a net operational income of Rs. 2,500. Hardly 10% of trawlers operate during monsoon. Having 25-30 trips during monsoon (June-August), a trawl unit on an average earns Rs. 70,000 over operational expenses. Against this an earning of about Rs. 2.5 lakhs was calculated in fair season. The major repairs/maintenance and fixed cost were not taken into account for the calculation of the operational income.

The gillnet fishing is observed all along the northwest coast (including Goa) during monsoon

with mechanised boats, non-mechanised boats and country craft fitted with OBE. For mechanised gillnetters 25-35 fishing days were observed during monsoon whereas total duration of fishing was observed for about 220 days a year. About 11% of the annual catch and 12% of the gross fishery income was obtained during monsoon. For non-mechanised units the number of fishing days ranged from 35-40 during monsoon and the annual fishing days ranged from 200 to 235. About 13% of total catch and 16% of annual income accrued during monsoon. Of annual net operational income (Rs. 80,000) of a mechanised gillnetter about 11% is earned during monsoon. For non-mechanised boats the net fishery income of a unit during monsoon is about Rs. 500/-. For a country craft fitted with OBE the gross annual income is calculated at about Rs. 30,000 and the net operational income is about Rs. 8,000.

Dolnet operation is limited to a few centres during monsoon. It is smaller in size as compared to that used in fair season and is operated in creeks and inshore waters.

From June to August the *Bokshi* operation is limited for a period of about 20 days. About 8% of annual catch was landed during monsoon fetching a revenue of Rs. 3000 and for non-mechanised units Rs. 1800/-. An amount of about Rs. 800/- is earned over operational cost during monsoon in a *Bokshi* unit.

Besides the three main gears mentioned above, other gears under operation during monsoon season include hook & line, traps, *Rampani* and dragnet (*Pagadia*) operated at a subsistence level of fishing in the creek areas. This type of fishery is carried out for about 40 days during monsoon to obtain an income of about Rs. 1500/- for a unit over a period of three months. Since there is no need of craft for this type of fishing, the net revenue is found to be about 50% of the gross revenue. Fishing by hand picking does not incur any expenditure other than labour. In non-monsoon period the average income of these fishermen is the range of Rs. 3000-4000/- per family in different regions.

Karnataka

Karnataka has a coastline of 270 km and a shelf area of 25,000 sq. km. The State's contribution to national marine fish production is about 10%.

Fishing is almost confined to near-shore areas and the major contribution to the State's total landings is from oilsardine and mackerel. The fishermen population is estimated to be about 1.25 lakhs inhabiting in about 150 fishing villages. About 2000 mechanised country crafts are under operation along this coast. Till recently fishing operation was mainly carried out by traditional fishing units, the types of craft commonly used were rampani boats, dug out canoes and out-rigger boats and the gears used were rampani, small shore seines, gillnets, drift nets and hook & line. By mid seventies mechanised craft and gears started dominating the marine fishery sector, with the result, rampani, the major traditional gear which used to contribute more than 60% of the total catch has almost disappeared from the Karnataka Coast.

About 70% of the annual catch and 65% of the annual income of both mechanised and non-mechanised units along Karnataka Coast are accounted during postmonsoon season (September - January). During monsoon period (June - August) there is no mechanised fishing along Karnataka Coast. For non-mechanised units including the OBM units about one fourth of the annual income is earned during monsoon season and the lean period is premonsoon (February - May). The contribution of monsoon catch of non-mechanised units to total annual catch is only around 20%, whereas the contribution of income is at about 30% because of the higher prices fetched for different species during this period.

For *Mattubala* operating with OBM, about 60% of the annual revenue is earned during postmonsoon and the remaining during monsoon period. When *Mattubala* was introduced around 1985-86, its operation was confined to monsoon season when there was no mechanised fishing. However, later *Mattubala* fishing has been extended to postmonsoon also since it is found to be much more profitable. There is no operation of *Mattubala* during premonsoon. The average gross revenue per trip during postmonsoon during 1987-88 was about Rs. 4,000 as against Rs. 1,300 during monsoon period. Cost per kg of fish is much higher during monsoon as the catch per unit of effort (CPUE) is very low. Even cost per trip was higher during monsoon.

The contribution of premonsoon to the annual income is highly fluctuating. As in the case

of monsoon and postmonsoon there is not any definite trend in the catch as well as in the income during this period.

For purse seines, about 80% of the annual income is earned during postmonsoon. The average revenue per day of operation is also much higher (Usually more than double) than that of premonsoon period. The only gear which shows a better performance during premonsoon as compared to other seasons is trawlnet. During 1987-88 about 55% of the annual income of trawler was earned during premonsoon. The revenue per trip during this period also was about 50% higher than postmonsoon period. Gillnet (mechanised and motorised) operation is mostly confined to postmonsoon season. However gillnet operation by OBM has been recently started during monsoon season.

Along Karnataka Coast, during monsoon there is no mechanised trawl or purse seine fishing at all. Since more than 15,000 fishermen are engaged in mechanised fishing and most of them are only wage earners, it is a difficult task to provide all of them employment during monsoon either in fishery sector or in any other sector that too during a period when overall employment opportunities are comparatively less. The recently introduced *Mattubala* is essentially for monsoon operation and it is estimated that about 50% of the usual workers in mechanised fishing get employment in *Mattubala*, *Kairampani* and gillnets.

In traditional sector, because of the recent introduction of motorisation of country crafts, employment potential has been much improved. About 10,000 artisanal fishing units are under operation along the Karnataka Coast. Since most of these units are not fully engaged throughout the year, only about 20,000 fishermen are estimated to be employed in this sector at a time. In the absence of mechanised fishing during monsoon only less than 50% of the artisanal fishermen are employed that too at sub-subsistence level.

Kerala

Kerala Coastline is about 600 km. The State occupies the foremost position in marine fish production in India, accounting for almost a quarter of total marine fish landings of the country. Marine fishing using traditional gears like boat seines, shore seines, stake nets and Chinese dipnets is an

age old occupation of the coastal fishermen. Mechanisation was started in the late fifties by Indo-Norwegian Project first at Quilon. A major technological development namely the shift from cotton to synthetic nylon nets took place during early sixties. Trawl fishery was introduced on an industrial footing by mid-sixties. Commercial purse seining started by late seventies confined only to Cochin area without further expansion. Motorisation of country craft began in early eighties and its development at present is too fast. Kerala's fishermen population is about 7 lakhs and there are 304 fishing villages along the coastal area.

Kerala contributed more than 50% of the country's export earnings from marine products mainly consisting of prawns, especially penaeid group which is a major component of prawn landings in Kerala. More than 50% of this earning is contributed by monsoon catch because of the heavy landings at Sakthikulangara during this period.

The trawlers earn maximum income during monsoon season. The revenue per trip during monsoon is much higher than that in other season. It is mainly because of the *Karikkadi* fishery during monsoon at Sakthikulangara areas and a few other centres.

Only about 45 purse seines are operating at Cochin Fisheries Harbour. About 80% of the annual revenue of purse seiners is earned during postmonsoon period.

For drift gillnets also maximum earning is accounted for postmonsoon period. Catch rate and average revenue per trip is also highest during postmonsoon period.

The socio-economic studies conducted in the selected villages along the west coast revealed that the majority of the fishermen families, mainly those who depend on the traditional way of fishing for their livelihood find it difficult to tide over the monsoon period which is characterised by slack fishing activities. However along Kerala Coast there are some centres where fishing activity specially artisanal fishing is brisk. Poonthura fishing village in the Trivandrum region is one such centre where fishing is carried out throughout the year whereas at many other centres in this region fishing remains suspended during monsoon months as the artisanal fishermen find it difficult to launch

their catamarans through the breakers. Catamaran is the major fishing unit under operation in this area. Catamarans operate mainly either hook and line or gillnet. During the period 1985-86, the average catch per day of operation worked out at 11 kg during premonsoon (February-May) and 81 kg during monsoon (June-August). The average gross revenue per day of operation worked out at Rs. 98 during premonsoon, Rs. 298 during monsoon and Rs. 92 during postmonsoon. Out of the annual income of Rs. 38,000 for a catamaran unit about 50% was earned during the 3 months of monsoon. However the corresponding catch was about 60%. Value realised per kg of fish was less during monsoon than other seasons. It was Rs. 8 per kg during premonsoon, Rs. 4 during monsoon and Rs. 5 during postmonsoon. It is actually a sort of exploitation of the situation by middlemen or traders. Along the west coast, especially Kerala Coast, monsoon is a lean season and generally fish prices are ruling high. However fishermen at certain centres where monsoon fishery is active, cannot take the advantage of overall scarcity of landings, because of the abundance in monsoon catch at these centres which helps the traders to pull down the price. But at interior markets prices will be higher than those during other seasons and traders can take full advantage out of it. The lower level of average value realised per kg of fish during monsoon may also be due to the occurrence of cheaper variety of fishes more in the catch. Catamaran operating gillnets also showed the same trend. About 50% of its annual revenue is obtained during the monsoon period. For motorised canoe postmonsoon is the peak season and about 55% of the annual income is earned during this period. The average value realised per kg of fish is minimum (Rs. 5.53) during postmonsoon and maximum during premonsoon (Rs. 6.63). Average catch per unit per day of operation does not show much variation between postmonsoon (85 kg) and monsoon periods (74 kg).

About 1.5 lakh fishermen are engaged in actual fishing along Kerala Coast and about 1 lakh people are engaged in all other fishery allied activities. About 20,000 fishermen are engaged in mechanised fishing, of that 70% are in trawlers. The only fishing unit which earns about 50% of its annual income during monsoon period is the trawler. Hence, as compared to Karnataka Coast employment situation of those engaged in mecha-

nised fishing in Kerala is not much affected during the monsoon season. But due to rough weather non-mechanised fishing is restricted only to few centres. For traditional fishermen it is almost a fishing holiday and most of them take loans to tide over this season. Due to the reduction in fish landings during monsoon the freezing plants, ice factories and other processing units cannot work to the full capacity and the workers in these units have to face full or partial reduction in employment as well as wages.

Monsoon fishing and its socio-economic implication

Except commercial trawl and gillnet fishing at few centres, near about subsistence level of fishing is noticed in northwest coast during monsoon. Economic evaluation of fishing operations shows that monsoon fishing provides a surplus revenue over operational expenditure for different types of craft and gears. It accounts for about 20% of total annual revenue for different types of units. At a few centres trawl fishing is somewhat profitable along northwest coast, but hardly 10% of the units are operating during monsoon. Since boats are not insured against the risk involved in fishing during rough sea, only new and good conditioned units operate during monsoon. In most of the mechanised units contracted labourers are engaged during fair season (September-May) and during the monsoon period the family members and people from different units join to operate. Generally, catch and operating expenses are shared by the crew members.

There is no significant conflict specially in monsoon fishing between mechanised, OBM units and non-mechanised units throughout the northwest coast. Since there is no intensive fishing by a particular type of unit or a gear no conflict is arising over the issue of encroachment of area of operation between different groups of fishermen.

The socio-economic factors do not warrant the imposition of blanket ban on monsoon fishing unless it has got adverse biological effects on the stock. The fishermen in general have to depend on fish traders and money lenders for loan during monsoon due to the insufficient income. Those, who can manage fishing during rough weather, even though at subsistence level will be in a position to employ themselves during monsoon.

Along southwest coast, generally, postmonsoon is the peak season for all types of fishery activities and monsoon is a lean period. In Karnataka there is no mechanised fishing during monsoon period. Along Kerala and Tamil Nadu Coasts during monsoon there is intensive fishing both by trawlers and non-mechanised units including motorised crafts at certain centres. Premonsoon is almost a lean season throughout this region except for trawlers. Trawler is the only type of fishing unit which earns about 50% of its annual income only during the monsoon period. For all other types of units as a whole, less than 20% of the annual income is earned during monsoon period.

The socio-economic studies conducted in the selected villages of this region indicated that the seasonality of the fishery considerably affects the living condition of the fishermen in many ways which can be summarised as follows :

1. The major portion of the fishing income is received during few months mostly during postmonsoon period. Since the fishermen are not in the habit of saving and in most of the cases income is not sufficient to cover day to day expenses and for repayment of loan, they are forced to take further loans during lean season.
2. They produce a commodity which is highly perishable and due to the absence of storage facilities, marketing, co-operative societies or even proper regulated markets, they dispose off their catch at the terms of local traders.
3. They are employed only during few months in a year because of the seasonality of the fishery. There is no alternate employment opportunity in the coastal areas. Most of the fishermen especially those who are engaged in active fishing, are not skilled in attending any other work. Generally they do not want to leave their villages. Even if some of them move out, it is only for fishing. Hence due to seasonality of marine fishing, a number of mandays is wasted in the fishing villages which could be planned to divert for some productive purposes.
4. Since fishing is concentrated to a limited period it is difficult to set up permanent regulated markets at the primary (landing centre) level itself and also the marketing infrastructure.
5. The capacity of processing units, ice factories, curing yards and other infrastructure

facilities cannot be fully utilised, so it is difficult to establish such facilities at most of the landing centres.

No doubt, monsoon is a nightmare for fishermen of west coast and it creates tension and uncertainty among them. It is highly essential to focus attention on the practical problems encountered by the fishermen due to the onslaught of southwest monsoon and to evolve ways and means to overcome them.

SUGGESTIONS

1. Throughout the west coast the major problem for fishermen during the monsoon is loss of fishing days due bad weather. There is no alternate employment opportunity during this period. Hence it is essential to find out alternate employment potential. For the coastal area the most suitable scheme is the development of brackishwater aquaculture. Other intergrated projects can also be formulated with proper institutional arrangement for the sustained supply of required inputs.

2. Since the quantity of fish produced during monsoon is very low it reduces the average household income of the fisherfolk and consumers do not get sufficient quantity of fish at reasonable price. It provides opportunity to middlemen to exploit the situation to their own benefit. The major step, to be taken to overcome this, is the proper distribution of the fish produced during peak season. This can be done only by establishing adequate storage and processing facilities at all major landing centres. Usually there will be glut in the market during peak season atleast for some species every year. In such cases the fishermen dispose off the fish at throw-away price. This can be avoided by establishing a public agency to purchase the fish at minimum support price and the fish can be disposed off during monsoon after the required processing. Such an agency must arrange adequate distribuion system so that the fish can be transported and marketed at interior places. This will help the producer to get a remunerative price and the consumer, the fish at a reasonable price.

3. During monsoon the fishermen face difficulties not only in actual fishing operation, but also in landing the catch. Most of the rural landing centres do not have proper jetty facilities. At many

centres fishing can be done even in monsoon if properly designed jetties are constructed.

4. Along the west coast, extensive waterlogged areas suitable for prawn farming are available. With adequate technical and financial support from the public agencies, these areas can be fully utilised for prawn fish farming so that more employment potential can be created for the marine fishermen who are unemployed or underemployed during the lean season for capture fishery.

5. The major problem along coastal rural area is the absence of economic activities other than fishing even during the peak season. A number of household ancillary industries such as net making and repairing, making of baskets, coir products, processing, curing and preparation of value added products have very good scope for providing employment to marine fishermen throughout the year.

6. Another major problem during monsoon is the credit requirement of fishermen families. Most of these families depend on money lenders, fish traders or boat owners for loans to tide over the monsoon season. Since it happens every year they cannot escape from the clutches of these middlemen who in effect keep them in poverty. The only way to save them from this situation is to formulate credit facilities through institutional financing with appropriate terms and conditions. In the present socio-economic frame work of our coastal rural sector the most suitable organisation for this purpose is the co-operative society of fishermen. Though it is considered as a failure in some States including Kerala and Tamil Nadu, its success has already been proved in Gujarat, Maharashtra and Karnataka to a certain extent. Even in these States, the co-operative movement among fishermen has not come up to the level of expectation, because the involvement of ordinary fishermen is only partial. Hence steps should be taken for full involvement of all fishermen to make the co-operative movement a success.

ACKNOWLEDGEMENT

The authors are grateful to Dr. P. S. B. R. James, Director, CMFRI, Cochin for his encouragement in the preparation of this article. Thanks are due to Shri. R. C. Sheno of the Institute for typing the paper and Smt. K. P. Salini for helping in data processing.