

## FISHING METHODS OF KARWAR WATERS\*

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### ABSTRACT

As knowledge on fishing gear and fishing methods is essential for scientific and judicious exploitation and management of any capture fishery, a survey was undertaken to study different types of gears and fishing methods used both in inshore and estuarine (Kali Estuary) waters of Karwar. Different types of gears and crafts used to catch demersal and pelagic fishes in inshore waters and a brief account of various types of indigenous methods in practice to catch different species of finfish and shellfish in the estuarine waters are discussed.

### INTRODUCTION

KARWAR ( $14^{\circ}48'30''\text{N} - 74^{\circ}07'42''\text{E}$ ) is one of the important fish landing centres on the central west coast of India forming a part of the 144 km stretch coastline of Uttara Kannada (Fig. 1) of Karnataka State. The waters of Karwar Coast abound in economically important food fishes like mackerel, sardine, sciaenids and prawns, as can be seen elsewhere on the west coast of India. The fisheries of Indian waters are mainly supported by large number of pelagic and demersal fish which are exploited by different types of crafts and gears. However the major share is contributed by conventional or traditional methods (Neelakantan, 1981) and the exploitation at Karwar Coast was not an exception till the advent of mechanisation.

There is little information about the different fishing methods of Karwar waters except for

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few studies by Sorley (1948), Pradhan (1956) George and Nayak (1961) and Neelakantan (1981). Thus keeping in view of the importance of methods of fishing in the exploitation of the

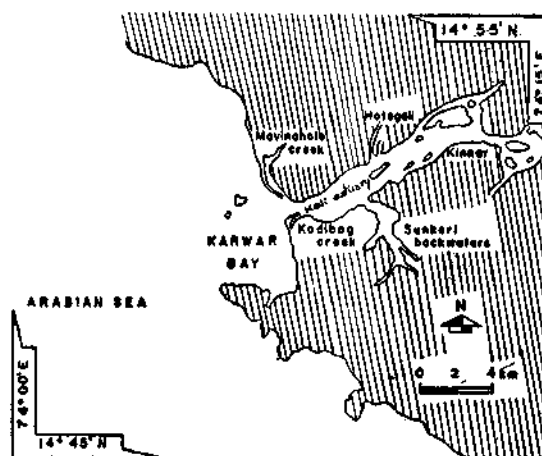


FIG. 1. Karwar coastal area and Kali Estuary. fish resources, a study was conducted to understand the different methods, both traditional and modern in terms of fish landings over a period of six years.

Sea fishing in Karwar till the advent of mechanisation was mainly carried out employing the traditional methods which form an integral part of country's heritage. Just a couple of decades ago, the fishing was mainly confined to nearshore waters for distances that could be safely covered by conventional crafts. For the first time, mechanisation was introduced in Karwar with the arrival of trawlers during 1961-'62 followed by the purse-seiners during 1975-'76. Side by side, few of the country boats were also mechanised by outboard engines almost during the same period. Thus the fishing industry gained an instant momentum which not only increased the total catch, but also the extent of area exploited, not to neglect the fact that mechanisation also helped in the replacement of hard labour of fishermen and greatly reduced their exposure to risks at sea. Thus a silent transitional change was felt in the fishing industry soon after the introduction of mechanisation.

The main types of crafts that are used in Karwar includes rampani boats, yendi boats, out-rigger boats, plank-built and dug-out canoes, while the important gears are rampani, yendi, shore-seines, gill nets, boat-seines, drift nets and hook and lines. The mechanised fishing includes trawlers, purse-seiners and motorised boats. The type of gear used by traditional fishermen depend on local conditions, seasons and distance covered from the shore.

An account of the different types of gears used, season of operation, type of fishes caught and the main areas of operation both in inshore and estuarine waters are represented in Table 1.

#### METHODS OF FISHING

##### *Traditional/Conventional*

**Rampani:** This is the conventional type of gear used by the fishermen of both Uttara

Kannada and Dakshina Kannada Districts of Karnataka State. It is believed to have been introduced by a Portuguese priest Rev. Fr. Rampon. It is a version of shore-seine and sometimes exceptionally large consisting about 400-600 pieces laced together. Each piece is about 10-12 metres long with varying breadth. The mesh size of the gear decreases from the outer end towards the centre while the thickness of the twine increases from the outer wing towards the central part. Basically rampani net consists of three parts—a central portion called 'chikkanable' joined on either sides by wing-like nets. Usually the length of the wings constitutes 85-95% of the total length of the net. Another feature of this net is that the length of the net can either be increased or decreased by adding or removing few pieces as and when required. The head rope of the net is kept buoyed with wooden floats and the foot rope weighed with stones which act as sinkers. A large float is fixed on the centre of the net to indicate the entire position of the net.

**Operation:** About 80-90 fishermen are required to operate this net depending on the number of pieces the net has. A Rampani out-rigger boat measuring 15-16 m, locally called as 'Pandy' and 4-6 dugout canoes locally known as 'Dhoni' are used in the operation of the net.

When a shoal is detected by the pilot boat, the pandy boat is steered in a semicircular path paying one end of the net and bringing back the other end of the net surrounding the shoal. The small dugout canoes are used to keep the net in erect position. Then the net is dragged at either ends bringing the catch ashore or at times kept impounded for few days and is caught in stages depending on the demand. For catching the impounded fish a small shore-seine called 'Kai-rampani' or 'Yendi' is used. Sardines and mackerel are the main fishes caught by rampani operations. The

TABLE 1. Gears employed, season of operation and fishes caught from Karwar waters

Fishing gear	Season of operation	Fishes caught	Main areas of operation
<i>Inshore waters</i>			
Purse-seiners	August-May	Pelagic fishes mainly Mackerel and Sardine.	Inshore waters
Trawlers	August-May	Demersal fishes mainly Sciaenids, Prawns, Sharks, etc.	Inshore waters
Gill nets	September-May	Seerfish, <i>Chirocentrus</i> , Tuna, etc.	Inshore waters
Rampari	August-March	Mackerel, Sardine, etc.	Inshore waters
Other non-mechanised boats	Throughout the year	All fishes that come near to the shore.	Inshore waters
<i>Estuarine waters</i>			
Gill nets (Small)	Throughout the year	<i>Teuthis</i> sp., <i>Eetroplus</i> sp., <i>Chrysophrys</i> sp. etc.	Sunkeri, Nandangadda
Cast nets	Throughout the year	Mulletts, Prawns, <i>Engraulis</i> sp., <i>Equilla</i> sp. etc.	Sunkeri, Kodibag, Mavinahole Creak
Line fishing	Throughout the year		
(a) Hand lines with bait of mussel/Clam meat /Wheat flour/Polychates.		<i>Gerrus</i> sp., <i>Eetroplus</i> sp. <i>Sillago sihama</i> .	Kodibag, Sunkeri
(b) Hand line with algal bait		<i>Teuthis vermiculata</i> , <i>Eetroplus</i> sp.	Kodibag, Sunkeri, Mavinahole
(c) Hand line with chick intestine bait		<i>Chrysophrys berda</i> .	Kodibag
(d) Bottom long-line with fish pieces		Crabs.	Sunkeri, Mavinahole Creak
Scare lines			
(a) With cast nets	September-March	Mulletts.	Sunkeri, Mavinahole Creak
(b) With bag net	September-March	<i>Eetroplus</i> sp., Catfish, <i>Scatophagus</i> sp., Prawns.	Sunkeri
Light fishing	Throughout the year	Prawn, Mulletts, Crabs.	Sunkeri, Mavinahole Creak
Drag net	September-March/April	Prawn seeds.	Sunkeri, Mavinahole Creak, Hottegalli.
Scoop net	Throughout the year	Prawns and Crabs.	Sunkeri, Mavinahole Creak

main advantage of Rampani is that the catch can be kept impounded for few days and can be caught whenever there is good demand.

*Yendi or Kairampani*: The shore-seine 'Yendi' is a smaller version of Rampani. This gear is operated throughout the year upto a depth of 5 m for small shoals of mackerel and sardines near the shore. It consists of 50-60 pieces with length ranging between 400-500 m with a depth of 7-8 m. The operation of this net is almost similar to Rampani. A small 'Pandy' and two canoes with about 20-30 persons are required for its operation. Mackerel, sardines and sciaenids constitute the bulk of the catch.

#### *Boat seines*

(a) *Maribala*: Maribala is a boat seine locally called as 'Gal bala' operated in the inshore waters upto a depth of 30 m. It involves three small dug-out canoes or out-rigger boats, one for scouting the fish shoals and the other two called 'Maribala dony' for encircling the shoal. The net is attached in both the donys and ventured into the sea when the pilot boat gives the signal detecting a shoal. First the two donys move outwards and then parallel to each other to give maximum spread to the net thereby encircling the shoal. The hauling is carried out fast and the fish gets confined in the bag of the net. The important fishes caught by this gear includes sciaenids, catfishes, and at times pomfrets and rays.

(b) *Chikkaebala*: Chikkaebala is identical to maribala in construction and operation. This gear can be operated upto a depth of about 6-10 m and the catch mainly consists of miscellaneous varieties of fishes. Here the pilot boat is not used and two small canoes operate the net specially during non-monsoon periods.

(c) *Bangadabala*: The net gets its name as it is exclusively used to catch mackerel which is locally called 'Bangada'. The boats used

in the operation of this net are canoes and the number depends on the availability and need. They are manned by a crew of about 6-10 members. The mesh size of the net ranges between 3.0- 3.5 cm and is uniform throughout.

The mode of operation is by way of encircling the detected shoal and the net extends from surface to the bottom of the ground except when operated in deeper waters.

Usually the operation is carried out during the early morning hours by one or more boats. When the shoal is detected, the boats encircle the shoal paying their net in the form of an arc, thus effecting the catch. Most of the times 3 or 4 persons are seen operating the net and at times using a single boat.

#### *Gill nets*

Gill nets are passive type of gear used to catch moving fishes from different layers of water column and are generally classified as surface, midwater and bottom gill nets. The nets may be allowed to drift along with the wind, tide or current or the nets are set at a particular position by anchoring which are likewise referred to as drift gill nets and set gill nets respectively. The nets are of different dimensions depending on the type of fishes to be caught. The main feature of the net as its name implies, the fishes are caught behind their gills in the net which necessitates the use of nets with varying mesh sizes for different species of fishes. Locally these nets are referred as 'Pattaebalae'.

The gill nets are usually operated during night times by the help of out-rigger canoes or plank-built motorised boats. The nets are hauled twice, once at midnight and other during morning hours.

Besides these types of gears other indigenous gears like cast nets, hook and line, long lines are also operated along Karwar Coast.

*Mechanised fishing*

Purse-seining and trawling constitute the backbone of mechanised fishing together with other boats fitted with outboard engines which are mainly used in gill net fishing, heralding a new era in the fish catching methods of Karwar Coast.

*Purse-seining* : Purse-seiners were introduced in Uttara Kannada during the year 1975-'76 and went on operation since 1977 which at present dominates the other gears in the total fish landings. The purse-seining technique is an innovation employed to catch pelagic shoaling fishes by encircling them by long webbing of netting. Depending on the number of boats used, the operation is termed single boat purse-seining or two boat purse-seining. When the net has encircled the shoal, its bottom is pulled together joined by a string so that an artificial pond of webbing is formed which holds the catch. In Karwar Coast, the bulk of the purse-seine catch comprises of mackerel, sardine, silverbellies and anchovies, etc. Purse-seine is actually the name given to the type of net used in the purse-seining whose mesh size ranges between 13-14 mm, 45 mm and 9 mm at the upper portion, margin of the net and at the bunt portion respectively. The gear is operated at depths ranging from 30 m to 60 m deep.

The craft used in purse-seining measures 12.1 m to 14.6 m and at times bigger vessels are also seen, measuring 27.3 m to 30.3 m. Another small boat called skiff or scout boat is also employed in the operation and used as an anchor to keep one end of the net when the boat cruises encircling the shoal.

*Trawling* : Trawlers were first introduced in Karwar during 1963 under Indo-Norwegian project and later on private entrepreneurs took to mechanised fishing by switching over to trawlers during 1967 heralding a new era.

Usually the otter trawlers operate at depths ranging between 20 and 60 m. Fishing season starts immediately after the monsoon from September and lasts till May. The length of the trawlers range between 9.1 to 12.7 m in length with engine capacity of 45 HP. to 65 HP. The gear used in the trawling basically consists of a large bag made of synthetic netting which is drawn along the sea bed on or near the bottom to catch demersal and benthic fishes and shellfishes. The operation of the net is similar to any of its kind elsewhere.

*Methods of fishing in estuarine waters*

The fishing methods practised in Kali Estuary at Karwar are conventional in nature and diversified. The important indigenous gears used in this estuary are gill nets, cast nets, lines and drag nets.

*Gill nets* : Gill nets of varying size are operated all along the Kali Estuary to catch various species of fish. Usually the nets are operated after seven in the evening and during early hours before sunrise. As the nets are set along the width of the estuary, the fishermen are left with no choice, but to operate between the said hours to avoid inconvenience to other artisanal fishermen and smooth navigation of other crafts. When a net is set at a particular area it is indicated to moving crafts by continuous flashing of the light on either side of the shore as a precaution. The gill net catch comprises of mixed variety of estuarine species of fish (Table 1).

*Cast nets* : Cast nets are locally called as 'beesu bala' or 'pal bala' and are operated either from the shore or from a boat both in inshore and estuarine waters. Two types of nets are prevalent in Karwar viz. stringless with peripheral pockets and stringed without peripheral pockets. The nets with closing strings and without peripheral pockets are more common in and around Karwar. The mesh size of the net varies depending on the type of fish

to be caught. The cast nets are mainly used to catch adult prawns, mullets, lady-fishes and silverbellies, etc.

At times group fishing by using cast nets are also witnessed at Karwar. In this method more than eight fishermen with their dug-out canoes converge from different areas and form a circle and operate their nets simultaneously. This method enables the fishermen to cover a big shoal of fishes such as mullets whenever they are encountered. The same technique is followed in shallower waters which is accessible without the use of boats. About 30-40 cast nets are seen operated everyday all along the coast on an average.

**Line fishing :** Different types of line fishing are carried out along the estuary, among them hook and line, pole and line are the notable ones.

**Hook and line :** In this method, different numbered hooks with baits are tied to a line to catch different varieties of fishes. The operation is done either from the shore or from a dug-out canoe by single fisherman. Different types of baits are used depending on the type of fish to be caught. Thus polychaetes, wheat flour bait are also used for catching *Sillago sihama*, *Gerres filamentoses* besides clam meat, mussel meat and chicken viscera as baits. Algal bait is used for catching *Teuthis vermiculata* and *Etroplus suratensis* while chicken intestine for catching *Chrysophrys berda*. For catching crabs, bottom lines with bait of fish pieces are used in this region.

**Pole and line :** This is another version of line fishing wherein the hook and line is attached to a piece of pole, the length of line being  $1\frac{1}{2}$  times the length of the pole so that fishes at a distance can be caught without the use of canoes.

**Scare lines :** These are not the gears as such, but are used as accessories in other fishing

methods, like cast net and bag net operations. Here the coconut leaves are tied together using lines at regular intervals and used to scare the fish shoals to move towards the area of operation of the cast net and bag net. Mulletts are mainly caught by this method.

**Drag nets :** Drag net is a piece of nylon net with varying dimensions mainly used to catch prawn seeds in the backwater during low tides. Usually the length of the net exceeds double the width. This gear is operated by two persons by holding them at both the ends and dragging it above the bed for about 8-10 minutes.

**Scoop nets :** It is nothing but a piece of nylon net attached loosely to a rectangular wooden/metal frame and is used to catch prawns by fishermen children.

**Light fishing :** During night times, especially during lunar days lights are used to catch fishes. The light is made use to attract fishes and are caught by different gears like cast nets and drag nets.

**Crab fishing :** Crab fishing is yet another type of indigenous method practiced to catch crabs in the estuarine and backwaters by using bamboo traps with baits kept inside. Here a round shaped trap made of bamboo splits with bait inside is lowered into the bottom of the water which serves as a resting place for crabs. After every 3-4 hours the fisherman will haul the bags slowly to catch any crabs taking rest inside the trap. Thus in a day it can be operated several times without actively engaging in the operation.

**Clam fishing :** The Kali Estuary is rich with different species of clam resources like *Meretrix meretrix*, *M. casta*, *Paphia malabarica*, etc. The collection by way of hand-picking is the most interesting scene that can be witnessed everyday when the clam beds are partially exposed during the low tides. Groups of people both women, men and children alike

actively take part in the collection and the clams are scooped from the sand by means of small rakes.

bed to collect clam along with the sand. Then the clams are separated from the sand which is more efficient than hand-picking. Another

TABLE 2. Fish landing (tonnes) from mechanised and non-mechanised boats during 1981-82 to 1986-87 at Karwar (Source : CMFRI, 1981)

Year	Purse seine	Trawlers	Gill nets	Total (Mech.)	Rampani boats	Country boats	Total (Non-mech.)	Catch (Total)	Total Value (Rs.)
1981-82 ..	4,258.8	4,895.3	97.5	9,251.6	37.5	1,087.1	1,124.6	10,376.2	5,64,56,800
1982-83 ..	3,967.8	5,357.8	107.2	9,432.8	4.0	1,408.8	1,412.8	10,845.6	3,32,45,900
1983-84 ..	3,847.3	6,897.8	35.8	10,780.9	3.3	1,109.3	1,112.6	11,893.5	3,26,55,930
1984-85 ..	8,497.5	6,528.5	110.0	15,136.0	—	1,550.0	1,550.0	16,686.0	4,08,12,200
1985-86 ..	19,053.9	4,343.0	33.0	23,429.9	—	1,469.6	1,469.6	24,899.5	6,30,44,200
1986-87 ..	7,192.5	6,599.2	43.5	13,835.2	—	1,227.6	1,227.6	15,062.8	5,38,13,800

However, specially designed gears are also used for the collection of clams. It consists of a semi-circular frame attached to a hori-

advantage of this method over the hand-picking is that clams can be collected in areas where the depth of water is more.

TABLE 3. Gearwise percentage to the total fish landings (tonnes) during 1981-82 to 1986-87 at Karwar

Gear	1981-82		1982-83		1983-84		1984-85		1985-86		1986-87	
	Catch	%	Catch	%	Catch	%	Catch	%	Catch	%	Catch	%
<i>Mechanised</i>												
Purse-seine ..	4,258.8	46.03	3,967.8	42.06	3,847.3	35.69	8,497.5	56.14	19,053.9	81.32	7,192.5	51.99
Trawlers ..	4,895.3	52.91	5,357.8	56.80	6,897.8	63.98	6,528.5	43.13	4,343.0	18.54	6,599.2	47.70
Gill nets ..	97.5	1.06	107.2	1.14	35.8	0.33	110.0	0.73	33.0	0.14	43.5	0.31
Total ..	9,251.6	100	9,432.8	100	10,780.9	100	15,136.0	100	23,429.9	100	13,835.2	100
<i>Non-mechanised</i>												
Rampani ..	37.5	3.33	4.0	0.28	3.3	0.3	—	—	—	—	—	—
Country boats ..	1,087.1	96.67	1,408.8	99.72	1,109.3	99.7	1,550.0	100	1,469.6	100	1,227.6	100
Total ..	1,124.6	100	1,412.8	100	1,112.6	100	1,550.0	100	1,469.6	100	1,227.6	100

zontal structure struck into the ground to which a conical bag net is fixed. The whole gear gives the appearance of a bow. The bag net is dragged or scooped over the bottom of the

#### GEARWISE FISH LANDINGS

An account of the fish landings by mechanised (Purse-seines, Trawlers, gill nets and

other mechanised boats) and non-mechanised boats (Rampani and other country boats) during the period 1981-'82 to 1986-'87 at Karwar is given in Table 2 (Source : Department of Fisheries, Government of Karnataka). While wide fluctuations are seen in the annual catch by mechanised boats from year to year, there is a stagnation in the fish landings by non-mechanised boats. The magnitude of landings by mechanised boats is ten-folds higher than that of non-mechanised boats. Nothing can be derived out of the fluctuation in the total value of the landing due to differential cost factor, value of the rupee and market conditions.

Table 3 gives a picture of the gearwise percentage catch to the total fish landings during 1981-'82 to 1986-'87 at Karwar. It can be seen that till 1983-'84, trawlers played an important role in the total fish landings followed by purse-seines and the percentage catch by gill nets and other mechanised boats are negligible. But with the fast growth in the number of purse-seiners the major share to the percentage landing has been taken over by this particular gear during 1984-85 and is still continuing. In the case of non-mechanised boats, the major share was contributed by country boats which includes gill nets, while the age old traditional method of rampani contributed negligible share, the operation of which has been even abandoned after 1983-'84. Now very rarely once or twice in a year its operation can be witnessed at Karwar when the fishermen spot a big shoal near the shore.

The catch per unit for different gears to the total catch is given in Table 4. A unit denotes one type of boat operating one type of net. Thus a purse-seiner operating a purse-seine is one unit; a canoe operating a line is yet another unit; a rampani operating a rampani net is yet another and so on.

TABLE 4. Total catch (tonnes) and catch per unit (kg) for different gears

Gear	Year	Average No. of units operated	Total catch	Catch/Unit
Purse-seines	1981-82	288	4,258.8	14.78
	1982-83	312	3,967.8	12.71
	1983-84	320	3,847.3	12.02
	1984-85	377	8,497.5	22.53
	1985-86	422	19,053.9	45.15
	1986-87	244	7,192.5	29.47
Trawlers	1981-82	863	4,895.3	5.67
	1982-83	1234	5,337.8	4.34
	1983-84	1131	6,897.8	6.10
	1984-85	850	6,528.5	7.68
	1985-86	759	4,343.0	5.72
	1986-87	839	6,599.2	7.87
Gill nets	1981-82	59	97.5	1.65
	1982-83	28	107.2	3.82
	1983-84	24	35.8	1.49
	1984-85	35	110.0	3.14
	1985-86	14	33.0	1.42
	1986-87	34	43.5	1.28
Rampani	1981-82	50	37.5	0.75
	1982-83	3	4.0	1.33
	1983-84	1	3.3	3.33
	1984-85	—	—	—
	1985-86	—	—	—
	1986-87	—	—	—
Other mech. boats	1981-82	1590	1,087.1	0.68
	1982-83	2015	1,408.8	0.69
	1983-84	2120	1,109.3	0.52
	1984-85	2435	1,550.0	0.63
	1985-86	2710	1,469.6	0.54
	1986-87	2725	1,227.6	0.45

The total fish landings for the six years 1981-'82 to 1986-'87 and the catch according to the type of fishing unit are shown in Tables 2 to 4. Also, the monthly fluctuations in the catch for the year 1986-'87 are given in the Table 5.



TABLE 5. Gearwise fish landings (tonnes) in different months during 1986-87 at Karwar

	PS	U	Mechanised					Non-mechanised			Total (M+NM)	Value (Rs.)		
			T	U	G	U	M	R	U	O			U	NM
April 1986	.. 56.5	8	944.0	120			1,000.5			105.5	220	105.5	1,109.0	43,83,000
May	.. 19.5	4	618.5	44	—	—	638.0	—	—	97.9	210	97.9	735.9	40,28,000
June	.. —	—	47.0	8	—	—	47.0	—	—	65.1	170	65.1	112.1	55,71,500
July	.. —	—	15.9	12	—	—	15.9	—	—	54.0	240	54.0	69.9	4,25,500
August	.. 305.0	20	338.8	80	—	—	643.8	—	—	105.2	210	105.2	749.0	23,61,900
September	.. 1,911.0	50	19.0	4	2.5	3	1,932.5	—	—	105.8	240	105.8	2,038.3	56,42,600
October	.. 2,265.5	45	13.0	5	—	—	2,278.5	—	—	149.9	220	149.9	2,428.2	56,95,500
November	.. 1,521.0	45	34.0	5	3.0	4	1,558.0	—	—	100.2	225	100.2	1,658.2	41,42,500
December	.. 224.5	15	943.0	110	5.0	3	1,172.5	—	—	79.7	260	79.7	1,252.2	53,09,600
January 1987	.. 290.5	18	943.5	110	11.0	5	1,245.0	—	—	110.0	240	110.0	1,355.0	82,74,400
February	.. 356.0	25	1,410.0	180	13.5	9	1,779.5	—	—	111.8	240	111.8	1,891.3	71,65,700
March	.. 243.0	14	1,272.5	160	8.5	10	1,524.0	—	—	142.0	250	142.0	1,666.0	58,13,600
Total	.. 7,192.5	244	6,599.2	839	43.5	34	13,835.2	—	—	1,227.6	2725	1,227.6	15,062.8	53,81,38,000

PS : Purse seine catch  
R : Rampani catch  
U : Number of units.

T : Trawl catch  
O : Other non-mechanised boat catch  
M : Total mechanised catch

G : Gill net catch  
NM : Total non-mechanised catch

It can be seen from Table 4, the marked fluctuation in the catch/unit for different gears during these years. During 1981-'83, the increase in the catch/unit were marginal though there was increase in the number of units operated when compared to the catch/unit during 1983-'84. During this particular year, the catch/unit was almost double the previous years even when the number of units operated were more than in the preceding years. The same trend continued in the next year also to be followed by a slack season later. In the case of trawlers, gill netters and other non-mechanised boats, there was not much variation in the trend. But it can be seen that, the trawl and gill net catches were stabilised unlike the purse-seine catch irrespective of the number of units operated. Contrary to the developments, the downward trend in the non-mechanised catch is very clear. Not only the operation of the Rampani has been stopped, the catch per unit of other boats also dwindled year after year. Thus it is evident that the purse-seine is the most effective and also unreliable gear when compared to other gears.

The major share to the annual fish landings came during the month of September-November

during 1986-'87 (Table 5). Major portion was contributed by purse-seines followed by non-mechanised boats. But during the remaining period of the year the catch was dominated by the landings of the trawlers. In spite of year round operation of non-mechanised boats, their total catch falls far below to that of mechanised boats.

Though at all India level major fish landings are brought by conventional methods of fishing, the picture is different at Karwar Coast. Major share to the total landings of fish in Karwar Coast is brought by mechanised vessels as can be seen from the landings during the study period. There is a ten-fold difference in the landings between mechanised and non-mechanised boats. This is not surprising in a State where the number of mechanised boats per kilometre of coast line is the highest in the country. The catch from the non-mechanised sector is staggering over one thousand tonnes per year during the period of study. This is the sector wherein there is need to improve the fishing techniques to boost the landings and to save the traditional fishing industry since the men involved in this sector are the real fishermen of the country.

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