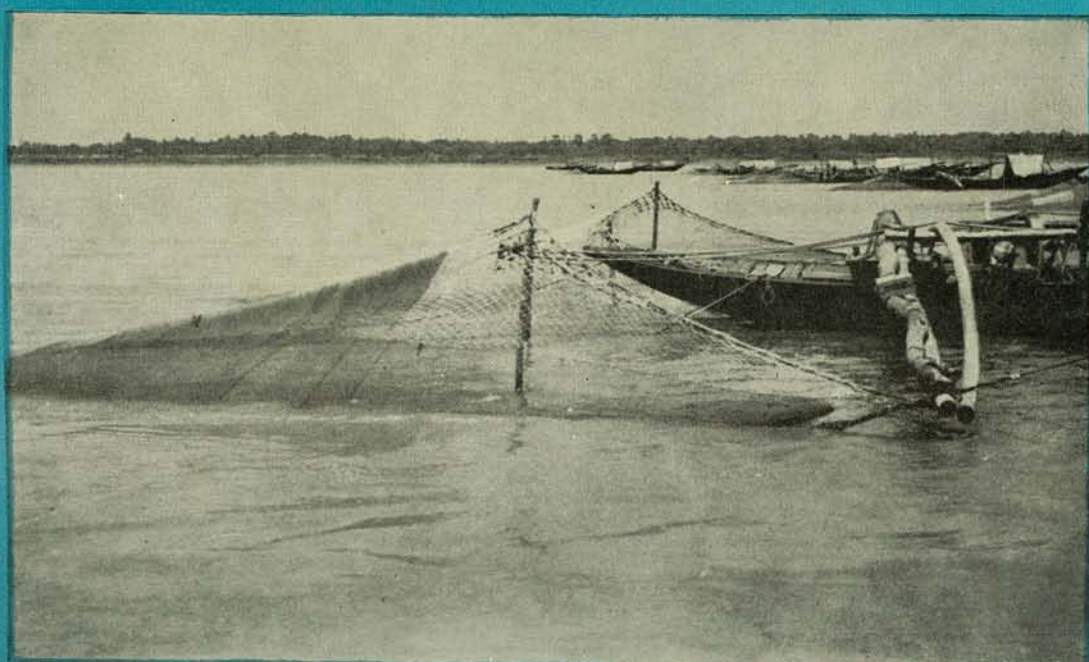
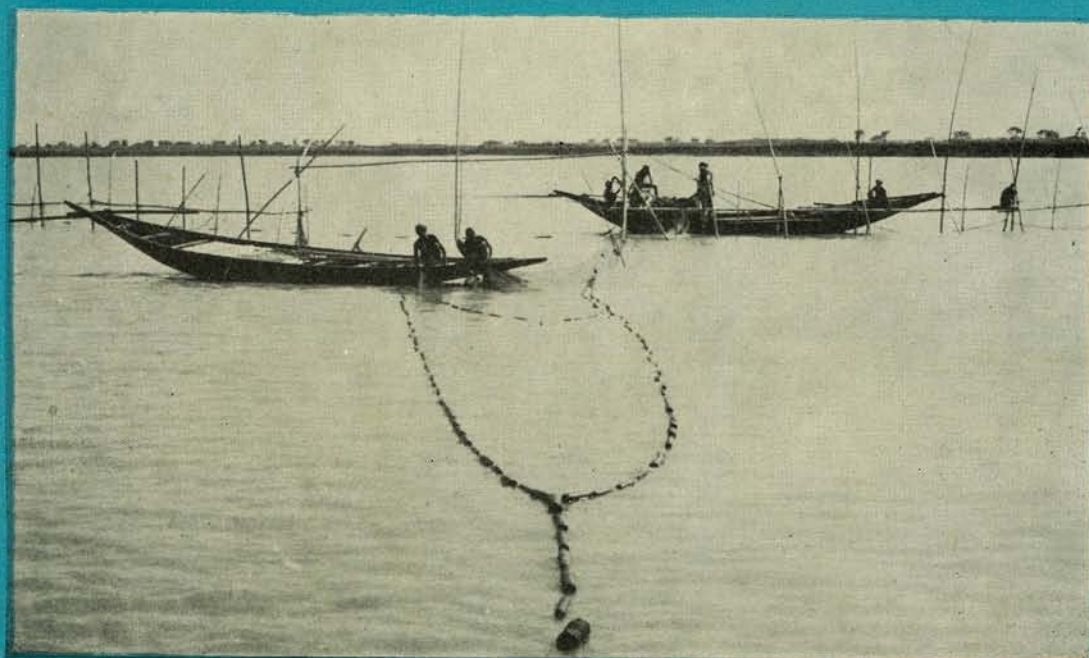


FISHING GEARS OF THE UPPER AND THE MIDDLE HOOGHLY ESTUARY



CENTRAL INLAND CAPTURE FISHERIES RESEARCH INSTITUTE
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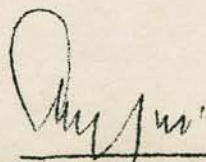
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Central Inland Capture Fisheries Research Institute
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FOREWORD

The Hooghly Estuary with its deltaic region spanning across about 0.8 million ha in the Bay of Bengal is perhaps the largest estuarine system of the world and forms the mainstay of the capture fisheries of India. It sustains a major multispecies commercial fishery providing a source of livelihood to about 25,000 to 30,000 fishermen and a flourishing trade. A variety of gears and tackles are operated round the year in different parts of the estuary for commercial exploitation. These gears are so varied that for a single gear there may be several modifications in shape and size. These modifications are often made considering the fishery of a particular species. An understanding of the fishing gears and tackles is extremely essential for estimating the extent and fluctuations in the population of the multispecies fishery and the distribution of the species in space and time in the Hooghly Estuarine System. An inventory of the fishing gears and tackles, currently being operated in the freshwater zones of the Hooghly estuary, was carried out by the Institute during April 1982 to October 1983. Socio-economic aspects of the fishing communities, their holdings in terms of gears, boats and other fishing implements were also taken into account for the census. The findings of the survey are embodied in this bulletin. It is hoped that these results will prove very useful for the fishery scientists in determining the level of exploitation in view of the changing fishing patterns in the Hooghly Estuarine System.



A.G. Jhingran 13.3.87
Director

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ABSTRACT

An inventory survey of the crafts and the gears employed for the resource exploitation in the upper and the middle Hooghly estuary as well as its tributary, Rupnarayan was conducted during April 1982 to October, 1983 by the Estuarine Division of the Central Inland Fisheries Research Institute, Barrackpore. The present communication dealing with the results of the survey highlight the significant structural changes in the gear inventory relating to the drift gills and other nets specially operated for capturing Hilsa ilisha. The plausible reasons for the increase or decline of different gears in the regions covered are discussed. Income from fishing appears to be the main causative factor leading to increase or decrease of a particular gear in its operations. The size and average cost of principal gears, areas, seasons of operation and the main species caught have also been presented.

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Hooghly estuarine system in the State of West Bengal sustains world's important multi-species commercial fishery. A large variety of fishing gear and tackle are operated in different stretches of the estuary for commercial exploitation of the fishery resource and about 15,000 fishermen families earn their livelihood by exploiting the fishery of this unique estuarine system of the world. Equally large number of fish traders and others are engaged in the trade of the produce and in the supply of fish exploitation craft and gear.

The inventory of fishing potential of the Hooghly Estuary comprising the enumeration of active fishermen, their holdings of craft and gear was conducted about 25 years back. Several factors have accumulatively contributed to a major change in the fishing potential and exploitation of fishery resources of the estuary. These may be enumerated as -

i) The commissioning of the Farakka Barrage in April 1975 to augment freshwater discharge to Hooghly estuary to keep the port area navigable and desilt lower estuary has resulted in a major change in estuarine ecology and the associated environment. The structure of commercial catches from the estuary has shown marked changes particularly in the upper estuary.

ii) The pressure of urbanisation and industrialisation on its banks of upper Hooghly and the pressure of large settlement of migrated refugees from the erstwhile East Pakistan has changed the fishermen population.

iii) The income from fishing vis-a-vis other sectoral engagements in the fast developing urban complex of Calcutta has undergone a change depending on costs and returns of operation of different gear and their catch structure.

iv) The shift from age old cotton nets to nylon net has taken place.

In view of the above, it was felt desirable to conduct a fresh census of the crafts and the gears employed for this resource exploitation in the Hooghly estuarine system. The socio-economic aspect of the fishing communities, such as the number of active fishermen engaged in fishing, their holdings in terms of boats, gear and other fishing implements were also taken into consideration for this census, initiated by the Estuarine Division of the Central Inland Capture Fisheries Research Institute during April 1982 to October 1983 by conducting village-to-village survey. The main objectives of these investigations were to account for,

- 1) to quantitatively assess the structural and concentration changes in the fishing potential of the estuary during the last 25 years.
- 2) to ascertain the number of actively operating fishermen and their owner/labour structure.

- 3) to provide a sampling frame for development of a modified sampling design for estimation of catches.

COVERAGE

Since the principal factors contributing the change were most likely to affect the middle and upper stretch, as has been observed in catch structure and ecological studies, this inventory was limited to upper and middle estuary and its tributary, Rupnarayan (Fig.1). The upper stretch or zone extends from Nabqdwip (the station being 149 km upstream of Calcutta) to Baranagar (near Calcutta) and the middle zone from Baranagar to Diamond Harbour (the station being 48 km downstream of Calcutta). Thus, a total stretch of 197 km of the estuary was covered in this survey besides, the tributary Rupnarayan. In the upper and middle stretches of the Hooghly estuary as well as its tributary, Rupnarayan, both banks have numerous fishing villages with varying concentration of crafts and gears. Fishermen villages situated on Hooghly estuary along with its tributary were covered in this survey. The lower estuary (marine zone, comprising the Matlah and lower Sunderbans) has been least affected by the Farakka Barrage. The socioeconomic structure has undergone nominal changes and fishing patterns have remained fairly stable. Accordingly, the inventory, which is highly costly, was deferred there. Moreover, the sampling system requiring a new frame was relevant to upper and middle stretches only. In the lower estuary, landing centres provide the frame and sampling system is different.

DATA COLLECTION : METHODOLOGY

The information was elicited by interviewing the owners of at least one gear or a boat, operating in the estuary for purposes of fishing in a household survey of all fishing villages. Each household possessing a gear/boat was interviewed for gathering information on the type of gear or tackle, material used, cost, number of men/boat required for its operation, size of nets (in case of drift and gill nets, set barrier nets, seine nets), the number of pieces of nets laced together, piece size, mesh size (the no.of meshes at mouth in case of bagnet) and in case of longlines, the number of hooks and so on, seasons of operation, principal fishes caught etc. The above information was recorded in a schedule (Appendix I). To bring about cost effectiveness, this survey was conducted in conjunction with the fish catch survey. This resulted in saving travel costs very effectively and did not require additional manpower.

RESULTS AND DISCUSSIONS

The survey revealed that 302 fishermen villages existed in the upper and middle stretches of the Hooghly and its tributary, the Rupnarayan (hereafter designated as Region I, II and III respectively) and there were over 7 thousands fishermen possessing at least one net each. The active fishermen population engaged in actual fishing operations was found to be about 14,821 x out of which where were over 8 thousand (57%) wholetime fishermen, fishing being their principal occupation. The regions covered

in the investigation thus provide livelihood to about 8500 families directly and a further sizeable population through employment connected with the fishery, and its trade. Table-I presents the total census figures of fishermen villages, number of fishermen possessing at least one net, manpower engaged in fishing etc. In the upper stretch, Sanyalcher on the east bank and Balagarh on the West bank are the two villages with maximum concentration of gear and fishermen. In Rupnarayan tributary, Deygram and Jamitya are the two villages with maximum concentration of gears and fishermen population.

Table-I

Regions	No.of fishermen villages	No.of fishermen possessing at least one net	No.of boats engaged in fishing	Fishermen population engaged in actual fishing		Total
				Principal occupation	Part time occupation	
I	164	3421	2284	3206	1404	4610
II	61	1453	1401	1940	3051	4991
III	77	2364	1315	3309	1911	5220
Total	302	7238	5000	8455	6366	14821
%				57.0	43.0	

A wide variety of gears and tackle are operated round the year in the Hooghly estuarine system for commercial fishing. Some of them are selective for a particular species, whereas others account for a number of species caught during operation giving multi species nature of the fishing. The entire fleet of gears available

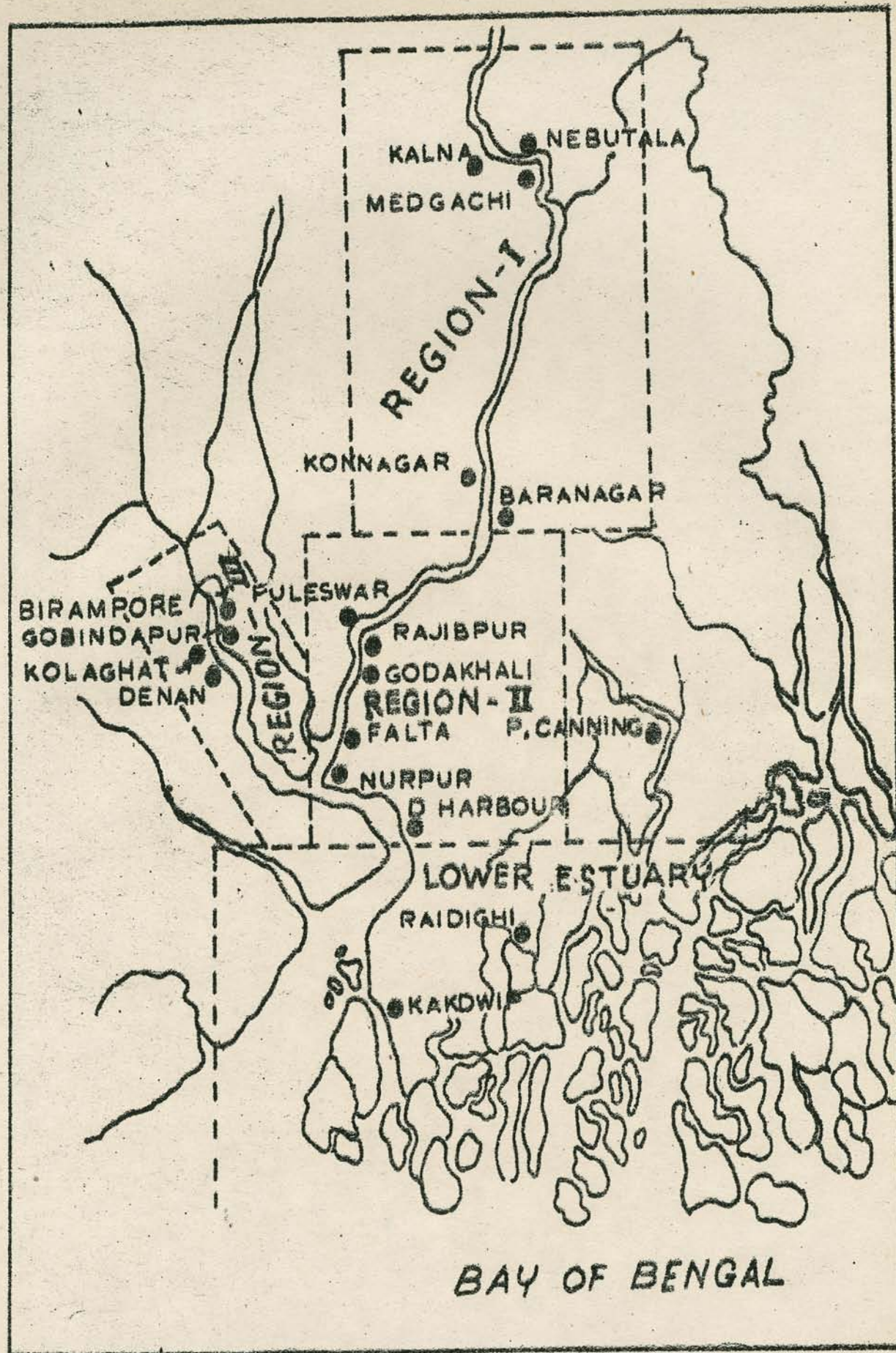


Fig. 1. Hooghly-Matlah Estuary showing different regions covered in the survey.

is non-mechanical. Based on the mode of operation, the gears encountered in the Hooghly estuary have been classified into the following major groups : (1) trawl nets, (2) Seine nets, large and small (3) purse or clap nets, (4) drift gill nets, (5) lift nets, (6) cast nets, (7) bagnets (stationary), (8) set-gill nets, (9) set-barrier nets, (10) hooks and lines, (11) trap nets. The Table II present the different types of gears, their local names, area and seasons of operation and the main species caught. Time to time the information in this regard have earlier been presented by different workers; Hornell (1922-28), Naidu (1952), Mitra (1952) and Dutta et. al. (1973).

The highly variable "unit dimension", especially in such gears where units are formed by assembling a few pieces makes it difficult to precisely define a unit for a particular gear. The units operated were also highly variable in size, mesh size etc. Fishing gears representing a variety of gears were observed in the 3 regions covered during the survey. It was seen that over the past 25 years the use of the nylon thread has almost replaced the cotton thread webbing of the fishing nets operated in the different regions. Table III presents the total number of different gears that have been observed in the village to village survey during 82-83 in regions I, II & III in the upper and middle stretch of the Hooghly estuary. The data presented indicated that the structural changes in the gear inventory were very significant. A marked decline in seines, purse (or clap) nets, lift and long lines has been observed. Trawls and trapnets which were not operated in regions II & III also

showed a marked decline in region I. Operation of cast-nets also decline in region I & III as indicated in their low numbers but in region II it has increased. The gears that are operated for capturing hilsa indicated a significant change in their numbers except for purse net (Table 3). The maximum increase in numbers (98083) was observed in case of drift nets in zone III. In zone I & II also a significant increase in the numbers of drift nets was observed. The comparative figures are presented in Fig. 2 (Table 3). Set barrier nets too showed marked increase in all the regions over the 1956-58 level of inventory. Bagnets also showed increase in regions II & III, but in region I it has gone down although the total number of bagnets remaining almost the same in the regions covered.

Purse net, a selective gear exclusively used for catching Hilsa, has been a very common gear in earlier years. But because of lower magnitude of yield as is reflected by its CPUE (catch per unit effort), a switch over to the drift gill nets with a higher CPUE is the only plausible explanation accounting for the decline of purse nets and increase in the number of drift gills for exploitation of hilsa in the estuary. Besides, purse net is operated in deeper waters and the general loss of depth in these regions of the estuary in recent years made the net ineffective too.

The catch by gears viz. trawl, lift, cast and traps comprise small size prawns and other commercially unimportant smaller varieties of fishes mostly. The

TABLE-II : Principal gears operated in the Hooghly estuary

Type of gear	Local names	Main seasons of operation	Area where usually operated	Principal species caught
Bag nets (Stationary)	1) Been (2) Behundi 3) Thor	November to June and occasionally in monsoon	1) & (2) all regions 3) region II only	<u>Setipinna</u> spp., <u>Pama pama</u> , <u>Pangasius pangasius</u> , <u>Sillago</u> <u>Panijus</u> , <u>Polynemus paradiseus</u> <u>Sciaena biauritus</u> , <u>Coila</u> spp. small sized <u>Hilsa ilisha</u> , <u>Eutropichthys vacha</u> and prawns.
Drift gill nets	1) Chandi, (2) Dholi, 3) Kona	1) Monsoon and winter- June to March and occasionally in summer months (intensity greater in monsoon) (2) November to May (3) Monsoon only	1) All regions 2) Upper and Middle areas of region I 3) Region I only	Mainly <u>Hilsa ilisha</u> .
Purse nets	Sanglo, Dar, Khirki	Same as chandi	Region I	<u>H. ilisha</u> only.
Trawl nets	Moi, Buro, Katni, Kelte	All seasons except monsoon	Upper and middle areas of region I	Mainly prawns
Cast nets	Bachari and Khepla	All seasons	Region I & II	Prawns
Lift nets	Seitki, Nanka-Bhesal, gara-bhesal, veshali, papa	All seasons	Region I	Mainly prawns.
Hooks and lines	Barsi	All seasons	Region I & II	<u>P. pangasius</u> , <u>P. pama</u> , <u>P. paradiseus</u> , <u>Rita rita</u> and Prawns.
Set gill nets	Khuti, Nangar, Patang	Monsoon and winter	Region I	<u>H. ilisha</u> , <u>Catla catla</u> and <u>Labeo rohita</u>

Contd....

Type of gear	Local names	Main seasons of operation	Area where usually operated	Principal species caught
<u>Seine nets</u>				
(a) Large	Kochal, Jungla	November to February (Occasionally in monsoon)	Coastal region of lower estuary	<u>H. ilisha</u> , <u>Tachysurus jella</u> , <u>Stromatous cinereus</u> , <u>S. biauritus</u> , <u>Setipinna</u> spp., <u>P. pama</u> , <u>Polynemus</u> <u>indicus</u> , <u>Eleutheronema tetradacty-</u> <u>lum</u> .
(b) Medium & small	Ber, Chatber	All seasons except monsoon	All regions	<u>P. pama</u> , <u>S. panijus</u> , <u>Settipinna</u> <u>phasa</u> , <u>H. ilisha</u> (young) and prawns.
Set-barrier nets	Charghera, Char- pata, Pata	All seasons	All regions	<u>P. pama</u> , <u>S. phasa</u> , <u>S. panijus</u> , <u>P. pangasius</u> , <u>Aorichthys aor</u> , <u>Liza corsula</u> , <u>C. catla</u> , <u>Wallago</u> <u>attu</u> , <u>Mystus gulio</u> and prawns.
Traps	Bitti, Dwar-bitti	All seasons except monsoon	Region I	Prawns.

TABLE-BII: Census figures of different gears in Region I, II & III

Regions	Gears	Trawl		Large seine		Small seine		Purse		Drift		Lift	
		82-83	56-58	82-83	56-58	82-83	56-58	82-83	56-58	82-83	56-58	82-83	56-58
I	430	439	1067	1413	9204	6595	9375	4335	12329	67976	49435	1483	3648
II		-	551	551	3534	837	2717	52	2262	56892	42563	23	395
III		-	-	77	726	2864	3914	38	651	98083	36966	56	126
Total		439	1067	2041	13484	10296	16006	4425	15242	222951	128964	1562	4169

Regions	Gears	Cast		Bag		Set-gill		Set-barrier		Hooks		Traps	
		82-83	56-58	82-83	56-58	82-83	56-58	82-83	56-58	82-83	56-58	82-83	56-58
I		2434	4635	584	887	1196	680	2138	1311	136	186	4490	6386
II		681	396	1071	866	26	784	226	71	24	234	-	-
III		41	302	682	532	-	792	2476	-	-	27	-	-
Total		3156	5333	2337	2285	1222	2256	4840	1382	160	447	4490	6386

operation of such gears fetch low economic value. The economic factor of income from fishing may be main cause of decline of these gears in the regions covered. Although the catches by set-barrier nets do not differ much in qualitative composition as compared to the aforesaid four gears, the higher magnitude of yield by this gear as reflected by its CPUE, might have increased the number of this gear in all the three regions.

Some of the commercially important species viz. Polynemeus paradiseus, Pama pama, Setipinna spp., Pangasius pangasius which are usually caught by bagnet, have been showing a marked declining trend in region I in recent years due to major ecological changes after the freshwater release from Farakka Barrage. The poor abundance of these species might have caused the decline of bagnet operations in region I.

Going by the effort pattern, in the earlier years (56-58) it was observed that the bagnet dominated the gears in operation. However, in recent years the pattern has changed. Drift gill nets (hilsa gill nets) are equally, if not more, dominant as bag nets. This is well reflected by the much higher effort put in by different hilsa gill nets specially during monsoon and winter months in recent years (Table IV). Even in summer months a sizeable number of drift gill nets operate in the all regions whereas in earlier years operation of this gear was almost absent in summer months.

TABLE IV

Effort (net-tides) pattern of drift-gill net and bagnet in the regions covered

Year	Month	Region I		Region II		Region III	
		Drift gill	Bag	Drift gill	Bag	Drift gill	Bag
1981	July	45255	Nil	18740	5844	11243	Nil
	August	53884	Nil	20508	Nil	11226	Nil
	September	75673	Nil	18054	Nil	11713	Nil
	October	47054	894	12516	Nil	8904	1683
	November	23593	7074	1816	3039	6874	5002
	December	10284	7735	Nil	3623	2342	7384
	1982	January	18296	4880	776	5435	5168
February		26119	5610	3610	6515	9076	5225
March		27341	2199	698	9526	9121	4554
April		20175	3804	Nil	14026	6196	6229
May		18966	5711	Nil	15097	8045	6656
June		37952	2890	13751	3740	12724	2112
July		62932	Nil	21169	Nil	23786	Nil
August		58514	Nil	21891	Nil	16834	Nil
September		55403	Nil	20952	Nil	20589	Nil
October		23475	Nil	14723	Nil	14099	383
November		27265	5462	357	5260	6210	4552
December		43329	6183	1490	3925	7943	7253
1983	January	57642	5240	1048	7247	7735	6154
	February	44254	3074	Nil	7363	6365	8338
	March	31757	4137	Nil	13688	3784	24758
	April	8045	6204	Nil	20454	49	20993
	May	5238	6618	Nil	25866	Nil	28913
	June	29161	1794	1164	20648	575	24901
	July	38474	Nil	8901	526	9480	7232
	August	85634	Nil	15716	Nil	16977	1340
	September	97780	Nil	15737	Nil	14736	1872
	October	115161	54	14434	Nil	15713	2198
	November	29115	4204	13037	Nil	13293	1588
	December	22628	7017	12509	Nil	16066	8040

Contd ...12

Year	Month	Region I		Region II		Region III	
		Drift gill	Bag	Drift gill	Bag	Drift gill	Bag
1984	January	38606	5843	5773	701	17607	7912
	February	58699	3317	5176	2542	14058	10692
	March	64504	4062	4276	4771	8916	10380
	April	19551	10199	Nil	25714	Nil	19689
	May	8970	7995	Nil	34484	2201	15825
	June	16483	2537	5281	33545	14332	9682
	July	72741	892	38480	5584	19526	972
	August	80339	Nil	52117	Nil	12867	Nil
	September	72617	Nil	34927	143	26288	14552
	October	23450	2924	18951	97	15168	12825
	November	4152	11036	8398	8028	7887	19660
	December	23680	6371	6791	8548	4887	11916
1985	January	15026	3464	8567	5508	13594	9519
	February	15073	6509	17174	3750	15266	8837
	March	24023	7954	5625	13836	10377	11899

*. 1 net-tide = 1 net * 1 tide.

SIZE AND AVERAGE COST OF PRINCIPAL GEARS OF THE HOOGLY ESTUARY

Bag-net

The bag-nets operated in the Hooghly estuary exhibit distinct size variations in terms of mesh numbers at the mouth end. Accordingly the nets operated have been grouped into 4 distinct classes and their distribution in the three regions has been indicated in Table V.

TABLE-V
Distribution of bagnets

Region/Size (No. of meshes at mouth)	<800 (No.)	800-1000 (No.)	1000-1200 (No.)	1200 (No.)	Not available (No.)	Total
I	56	281	142	90	15	584
II	600	329	47	1	19	996
III	147	389	113	33	-	682
Total	803	999	302	124	34	2262

The cost pattern of the net depending upon the mesh numbers and the material used also varies. The average cost of a net for a given mesh size is indicated in Table VI. The cost pattern for both nylon and cotton nets have been given. However, the inventory has shown that only about 3% of the bag-nets are made of cotton yarn.

TABLE-VI

Size (No. of meshes at mouth)	Average cost (in Rs.)	
	Material used	
	Nylon	Cotton
300	350	N.A.
400	550	N.A.
500	800	600
600	1000	680
700	1500	750
800	1780	855
1000	2150	1075
1200	2780	1100
1500	3040	-
1800	4590	-
2000	5640	-

N.A. : Not available

The smaller size of bagnet with No. of meshes at mouth less than 800 is generally known as 'Thor' and is operated only in region II.

Drift-gill net

(a) The principal drift-gill net, locally called 'chandi' which mainly operates in monsoon and winter varies in dimensions and mesh size from area to area. The other drift-gill nets are 'Dholi' and 'Kona' which too vary in dimensions and mesh size. These nets are mostly made of nylon. Moreover these nets are operated by assembling a number of pieces which render difining units rather difficult. The number of pieces of 'chandijal' laced together to form a 'ber' for operation varies be-

tween 20 to 150 depending on sizes and area of operation. Drift-gills with varying piece and mesh sizes are operated in all the regions. The common average piece size (about 56% of total 'chandijal') found in the region I is 36' x 12' with average cost of Rs.45 with range of Rs. 40-60. In region II the common piece size is 36' x 24' (about 57% of total 'chandijal') with average cost of a picce being Rs. 70 and in region III the common size is 24' x 18' with average cost of a piece being Rs.40. The other different sizes of a piece with average cost in the 3 regions are tabulated below (Table VII).

TABLE-VII

Region	Piece size	% to total nets of the regions	Average cost (in Rs.)	Range of cost (in Rs.)
I	36' x 12'	56	45	40-60
	45' x 24'	10	76	60-80
	36' x 15'	21	62	60-66
	21' x 14'	5	35	30-40
	24' x 18'	4	45	40-55
	24' x 9'	3	25	-
II	36' x 24'	57	70	60-75
	48' x 24'	10	80	75-90
	50' x 45'	5	100	-
III	24' x 18'	40	40	35-45
	30' x 18'	10	45	40-50
	36' x 30'	4	68	60-68
	30' x 24'	11	50	45-60
	45' x 18'	18	50	-

It is seen from the table that the largest size (50' x 45') of this net is found in region II. The mesh size of drift-gills on an average ranges from 2" to 3.5".

(b) 'Dholijal' also called 'Ghono chandi' a drift-gill net with fine mesh size of about 1.5" is usually operated in winter in region I. Its catches mostly comprise young hilsa (size range 20 to 30 cm). These nets have also been observed with varying sizes. The two common sizes found in operation in region I are 36' x 20' (73% of total 'Dholijal') and 36' x 24' (21%) with average cost of a piece being Rs. 70/- and Rs. 80/- respectively.

(c) 'Konajal', another drift-gill net is only operated in region I and has 3 different sizes. The net with a size of 60' x 30' and with mesh size ranging from 1.5" to 3" is the common one, the average cost of each is Rs. 270/-, range being Rs. 230-300/-. The other sizes of this net are 30' x 45', 54' x 37' with mesh size ranging from 1.5" to 3" with average cost being Rs. 200 and 450 respectively. Usually 12 to 13 pieces are laced together to form a 'ber' for operation.

Purse net

The number of purse nets, generally known as 'Sanglojal' or 'Darjal' is negligible in region II & III as compared to region I. The average cost of this net, made of nylon almost wholly, varies according to net size and mesh size. The size of majority (over 95%) of 'sanglojal' is 24' x 12' with varying mesh size of 1.5" to 3.5". The cost of 'Sanglojal' ranges from Rs. 50 to 65/-, the ave-

rage being Rs. 53. The bigger sized 'Sanglojal' called 'Darjal' varies in size from 30' x 12' and 36' x 18' with average cost of Rs. 80/- and Rs. 90/- respectively. The net is usually operated in monsoon and winter months.

Trawl net

Trawl nets, locally named as 'Moi' or 'Buro' or 'Kelti' or 'Katni' at different places are operated only in the upper and middle areas of region I. Unlike other gears, trawl nets are mostly made up of cotton yarn. The cost of this type of net ranges from Rs. 140/- to Rs. 170/-, the average being Rs. 150/-. 'Kanti' is the large sized trawl net and costs Rs. 400/- on an average. Prawns and miscellaneous fishes are normally caught with its operation.

Castnet

The castnets of smaller and large size, locally called 'Khepla' and 'Bachari' respectively are mostly made up of nylon. The average costs of nylon made 'Khepla' and 'Bachari' are Rs. 142/- and Rs. 700/- respectively, the range of the latter being Rs. 650-800. The average cost of cotton made 'Khepla' is Rs. 82/-. These nets are operated all through the year in shallow waters.

Liftnet

There are different types of liftnet locally named as 'Seitki', 'Nauka-Bhasal', 'Gara-Bhasal', 'Veshali', 'Pala' and 'Thopa' depending on the mode of operation and size. Table VIII present different types of liftnet together with average and range of cost.

TABLE-VIII

Liftnet	Material used			
	Nylon		Cotton	
	Av. cost (Rs.)	Range (Rs.)	Av. cost (Rs.)	Range (Rs.)
Seitki (made up of cotton only)	-	-	80	65-90
Nauka-Bhasal	1100	1000-1200	755	700-800
Gara-Bhasal	1200	1200	782	700-800
Veshali	100	-	60	-
Pala (made up of cotton only and size 30' x 18')	-	-	80	-

Liftnet is usually operated throughout the year, the main species caught are prawns, Pangasius pangasius (young) and miscellaneous fishes.

Hooks and lines

The cost of Hooks and Lines, popularly known as 'Barshi' varied according to the number of hooks fixed to the ropes. The average cost classified by the number of hooks fixed to the ropes is as follows :-

<u>No. of hooks fixed to the ropes</u>	<u>Average cost (Rs.)</u>
500	250
800	400
1000	500
3000	1500

Hooks & lines are operated all seasons and the main species caught are P. pama and prawns (mainly Machrobrachium rosenbergii) and miscellaneous fishes.

Set-gill net

Set-gill net, commonly known as 'Khuti' or 'Nangar' is a fixed gear which is operated mainly for capturing hilsa. These nets are of varying dimensions and mesh sizes and are mostly operated in region I during monsoon and winter months. Usually 5 to 6 pieces of nets are laced together to form the 'ber' for operational purposes. Based on the inventory it has been observed that the common piece size is 60' x 21' with a mesh size varying between 2" to 3". The average cost of such a piece of net is about Rs. 235/- with cost range of Rs. 220-250. The piece size 60' x 21' forms 40% of the total number of different types of piece sizes of the net observed. The next common net piece size (24% of total) is 45' x 18' with 2" - 3.5" mesh size and average and range of cost being Rs. 165/- and Rs. 150 - 220 respectively. Usually 30 such pieces are laced together for operation. Other net piece sizes are 84' x 30' and 90' x 20' with average cost of Rs. 500 and Rs. 275/- respectively. A very few number of large size such as 500' x 45', 300' x 12', 420' x 30', 240' x 21' with mesh size varying between 2" - 3.5" and average cost being Rs. 6000/-, Rs. 1000/-, Rs. 1500/- and Rs. 1200/- respectively are also found under operation. Only a single piece of such a large size is operated.

Seine nets

There are two types of seine nets (a) large and (b) medium and small. Large seine net, locally called 'Kochal' and 'Jangla' are also of varying dimensions and

mesh size. 'Kochaljal', mostly made of nylon are operated in lower estuary specially at Digha area in winter season. The common used net piece size is 48' x 18' (about 30% of total large seine) with mesh size 1.5" - 2.5" and average cost of such a piece is about Rs. 90/-, the cost range being Rs. 80-100. Other sizes with average cost in all the regions combined are as follows :

TABLE IX

Piece size	% of total nets	Average cost (Rs.)	Range of cost (Rs.)
54' x 18'	20	100	-
45' x 36'	17	125	-
150' x 18'	11	325	300-325
45' x 33' (made of cotton)	17	70	65-80

The mesh size of majority of these nets ranged from 1.5" to 2.5". Only the size 45' x 33', called 'Ghono Kochal' has fine mesh 0.25"-0.75", 40-70 such piece of nets were assembled together for operation.

Another large seine net, called 'Jangla' is found only in one village (Goberchar) in region I with 312 pieces of same size 12' x 4.5' made of cotton with an average cost per piece being Rs. 30/-. The main species caught by large seine are Hilsa, T. jella, Stromateus cinereus, Sciara biauritus.

Small and medium seine nets locally called 'Ber' or

'Chatber' mostly made of nylon are also of varying dimensions and operated in all seasons. The different sizes are 37' x 10.5', 45' x 12', 24' x 12', 30' x 6', 30' x 18', 15' x 9' and 150' x 4.5' with average cost of Rs. 45, 50, 40, 30, 55, 20 and 130 respectively. The main species caught by this gear are prawns and some other miscellaneous fishes.

Set-barrier nets

Set-barrier nets, locally named 'Charghera' or 'Charpata' or 'Pata' are of varying dimensions. However, average size (over 97% of total) of such type of nets is 150' x 4.5' with an average cost of Rs. 125. The gear is operated in all the seasons.

Traps

The cost of traps, locally called 'Bitti' or 'Dwarbitti' varies according to small, medium and big size. The average costs of big, medium and small size of traps are Rs. 40, Rs. 30 and Rs. 17 respectively. Traps are usually operated during all the seasons except monsoons and prawns are mainly caught by these besides a few other miscellaneous fishes.

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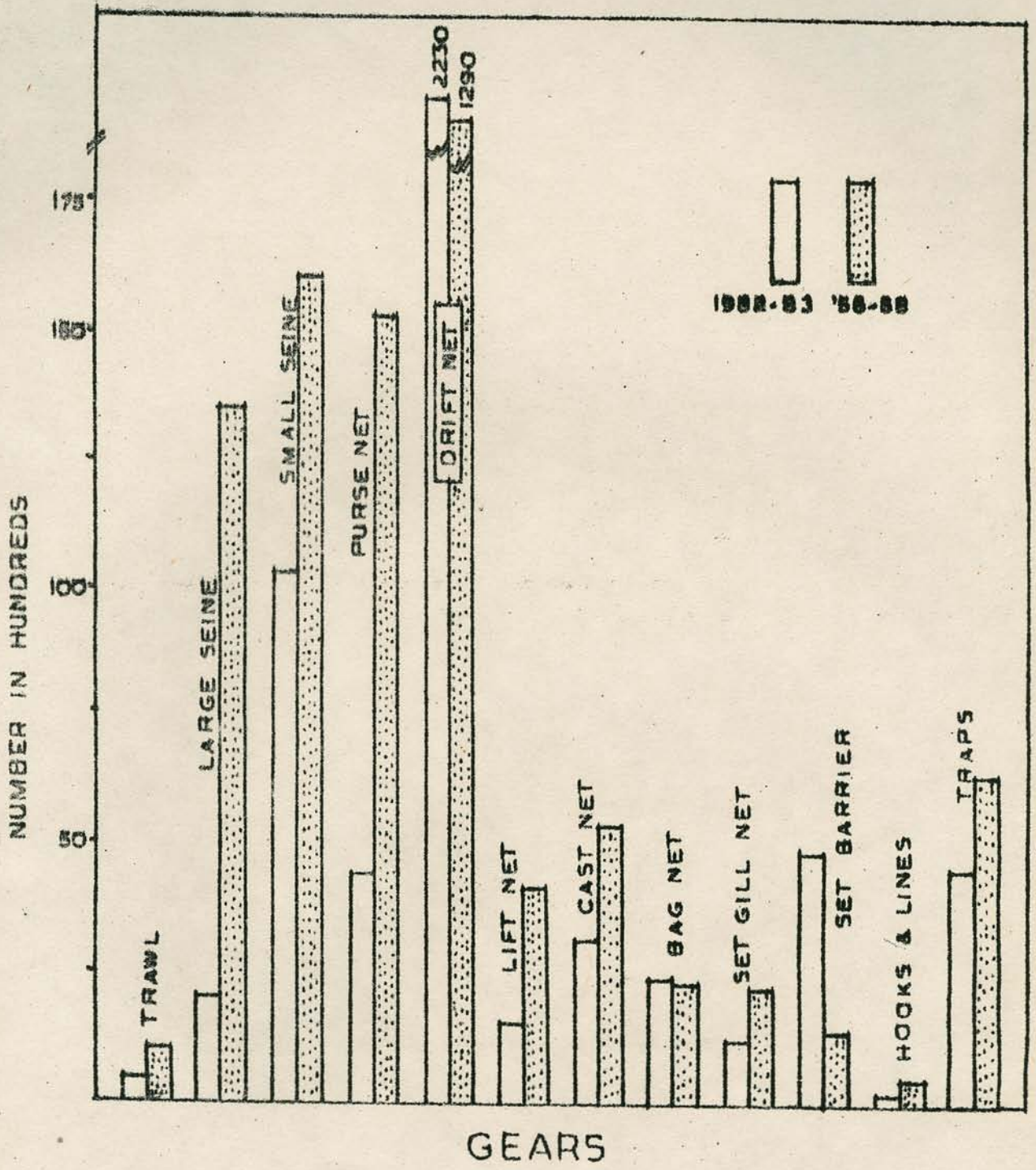
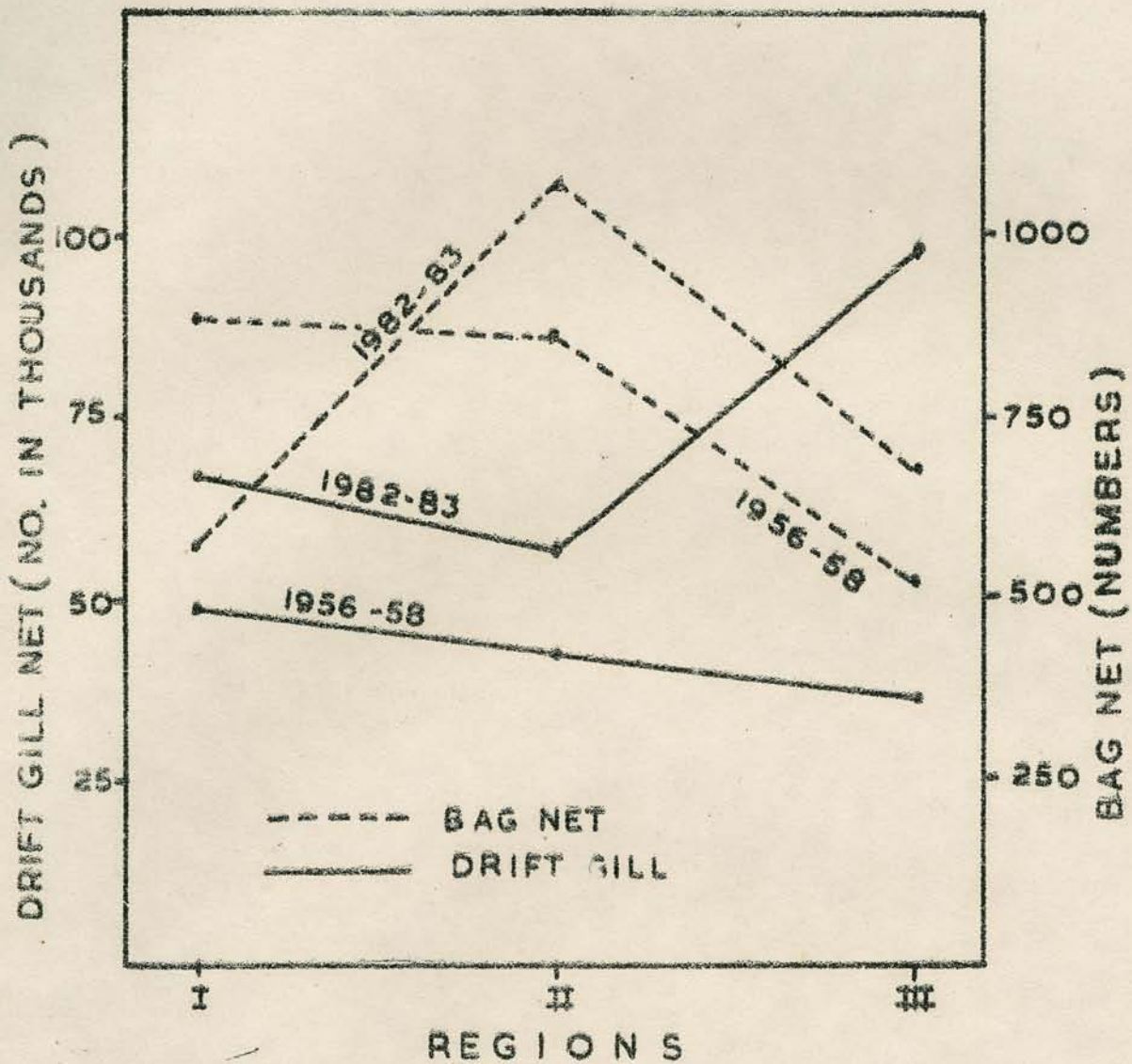


Fig. 2. Bar diagram showing totals of different gears for the stretch covered for 1982-83 and 56-58



2 : Graph showing two principal gears (Drift-gill and bag-net) at different regions over the two periods 1982-83 and 56-58

