CHAPTER V

THE MARCH OF TECHNOLOGY IN THE FISHING INDUSTRY

Fishing, as it has been universally acknowledged is one of the oldest of industries known to mankind. It is not only a veritable source of livelihood for millions of people around the globe but has also been acknowledged as an unparalleled source of one of the most widely sought after items of food in both developed and under developed countries. Facts reveal that the contributions made to the GDP (Gross Domestic Product) by the production, processing and marketing sectors of the fishing industry have registered a phenomenal increase over the years. In this chapter attempts are made to show how new and sophisticated methods of fishing have made their entry into the coastal villages of Kanyakumari District as a prelude to an in-depth study on the environmental changes which have come about in the coastal villages as a sequel to them.

Fishing Crafts - the Most Ancient and the Most Modern

Traditional Catamaran

In Kanyakumari district, which was inextricably linked with the state of Travancore, Cochin for a pretty longtime, Fishing was done mostly by means of old fashioned catamarans. An average catamaran, which is today regarded for all practical purposes, as old fashioned and
anachronistic, is made of wooden blocks and bamboos poles. They are tied together by means of coir ropes and made sea worthy. Catamarans of this type, are operated by 3 able bodied men. It requires a lot of practical training skill and muscle power, to launch out into the sea against the furies of the ever roaring waves. Soon after reaching the other sides of the waves the fishermen do not find the sea water too rough to manage. Then the catamaran is vigorously oared by the men in action towards the desired direction. On their way they very often encounter problems such as violent tempests and alarming gales. They are dangerous, and they can easily topple the catamarans claiming the lives of these who are on board. The fishermen can change the direction of their sails from time to time to move smoothly towards the desired direction. The following three exhibits would show how the fishermen handle their fishing crafts that with and with out sails.
As it could be seen from the table which follows the exhibit, an average traditional catamaran measures longitudinally up to 7 meters. It can cover an area of 3 nautical miles. The quantity of fish which could be landed at a time usually veers around 25 Kilograms. The money made out
the catch is divided equally among the 3 men who handle the catamaran, leaving a share for the owner of the catamaran. The fish normally landed by these catamarans mostly belong to four species which include Nethali, Chavalai, Chalai, and Prawn.

The fishermen who handle traditional catamarans are known for their hardy hood. They are endowed with a remarkable muscle power and will power. No one can stand against the furies of the ocean in the absence of these two attributes. They don’t use any life saving device at all. The stars, the steeples of churches and the light houses always give them a sense of direction. When they lose sight of them they tend to drift towards unknown directions until they reach their watery bier. In Kanyakumari district, as it is quite common in other districts also, traditional type of catamarans are yielding place to fiber catamarans and mechanized boats. The table which ensues would give an empirical portrayal of the decline which has set in quite conspicuously in the catamaran sector.
The rates at which the traditional catamarans have registered a decline over the years have been brought out rather impressively by the following trend models fitted for table 5.2. The b value in all the trend models is negative. The reason for this state of affairs is not far to seek. It
is self evident in is . In their quest for profits, better living conditions and a sunny future for their children the fisher folks are going in for better means of fishing. Consequently the old crafts are being replaced by the new ones. The discussion which ensures would show how traditional types of catamaran have been replaced by catamaran fitted with outboard machines, mechanized fiber catamarans, mechanized vallam, and mechanised boats.

**Mechanised Catamaran**

Mechanised catamaran is in use in 40 coastal villages. In coastal villages such as Puthenthurai, Kesavan Puthenthurai, Pozhikkarai, Periyakaadu and Rajakkamangalam Thurai where the sea is always rough with billows giving to great height during high tides traditional catamaran are found to be very useful.
The Mechanised catamaran as it could be seen from the above exhibit is fitted with an outboard engine. It has an Rpm ranging from 8 to 12. The kerosene consumption of an outboard engine ranges from 20 to 25 liters per day. The distance covered in terms of nautical miles (1 nautical mile = 1.8 kilometers) ranges from 4 to 6. The cost of a catamaran with outboard engine is Rs.74000/-. The fish landed by an average
mechanised catamaran ranges from 40 to 60 kilograms. The investigator could see in the course of his survey a mechanised catamaran is operated by 4 persons. The income earned is shared equally among them leaving one equal share to the owner of the catamaran. Fishermen using mechanised catamaran are equipped life saving devices such as life jackets, safety ropes and marine compasses. In addition to these they carry with them a cell phone to get into touch with their friends in the high seas or on the shores during times of disaster.

The following tables show these basic features. The bar diagrams which follow the table would enable one to visualize the extent to which the use of mechanised catamarans has grown over the years. The linear trend models which come close on the heals of the diagrammatical representations, give a clear idea of the rate of growth registered by the mechanised catamaran during the years under consideration. From the b values one can make meaningful comparisons between villages with regard to their proclivity towards mechanisation.
Fibre Catamaran

Fibre catamarans are of recent origin. After the Tsunami disaster fibre catamaran have been introduced to facilitate the growth of fishermen. A glance through the following exhibit and table would give a clear idea salient of its features and the costs involved in getting one. It is
important to observe here that fishermen in almost all the coastal villages have become proud owners of fibre catamaran with the help of NGOs, Government support and other social service organizations, including INGOs.
The advent of fibre catamaran has resulted in the fading away of the traditional type of catamaran into oblivion. However, it cannot be denied that there still easiest the traditional type of catamaran in certain villages where the relief materials have not yet reached the fisher folk. Further, the fishermen in coastal villages such as Puthenthrurai, Kesavan Puthenthrurai, Pozhikkarai, Periyakaadu and Rajakkamangalam Thurai,
purposely avoid the fiber catamarans for the simple reason that they could be easily turned upside down when the sea becomes very rough. In the remaining areas, as the sea is not rough and the high tide is not fierce, the fibre catamaran has almost thrown the traditional catamaran made of wood, out of use. The following table would show how the number of takers for the fibre catamaran is bouncing forward ever since their advent in 2005 which marks the beginning of the post Tsunami era.
This table could be given a diagrammatical representation as shown below. The bar diagrams show the levels of popularity gained by the fibre catamaran in all the 45 fishing villages in Kanyakumari district.
The investigator has adequate grounds to hold that traditional catamaran will become a thing of a past in the years ahead.

**Vallam**

Vallam is an intermediary between the traditional catamaran and fibre catamaran on the one hand and the mechanized boats on the
other. It has certain unique features. They could be seen from the following exhibit.

A close study of the above exhibit is very crucial to understand how significant they are to exploit with relatively more efficiency the potentials of the fishing industry. Generally speaking a vallam needs two teams of committed fishermen to keep it operational on all days in a month with the exception of Sundays. The nautical miles which could be covered by a vallam and its fish harvesting capacity could be better understood from the following table.
As it could be seen from the above table vallams are little bit expensive. They cost on an average 2 lakhs of Rupees. Its life span is expected is estimated at 8 years. They have the capacity to hold 60 to 100 kilograms of fishes. As vallams can take the fishermen far into the sea landing of fishes such as Squid, Velameen, Neimeen, Prawns, Neduva, Mackeral and Tuna which have a world wide market, becomes quite possible.
The use of the vallam is on the increase in most of the coastal villages. It is a welcome feature indeed. In fact it angers well for the fishing industry in Kanyakumari district. The table and bar diagrams and the trend models which follow give a vivid portrayal of the dent made by vallam on the fishing industry over the years.
In fact vallam, as a fishing craft, has been instrumental in fast tracking the growth prospects of the fishing industry in Kanyakumari district.

**Mechanised Boat - Small (9.8 meters)**

In Kanyakumari district there are two kinds of mechanised boats in use. For the sake of convenience they could be identified as
mechanised boat (small) and mechanised boat (big). The investigator has dealt with these two types of fishing crafts rather exhaustively. The empirical findings have been reduced to a table as shown below.
Mechanised boats are designed in such a way as to suit the oceanic fishing environment in Kanyakumari district. The investigator could see is the course of his study that this kind of boats could be used in places like ChinnaMuttom, Kanyakumari, Colchel and Thengaipattanam. These coastal areas have certain natural advantages for harbouring such fishing crafts. The other coastal villages do not have such a natural environment. So the use of such boats is not possible in these villages. One of the unique characteristic features of boat fishing is that it goes on without any break both during night and day for 2 to 3 days. These boats
are equipped with a mariner’s compass, life jackets, safety ropes, freezers, cooking facilities, toilet facilities, storage facilities, recreation facilities, lighting facilities. These features could be well understood from the following two exhibits.

The general trend about the growth of mechanized boat (small) could be understood in clear term from the following table which is accompanied a diagrammatic representation and the linear trend models.
The trend models show the how the ‘b’ values are encouraging for the mechanized boat (small) sector in Kanyakumari district.

**Mechanised Boat - Big (16 meters)**

Mechanised boats (big) could be seen in places like ChinnaMuttom, Kanyakumari, Colchel and Thengaipattanam where there are natural harbouring facilities. Their features could be better understood from the following two exhibits.
An average mechanised boat (big) measures 16 meters longitude. Its market value ranges from 46 lakhs to 75 lakhs. It has a storage capacity of 225 to 500 kilograms of fish. Its coverage in terms of nautical miles (1 nautical mile = 1.8 kilometers) ranges from 72 to 82 nautical miles. They catch all varieties of fishes during their week long stay, store them in deep freezers and land them in their respective harbours as fresh as ever. The extent to which their uses have grown over the years could be better understood from the following table. The bar diagram which accompany this table will help any casual reader of this thesis to visualize their growth in numbers during the years under consideration.
The trend models given above help the investigator to be specific about their respective growth rates during the years under consideration in the four coastal villages which enjoy in an abundant measure natural harbouring facilities.

**Fishing Nets**

Fishing net is another important fishing device which has been in use from time memorial. There are different types of fish nets. Their dimensions depend on the nature of catch for which they are used.
Mentioned below are some of the most popular kinds of fishing nets in the coastal villages of Kanyakumari District.

**Nethali Valai**

Nethali is one of the most delicious fishes available in Kanyakumari district. Though it looks like a typical shrimp, it is available in plenty during the month of Karthigai (from Mid November to mid December). There is no denying the fact that it could be caught in certain other nets as well. This fish is so small in size that a special kind of net is used for catching it. Normally the holes of the kind of fish nets are 5mm in diameter. The net is known as ‘kachavalai’. Traditionally this fish net was produced by means of cotton threads. Later an nylon thread was used for this type of net.

**Chalai Valai**

Chalai valai is a special type of net. The nets should have 12mm holes. The fishermen casually launch in to the sea with chalai valai around 2 am during the chalai season they came back with their catch around 6 am on the same day. Once the catch is evaded by fishermen carry them in head loads to the auctioneers.

**Lobster Net**
Lobster, as it is well known, is a very good type of fish which is used mostly for export purposes. It has vibrant local market. However, overseas markets are preferred with a view to make more profits. It is a relatively big holed net which is used more as a trap than anything to catch more lobster. The fishermen who intend going in for lobsters instead of other varieties, usually require a lot of skill in handling down. It is usually done is that they placed them at the cave openings of the rocks under the sea. Special buoys are used to identify their position. The next morning they renewed and brought to be shore. The lobsters assure the fishermen of very high income.

**Karamadi**

Karamadi does not have an English equivalent because it is used by fishermen of Kanayakumari district alone. The principle involved in using it is very easy to explain. The fishermen lower a karamadi in the sea at a distance which is quite convenient for keeping the net under operation from the seashore itself. It is cast in to the sea in the night around 9 pm and it is pulled to shore with the ropes of attached with by fishermen who form a team of 10 and stand apart from one another at the 100 meters. Once it is brought to the shore the team gathers round it separates the catch from the net before it is send for auctioning. This is the costly net with tiny holes at one end and develops to bigger holes net for equal distance for
about 25 meters. This net is a kind of trap that it is thrown into the sea. The two ends of the nets tied by the long ropes (kambam) pulled by a group of fishermen about 20 by both sides, when it is pulled the smallest size of fish along with the bigger ones trapped inside the net. When the net reaches ashore the fishes are alive and very fresh. This also ridiculously expensive net and this holes are most 5 mm in dimensions. It is used invariably to catch very small fishes which have a very good market in the district itself. The fishes caught in Karamadi are usually delicious. People going for it because brought to the market fresh from the shore. There are three types of such nets. The cost of these nets varies from one another on the basis of size and quality. It could be seen from the following table.

TABLE No. 5.13
KARAMADI - SIZE, PRICE AND QUALITY

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>Size</th>
<th>Price (in Rs.)</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Karamadi-02 Nautical Miles</td>
<td>22 meters</td>
<td>25,000</td>
<td>Cotton Thread</td>
</tr>
<tr>
<td>2</td>
<td>Karamadi-03 Nautical Miles</td>
<td>25 meters</td>
<td>80,000</td>
<td>Nylon Thread</td>
</tr>
<tr>
<td>3</td>
<td>Karamadi-04 Nautical Miles</td>
<td>30 meters</td>
<td>1,00,000</td>
<td>Nylon Thread</td>
</tr>
</tbody>
</table>
A close look at the above table shows how there exist different types of Karamadi with different prices.

**Dredges**

Dredges act like small trawl to collect mollusks and other sluggish sessile organisms. Some are hydraulic and use jets of water to dislodge the mollusks from the bottom and wash them into the dredge bag or directly onto the boat via a conveyor belt. In Kanyakumari district this type of nets are called Mady. The difference between Karamadi and ‘Mady’ is that the latter is cast into the sea several kilometers away from the shore by means of mechanized boats. The fishermen at a time cast four or five nets in and around a particular place which they think are haunts of fishes. The withdrawal of the net is carefully times by means of a trawl which is a hydraulic device. The fishes obtained are immediately taken to the coast. The ways karamadi and dredges are handled are one and the same. But the differences are centered on the positions which the fishermen take in handling them from the sea shore or by a means of a hydraulic device positioned the boats. A typical ‘madi’ is made out by hi count nylon threads.

**TABLE No. 5.14**
A look at the above table would show the different variants of a typical ‘madi’ are used by fishermen in the coastal villages of Kanyakumari District. The prices changed are based on the quality of the stuff with which they are made on one hand and the size of them measured in terms of length and weight.

**Hand Net**

Hand nets have been in use since very early times. They are held open by a hook positioned at and are possibly on the end of a long stiff handle. They are used for sweeping up fish near the water surface. In England, hand netting is the only legal way of catching eels. It has been practiced for thousands of years on the Rives Parrett and River Severn. The
investigator could see in the course of his study that these nets are used by the fishermen who carry on the fishing activities in estuaries, tanks, channels and ponds. In the coastal villages like Puthenthurai, Pallam, Muttom and Kodimunai this kind of fish net is used mostly by the fishermen still depending on traditional type of catamaran referred to earlier.

Trawl

A trawl is used mostly by fishermen who move along the high seas in mechanized boats fitted with high duty engines to handle trawls. This is quite a large net, conical in shape, designed to be towed in the sea or along the sea bottom. The trawl is pulled through the water by one or more boats, called trawlers. The activity of pulling the trawl through the water is called trawling.

Casting the trawl is not an easy task. The methods involved in using it could be better understood from the following discussion on the working of trawls.

Working of a Trawl

The idea that fishes are passively “scooped up” is commonly held, and has been in vogue since trawling was first developed. But, however, this notion has been found to be erroneous. Since the
development of scuba diving equipment and cheap video cameras, it has been possible to directly observe the processes that occur when a trawl is towed along the sea bed.

The trawl doors disturb the sea bed, create a cloud of muddy water which hides the oncoming trawl net and generates a noise which attracts fish. The fish begin to swim in front of the net mouth, but do not seem to be distressed by it. As the trawl continues along the sea bed, fish begin to tire and slip backwards into the net. Finally, the fish become exhausted and drop back, into the “cod end” and are caught. The speed with which a trawl is towed depends on the swimming speed of the species which is being targeted and the exact gear that is being used. For most demersal species, a speed of around 4 knots (7 km/h) is appropriate.

Gill Nets

Gill nets passively depend on the fish entangling themselves in the meshes of the net, usually being held fast by their gill covers. An example is the drift net used for pelagic fish, but in many areas it is now superseded by purse seines and pelagic trawls. Drift nets are walls of netting suspended from floats on the surface. Those used in the East Anglian herring fishery were only 70m/230 ft long but were set in fleets up
to 4 km /2.5 miles long. Herring were caught in them as they came up to the surface at night to feed. Other types of gill net can be used near the sea bed, and one, the trammel, is still used quite commonly in inshore fisheries along the south coast of England. This typically consists of a curtain of large and small- mesh netting into which the fish swim, forcing the small-mesh net into the large and becoming trapped in a net bag.

The discussions so far held have presented a clear picture of the fishing gears and crafts used widely in the coastal villages of Kanyakumari district. As it could be seen form the discussions Kanyakumari District has been enjoying the unique distinction of cling on to antiquity with regard to the use of crafts and gears. Though highly sophisticated mechanised boats are owned by the fishermen of Kanyakumari district, they are being used for business purposes only in the waters of neighbouring state of Kerala. It is a wonder that the fishermen in kanyakumari villages have registered impressive rates of growth with regard to their production potentials using traditional catamaran. Catamaran with outboard machines, fibre boats and mini mechanised boats.