

D R A F T

NATIONAL SAMPLE SURVEY
PILOT SURVEY ON THE ESTIMATION OF
CATCH OF FISH FROM INLAND WATER
RESOURCES : 1973-74

NUMBER 253/4

REPORT ON THE SECOND PHASE OF
THE SURVEY IN THE DISTRICT
OF MADURAI (TAMIL NADU)

ISSUED BY
NATIONAL SAMPLE SURVEY ORGANISATION
DEPARTMENT OF STATISTICS : MINISTRY OF PLANNING
GOVERNMENT OF INDIA
NOVEMBER 1975

Note of Caution

Being the scanned copy of old NSS report, this document may suffer from following limitations -

- i. Poor Quality of the Scanned images.
- ii. Page(s) missing in between.
- iii. Improper sequencing/arrangement.

NATIONAL SAMPLE SURVEY

PILOT SURVEY ON THE ESTIMATION OF CATCH OF
FISH FROM INLAND WATER RESOURCES : 1973-74

Report on the Second Phase of the Survey
in the District of Madurai (Tamil Nadu)

-: C O N T E N T S :-

	<u>pages</u>
TEXT OF THE REPORT	: 1 - 35
APPENDIX-1 (DETAILED TABLES)	: 37 - 96
APPENDIX-2 (FACSIMILE OF SCHEDULES)	: 97 - 120

Report on the second phase of the pilot survey for
the estimation of catch of fish from inland water
resources in the district of Puri (Talil Kila)

I n t r o d u c t i o n

1.1 No reliable statistics of the catch of fish from inland water resources is available at present. Some ad-hoc estimates, however are furnished by the different states based on market arrivals, consumption etc. The different states follow different methods. It is realised that a scientific method is very necessary for adoption by the different states for estimating the catch of fish from inland water resources. A first attempt to evolve a suitable methodology was done by the then Agricultural Statistics Division of the Directorate of National Sample Survey in the year 1962-63. ^{1/} This study was carried out in three districts of Orissa and covered only the impounded water resources and excluded the riverine canal and estuarine areas. It was felt that the problem of estimation of catch from the latter types of water areas ^{was} different from that of impounded water units and needed to be tackled separately. The study therefore covered the impounded water areas namely tanks, ponds and swamps. A large sample was surveyed for estimating the water resources and a smaller sample for obtaining the catch of fish by physical observation. This pilot survey demonstrated the feasibility of employing sampling techniques for estimation of area under water and total catch of fish by making use of sampling techniques. It was however felt that considerable research investigations will have to be undertaken to improve upon the sampling design and methods of estimation. Further, it was revealed that based on objective enumeration, estimates of 'catch' with a reasonable degree of precision can be obtained only at a very high cost. A very large divergence was observed between the estimates of 1962-63 based on physical observation and 1961-62 based on interview method (1962-63 estimates were about 50% of 1961-62), data on which were also collected in the survey. A doubt was raised whether complete data on catch could be obtained in 1962-63. In other words quite a number of catches might have been missed, thus making the catch data incomplete and such failures could be possible in a scheme where catch data have to be collected on the basis of physical observation.

^{1/} Report on the pilot survey of inland fisheries, Orissa, 1962-63
(Series F, No.2. Directorate of National Sample Survey).

1.2 At the instance of the Ministry of Agriculture, the Governing Council of the National Sample Survey Organisation considered the question of developing a suitable methodology for obtaining reliable estimates of a part of the inland water resources. It felt the need for undertaking another pilot survey with this end in view. A working group of technicians was specifically formed to examine the technical details of the work done in the past and make appropriate proposals for further work to be undertaken in this field. A scheme was drawn up by the Working Group and later somewhat modified by a Steering Group which was formed for the implementation of the scheme.

1.3 The scheme envisaged carrying out the pilot survey in three districts belonging to three different states namely Andhra Pradesh, Tamil Nadu and West Bengal. The districts selected in these states were respectively Karimnagar, Madurai and Murshidabad. The choice of these districts was made by the respective state Directorates of Fisheries. The survey was to be carried out in two phases jointly by the National Sample Survey Organisation and the State Department of Fisheries. The field work was to be carried out by the Department of Fisheries of the respective States and the technical direction of the survey tabulation, analysis and writing of reports were the responsibility of the National Sample Survey Organisation of the Government of India under the overall guidance of the Steering Group. The results based on the data collected in the first phase from the three different districts are presented in the draft reports 253/1, 253/2 and 253/3 issued by the National Sample Survey Organisation. The present report deals with the results of the data collected in the second phase of the survey in the district of Madurai in Tamil Nadu.

1.4 This report in section 2 gives the details of the scheme and the relevant concepts and definitions adopted in the survey. The sampling design and estimation procedures are given in section 3. Some important summary results are presented with discussions in Section 4. The detailed results obtained from the second phase of the survey are given in Appendix I and facsimile of the schedules used for the survey in Appendix II.

2. Outline of the scheme, concepts and Definitions

2.1 As mentioned earlier the entire survey was planned in two phases. The first phase consisted of a complete enumeration of inland water resources comprised of: (i) impounded water units, (ii) riverine areas and (iii) inundated patches in each of the villages selected for the survey. Data were collected about the

type of water resources, extent of the water resources, particular characteristics of the resources, ownership, main catch period, fishes, programs affecting these resources etc. Each water resource was verified on the spot and data collected by physical observation and by interviewing the operators of these water resources. In addition, particulars of catch of fish from these resources for the calendar year 1972 were also collected by enquiry method.

In the second phase, the main emphasis was on collecting reliable data on catch of fish from impounded water resources and riverine areas adopting interview method though physical observation was resorted to whenever possible. The inundated patches were left out from the scope of the second phase survey as the results of the first phase survey revealed that the contribution of catch from them to the total catch was very negligible. It was in fact nil for Madurai district. The operators of the different water resources listed were contacted for collecting the data. Collection of catch particulars by physical observation on a large scale was however ruled out. The entire survey period was split into four quarters and the operators were visited every three months, each time collecting data relating to the three months preceding the dates of survey, thereby reducing the maximum recall period to three months. A total over these repeated four visits gives the picture for a reference period of one full year. Apart from the catch data, particulars regarding gears and crafts possessed by the operators and used for fish catch operations, their cost, expenditure incurred on repairs and maintenance etc., cost of pisciculture, expenditure incurred on exploitation of fish etc. were also collected, both for the impounded and riverine areas. For the riverine areas the river fishing crafts were considered as the operators.

2.3 As already mentioned attempts were made to obtain data on catch of fish by physical observation. The investigators were to observe any catch operation that took place in the sample villages during their stay in those villages and record the relevant data required.

2.4 At the planning stage it was felt that there might be organised fishing in riverine areas and the bulk of the catch may go to some fixed places known as assembly points for disposal of catch by regular dealing agents. To explore this situation, an attempt has been made to study the occurrence of such assembly points in a general sample of villages selected, extent and type of catch arrivals in such assembly points and their disposal pattern.

contd.

2.5 Six different types of schedules were used for collecting the data in the second phase of the survey. They were :

- i) Schedule V : for collection of some general particulars of the sample cluster/village and assembly points located within them or within 16 Km. of them.
- ii) Schedule IW : for collection of data on (a) catch of fish from impounded water units and their disposal, (b) fishing gear and crafts possessed by the operators of the impounded water units and cost of procurement, repairs and maintenance of them and (c) particulars regarding assistance received etc.
- iii) Schedule LR : for listing the river fishing units in the sample cluster and adjacent villages.
- iv) Schedule FR : for collection of data on (a) catch of fish from river areas (b) fishing gear and crafts possessed by the river fishing units and cost of procurement, repairs and maintenance of them and (c) particulars regarding assistance received etc.
- v) Schedule O : for collection the particulars of catch by physical observation.
- vi) Schedule A : for collection of particulars of primary arrival and disposal of catch in the assembly points.

2.6 Some of the important concepts and definitions followed in the pilot survey are given below.

2.7 Impounded water units : Any sheet of water unit surrounded by embankments on all sides with or without inlet and or outlet is an impounded water unit. Tank, pond, lake, reservoir, jheel, beel, hoar, swamps etc. are examples of impounded water units.

2.7 Inundated patches : Inundated patches are those patches of land which remain inundated for a sufficiently long period in the rainy season, say for a period of 3 months or more and considered suitable for some sort of fish cultivation or fish catch.

contd.

2.9 Fishing/pisciculture household : Fishing/pisciculture household is defined as a household having any member who had fishing/pisciculture as usual occupation, principal or subsidiary during any part of the year preceding the date of survey. If the total earnings of the members of such a household out of fishing/pisciculture constituted the major income of the household during the year preceding the date of survey that household is considered to be a household with fishing/pisciculture as principal occupation and if it is not the major income, then that household is considered to be having fishing/pisciculture as subsidiary occupation. Nominal or occasional participation was ignored.

2.10 River fishing unit : A river fishing unit (r.f.u.) is defined as an individual or a group of individuals always operating jointly during the reference period or a co-operative fishing body or any such organisation engaged in fishing in that part of the river in the sample cluster/village.

2.11 Assembly point : An assembly point is a place where catches of fish from different parts arrive regularly for first stage disposal and where regular recognised dealing agents handle the disposal of fish arrival. This can be a wholesale or retail market also, where for both first stage disposal and second or higher stages of disposal fish may arrive.

2.12 Dealing agents : They are also known aravdars. They are people who regularly handle first stage disposals of catch arrivals at the assembly points on commission basis or any other contract terms.

2.13 Area under impounded water unit : The area extending upto the embankments, that is, the area covering upto the point where the concavity of the impounded water unit starts irrespective of the extent of the water level is considered as the area under impounded water unit.

2.14 Operator of the water unit : The person who has got the fishing or pisciculture rights in a water unit during the reference period is considered as the operator of that water unit.

2.15 Possession of gear or craft : An operator is considered to be possessing a gear or craft if it is in his custody.

3. Sample design and estimation procedure

3.1 Coverage : The pilot survey was confined to the rural areas of Madurai district. The 1971 census list of villages constituted the sampling frame. According to the 1971 census there are 1115 villages in Madurai district.

3.2 Sample Design : The sampling design adopted was a stratified uni-stage one with clusters of two adjacent villages as the sampling units.

3.3 Stratification and allocation : The rural areas of Madurai district was divided into 8 strata. Talukas individually or a group of them jointly formed strata. Adjacent talukas were grouped so as to have more or less equal population content as per census 1971 in each stratum. The total sample size was equally allocated to the different strata for the first phase survey. At the time of second phase as it was felt that the work load will be heavy, a reduction in the sample size was effected. The reduced sample size was allocated to the different strata in proportion to the number of 1971 census villages in them so as to have a very limited number of multipliers to arrive at the estimate.

3.4 Selection of sample clusters : From each stratum 15 clusters of two adjacent villages were selected for the first phase survey. The village clusters were selected with equal probability in a circular systematic manner by arranging the villages in the ascending order of their serial numbers as given in the census list, in 3 instalments forming three sub-samples. Thus a total of 120 two-village clusters (that is, 240 villages) was selected from the entire district. For the second phase survey the sample size was reduced to 48 village clusters. The excess number of sample clusters selected for the first phase over the second phase in each stratum was rejected from the original sample for the respective stratum to obtain a total of 48 sample clusters.

3.5 Survey Units : In each of the selected sample cluster of 2 villages all the impounded water units were surveyed for catch and other particulars related to the units. In those clusters with any river area, the different river fishing units located in them as well as in the adjacent villages were listed and particulars regarding catch of fish from river areas, gears and crafts used etc. were collected by surveying those river fishing units. In addition, the number of river fishing units located elsewhere but fishing in the river areas of the sample cluster was also ascertained. For the particulars of catch arrival and disposal at assembly points, those assembly points located within the sample clusters and those located within 16 Km. of the sample clusters were surveyed. Physical observation was carried out for those catch operations which had taken place in the sample clusters during the investigators' stay there.

3.6 Primary field strength and period of survey : Eight inspectors of the Directorate of Fisheries, Government of Tamil Nadu were engaged in the collection of data under the overall supervision of an Assistant Director. Four Assistant Superintendents and one Superintendent of the Field Operation Division of the National Sample Survey, engaged in the manual tabulation of the data collected in the pilot survey, made occasional supervision of the field work mainly as observers.

The field work started in January 1974 and was over by December 1975. As mentioned earlier the entire survey period was split into four quarters and the survey units were visited four times following required data relating to the reference period of 3 months preceding the date of survey. Table (c) gives the period of survey for the different visits.

Table (c) : Period of survey for the different visits.

v i s i t (1)	period of survey (2)
1	Jan. - March 1974
2	April - June 1974
3	July - Sept. 1974
4	Oct. - Dec. 1974
all visits	Jan. - Dec. 1974

3.7 Estimation procedure :

Notations :

- h - subscript for the hth stratum
- i - subscript for the ith sample cluster of 2 villages
- L - number of strata in the district
- N_h - total number of villages in the hth stratum
- n_h - number of 2-village sample clusters in the hth stratum
- r_{hi} - number of river fishing units listed for ith sample cluster and adjacent villages of hth stratum
- R_{hi} - total number of river fishing units operating in the river areas of the ith sample cluster of the hth stratum
- x_{hi} - value of the characteristic in the ith cluster of hth stratum
- X - estimate of the characteristic for the district.

The estimate for the impounded water unit is given as

$$X = \sum_{h=1}^{L} \frac{N_h}{2n_h} \sum_{i=1}^{n_h} x_{hi}$$

The estimate for the river areas is given as

$$X = \sum_{h=1}^{L} \frac{N_h}{2n_h} \sum_{i=1}^{n_h} \frac{R_{hi}}{r_{hi}} x_{hi}$$

Estimates were prepared separately for each visit. Summation of these estimates over the four visits gives the total for a year.

4. Summary of results

4.1 Coverage : The results presented are based on the data collected from the 48 sample clusters of two villages each, retained for the second phase survey out of the 120 sample clusters selected initially for the first phase survey. For keeping uniformity and for comparative purposes, the data collected in the first phase were also analysed only for the corresponding 48 clusters of the second phase survey.

4.2 Presentation of the results : In presenting results, the area figure have been given in acres and not hectares. This is because the data were collected in acres (since the people are still accustomed to give the figures in acres) and it was not considered necessary to convert the figures into hectares. In the tables presented '0' is given in some cases and '-'/in some other cases '0' indicates that some estimated figure is obtained in the particular case but the estimate does not come up to any significant figure in the last integral or decimal place. '-'/^{or blank} indicate that the entry is nil.

4.3 Sample size : The sample size on which the results are based is given in table (1). It may be noted that the samples were repeatedly visited four times during the one year of survey. There is an increase in the sample size for impounded water units in the third and fourth visits. This is because some new units have appeared in the course of the survey. There is also a decrease in the number of river fishing units in the third and fourth visits compared to the first two visits. The number of units physically observed varies from visit to visit. The number of assembly points surveyed also differs from visit to visit.

Table (1) Sample size

u n i t	number of units in the sample surveyed during			
	visit 1	visit 2	visit 3	visit 4
(1)	(2)	(3)	(4)	(5)
1. cluster	48	48	48	48
2. village	96	96	96	96
3. impounded water unit	584	584	589	590
4. river fishing unit	55	55	54	54
5. catches observed from impounded water unit	8	8	1	1
6. catches observed from river area	4	1	-	-
7. assembly point				
(i) within sample clusters	1	1	1	1
(ii) outside sample clusters but within 16 Km.	5	5	11	13

It is seen that 18 catch operations from impounded water units and 5 from riverine areas could only be observed during the entire year. This obviously indicates that with a moving team of investigators it may be difficult to attend to the catch operations for physical observation. Unless stationary investigators are employed with limited area to cover so that all catch operations can be attended to it becomes difficult to execute a scheme where objective enumeration can be undertaken. A plan like this obviously will be prohibitively costly at national level. It is also seen that the maximum number of assembly points encountered was only 14 for the entire district and that also only one within the sample clusters and 13 located outside but within 16 Km. of the sample clusters. An attempt to estimate the catch outturn through assembly points in a general scheme where villages are selected as sample units therefore may not be successful.

4.4 Extent of fishing/pisciculture activities : In the first phase the data on the number of households engaged in active fishing/pisciculture were collected. But it was felt that the definition of active fishing/pisciculture was not strictly followed. Even households whose members were engaged in fishing for a day or as hobby (nominal participation) were also included. So the data were again collected in the second phase adopting the definitions strictly. Table (2) gives the percentage distribution of households and persons engaged in active fishing and pisciculture in the rural areas of Madurai district.

Table (2) : Percentage distribution of households engaged in active fishing and or pisciculture.

occupation	percentage of hhs. to total hhs.	percentage of hhs. with fishing/pisciculture as principal or subsidiary occupation	percentage of persons with fishing or pisciculture as principal or subsidiary occupation	percentage of persons to total as principal or subsidiary occupation
(1)	(2)	(3)	(4)	(5)
<u>active fishing as:</u>				
1. principal occupation	0.12	14.40	0.03	13.68
2. subsidiary occupation	0.70	85.60	0.20	86.32
3. principal or subsidiary occupation	0.82	100.00	0.23	100.00
<u>pisciculture as :</u>				
4. principal occupation	0.02	2.53	0.01	3.68
5. subsidiary occupation	-	-	-	-
6. principal or subsidiary occupation	0.02	2.53	0.01	3.68
<u>active fishing and/or pisciculture as:</u>				
7. principal occupation	0.12	14.40	0.03	13.68
8. subsidiary occupation	0.70	85.60	0.20	86.32
9. principal or subsidiary occupation	0.82	100.00	0.23	100.00

(i) total number of rural households (1971 census) : 557,025

(ii) total rural population (1971 census) : 2,614,033

It is seen that only 0.3% of the households living in the rural areas of Madurai district have fishing or pisciculture as either principal or subsidiary occupation. This was estimated as 16.5% in the first phase revealing that nearly 15% of the rural households have nominal or occasional participation in fishing or pisciculture. It is also seen that only 0.2% of the rural population of Madurai district is engaged in active fishing or pisciculture as principal or subsidiary occupation. Amongst the households having fishing or pisciculture as either principal or subsidiary occupation about 14% of households have this as the main occupation. A similar proportion of the population also have fishing or pisciculture as main occupation.

4.5 Distribution of impounded water units : The initial listing of impounded water resources in the sample clusters was undertaken in the first phase of the survey. They were then revisited in the second phase for collection of data on catch of fish and other ancilliary information. There was a gap of 4 months between the end of the first phase survey and the beginning of the second phase survey. It is observed that some units listed in the first phase have disappeared and some new units have formed since the initial surveys, the magnitude of these changes being quite negligible. The number of impounded units surveyed in the first phase was 594 whereas it varied from 584 to 590 in the four different visits of the second phase. The distribution of water units by size class based on the average of the four different visits of the second phase survey is given in table (3).

contd.

Table (3) : Percentage distribution of the number of water units and their area for the different size classes of impounded water units along with the area per water unit.

size class of water units (acres)	percentage of the number of water units	percentage of the area under the water units	area per water unit (acres)
(1)	(2)	(3)	(4)
1. upto 0.99	17.79	0.54	0.44
2. 1.00 - 2.49	21.86	2.36	1.56
3. 2.50 - 4.99	16.12	3.75	3.37
4. 5.00 - 7.49	12.27	5.08	6.00
5. 7.50 - 9.99	4.20	2.49	0.59
6. 10.00 - 14.99	5.78	4.75	11.89
7. 15.00 - 19.99	5.65	6.60	16.92
8. 20.00 - 29.99	6.05	9.98	23.91
9. 30.00 - 49.99	2.74	6.80	36.01
10. 50.00 - 99.99	4.06	18.66	66.59
11. 100.00 & above	3.48	38.99	162.20
12. all	100.00	100.00	14.49
(i) total number of water units (a) first phase : 6.67			
(b) second phase : 1.02			
(ii) total area of water units (acres) (a) first phase : 101310			
(b) second phase : 102762			
(iii) average area per water unit as per first phase (acres) : 14.14			

Though the estimated number of impounded water units is slightly less in the second phase compared to the first phase, there is a slight increase in the water area in the second phase, the average area per water unit being 14.5 acres indicating that the disappearance of water units have occurred amongst small sized units. A comparison with the corresponding distribution of the first phase also reveals this though the changes are quite negligible.

4.6 Operational pattern of impounded water units :- The impounded water units are either operated singly or jointly by two or more operators. The distribution of water units according to the number of operators is given in table (4).

Table (4) : Percentage distribution of the number of water units and their area by number of operators with average area and number of operators per water unit.

number of operators	percentage of the number of water units	percentage of the area under the water units	area per water unit (acres)	number of operators per water unit
(1)	(2)	(3)	(4)	(5)
1	68.93	48.84	10.27	1.00
2	3.90	1.92	7.00	2.00
3	3.74	2.18	8.46	3.00
4	1.89	1.33	10.21	4.00
5-9	4.00	2.48	8.97	6.35
10-14	2.02	1.20	8.61	11.72
15-19	1.16	0.66	8.24	15.80
20 & above	13.65	38.97	41.37	102.89
not recorded	0.63	2.42	55.37	-
t o t a l	100.00	100.00	14.49	15.77*

(i) total no. of water units : 7092
(ii) total area of the water units (acres) : 102762

* excluding not recorded.

69% of water units covering 49% of area are operated singly, the average area of such units being 10 acres. There are a large number of operators for big water areas about 103 operators per water unit with average area of the water units operated being about 41 acres. Taking all the water units into consideration the average number of operators is 16 per water unit. For the year 1972 it was 20 as per the first phase survey.

4.7 Catch of fish for the years 1972 and 1974 : In the first phase of the survey, catch data collected related to the calendar year 1972 while in the second phase, the data collected gave the average picture for the year 1974. (In fact the second phase data gave the average pattern of a year based on the period Oct. 1973 - Dec. 1974, the major part being the calendar year 1974). Table (5) gives the estimates of catch of fish from the impounded water units and riverine areas for the above two reference periods. As mentioned earlier the inundated patches were excluded from the scope of the second phase survey.

Table (5) : Estimated catch of fish based on the first and second phases of survey.

type of water resource	1974 (second phase)		1972 (first phase)	
	catch of fish in kg.	percentage to total catch	catch of fish in kg.	percentage to total catch
(1)	(2)	(3)	(4)	(5)
1. impounded water unit	72541	82.3	856658	89.1
2. riverine area	16721	17.7	105318	10.9
3. impounded water unit & riverine area	951262	100.0	961976	100.0

The catch of fish from impounded water units in the year 1974 have decreased by 9% compared to 1972, whereas the catch from riverine areas have increased by 6%. While assessing these increase or decrease, one has to bear in mind that for the year 1972 the recall period was one year whereas it was only three months for the year 1974. For the riverine area individual river fishing units were contacted for the year 1974, but for the year 1972 the total catch from river areas was obtained by a general enquiry in the sample villages. It is seen from the table that in the year 1974, 82% catch was from impounded water units and 18% from river areas. The corresponding percentages for the year 1972 were 89% and 11% respectively.

4.8 Seasonal variation in catch of fish - It has been already mentioned that the operators of the water areas were repeatedly visited every quarter for the collection of data related to the three months preceding the date of survey. Thus the catch data of each visit give the average three months' catch preceding the survey period of each visit. A study of these estimates of catch of fish based on the four different visits will give an idea of the seasonal fluctuation in the catch of fish for the year 1974. Table (6) gives the percentage composition of the catch of fish for the different three months periods based on the four quarterly visits.

contd.

Table (6) Percentage of catch for the different three month periods based on the quarterly visits.

visit	survey period	percentage of catch		
		impounded water units	riverine areas	impounded water units and riverine areas
(1)	(2)	(3)	(4)	(5)
1. Jan. - March 1971		2.3	59.0	12.4
2. April - June 1971		75.3	12.4	64.1
3. July - Sept. 1971		22.1	19.1	21.6
4. Oct. - Dec. 1971		0.3	9.3	1.9
All Jan. - Dec. 1971		100.0	100.0	100.0

i) total catch from impounded water units (kg.) : 782541
ii) total catch from riverine areas (kg.) : 168721
iii) total catch from impounded and riverine areas (kg) : 951262

75% of the catch from impounded water units was obtained during the three month period based on the second visit, and 22% for the period based on the third visit. For the riverine areas 59% of the catch was obtained during the three month period based on the first visit. When the entire exploitation from both the impounded water units and river areas is considered the period based on the second visit contributed 64% of the total catch. The period based on the third visit accounted 22% and 12% of the total catch was obtained from the period based on the first visit. Only about 2% of the catch was contributed by the period based on the last visit.

4.9 Catch of fish by variety from impounded water units and riverine areas:

It may be recalled that the inundated patches were excluded from the second phase survey. Thus the survey attempted only to estimate the catches from impounded and riverine areas. Table (7) gives the total catch by varieties from impounded water units and riverine areas with percentage break-up between impounded water units and riverine areas.

Table (7) : Catch of fish by varieties for the year 1974 with percentage break up between impounded water units and riverine areas.

variety	total catch (kg.)	percentage of catch		
		impounded water units	riverine areas	total
(1)	(2)	(3)	(4)	(5)
1. carp	246723	79.5	20.5	100.0
2. cat-fish	99279	80.6	19.4	100.0
3. murrel	153268	92.8	7.2	100.0
4. barbus species	154985	86.2	13.8	100.0
5. cyprinus	2083	98.0	1.2	100.0
6. tilapia	180352	80.4	19.6	100.0
7. hilsa	20	100.0	-	-
8. shrimp/prawn	-	-	-	-
9. others	114552	72.9	27.1	100.0
10. all varieties	951262	82.3	17.7	100.0

As observed for the year 1972 based on the first phase survey, for the year 1974 also catch was more from impounded water units than from riverine areas for every variety.

A comparison of the total catch by variety from both the impounded water units and riverine areas between the years 1972 as per first phase survey and 1974 based on the second phase survey is made in table (8).

Table (8) : Catch of fish by varieties from impounded water units and riverine areas with percentage break up between varieties for the year 1974 and 1972.

variety	total catch (kg.)		percentage of catch	
	1974	1972	1974	1972
(1)	(2)	(3)	(4)	(5)
1. carp	246723	291348	26.0	30.3
2. cat-fish	99279	109453	10.4	11.4
3. murrel	153268	127198	16.1	13.2
4. barbus species	154985	144894	16.3	15.1
5. cyprinus	2083	150	0.2	0.0
6. tilapia	180352	161021	19.0	16.7
7. hilsa	20	-	0.0	-
8. shrimp/prawn	-	-	-	-
9. others	114552	127912	12.0	13.3
10. all varieties	951262	961976	100.0	100.0

It is seen that for both the years the maximum quantity of fish caught was carps followed by tilapia. In the year 1974 quantity of carps caught has come down compared to 1972 where as catch of tilapia has increased. Catch of murrels and barbus species also has increased in the year 1974 compared to 1972.

4.10 Extent of exploitation of the impounded water units in the year 1974 :
 Table (9) gives the distribution of impounded water units and their area according as to whether they were exploited in the year 1974 or not. The corresponding distribution for the year 1972 is also given side by side.

Table (9) : Percentage distribution of the impounded water units and their area according as whether they were exploited or not.

exploitation type	percentage of the number of water units		percentage of the area of water units		area per water unit (acres)	
	1974	1972	1974	1972	1974	1972
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. exploited	35.5	46.5	72.6	80.8	29.6	24.6
2. not exploited	64.5	53.5	27.4	19.2	6.2	5.1
3. total	100.00	100.00	100.00	100.00	14.5	14.1

- (i) total number of water units, (a) first phase : 7167
 (b) second phase : 7092
 ii) total area of the water units (acres) (a) first phase : 101310
 (b) second phase: 102762

From the table it is seen that in 1974 less number of water units with less water area were exploited than in the year 1972. 36% of the water units covering 73% area was exploited during the year 1974 whereas in the year 1972, 7% of the units with 01% of area was exploited.

4.11. Catch of fish from impounded water units : A comparative picture of the catch of fish from the impounded water units for the years 1974 and 1972 with the corresponding area of water units from which catch was obtained is given in table (10).

Table (10) : Catch of fish from impounded water units for the years 1974 and 1972 and corresponding area from which catch obtained with catch per acre of water units from which catch obtained

year	total catch of fish (kg)	area from which catch obtained (acres)	catch per acre of water units from which catch obtained (kg.)
(1)	(2)	(3)	(4)
1974	732541	74591	10.5
1972	856650	80631	10.6

The distribution of water units by size from which catch obtained in the year 1974 and catch per acre of the water units from which catch obtained is given in table (11).

Table (11) : Percentage distribution of the impounded water area from which catch was obtained in the year 1974 and percentage of the total catch for the different size classes of water units with catch per acre of water units from which catch obtained.

size class of water units	percentage of area of water units from which catch obtained	percentage of catch	catch per acre of water units from which catch obtained (kg.)
(1)	(2)	(3)	(4)
1. - 0.99	0.0	0.5	214.50
2. 1.00 - 2.49	0.6	1.9	33.92
3. 2.50 - 4.99	1.0	2.5	14.55
4. 5.00 - 7.49	3.5	3.9	11.70
5. 7.50 - 9.99	1.5	2.5	17.04
6. 10.00 - 14.99	2.0	2.6	13.65
7. 15.00 - 19.99	4.0	7.0	15.26
8. 20.00 - 29.99	10.1	9.3	9.65
9. 30.00 - 49.99	7.6	10.0	13.02
10. 50.00 - 99.99	10.8	17.2	9.59
11. 100.00 & above	49.3	42.6	9.06
12. t o t a l	100.0	100.0	10.49

(i) total area of the water units from which catch obtained (acres) : 74591
(ii) total catch from the water units (kg.) : 702541

Though the quantity of fish caught from the smallest units was negligible the catch per acre of water area was found to be very high for the year 1974. The trend observed for the year 1972, that is the decrease of catch per acre with increase in the size of water units with some exceptions is also observed for the year 1974.

Percentage composition of the catch of fish from impounded water units by variety for the year 1974 is presented in table (12). The corresponding percentages for the year 1972 based on the first phase survey are also given in the table for comparison.

Table (12) : Percentage of catch by varieties and catch per acre of water units from which the particular variety was caught for the year 1974 and 1972.

v a r i e t y	percentage of catch		catch per acre of water units from which catch was obtained(kg.)	
	1974	1972	1974	1972
(1)	(2)	(3)	(4)	(5)
1. carp	25.1	31.2	3.0	3.6
2. cat-fish	10.2	12.0	1.4	1.5
3. murrel	18.2	14.4	2.2	1.8
4. barbus species	17.1	14.8	2.4	2.3
5. cyprinus	0.3	0.0	1.4	0.4
6. tilapia	10.5	17.8	3.5	8.6
7. hilsa	0.0	-	0.1	-
8. shrimp/prawn	-	-	-	-
9. others	10.7	9.8	1.3	1.2
10. all varieties	100.0	100.0	10.5	10.6

(i) total area of water units from which catch obtained	(a) first phase : 50631
	(b) second phase : 74591
(ii) total catch from the water units	(a) first phase : 856650
	(b) second phase : 702541

Carp contributed maximum (29%) to the total fish caught from impounded water units followed by tilapia (19%) for the year 1974. Murrels and barbus species contributed 18% and 17% of the total catch respectively. Compared to the year 1972, the contribution of carps to the total catch had come down whereas contributions of murrels and barbus species have increased. Though tilapia contributed almost similar proportion of catch (about 10%) to the total in both the years the catch per acre of exploited area reduced considerably in the year 1974 compared to 1972. For all the other varieties excepting cyprinus the catch yield was of similar magnitude for both the years under study.

4.12 Catch of fish from impounded water units by their different physical characteristics : It was seen that the fish yield vary according to the size of water units (Table-11). There may be many other factors like, soil type, colour of water, silt position, weed pattern etc. on which also the yield of fish may have definite bearing. It will be interesting to study the yield pattern according to these physical characteristics of the impounded water units.

Table (13) gives distribution of water units exploited in the year 1974 and percentages of total catch from them by source of supply of water.

Table (13) : Percentage distribution of the area of the water units exploited in the year 1974 and percentage of total catch by source of supply of water along with the catch per acre of water units exploited.

source of supply of water	percentage of area of water units exploited	percentage of catch	catch per acre of water units exploited (kg.)
(1)	(2)	(3)	(4)
1. rain fed	32.7	24.0	6.0
2. river or channels	67.3	75.2	11.7
3. spring	-	-	-
4. others	-	-	-
5. total	100.0	100.0	10.5

(i) total area of the water units exploited (acres) : 74591
(ii) total catch from the water units (kg.) : 782541

About 75% of the total catch was from those water units whose source of supply of water is river or channels. They had a higher yield rate, about 12 kg. p.r acre compared to those water units which are rainfed.

The distribution of water units exploited by seasonality and the catch per acre of water units exploited is given in table (14).

Table (14) : Percentage distribution of the area of the water units exploited in the year 1974 and percentage of total catch by seasonality of water unit along with the catch per acre of water units exploited.

seasonality of water units	percentage of area of water units exploited	percentage of catch	catch per acre of water units exploited(kg.)
(1)	(2)	(3)	(4)
1. perennial	0.8	1.4	17.3
2. 9 to less than 12 months	11.1	30.4	28.0
3. 6 to less than 9 months	29.2	39.9	14.3
4. 4 to less than 6 months	39.5	22.3	5.9
5. less than 4 months	19.4	6.0	3.2
6. total	100.0	100.0	10.5

(i) total area of the water units exploited (acres) : 74591
(ii) total catch from the water units (kg.) : 782541

40% of the water area exploited has water only for 4 to less than 6 months contributing 22% of the total catch. The units having water 6 to less than 9 months constituted 29% of the water area exploited accounting 40% of the total catch. 30% of the catch was obtained from those units which have water for 9 to less than 12 months and they had the maximum fish yield - about 29 kg. per acre of exploited area followed by perennial units with 17 kg. per acre but their contribution to total catch was less than 2%.

Table (15) gives the distribution of the water units exploited in the year 1974 and catch of fish per acre by soil type of the water units.

Table (15) : Percentage distribution of the area of water units exploited in the year 1974 and percentage of total catch by soil type of the units along with the catch per acre of water units exploited.

soil type	percentage of area of water units exploited	percentage of catch	catch per acre of water units exploited(kg.)
(1)	(2)	(3)	(4)
1. loamy	30.3	29.0	10.0
2. sandy	2.3	3.8	17.0
3. alluvial	11.2	5.9	5.6
4. clay	27.4	51.3	19.6
5. others	28.8	10.0	3.7
6. total	100.0	100.0	10.5

(i) total area of the water units exploited (acres) : 74591

(ii) total catch from the water units (kg.) : 702541

27% of the water area exploited has clay soil giving maximum catch. 51% of the total catch was obtained from them with an average yield of 20 kg. per acre. Sandy water units contributed only about 4% of the total catch. though they had a yield of 17 kg. per acre. 30% of the water area contributing 29% of catch has loamy soil type with 10 kg. of catch per acre. Water units having alluvial soil type gave much less yield compared to the other three types, only 6 kg. per acre contributing 6% of the total catch.

The distribution of the water units exploited in the year 1974 and the catch per acre of exploited area by extent of silting of the units is presented in table (16).

Table (16) : Percentage distribution of the area of water units exploited in the year 1974 and percentage of total catch by the extent of silting of the units along with catch per acre of water units exploited.

extent of silting	percentage of area of water units exploited	percentage of catch	catch per acre of water units exploited (kg.)
(1)	(2)	(3)	(4)
1. not silted	3.7	4.0	11.1
2. partially silted	91.4	92.6	10.6
3. badly silted	4.9	3.4	7.4
4. total	100.0	100.0	10.5

(i) total area of water units exploited (acres) : 7,591

(ii) total catch from the water units (kg.) : 782541

It is seen that 91% of the water area exploited in the year 1974 was partially silted and accounted 93% of the catch. Only 4% of the water area exploited with a smaller proportion of total catch was free from any silt. For both these categories of water units the catch per acre of exploited area was found to be of the same order - about 11 kg. per acre. Badly silted units had lower comparatively less yield of fish.

Table (17) gives the distribution of water units exploited in the year 1974 and the corresponding catch per acre of exploited area by colour of water.

Table (17) : Percentage distribution of the area of water units exploited in the year 1974 and percentage of total catch by colour of water along with the catch per acre of water units exploited.

colour of water	percentage of area of water units exploited	percentage of catch	catch per acre of water units exploited (kg.)
(1)	(2)	(3)	(4)
1. bluish	7.7	19.0	25.9
2. greenish	13.7	17.3	13.2
3. brownish	19.0	15.2	8.0
4. turbid	32.7	34.0	11.2
5. others	23.2	11.0	5.4
6. not recorded	2.9	1.9	6.7
7. total	100.0	100.0	10.5

(i) total area of water units exploited (acres) : 74591

(ii) total catch from the water units (kg.) : 782541

The maximum yield of fish per acre of exploited area was obtained from bluish water units (25 kg. per acre) but such water units constituted only 3% of the water area exploited accounting 19% of the total catch. Maximum water area exploited was turbid (33%) contribution also maximum percentage of total catch (35%) but the yield of such units was less than half of the yield obtained from bluish water units. Greenish water units produced 13 kg. per acre while only 6 kg. per acre was obtained from water units of brown colour.

The distribution of water units exploited and the corresponding catch per acre of exploited area in the year 1974 by the extent weeds in the units is given in table (10).

Table (10) : Percentage distribution of the area of the water units exploited in the year 1974 and percentage of total catch by extent of weeds in the units along with the catch per acre of water units exploited.

extent of weeds	floating weeds			submerged weeds		
	percentage of area of water units exploited	percentage of catch	catch per acre of water units exploited (kg.)	percentage of area of water units exploited	percentage of catch	catch per acre of water units exploited (kg.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. no weeds	34.1	68.0	8.6	76.7	63.3	8.7
2. covering less than 50%	11.1	24.0	23.3	17.9	30.2	17.7
3. covering more than 50%	1.1	4.6	25.0	2.5	4.7	19.4
4. not recorded	2.9	1.8	6.7	2.9	1.0	6.7
5. total	100.0	100.0	10.5	100.0	100.0	10.5

(i) total area of water units exploited (sarea) : 74591

(ii) total catch from the water units (kg.) : 702541

It is observed that the water units with some weeds either floating or submerged produced better yield of fish varying from 16 kg. per acre to 26 kg. per acre compared to the units which had no weeds. Such units had a yield of only 9 kg. per acre of exploited area, though they contributed the major portion of the total catch.

4.13 Catch of fish from riverine areas : Table (19) gives the catch of fish by varieties obtained from the riverine areas for the years 1974 and 1972

Table (19) : Percentage of catch of fish by varieties from riverine areas for the years 1974 and 1972.

v a r i e t y	percentage of catch	
	1974	1972
(1)	(2)	(3)
1. carp.	30.0	23.1
2. cat-fish	11.4	6.4
3. murrel	6.6	3.7
4. barbus species	12.6	11.2
5. cyprinus	0.0	-
6. tilapia	21.0	0.2
7. hilsa	-	-
8. shrimp/prawn	-	-
9. others	10.4	41.4
10. all varieties	100.0	100.0

(1) total catch for all varieties (kg.) (a) 1974 : 168721
(b) 1972 : 105313

The catch of fish for the year 1974 from the riverine areas shows a 60% increase compared to the year 1972. It has already mentioned earlier that the catch particulars for the year 1972 were obtained by a general enquiry at the sample village level whereas the data for the year 1974 was collected by contacting the different river fishing units of the sample village and as such the 1972 estimates should be viewed with reservation. It is seen that in the year 1974, 30% of the total catch from riverine areas was carp followed by tilapia which contributed 21% of the catch. Catfish and barbus species constituted almost similar proportions of the total catch - about 11% and 13% respectively.

4.14 Disposal of fish caught : In the second phase of the survey particulars regarding the disposal of catch of fish were collected both for the catch from impounded water units and riverine areas. Table (20) gives the percentage breakdowns of total catch for the different disposal types.

Table (20) : Percentage of total catch by type of disposal

type of disposal	percentage of catch		
	impounded water units	riverine areas	impounded water units and riverine areas
(1)	(2)	(3)	(4)
1. consumed	23.7	10.1	2.1
2. sold fresh	64.0	81.0	66.6
3. wages in kind	1.0	-	1.2
4. salted & dried	0.2	0.9	4.5
5. waste	0.0	-	-
6. others	2.3	-	3.6
7. total catch	100.0	100.0	100.0

24% of the total catch from impounded water units was consumed by the operators and 64% of the catch was sold. Out of the riverine catch only 10% was consumed and 81% of the catch was marketed. For the entire inland water resources, the marketed quantity of fish caught from them constituted 67% of the total catch.

The percentage distribution of the total catch of fish from inland water resources sold by place of sale as presented in table (21)

Table (21) : Distribution of total catch of fish from inland water resources sold by place of sale.

place of sale	percentage of catch of fish sold		
	impounded water units	riverine areas	impounded water units and riverine areas
(1)	(2)	(3)	(4)
1. at site	72.7	67.9	71.7
2. local markets	5.0	0.1	4.0
3. distant markets (within district)	22.1	-	17.4
4. exported to places outside district	-	-	-
5. others	0.1	32.0	6.9
6. total	100.0	100.0	100.0
(1) total catch of fish sold (kg.)	500364	136772	637136

It is observed that a major portion of the fish sold was disposed of at the site of catch itself. The 'others' category was mainly comprised of the category of 'direct selling to consumers'. For riverine areas it constituted 32% of the total fish sold. Out of the fish caught from impounded water units and sold, 73% was sold at the site of catch and the remaining at markets. 63% of the riverine fish sold was disposed of at the place of catch. When the entire catch from inland water resources is considered, 72% of the catch of fish sold was at the site of catch itself, 7% directly to consumers most likely by the operators hawking themselves. 21% of the sale was at the local markets or at the markets situated within Madurai District itself. No fish caught in Madurai district was exported outside the district.

It would be interesting to study the composition of fish sold by the agency to which sold. Table (22) gives the percentage distribution of fish caught from inland water resources and sold, by the agency to which sold.

Table (22) : Percentage distribution of catch of fish from inland water resources sold by agency to which sold.

agency to which sold	percentage of catch of fish sold		
	impounded water units	riverine areas	impounded water units and riverine areas
(1)	(2)	(3)	(4)
1. hawkers	33.0	33.6	33.0
2. retailers	28.3	2.5	22.7
3. whole sellers	19.5	-	15.3
4. co-operative	-	-	-
5. others	18.4	63.9	26.2
6. total	100.0	100.0	100.0
(1) total catch of fish sold (kg.)	500364	136772	637136

Out of the catch of fish from impounded water units sold, 34% was disposed to hawkers, 10% of fish sold belonged to 'others' which was mainly comprised of 'direct selling to consumers' by the operators themselves either at the site of catch or hawking themselves. Thus only about 40% of the fish sold belonging to impounded water units went to any organised sellers. For the riverine areas

this percentage was as low as 3% for Madurai district. When the entire catch from inland water resources is considered 36% of the fish sold was to organised selling agencies (either retailers or whole salers).

Combining tables (20) and (22) it is seen that for Madurai district only 31% of the catch from impounded water units came to any organised selling agencies or in other words selling points. For the riverine areas the corresponding percentage is worked out as 2%. For the entire catch from inland water resources, the portion that went to organised selling agencies is obtained as about 25%. Thus, in Madurai district majority of catch obtained from the district was either consumed or sold by hawking. It, therefore appears that for this district any approach to estimate the catch of fish through organised disposal points may cover only about 2% of the riverine catch and 31% of catch from impounded water units as revealed from this pilot survey.

4.15 Expenditure on pisciculture in impounded water units during the year 1974 : The expenditure for a year covering the major part of the calendar year 1974 on rent, maintenance, and pisciculture of impounded water units is presented in table (23)

Table (23) : Distribution of total expenditure on impounded water units by type of expenditure.

type of expenditure	actual expenditure per acre of water units (Rs.)	percentage to total expenditure
(1)	(2)	(3)
1. rent	4.35	18.9
2. repairs	17.92	77.7
3. desilting & dewatering	0.55	2.4
4. dewatering	-	=
5. other maintenance costs	-	-
6. total maintenance cost	16.47	80.1
7. spawn, fry etc.	0.22	1.0
8. other pisciculture costs	0.01	0.0
9. total pisciculture cost	0.23	1.0
10. total cost	23.05	100.0

The maximum expenditure was on repairs and renovation of embankments. It constituted 70% of the total expenditure, 19% of the total expenditure was on rent. The cost on pisciculture by the operators was found to be only 23 paise per acre of water unit which was only 1% of the total expenditure.

4.16 Gears and crafts used in inland water resources : Particulars related to the gears and crafts possessed by the different operators of the impounded water units and river fishing units were collected in all the four different visits of the second phase survey. The nets and boats which were in custody of the operators were listed collecting data on the type of nets, size of the nets and boats, cost of raw materials if home made, value of purchase if purchased, cost of repairs and maintenance and extent of use in impounded water units or river areas etc. It may be noted that data obtained related only to one sector of the gears and crafts used in impounded water units, that sector which was possessed by the operators. Sometimes large scale exploitations in impounded water units are undertaken for the operators by professional fishermen using their own gears on certain terms. The survey could not cover this sector of gears and crafts possessed by fishermen unless they also happened to be operators. No attempt therefore has been made to estimate the totality of implements used for exploitation. Some broad indicators on cost, expenditure on repairs etc. have however been worked out as averages of sample values. To get an idea on the extent of use of these implements in impounded water units or river areas during the different parts of the year, the number of gears and crafts possessed by the operators of the impounded water units or river fishing units and used during the four different three month reference periods preceding the dates of survey has been estimated. For Madurai district it was revealed that no rented nets were in possession of the operators. So the particulars relate to only owned nets. Also it was seen that crafts were rarely used. Only one sample craft was encountered in the entire survey and as such no results are presented in respect of crafts.

4.17 Gears used in impounded water units : The number of different types of nets possessed by the operators of the impounded water units listed in the four different visits, their average size, cost of raw materials, purchase price, annual cost on repairs and average expected life etc. are presented in table (24).

Table (24) : Number of nets possessed by the operators of the impounded water units listed in the different visits, with their average size and expenditure on them

type of net	no. of nets listed				average size (sq. net.)	cost of raw materials if home made per net (Rs.)	purchase cost in purchased per net (Rs.)	expenditure on repairs per net (Rs.)	average expected life (years)
	visit 1	visit 2	visit 3	visit 4					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. dragnet*	7	63	76	76	7.7	61	29	1.73	5.0
2. cast net	2	16	10	10	11.9	-	35	0.98	3.4
3. gill net**	16	16	16	16	75.0	-	39	0.36	4.0
4. fixed net	-	-	-	-	-	-	-	-	-
5. seines	-	-	-	-	-	-	-	-	-
6. scoop net	3	41	49	37	0.90	22	7	0.59	-
7. other nets	-	-	1	1	1.50	30	-	-	11.2
8. a l l	28	136	160	140	X	X	X	X	X

* The average purchase price of a cotton net was Rs. 25/- and that of a synthetic net was Rs. 113/-

** relates to synthetic nets only.

It is seen that no fixed nets and seines were in possession of the operators. Of the sample nets listed gill nets possessed were all made of synthetic fibre, whereas the cast nets and scoop nets possessed were made of cotton fibre. Amongst the drag nets, only 2 were of synthetic fibre and all the rest were of cotton in all visits (Table 7, Appendix I). Home made nets were found to be costlier than purchased nets for these types of nets made at home. The average annual expenditure per net is found to be very little for all types of nets varying from 59 paise for scoop net to Rs. 1.73 for drag nets. This may be due to the fact that these nets are put to use in impounded water units once in a way only calling for very minor repairs. These results of course are to be considered as broad indicators only as they are based on only those nets possessed by the operators and sparingly used. Also they are unestimated values based on a small sample.

It would be interesting to see the extent of use of these nets in the different reference periods related to the 4 different visits. It was observed that the maximum use was during the reference period of three months preceding the second visit. Taking this as 100, the nets used in the other three reference periods are expressed as indices and presented in table (25).

Table (25) : Extent of use of nets possessed by the operators of the impounded water units during the four different reference periods.

type of net	extent of use of nets expressed as indices to the number of nets used during the 3 months preceding the second visit taken as 100			
	visit 1	visit 2	visit 3	visit 4
(1)	(2)	(3)	(4)	(5)
1. drag net	5.4	100.0	30.0	30.0
2. cast net	3.5	100.0	-	-
3. gill net	100.0	100.0	100.0	100.0
4. scoop net	9.4	100.0	12.0	1.5
5. all nets	21.4	100.0	33.1	27.6

It is seen that the extent of use of nets in the other three reference periods compared to the reference period related to second visit was much less, varying from 21% to 33%.

4.10 Gears used in riverine areas : The nets used in the riverine areas of Madurai district and possessed by the river fishing units as listed/ were of the types drag nets, cast nets, gill nets, fixed nets and scoop nets all made of cotton fibre only. No nets made of synthetic fibre were found in possession of the operators belonging to the river fishing units. Table (26) gives the number of cotton nets listed during the different visits with their average size, cost of raw materials, purchase price, and annual repairing cost etc.

Table (26) : Number of nets possessed by the operators of the river fishing units listed in the different visits with their average size and expenditure on them

type of net	no. of nets listed				average size (sq.met)	cost of raw materials if home made per net (Rs.)	purchase cost if purchased per net (Rs.)	expenditure or repairs per net (Rs.)	average expected life (years)
	visit 1	visit 2	visit 3	visit 4					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. drag net	20	20	20	20	20.2	30	90	17.10	8.2
2. cast net	21	21	20	20	11.5	156	53	24.21	14.6
3. gill net	11	11	0	4	68.2	45	120	16.41	7.1
4. fixed net	1	1	-	-	15.0	30	-	40.00	3.0
5. seines	-	-	-	-	-	-	-	-	-
6. scoop net	266	266	266	266	2.5	5	14	1.35	10.3
7. other nets	-	-	-	-	-	-	-	-	-
8. all	327	327	322	310	X	X	X	X	X

It is seen that the repairing costs per net used in riverine areas were much higher compared to nets used in impounded water units for all types of nets. This may be due to the fact that nets used in river areas are constantly put to use calling for repairs very often. Also they are found to be more expensive but with a better expected life. The results given for 'fixed net' are based on one net and therefore should not be generalised.

In the riverine areas the maximum number of nets used was during the reference period of 3 months preceding the first visit. The extent of use in the other three visits expressed as indices to the use in the first visit taken as 100 is given in table (27).

Table (27) : Extent of use of nets possessed by the operators of the river fishing units during the four different reference periods.

type of net	extent of use of nets expressed as indices to the number of nets used during the 3 months preceding the first visit taken as 100			
	visit 1	visit 2	visit 3	visit 4
(1)	(2)	(3)	(4)	(5)
1. drag net	100.0	90.7	93.5	81.0
2. cast net	100.0	35.9	135.2	134.5
3. gill net	100.0	4.5	3.9	4.5
4. fixed net	100.0	-	-	-
5. scoop net	100.0	98.6	98.6	98.6
6. all nets	100.0	92.9	95.0	95.3

In the riverine areas, the extent of use is observed to be almost uniform in the different parts of the year, though the use during the three reference periods related to the last three visits are found to be slightly less than the use in the reference period of first visit, it varying from 93% to 96%. For cast nets, the use went up during the reference periods of the last 2 visits compared to the first visit, though the use was much less during the period related to the second visit. In case of gill nets the extent of use fell down to nearly 4% in the subsequent periods compared to the first period.

4.19 Assistance received from government : Data were collected regarding the different types of assistances received by the operators of the impounded water units and river fishing units from government for pisciculture and fishing activities for the years 1972-73 and 1973-74. It was seen that no operators of the sample river fishing units received any assistance. Of the operators of the sample impounded water units only 2 received any assistance for the year 1972-73 and 3 for the year 1973-74. Though this is a very small sample to base any results, the unestimated sample means are presented in the relevant appendix tables.

4.20 Collection of data on catch of fish by physical observation : An objective method of collection of data on catch of fish by an on the spot enumeration by the investigators presenting themselves at the time of catch operations no doubt ensures accuracy in those cases thus attended. In large scale surveys, with a large investigating area to cover for each investigator, it may not be possible for an investigator to attend to all the catch operations taking place in his area. Unlike the marine sector where catches are generally organised with fixed landing centres, for inland waters the areas are scattered with unorganised and irregular catch operations. It would be very difficult to keep track of all catch operations and attend to them to physically observe for an investigator, unless his area of investigation is made very small, which will call for very big team of stationary investigators. Even in such an arrangement, there is every chance of certain catch operations being missed altogether due to wrong information being supplied consciously or unconsciously by the informants. Moreover engaging a large team of investigators may prove to be prohibitively costly. The scheme based on an objective enumeration method of data collection under taken in Orissa in the year 1962-63 raised the doubt whether complete data on catch was obtained.

On the other hand in an interview method, though theoretically it may not be as accurate as physical observation at individual unit level there is every likelihood of getting broadly reliable info. if the survey is carried out scientifically with properly trained staff. The investigator can cover a much larger area reducing the cost considerably. Sufficient care of course should be taken to reduce the recall period and to elicit fairly reliable data through leading questions. In present survey adopted the interview method of data collection and data were collected by visiting the survey units 4 times during the entire survey period to reduce the recall period.

Some attempts however were made to physically observe the catch operations that took place in the sample villages during the investigators' stay in them. An analysis of the data thus collected showed that isolated cases numbering very few catch operations could only be observed by the investigators moving from sample village to sample village. In fact, 10 catch operations in impounded water units and 9 in the riverine areas could only be observed during the entire survey period of one year. Based on these catches physically observed the quantity of fish caught, the expenditure incurred and the man power engaged per catch from impounded water units and riverine areas were worked out as averages of the sample values and presented in table (20).

Table (20) : Quantity fish caught, expenditure incurred and man power engaged per catch from inland water resources.

type of water resource	no. of catches observed	quantity of fish caught per catch (kg.)	charges paid per catch (Rs.)	no. of man days engaged per catch (days)
(1)	(2)	(3)	(4)	(5)
1. impounded water unit	10	95.5	51.72	19.9
2. riverine areas	5	127.7	4.00	1.6

It is seen that about 96kg. of fish was the average quantity caught per catch from impounded water units, engaging about 20 people. The catch operations of riverine areas observed appear to be of small scale in which only about 2 persons are engaged on the average, obtaining about 20 kg. of fish per catch.

4.21 Assembly points as survey units as an alternate approach for obtaining estimates of inland fish catch specially from that of riverine areas : Survey of assembly points or disposal points of the fish exploited from inland water resources as an indirect approach to estimate the total catch presupposes three very important points - (i) a major portion of the fish exploited arrive at these disposal points, (ii) it would be possible to compile a frame of such disposal points and (iii) it should be possible at the selected disposal points to categorise and classify the catch arrival, to the respective water resource type, impounded water units or riverine areas and the geographical regions at which level, the estimates are required.

The Central Inland Fisheries Research Institute in the past carried out amongst its various studies, some pilot studies also to estimate the catch of fish from riverine system. The institute confined its studies to selected stretches of certain important rivers and the objective was to evolve methodologies for obtaining estimates of catch of fish from riverine areas^{2/}. An approach through survey of markets to estimate the catch of fish from riverine areas was tried out for stretches of rivers Ganges and Nerbada. In the course of the study of the selected Ganges system, it became evident that the assembly centres enumerated and surveyed "did not account for the total marketed quantity. Further a significant fraction did not find a way to the market". The study was ultimately restricted to some principal markets to assess fluctuations in fisheries. The scheme on a 720 km. stretch of river Nerbada ultimately was also restricted to two principal centres when faced with the experience of Ganges system study and limited resources.

A scheme of above type for adoption, say at state level will first call for delineation of areas along the stretches of all the rivers and their tributary system on both sides and preparation of a frame of assembly centres or markets with proper stratification, which definitely will be a very huge task. Also how interior one has to go away from rivers for demarcating this zone will be difficult to judge. Even assuming that this should be possible, at present there is no data on the proportion of catch actually marketed. The Ganges system study revealed that even for such big rivers a significant fraction of catch does not find a way to market. For small riverine system and in case of unorganised and scattered fishing

^{2/} A note on methodology adopted by the Central Inland Fisheries Research Institute for the estimation of Inland Fish Catches in selected water bodies of India (prepared by Shri K. K. Ghosh).

operations of the fishery, which are not necessarily marketed, but may be marketed at organised markets or even marketed, at all, it is also possible that even out of the marketed catch from riverine areas, a portion may be marketed outside the demarcated zone. In the Ganga study, the assembly centres enumerated did not account the entire marketed quantity of fish. Moreover the assembly centres in the demarcated zone may be receiving catches from other than rivers, that is, impounded water units also, in which case identification of source for the catch marketed may become quite difficult.

To study the behavioural pattern of assembly centres, and occurrence of them in a general sample of villages, in the second phase of the pilot survey, in those sample villages with river system, all the assembly centres situated within them or within 15 km of them were listed and data on arrival and disposal of catch of fish in those assembly centres were collected by interviewing the different selling agents operating at these centres. Now, it may be recalled that for Madurai district only 62% of the catch from impounded water units and 0% of the catch from riverine areas were marketed the remaining being mainly consumed. Even out of this marketed fish, it was seen that a major portion was sold by individuals and only a small percentage of catch came to any organised selling centre. In fact only about 31% of the fish caught in impounded water units and a negligible amount of 2% of the fish caught in riverine areas were sold to whole-sale and retailers. Hence the obvious pointer is that 'assembly point' approach is not feasible in getting the estimates of catch of fish from inland water resources.

Table (1) showed that the occurrence of assembly centres in Madurai district under a general scheme of sample villages is very small. In fact the maximum number of assembly points listed was 11, out of which only one was within the sample cluster and the rest were within 15 km of the sample villages. No estimation therefore was attempted and some broad indicators were worked out as averages of sample villages.

Table (2) gives the percentage break up of total catch arrival at assembly points between the impounded water units and riverine areas and the contribution of sample clusters to the total catch arrival.

Table (29) : Percentage break-up of total catch arrival at assembly points between impounded water units and riverine areas with percentage contribution of sample clusters to the total catch arrival

type of water resource	percentage of total catch arrival	percentage of contribution from sample clusters to total arrival
(1)	(2)	(3)
1. impounded water unit	95.4	0.4
2. riverine area	4.6	25.0
3. total	100.0	25.4

It is seen that in Madurai district, 95% of the catch of fish arrived at assembly points was from impounded water units and riverine areas contributed only 5% of the total arrival. The sample clusters contributed only 0.4% and 25% respectively of the arrival of catch at assembly points from impounded water units and riverine areas.

Another important fact observed regarding the listed assembly points of Madurai district is that no catch arrived to these centres from outside Madurai district (Appendix table - 44).

Appendix - 1
DETAILED TABLES
List of tables

table number (1)	description (2)	pages (3)
1.	Number of sample units surveyed in the different visits	41
2.	Number of households and persons engaged in active fishing, pisciculture and and active fishing and/or pisciculture	42
3.	Distribution of impounded water units by number of operators for each size class of water unit	43-45
4.	Expenditure incurred per unit area of impounded water units by type of expenditure for each size class of water units	46
5.	Number of owned nets by type of net and type of fibre used in impounded water units for different visits	47
6.	Number of owned-nets by type of net and type of fibre used only in impounded water units for different visits	48
7.	Number of owned nets by type of net and type of fibre used in impounded water units for different visits and average area per net (unestimated)	49
8.	Percentage distribution of owned nets by type of net and fibre type used in impounded water units (unestimated)	50
9.	Average cost (Rs.) of owned nets by type of net, fibre type and type of procurement used in impounded water units (unestimated)	51
10.	Average expenditure on repairs and maintenance and average life (expected) of an owned net by type of net and fibre type used in impounded water units (unestimated)	52-53
11.	Number of mandays spent in fishing and charges paid for each size class of impounded water units	54
12.	Catch of fish from impounded water units by varieties according to the source of supply of water	55-56

Contd.....

table number (1)	description (2)	pages (3)
13.	Catch of fish from impounded water units by varieties according to the seasonality of water units	57-58
14.	Catch of fish from impounded water units by varieties according to the soil type of water units.	59-61
15.	Catch of fish from impounded water units by varieties according to the extent of silting.	62-63
16.	Catch of fish from impounded water units by varieties according to colour of water.	64-65
17.	Catch of fish from impounded water units by varieties according to the extent of floating weeds.	66-67
18.	Catch of fish from impounded water units by varieties according to the extent of sub-merged weeds.	68-69
19.	Quantity of fish caught and disposed by variety for each size class of impounded water units.	70-73
20.	Quantity of fish caught from impounded water units and the area from which catch obtained by variety during the reference periods related to the four different visits.	74-75
21.	Quantity and value of fish caught consumed and sold fresh from impounded water units by variety.	76
22.	Quantity of total fish sold fresh by place of sale for each size class of impounded water units.	77
23.	Quantity of total fish sold fresh by agency to which sold for each size class of impounded water units.	78
24.	Amount of assistance received by type of assistance for fishing in impounded water units during 1972-73 and 1973-74 (unestimated)	79
25.	Average number of operators engaged in river fishing and average number of fishing days in a year per river fishing unit (unestimated).	79
26.	Number of owned nets by type of net and type of fibre used in river fishing for different visits.	80
27.	Number of owned nets by type of net and fibre type used only in river fishing for different visits.	81

table number (1)	description (2)	pages (3)
28.	Number of owned nets by type of net and type of fibre used in river fishing for different visits and average area per net (unestimated).	82
29.	Percentage distribution of owned nets by type of net and fibre type used in river fishing (unestimated).	83
30.	Average cost (Rs.) of owned nets by type of net, fibre type and type of procurement used in river fishing (unestimated).	84
31.	Average expenditure on repairs and maintenance and average life (expected) of an owned net by type of net and fibre type used in river fishing (unestimated).	85-86
32.	Number of mandays spent in fishing and charges paid for river fishing.	87
33.	Quantity of fish caught and disposed by variety for river fishing.	87
34.	Quantity and value of fish caught, consumed and sold fresh by variety for river fishing.	88
35.	Quantity of total fish sold fresh by place of sale for river fishing.	89
36.	Quantity of total fish sold fresh by agency to which sold for river fishing.	89
37.	Number of days spent in fishing and charges paid per catch for each size class of impounded water units based on physical observation (unestimated).	90
38.	Quantity of fish caught by variety per catch for each size class of impounded water units based on physical observation (unestimated).	91
39.	Number of man days spent in fishing and charges paid per catch for river fishing based on physical observation (unestimated).	92
40.	Quantity of fish caught per catch by variety for river fishing based on physical observation (unestimated).	92

Contd.,.....

table number (1)	description (2)	pages (3)
41.	Unestimated count of the number of assembly points and dealing agents within the two village sample clusters and listed within 16 km of the sample clusters.	93
42.	Percentage distribution of assembly points and dealing agents with number of dealing agents per assembly point by type of assembly points (unestimated).	94
43.	Quantity per assembly point of total catch arrival and arrival from the sample clusters to the assembly points (unestimated).	94
44.	Quantity (Kg.) per assembly point of catch arrival at the assembly points for each variety of fish (unestimated).	95
45.	Quantity (Kg.) per assembly point of disposal of catch at the assembly points by type of disposal for each variety of fish (unestimated).	96

Table (1) : Number of sample units surveyed in the different visits

District : Madurai

u n i t	number of units surveyed during			
	visit 1	visit 2	visit 3	visit 4
(1)	(2)	(3)	(4)	(5)
1. cluster	48	48	48	48
2. village	96	96	96	96
3. impounded water unit	584	584	589	590
4. river fishing unit	55	55	54	54
5. assembly point within sample cluster	1	1	1	1
6. assembly point outside sample cluster but within 16 km. of them	5	5	11	13
7. catches observed from impounded water units	8	8	1	1
8. catches observed from river fishing units	4	1	-	-

Table (2) . Number of households and persons engaged in active fishing, pisciculture and active fishing and/or pisciculture.

District Madurai

i t e m	active fishing as		pisciculture as			active fishing and/or pisciculture as			
	principal occupation	subsidiary occupation	principal/ subsidiary occupation	principal occupation	subsidiary occupation	principal/ subsidiary occupation	principal occupation	subsidiary occupation	principal/ subsidiary occupation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. number of households	603	3584	4187	110	-	110	603	3584	4187
2. number of persons	743	4690	5433	200	-	200	743	4690	5433

MM:

Table (3) : Distribution of impounded water units by number of operators for each size-class of water unit.

District : Madurai

size class of water units (acres)	number of operators per unit															
	1				2				3				4			
	no. of units	area of units (acres)	no. of opera- tors	area per unit (acres)	no. of units	area of units (acres)	no. of opera- tors	area per unit (acres)	no. of units	area of units (acres)	no. of opera- tors	area per unit (acres)	no. of units	area of units (acres)	no. of opera- tors	area per unit (acres)
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
1. up to 0.99	1208	5,104.04	1208	0.44	-	-	-	-	18	9.00	54	0.50	-	-	-	-
2. 1.00 - 2.49	1266	1977.56	1266	1.56	50	75.50	100	1.51	36	54.00	108	1.50	-	-	-	-
3. 2.50 - 4.99	776	2615.56	776	3.38	124	403.71	243	3.34	46	205.60	138	4.47	46	140.58	184	3.06
4. 5.00 - 7.49	458	2715.98	458	5.94	38	193.60	76	5.09	63	412.12	189	6.54	36	213.94	142	5.94
5. 7.50 - 9.99	176	1503.14	176	8.54	20	160.00	40	80.00	26	204.00	77	7.85	18	174.24	72	9.68
6. 10.00 - 14.99	207	2464.32	207	12.14	10	110.00	20	11.00	46	571.96	138	12.43	5	70.00	20	14.00
7. 15.00 - 19.99	212	3543.00	212	16.71	-	-	-	-	7	112.50	22	16.27	20	364.50	80	18.22
8. 20.00 - 29.99	218	5280.76	218	24.22	34	780.00	68	22.35	23	673.74	69	29.29	-	-	-	-
9. 30.00 - 49.99	131	4554.08	131	34.76	9	270.00	18	30.00	-	-	-	-	9	405.02	36	45.00
10. 50.00 - 99.99	154	9591.54	154	62.28	-	-	-	-	-	-	-	-	-	-	-	-
11. 100.00 & above	81	15404.03	81	177.06	-	-	-	-	-	-	-	-	-	-	-	-
12. all classes	4889	50189.01	4889	10.27	282	1972.81	565	7.00	265	2242.92	795	8.46	134	1368.28	534	10.21

Table (3) (contd.) . Distribution of impounded water units by number of operators for each size-class of water unit.

District : Adurai

size class of water units (acres)	number of operators per unit															
	no. of units	5 - 9					10 - 14					15 - 19				
		area of units (0.00 acres)	no. of operators	area per unit (0.00 acres)	no. of operators per unit	no. of units	area of units (0.00 acres)	no. of operators	area per unit (0.00 acres)	no. of operators per unit	no. of units	area of units (0.00 acres)	no. of operators	area per unit (0.00 acres)	no. of operators per unit	
(1)	(10)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	
1. up to 0.99	-	-	-	-	-	36	10.80	414	0.30	11.50	-	-	-	-	-	
2. 1.00 - 2.45	54	79.92	324	1.48	6.00	36	43.20	432	1.20	12.00	18	36.00	306	2.00	17.00	
3. 2.50 - 4.99	10	35.00	50	3.50	5.00	18	50.40	180	2.80	10.00	-	-	-	-	-	
4. 5.00 - 7.45	76	513.32	504	6.75	6.63	18	126.00	252	7.00	14.00	18	103.68	270	5.76	15.00	
5. 7.50 - 9.99	40	349.02	230	8.72	5.75	-	-	-	-	-	-	-	-	-	-	
6. 10.00 - 14.99	48	575.24	362	11.98	7.54	-	-	-	-	-	46	536.14	720	11.66	15.65	
7. 15.00 - 19.99	46	735.90	284	17.30	6.17	8	135.00	88	16.88	10.38	-	-	-	-	-	
8. 20.00 - 29.99	10	200.00	50	20.00	5.00	9	181.17	117	20.13	13.00	-	-	-	-	-	
9. 30.00 - 49.99	-	-	-	-	-	18	684.00	198	38.00	11.00	-	-	-	-	-	
10. 50.00 - 99.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11. 100.00 & above	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12. all classes	284	2548.40	1804	8.97	6.35	143	1230.57	1676	8.61	11.72	82	675.82	1296	8.24	15.80	

Table (3) (Contd.) - Distribution of unmounted water units by number of operators for each size class of water units.

District : Madurai

size class of water units (acres)	no. of operators per unit												
	20 & above					not recorded			total				
	no. of units	area of units (acres)	no. of operators	area per unit (acres)	no. of operators per unit	no. of units	area of units (acres)	area per unit (acres)	no. of units	area of units (acres)	no. of operators	area per unit (acres)	no. of operators per unit
(1)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)
1. up to 0.99	-	-	-	-	-	-	-	-	1262	550.84	1676	0.44	1.33
2. 1.00 - 2.49	90	159.48	2430	1.77	27.00	-	-	-	1550	2425.66	4966	1.56	3.20
3. 2.50 - 4.99	126	402.48	5813	3.19	46.14	-	-	-	1143	3857.33	7384	3.37	6.46
4. 5.00 - 7.49	166	939.50	4390	5.76	26.93	-	-	-	870	5222.14	6281	6.00	7.22
5. 7.50 - 9.99	18	168.66	900	9.37	50.00	-	-	-	298	2559.06	1495	8.59	5.02
6. 10.00 - 14.99	52	549.00	1445	10.56	27.79	-	-	-	410	4876.66	2908	11.89	7.09
7. 15.00 - 19.99	108	1855.64	10080	17.00	93.33	-	-	-	401	6786.54	10761	16.92	26.84
8. 20.00 - 29.99	126	2981.17	5445	23.66	43.21	9	180.00	20.00	429	10256.84	5967	23.91	*14.21
9. 30.00 - 49.99	27	1073.16	1395	39.75	51.67	-	-	-	194	6986.26	1778	36.01	5.56
10. 50.00 - 99.99	98	7274.12	13910	74.23	141.94	36	2311.74	64.22	288	19177.40	14064	66.59	*55.81
11. 100.00 & above	160	24659.65	53788	154.12	336.18	-	-	-	247	40063.68	53875	162.20	218.12
12. all classes	966	40042.86	99596	41.37	102.89	45	2491.74	55.37	7092	102762.41	111155	14.49	*15.77

* excluding not recorded

Table (4) : Expenditure incurred per unit area of impounded water units by type of expenditure for each size class of water units.

District - Madurai

size class of water units (acres)	no. of water units	area of the units (acres)	rent	expenditure (Rs.) per unit area by type of expenditure							piscicultural cost		
				repairs and renovation of embankments	desilting and detattering	deweeding	other maintenance cost	total maintenance cost	preparation of bed including liming and manuring	spawn, fry etc.	other piscicultural cost	total piscicultural cost	total cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1. up to 0.99	1262	550.84	5.24										5.24
2. 1.00 - 2.49	1550	2425.66	1.02										1.02
3. 2.50 - 4.99	1143	3857.33	1.58										1.58
4. 5.00 - 7.49	870	5222.14	1.53	15.30				15.30		0.42		0.42	17.25
5. 7.50 - 9.99	296	2559.06	0.54										0.54
6. 10.00 -14.99	410	4876.66	3.65	9.23				9.23		0.20		0.20	13.08
7. 15.00 -19.99	401	6706.54	3.61							0.27		0.27	3.88
8. 20.00 -29.99	429	10256.84	6.01	30.10				30.10		0.25	0.03	0.28	36.39
9. 30.00 -49.99	194	6986.26	11.15		2.44			2.44		0.60	0.07	0.67	14.25
10. 50.00 -99.95	283	19177.40	8.75	2.82				2.82		0.59		0.59	12.16
11. 100.00 & above	247	40063.68	1.93	33.89	0.99			34.88					36.81
12. all classes	7092	102762.41	4.35	17.92	0.55			18.47		0.22	0.01	0.23	23.05

KL:

Table (5) : Number of owned-nets by type of net and type of fibre used in impounded water units for different visits

District : Madurai

type of net	visit 1			visit 2			visit 3			visit 4		
	cotton	synthetic	all	cotton	synthetic	all	cotton	synthetic	all	cotton	synthetic	all
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. drag net	20		20	373		373	112		112	112		112
2. cast net	4		4	115		115						
3. gill net		155	155		155	155		155	155		155	155
4. fixed net												
5. seines												
6. scoop net	32		32	341		341	41		41	5		5
7. other nets							18		18			
8. all types	56	155	211	829	155	984	171	155	326	117	155	272

KL:

Table (6) : Number of owned-nets by type of net and type of fibre used only in impounded water units for different visits

District Madurai												
type of net	visit 1			visit 2			visit 3			visit 4		
	cotton	synthetic	all	cotton	synthetic	all	cotton	synthetic	all	cotton	synthetic	all
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. drag net	20		20	373		373	112		112	112		112
2. cast net	4		4	115		115						
3. gill net		155	155		155	155		155	155		155	155
4. fixed net												
5. seines												
6. scoop net	32		32	341		341	41		41	5		5
7. other nets							18		18			
8. all types	56	155	211	829	155	984	171	155	326	117	155	272

KM

Table (7) : Number of owned nets by type of net and type of fibre used in impounded water units for different visits, and average area per net (unestimated)

District : Madurai

type of net	cotton				synthetic				all fibre types				average area per net (sq. metres)		
	visit 1	visit 2	visit 3	visit 4	visit 1	visit 2	visit 3	visit 4	visit 1	visit 2	visit 3	visit 4	cotton	synthetic	all
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1. drag net	5	61	74	74	2	2	2	2	7	63	76	76	4.09	125.00	7.71
2. cast net	2	18	18	18					2	18	18	18	11.95		11.95
3. gill net					16	16	16	16	16	16	16	16		75.00	75.00
4. fixed net															
5. seines															
6. scoop net	3	41	49	37					3	41	49	37	0.90		0.90
7. other nets			1	1							1	1	1.50		1.50
8. all types	10	120	142	130	18	18	18	18	28	138	160	148	4.12	78.33	15.39

Table (8) : Percentage distribution of owned nets by type of net and fibre type used in impounded water units (unestimated)

District : Madurai												
type of net	cotton				synthetic				all fibre types			
	procurement type											
	home made	first hand purchase	second hand purchase	all	home made	first hand purchase	second hand purchase	all	home made	first hand purchase	second hand purchase	all
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. drag net	1.0	33.3	9.9	45.1		1.7		1.7	1.9	35.0	9.9	45.8
2. cast net		11.8		11.8						11.8		11.8
3. gill net						13.5		13.5		13.5		13.5
4. fixed net												
5. seines									1.7	22.2	3.6	27.5
6. scoop net	1.7	22.2	3.6	27.5					0.4			0.4
7. other nets	0.4			0.4								
8. all types	4.0	67.3	19.5	84.8		15.2		15.2	4.0	82.5	13.5	100.0

150

Table (9) : Average cost (Rs.) of owned-nets by type of net, fibre type, and type of procurement used in impounded water units (unestimated)

District : Madurai

type of net	fibre type											
	cotton				synthetic				all fibre types			
	procurement type											
	home made			home made				home made				
	cost of raw materials and making charges	mandays spent	first hand purchase	second hand purchase	cost of raw materials and making charges	mandays spent	first hand purchase	second hand purchase	cost of raw materials and making charges	mandays spent	first hand purchase	second hand purchase
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. drag net	60.56	8.3	24.96	7.60			112.50		60.56	8.3	28.87	7.60
2. cast net			35.28								35.28	
3. gill net							38.75				38.75	
4. fixed net												
5. seines												
6. scoop net	21.88	5.0	7.40	3.18					21.88	5.0	7.40	3.18
7. other nets	30.00	10.0							30.00	10.0		
8. all types	41.05	7.1	20.83	6.42			46.94		41.05	7.1	25.64	6.42

Table (10) : Average expenditure on repairs and maintenance, and average life (expected) of an owned-net by type of net and fibre type used in impounded water units (unestimated).

District : Madurai

type of net	fibre type															
	cotton					synthetic										
	home made	first hand purchase		second hand purchase		total	home made	first hand purchase		second hand purchase		total				
	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1. drag net	8.34	4.5	1.60	5.7	0.52	2.1	1.68	4.9			0.12	7.5			0.42	7.5
2. cast net		3.7	0.98	3.3			0.98	3.4							0.36	4.0
3. gill net											0.36	4.0			0.36	4.0
4. fixed net																
5. seines																
6. scoop net		5.1	0.63	4.1	0.44	2.2	0.59	4.0								
7. other nets	11.2							11.2								
8. all types	7.09	5.3	1.22	4.8	0.50	2.7	1.23	4.4			0.37	4.3			0.37	4.4

Table (10)(contd.) : Average expenditure on repairs and maintenance, and average life (expected) of an owned net by type of net and fibre type used in impounded water units (unestimated)

District : Madurai

type of net	fibre type							
	all fibre types							
	home made		first hand purchase		second hand purchase		total	
	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)
(1)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
1. drag net	8.34	4.5	1.63	5.8	0.52	2.1	1.73	5.0
2. cast net		3.7	0.98	3.3			0.98	3.4
3. gill net			0.36	4.0			0.36	4.0
4. fixed net								
5. seines								
6. scoop net		5.1	0.63	4.1	0.44	2.2	0.59	4.0
7. other nets		11.2						11.2
8. all types	7.09	5.3	1.12	4.7	0.50	2.1	1.17	4.4

1
53

Table (11) : Muster of mandays spent in fishing and charges paid for each size class of expanded water units.

District : Madurai

size class of water units (acres)	no. of units	area of unit (acres)	no. of mandays spent in fishing			total no. of mandays spent per unit water area	charges paid to the hired men			other charges paid (Rs.)	total charges paid (Rs.)	total charges per unit water area (Rs.)
			h.A labour	hired labour	total		cash	kind	total			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. upto - 0.99	10	19.27	630.0	140.9	770.0	40.1	1200.00	-	1200.00	400.00	1600.00	87.50
2. 1.00 - 2.49	232	108.20	6613.7	60.0	2661.7	10.9	200.00	142.00	344.00	70.00	414.00	0.97
3. 2.50 - 4.99	370	1320.36	10004.7	410.0	10414.7	7.9	940.00	643.50	1583.50	150.00	1741.50	1.31
4. 5.00 - 7.49	134	2507.72	6542.0	500.0	10130.7	3.9	2100.00	760.00	2860.00	960.00	3820.00	1.48
5. 7.50 - 9.99	127	1103.90	8050.0	265.0	3115.0	2.8	795.00	150.00	945.00	225.00	1170.00	1.06
6. 10.00 - 14.99	128	6507.52	4446.5	406.0	4552.5	3.0	1750.00	475.00	2225.00	685.00	2910.00	1.94
7. 15.00 - 19.99	214	3507.00	6450.0	532.4	6982.0	1.9	3930.00	200.00	4130.00	470.00	4600.00	1.20
8. 20.00 - 29.99	321	7551.24	5130.0	1830.0	7440.0	1.0	8644.00	1013.60	10457.60	1754.00	12211.60	1.62
9. 30.00 - 49.99	154	5552.46	3711.0	1092.0	5603.0	1.0	9020.00	5259.20	14279.20	3446.00	17725.20	3.14
10. 50.00 - 99.99	273	11762.54	25736.6	6040.0	32026.6	2.3	20065.00	9200.00	29065.00	3591.70	32656.70	2.32
11. 100.00 & above	227	36760.88	30670.0	723.3	45960.3	1.2	21320.00	36000.00	57320.00	7685.00	65005.00	1.77
12. all classes	2577	74597.50	139564.5	20725.3	129609.8	1.7	70852.00	53645.30	124497.30	19439.70	143937.00	1.93

Table (12) Catch of fish from impounded water units by varieties according to the source of supply of water.

District : Madurai

v a r i e t y	source of supply of water											
	rainfed				river or channels				spring			
	no.of un- its from which ca- tch obta- ined	area of the units (acres)	catch (kg.)	catch per unit area (kg.)	no.of un- its from which ca- tch obta- ined	area of the units (acres)	catch (kg.)	catch per unit area (kg.)	no.of un- its from which ca- tch obta- ined	area of the units (acres)	catch (kg.)	catch per unit area (kg.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. carps	902	18600.62	39051.3	2.1	853	46716.16	157011.0	3.4	-	-	-	-
2. cat-fish	1129	21132.40	27416.4	1.3	692	37971.26	52632.0	1.4	-	-	-	-
3. murrels	929	18475.32	35541.2	1.9	871	46954.30	106057.0	2.3	-	-	-	-
4. barbus-species	773	16784.44	42577.2	2.5	750	30952.15	91088.0	2.3	-	-	-	-
5. cyprinus	23	404.00	1007.5	2.5	20	1085.40	1950.0	1.0	-	-	-	-
6. tilapia	555	9306.12	37555.8	4.0	455	32160.36	107401.0	3.3	-	-	-	-
7. hilsa	10	150.00	20.0	0.1	-	-	-	-	-	-	-	-
8. shrimps/prawn	-	-	-	-	-	-	-	-	-	-	-	-
9. others	733	17755.90	10662.9	0.6	842	45717.40	72870.0	1.6	-	-	-	-
10. t o t a l	1463	24377.08	193632.3	0.8	1054	50213.50	588709.0	11.7	-	-	-	-

Table (12)(contd.) : Catch of fish from impounded water units by varieties according to the source of supply of water.

District : Madurai				
source of supply of water				
v a r i e t y	t o t a l			catch per unit area (kg.)
	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	
(1)	(14)	(15)	(16)	(17)
1. carps	1755	65324.16	196062.3	3.0
2. cat-fish	1021	59133.66	80040.4	1.4
3. murrels	1800	65429.62	142190.2	2.2
4. barbus-species	1523	55736.92	133665.2	2.4
5. cyprinus	43	1489.40	2057.5	1.4
6. tilapia	1010	41468.40	144956.8	3.5
7. hilsa	10	150.00	20.0	0.1
8. shrimps/prawn	-	-	-	-
9. others	1625	63477.30	83532.9	1.3
10. t o t a l	2517	74590.58	702541.3	10.5

'sch'

Table (13) Catch of fish from impounded water units by varieties according to the seasonality of water units.

District Madurai

v a r i e t y	seasonality of the water units											
	Perennial				9 to less than 12 months				6 to less than 9 months			
	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit area (kg.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. carps	41	638.36	1402.5	2.2	158	8112.90	73960.0	9.1	493	19578.82	70613.1	3.6
2. cat-fish	30	238.36	1260.0	4.4	176	6869.22	26370.0	3.9	494	14557.28	26150.1	1.8
3. murrel	41	538.36	4860.5	7.6	308	10099.22	51990.0	5.1	481	18445.58	50272.0	2.7
4. barbun-species	10	26.64	360.0	13.5	234	7813.22	26540.0	3.4	476	17626.26	70822.1	4.0
5. cyprinus	5	350.00	773.5	2.2	10	54.00	234.0	4.3	20	1085.40	1050.0	1.0
6. tilapia	23	376.64	1937.5	5.1	150	7456.22	36390.0	4.9	333	14171.74	67520.0	4.8
7. hilsa	-	-	-	-	-	-	-	-	-	-	-	-
8. shrimps/prawn	-	-	-	-	-	-	-	-	-	-	-	-
9. others	13	261.72	450.0	1.7	140	7606.92	22140.0	2.9	400	16026.50	26023.1	1.6
10. t o t a l	11	638.36	11044.0	17.3	204	8248.22	237824.0	28.8	672	21796.203	12650.4	14.3

Table (13)(contd.) : Catch of fish from impounded water units by varieties according to the seasonality of water units.

District : Madurai

v a r i e t y	seasonality of water units											
	4 to less than 6 months				less than 4 months				t o t a l			
	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit area (kg.)
(1)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
1. carps	573	25492.76	40972.7	1.6	490	11501.34	8914.0	0.8	1755	55324.10	196062.3	3.0
2. cat-fish	551	26038.40	17067.3	0.7	564	11350.40	9001.0	0.8	1021	59103.66	80048.4	1.4
3. murrel	139	24579.66	28363.7	1.2	473	11666.60	6712.0	0.6	1800	55425.62	142198.2	2.2
4. barbus-species	369	20235.26	26320.0	1.3	426	10035.54	9615.1	1.0	1523	55736.92	133665.2	2.4
5. cyprinus	-	-	-	-	-	-	-	-	43	1409.40	2057.5	1.4
6. tilapia	380	18013.72	37418.3	2.1	124	1450.16	1691.0	1.2	1010	41468.48	144956.8	3.5
7. hilsa	10	150.00	20.0	0.1	-	-	-	-	10	150.00	20.0	0.1
8. shrimps/prawn	-	-	-	-	-	-	-	-	-	-	-	-
9. others	444	26030.96	24009.7	0.9	643	13543.10	10830.1	0.8	1625	63477.30	83532.9	1.3
10. t o t a l	195	27439.70	174259.7	5.9	802	14160.10	46763.2	3.2	2517	74590.50	782541.3	10.5

Table (1r) : Catch of fish from impounded water units by varieties according to the soil type of water units

District : Madurea

v a r i e t y	soil type							
	l o a m y				s a n d y			
	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit area (kg.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. carps	917	16936.26	53790.5	3.2	64	1699.44	10100.0	5.9
2. cat-fish	479	20674.50	24750.0	1.2	66	1283.26	3895.0	3.0
3. murrel	393	19661.16	42500.5	2.2	66	1233.26	6600.0	5.2
4. barbus-species	552	17412.36	53336.0	3.1	70	1676.34	7015.0	4.7
5. cyprinus	33	409.00	1003.1	2.5	-	-	-	-
6. tilapia	375	12133.94	35553.5	2.9	34	96.90	440.3	4.6
7. hilsa	10	150.00	20.0	0.1	-	-	-	-
8. shrimps/prawn	-	-	-	-	-	-	-	-
9. others	770	16847.92	15030.0	0.9	21	451.00	647.7	1.4
10. total	1267	22606.78	22670.0	10.0	88	1736.34	29585.0	17.0

Table (14)(contd.) : Catch of fish from impounded water units by varieties according to the soil type of water units

District : Madurai

v a r i e t y	soil type							
	alluvial				clay			
	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit area (kg.)
(1)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1. carpa	236	7597.12	16742.0	2.2	359	10769.08	100403.7	5.3
2. cat-fish	164	6734.30	4116.0	0.6	329	11453.20	32603.3	2.6
3. murrel	172	749.48	6514.0	0.9	171	19627.40	74911.7	3.6
4. barbus-species	190	7340.04	6696.0	0.9	415	12701.52	40100.0	3.0
5. cyprinus	-	-	-	-	10	1000.40	1054.4	1.0
6. tilapia	162	7237.00	4250.0	0.7	322	13297.30	96035.0	7.3
7. hilsa	-	-	-	-	-	-	-	-
8. shrimps/prawn	-	-	-	-	-	-	-	-
9. others	190	7412.22	7300.0	1.0	345	17660.50	47210.0	2.7
10. total	326	8335.04	46390.0	5.6	515	20450.82	401143.7	19.6

Table (14) (Contd.) : Catch of fish from impounded water units by varieties according to the soil type of water units.

District : Madurai

v a r i e t y	soil type							
	others				total			
	no. of units from which catch obtained	area of the units acres	catch (kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units acres	catch (kg.)	catch per unit area (kg.)
(1)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
1. carps	179	20220.28	15026.1	0.7	1755	65324.18	196062.3	3.0
2. cat-fish	783	18958.24	14676.1	0.8	1821	59103.66	80048.4	1.4
3. mullet	198	17408.24	11512.0	0.7	1800	65429.62	112198.2	2.2
4. Barbus-species	280	16526.66	17638.2	1.1	1523	55736.92	133665.2	2.4
5. cyprinus	-	-	-	-	43	1489.40	2057.5	1.4
6. tilapia	117	8703.18	7170.0	0.8	1010	41468.48	114956.8	3.5
7. hilsa	-	-	-	-	10	150.00	20.0	0.1
8. shrimps/prawn	-	-	-	-	-	-	-	-
9. others	291	21097.50	12158.2	0.6	1625	63477.30	83532.9	1.3
10. total	321	21461.60	78714.6	3.7	2517	74590.58	782541.3	10.5

Table (15) : Catch of fish from impounded water units by varieties according to the extent of silting

District : Madurai

varie:	extent of silting							
	not silted				partially silted			
	no. of units from which catch obtained	area of the units acres	catch(kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units acres	catch(kg.)	catch per unit area (kg.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. carps	110	2705.40	7610.0	2.8	1599	60334.62	181652.3	3.0
2. cat-fish	100	2555.40	2710.0	0.1	1639	53685.76	74528.4	1.4
3. murrel	110	2705.40	7646.0	2.8	1636	60487.26	130142.2	2.2
4. barbuss-spec	100	2347.68	2260.0	1.0	1243	49973.46	122855.2	2.5
5. cyprinus	18	54.00	234.0	4.3	25	1435.40	1823.5	1.3
6. tilapia	38	926.54	4360.0	4.7	846	37280.60	138256.8	3.7
7. hilsa				.	10	150.00	20.0	0.1
8. shrimps/prawn				.				
9. others	64	1990.02	5810.0	2.9	1453	58148.46	75742.9	1.3
10. total	128	2759.40	30630.0	11.1	2181	68191.26	725021.3	10.6

Table (15) contd. : Catch of fish from impounded water units by varieties according to the extent of silting

District : Laduraj

variety	extent of silting							
	badly silted				total			
	no. of units from which catch obtained	area of the units(acres)	catch(kg.)	catch per unit area(kg.)	no. of units from which catch obtained	area of the units(acres)	catch(kg.)	catch per unit area(kg.)
(1)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1. carps	46	2234.16	6800.0	3.0	1755	65324.18	196062.3	3.0
2. cat-fish	82	2362.50	2810.0	1.0	1821	59103.66	30043.4	1.4
3. murrel	54	2236.96	1110.0	2.0	1800	65429.62	142198.2	2.2
4. brabus-species	180	3415.78	8550.0	2.5	1523	55736.92	133635.2	2.4
5. cyprinus	-	-	-	-	43	1489.40	2057.5	1.4
6. tilapia	126	3261.24	2340.0	0.7	1010	41466.48	124956.8	3.5
7. hilsa	-	-	-	-	10	150.00	20.0	0.1
8. shrimps/prawn	-	-	-	-	-	-	-	-
9. others	108	3330.02	1900.0	0.6	1625	63477.30	83532.9	1.3
10. total	208	3639.92	26890.0	7.4	2517	74590.58	782541.3	10.5

Table (16) : Catch of fish from impounded water units by varieties according to colour of water.

District : Madurai

v - r i e t y	colour of water															
	bluish			greenish			brownish			turbid						
	no. of units from which catch obtained	area of the units acres	catch (kg.)	no. of units from which catch obtained	area of the units acres	catch (kg.)	per unit area (kg.)	no. of units from which catch obtained	area of the units acres	catch (kg.)	per unit area (kg.)	no. of units from which catch obtained	area of the units acres	catch (kg.)	per unit area (kg.)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1. carps	208	5342.00	51407.5	9.6	349	9333.42	35771.0	3.8	208	14224.84	36472.0	2.6	446	18654.32	46923.7	2.5
2. cat-fish	216	5732.00	11490.0	2.0	370	8137.46	14669.0	1.8	200	14030.16	13776.0	1.0	359	12287.14	18917.3	1.5
3. mullet	198	5512.00	35830.5	6.5	310	9215.08	24738.0	2.7	174	12443.12	17860.0	1.4	558	19935.62	47937.7	2.4
4. barbuss-species	88	4449.00	21160.0	4.8	178	6074.92	16943.0	2.8	208	14449.84	22236.0	1.5	675	19524.54	51970.0	2.7
5. cyprinus	-	-	-	-	33	409.00	1043.0	2.6	-	-	-	-	10	1080.40	1014.5	0.9
6. tilapia	118	4812.00	23367.5	4.9	192	5445.06	20080.0	3.7	146	7972.70	18940.0	2.4	428	15717.78	75814.3	4.8
7. hilsa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. shrimps/prawn	-	-	-	-	-	-	-	-	-	-	-	-	10	150.00	20.0	0.1
9. others	28	3449.00	5090.0	1.5	232	7366.52	23328.0	3.2	162	13721.04	9450.0	0.7	561	20955.14	29926.7	1.4
10. total	228	5752.00	148969.0	25.9	454	10230.28	135248.0	13.2	246	14759.08	118734.0	8.0	845	24402.24	272509.7	11.2

Table (16)(Contd.) : Catch of fish from impounded water unit by varieties according to colour of water

District : Madurai

varieties	colour of water											
	others				not recorded				total			
	no. of units from which catch obtained	area of the units acres	catch (kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units acres	catch (kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units acres	catch (kg.)	catch per unit area (kg.)
(1)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
1. eel	450	15888.60	20898.0	1.3	94	1881.00	4590.1	2.4	1755	65324.18	196062.3	3.0
2. cat-fish	558	16795.26	18396.0	1.1	116	2121.64	2800.1	1.3	1821	59103.66	80048.4	1.4
3. mullet	486	10502.76	14202.0	0.9	74	1821.04	1630.0	0.9	1800	65429.62	142198.2	2.2
4. barbus-species	270	10285.92	17406.0	1.7	104	952.70	3950.2	4.1	1523	55736.92	133665.2	2.4
5. cyprinus	-	-	-	-	-	-	-	-	43	1489.40	2057.5	1.4
6. tilapia	108	7518.24	7380.0	1.0	18	2.70	90.0	33.3	1010	41468.48	144956.8	3.5
7. hilsa	-	-	-	-	-	-	-	-	10	150.00	20.0	0.1
8. shrimps/crabs	-	-	-	-	-	-	-	-	-	-	-	-
9. others	594	16749.54	14292.0	0.9	48	1236.06	1446.2	1.2	1625	63477.30	83532.9	1.3
10. total	612	17288.28	92574.0	5.4	132	2158.70	14606.6	6.7	2517	74590.58	782541.3	10.5

Table (17) : Catch of fish from impounded water unit by varieties according to the extent of floating weeds

District : Madurai

variety	extent of floating weeds											
	no weeds				covers less than 50%				covers more than 50%			
	no. of units from which catch obtained	area of the units acres	catch (kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units acres	catch (kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units acres	catch (kg.)	catch per unit area (kg.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. carps	1192	54647.05	117229.7	2.1	705	7109.40	64392.5	8.7	64	1389.72	9850.0	7.1
2. cat fish	1241	48889.30	54298.3	1.1	400	7203.00	17990.0	2.5	64	1389.72	4960.0	3.6
3. murrel	1312	59314.86	83707.7	1.5	350	6904.00	48470.5	7.0	64	1389.72	8390.0	6.0
4. barbun species	1253	48990.22	100135.0	2.0	120	4666.00	26600.0	5.7	46	1128.00	2980.0	2.6
5. cyprinus	38	1139.40	7284.0	1.1	5	350.00	773.5	2.2	-	-	-	-
6. tilapia	709	34281.78	113239.3	3.3	255	6144.00	28177.5	4.6	28	840.80	3250.0	4.1
7. hilsa	10	150.00	20.0	0.1	-	-	-	-	-	-	-	-
8. shrimps/prawn	-	-	-	-	-	-	-	-	-	-	-	-
9. others	123	57211.52	68516.7	1.2	70	3640.00	7400.0	2.0	64	1389.72	6170.0	4.4
10. total	1646	62729.26	538430.7	8.6	475	8313.00	193804.0	23.3	64	1389.72	35800.0	25.8

Table 17 (contd.) : Catch of fish from impounded water units by varieties according to the extent of floating weeds.

District : Madurai

v a r i e t y	extent of floating weeds							
	not recorded				total			
	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit area (kg.)	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit area (kg.)
(1)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1. carps	94	1881.00	4590.2	2.4	1755	65324.18	196062.3	3.0
2. cat fish	116	2121.64	2800.1	1.3	1821	59103.66	80048.4	1.4
3. murrel	74	1821.04	1630.0	0.9	1800	65429.62	142198.2	2.2
4. barbous species	104	952.70	3950.2	4.1	1523	55736.92	133665.2	2.4
5. cyprinus			-	-	43	1489.40	2057.5	1.4
6. tilapia	18	2.70	90.0	33.3	1610	41468.48	144956.8	3.5
7. malsa			-	-	10	150.00	20.0	0.1
8. shrimps/prawn			-	-				-
9. others	48	1236.06	1446.2	1.2	2625	63477.30	83532.9	1.3
10. total	132	2158.70	14506.6	6.7	2517	74590.58	782541.3	10.5

Table (18) : Catch of fish from impounded water units by varieties according to the extent of sub-merged weeds.

District : Madurai

variety	extent of sub-merged weeds											
	no weeds				covers less than 50%				covers more than 50%			
	no. of units in which catch obtained	area of the units (acres)	catch (kg.)	catch per unit (kg.)	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit (kg.)	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit (kg.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. euras	1084	49817.56	105079.7	2.1	495	11791.12	76542.5	6.5	82	1834.50	9850.0	5.4
2. cat fish	1123	43634.94	51878.3	1.0	498	11910.36	20260.0	1.7	84	1436.72	5110.0	3.6
3. murrel	1217	50836.14	75157.7	1.5	420	10985.72	56900.5	5.2	84	1436.72	8510.0	5.9
4. various-species	1399	43467.14	88185.0	2.0	236	9697.20	38330.0	4.0	84	1619.78	3200.0	2.0
5. cyprinus	38	1139.40	1284.0	1.1	5	350.00	773.5	2.2			-	-
6. tilapia	601	29956.42	108369.3	3.6	353	10636.56	32847.5	3.1	38	872.80	3650.0	4.2
7. hilsa	10	150.00	20.0	0.1			-	-			-	-
8. shrimps/prawn			-	-			-	-			-	-
9. others	1322	51142.02	65216.7	1.3	163	9250.52	10680.0	1.2	92	1848.70	6190.0	3.3
10. total	1692	57226.18	495190.7	8.7	591	13324.20	236334.0	17.7	102	1881.50	36510.0	19.4

Table 18 (contd.) : Catch of fish from impounded water units by varieties according to the extent of sub-merged weeds.

District : Madurai

variety	extent of sub-merged weeds							
	not recorded				total			
	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit (kg.)	no. of units from which catch obtained	area of the units (acres)	catch (kg.)	catch per unit (kg.)
(1)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1. carps	94	1881.00	4590.1	2.4	1755	65324.18	196062.3	3.0
2. cat-fish	116	2121.64	2800.1	1.3	1821	59103.66	80048.4	1.4
3. murrel	79	2171.04	1630.0	0.8	1800	65429.62	142198.2	2.2
4. bartu-buccies	104	952.70	3950.2	4.1	1523	55736.92	133665.2	2.4
5. cyrinus			-	-	43	1489.40	2057.5	1.4
6. tilapia	18	2.70	90.0	33.3	1010	41468.48	144956.8	3.5
7. hilsa			-	-	10	150.00	20.0	0.2
8. shrimps/prawn			-	-			-	-
9. others	48	1236.06	1446.2	1.2	1625	63477.30	83532.9	1.3
10. total	132	2158.70	14506.6	6.7	2517	74590.58	782541.3	10.5

Table (19) : Quantity of fish caught and disposed by variety for each size class of impounded water units

District : Madurai

size class of water units (acres)	variety	quantity of fish (kg.)							
		total catch	disposal type					waste	others
			consumed	old fresh	wages in kind	salted and dried			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
upto 0.99	carps	50.0	-	50.0	-	-	-	-	
	cat fish	500.0	180.0	320.0	-	-	-	-	
	murrels	290.0	160.0	130.0	-	-	-	-	
	1. barbun species	990.0	290.0	700.0	-	-	-	-	
	cyprinus	50.0	50.0	-	-	-	-	-	
	tilapia	540.0	180.0	360.0	-	-	-	-	
	hilsa	-	-	-	-	-	-	-	
	prawn/shrimps	-	-	-	-	-	-	-	
	others	1700.0	20.0	180.0	-	1500.0	-	-	
	total	4120.0	880.0	1740.0	-	1500.0	-	-	
1.00-2.49	carps	2700.0	1790.0	874.0	136.0	-	-	-	
	cat fish	1478.0	798.0	626.0	54.0	-	-	-	
	murrels	3970.0	1350.0	2620.0	-	-	-	-	
	2. barbun species	2610.1	2130.1	480.0	-	-	-	-	
	cyprinus	-	-	-	-	-	-	-	
	tilapia	1006.0	136.0	780.0	90.0	-	-	-	
	hilsa	-	-	-	-	-	-	-	
	prawn/shrimps	-	-	-	-	-	-	-	
	others	2760.1	240.1	360.0	-	-	-	-	
	total	14524.2	8604.2	5740.0	180.0	-	-	-	
2.50-4.99	carps	4736.0	3000.0	1664.0	72.0	-	-	-	
	cat fish	2676.0	2378.0	126.0	172.0	-	-	-	
	murrels	1666.0	936.0	730.0	-	-	-	-	
	3. barbun species	3736.0	3118.0	450.0	168.0	-	-	-	
	cyprinus	234.0	-	234.0	-	-	-	-	
	4. tilapia	4073.3	2058.3	1680.0	335.0	-	-	-	
	hilsa	-	-	-	-	-	-	-	
	prawn/shrimps	-	-	-	-	-	-	-	
	others	2172.7	1636.7	536.0	-	-	-	-	
	total	19294.0	13127.0	5420.0	747.0	-	-	-	

Table 19 (contd.) : Quantity of fish caught and disposed by variety for each size class of impounded water units

District : Madurai

size class of water units (acres)	variety	quantity of fish (kg.)							
		total catch	disposal type					waste	others
			consumed	sold fresh	wages in kind	salted and-dried			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
	carps	7626.0	5136.0	2400.0	90.0	-	-	-	
	cat fish	4696.0	2886.0	1720.0	90.0	-	-	-	
	murrels	6188.0	1688.0	4300.0	200.0	-	-	-	
4.	barbus species	6542.0	3712.0	830.0	-	2000.0	-	-	
5.00-	cyprinus	-	-	-	-	-	-	-	
7.49	tilapia	3010.0	2210.0	800.0	-	-	-	-	
	hilsa	-	-	-	-	-	-	-	
	prawn/shrimps	-	-	-	-	-	-	-	
	others	2414.0	1784.0	576.0	54.0	-	-	-	
	total	30476.0	17416.0	10626.0	434.0	2000.0	-	-	
	carps	5334.0	974.0	4360.0	-	-	-	-	
	cat fish	3328.0	718.0	2610.0	-	-	-	-	
	murrels	3041.0	771.0	2240.0	30.0	-	-	-	
5.	barbus species	5168.0	1368.0	800.0	-	3000.0	-	-	
7.50-	cyprinus	-	-	-	-	-	-	-	
9.99	tilapia	1090.0	1090.0	-	-	-	-	-	
	hilsa	-	-	-	-	-	-	-	
	prawn/shrimps	-	-	-	-	-	-	-	
	others	1730.0	1730.0	-	-	-	-	-	
	total	19691.0	6651.0	10010.0	30.0	3000.0	-	-	
	carps	5257.0	3427.0	1650.0	180.0	-	-	-	
	cat fish	2105.0	1365.0	650.0	90.0	-	-	-	
	murrels	6690.0	2927.0	3723.0	40.0	-	-	-	
6.	barbus species	2105.0	52.0	963.0	90.0	1000.0	-	-	
10.00-	cyprinus	-	-	-	-	-	-	-	
14.99	tilapia	3430.0	725.0	1705.0	-	1000.0	-	-	
	hilsa/	-	-	-	-	-	-	-	
	prawn/shrimps	-	-	-	-	-	-	-	
	others	915.0	540.0	375.0	-	-	-	-	
	total	20502.0	9036.0	9056.0	400.0	2000.0	-	-	

Table 19 (contd.) : Quantity of fish caught and disposed by variety for each size class of impounded water units

District : Medur

size class of water units (acres)	variety	quantity of fish (kg.)							
		total catch	disposal type						
			consumed	sold fresh	wages in kind	salted and dried	waste	others	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
	carps	10414.0	1258.0	9156.0	-	-	-	-	-
	cat fish	7618.0	1172.0	6446.0	-	-	-	-	-
	murrals	10438.0	910.0	9478.0	50.0	-	-	-	-
7.	barbus species	12386.0	334.0	2052.0	-	10000.0	-	-	-
15.00-	cyprinus	-	-	-	-	-	-	-	-
19.99	tilapia	12090.0	1090.0	1000.0	-	10000.0	-	-	-
	hilsa	20.0	20.0	-	-	-	-	-	-
	prawn/shrimps	-	-	-	-	-	-	-	-
	others	1782.0	1260.0	522.0	-	-	-	-	-
	total	54748.0	6044.0	28654.0	50.0	20000.0	-	-	-
	carps	13680.0	2260.0	8936.0	504.0	1908.0	72.0	-	-
	cat fish	10982.0	2622.0	8144.0	216.0	-	-	-	-
	murrals	14404.0	1404.0	12820.0	150.0	-	-	-	30.0
8.	barbus species	12180.0	3180.0	7650.0	720.0	540.0	90.0	-	-
20.00-	cyprinus	-	-	-	-	-	-	-	-
29.99	tilapia	14600.0	1980.0	7566.0	54.0	5000.0	-	-	-
	hilsa	-	-	-	-	-	-	-	-
	prawn/shrimps	-	-	-	-	-	-	-	-
	others	7070.0	1650.0	4480.0	-	832.0	108.0	-	-
	total	72916.0	13096.0	49536.0	1644.0	8280.0	270.0	-	30.0
	carps	20930.0	959.9	17900.2	2070.0	-	-	-	-
	cat fish	9630.1	480.1	8970.0	180.0	-	-	-	-
	murrals	14200.0	1190.0	12910.0	100.0	-	-	-	-
9.	barbus species	21930.1	1974.9	14685.2	270.0	5000.0	-	-	-
30.00-	cyprinus	-	-	-	-	-	-	-	-
49.99	tilapia	8380.0	540.0	6048.0	792.0	1000.0	-	-	-
	hilsa	-	-	-	-	-	-	-	-
	prawn/shrimps	-	-	-	-	-	-	-	-
	others	3051.1	1521.1	1530.0	-	-	-	-	-
	total	78121.4	6666.0	62043.4	3412.0	6000.0	-	-	-

Table (19) (contd.) : Quantity of fish caught and disposed by variety for each size class of impounded water units

District : Madurai

size class of water units (acres)	variety	quantity of fish (kg.)							
		total catch	consumed	disposal type					
				sold fresh	wages in kind	salted and dried	waste	others	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
10	carps	21369.2	1088.3	15719.2	500.0	66.7	-	-	
	cat fish	9583.3	2430.0	7153.3	-	-	-	-	
	murrels	24066.5	1406.0	22160.5	500.0	-	-	-	
	barbus species	10730.0	2530.0	8200.0	-	-	-	-	
	cyprinus	773.5	425.0	348.5	-	-	-	-	
	tilapia	41077.5	833.3	42977.5	-	266.7	-	-	
	hilsa	-	-	-	-	-	-	-	
50.00 - 99.99	prawn/shrimps	-	-	-	-	-	-	-	
	others	24201.7	1483.4	22231.7	500.0	66.7	-	-	
	total	131881.7	13191.0	119790.7	1500.0	400.0	-	-	
	11	carps	103966.0	25416.0	75550.0	3000.0	-	-	-
		cat fish	27452.0	11805.3	15646.7	-	1000.0	-	-
		murrels	57244.7	13011.3	41233.4	3000.0	-	-	-
		barbus species	55288.0	17793.0	13095.0	-	10000.0	-	11400.0
cyprinus		1000.0	-	1000.0	-	-	-	-	
tilapia		52660.0	9000.0	30060.0	-	10000.0	-	3600.0	
hilsa		-	-	-	-	-	-	-	
100.00 & above	prawn/shrimps	-	-	-	-	-	-	-	
	others	35656.3	13563.0	22093.3	-	-	-	-	
	total	333267.0	90500.6	197678.4	6000.0	21000.0	-	18000.0	
	12	carps	196062.3	48304.2	139259.1	6452.0	1974.7	72.0	-
		cat fish	90048.4	26834.4	51112.0	802.0	1000.0	-	-
		murrels	142190.2	25753.3	112344.9	1070.0	-	-	30.0
		barbus species	133665.2	36482.0	49905.2	1248.0	31540.0	90.0	14400.0
cyprinus		2057.5	475.0	1582.5	-	-	-	-	
tilapia		141956.6	19042.6	92976.5	1271.0	27266.7	-	3600.0	
hilsa		20.0	20.0	-	-	-	-	-	
all classes	prawn/shrimps	-	-	-	-	-	-	-	
	others	83532.9	27508.3	52804.0	554.0	2398.6	108.0	-	
	total	782511.3	185299.8	500364.5	11397.0	64180.0	270.0	18030.0	

Table (20) : Quantity of fish caught from impounded water units and the area from which catch obtained by variety during the reference periods related to the four different visits.

District : Madurai

variety	visit 1			visit 2			visit 3		
	area (acres)	catch (kg.)	catch(kg) per unit area	area (acres)	catch (kg.)	catch(kg) per unit area	area (acres)	catch (kg.)	catch(kg) per unit area
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. carps	4641.36	5531.5	1.2	55490.20	162914.0	2.9	5312.12	26950.1	5.1
2. cat fish	3533.20	2836.0	0.8	53084.22	68104.0	1.3	2255.64	9075.1	4.0
3. murrels	4515.90	1946.5	0.4	54529.98	112210.0	2.1	6410.64	28041.7	4.4
4. barbus species	2662.20	1620.0	0.6	50961.80	120630.1	2.4	2139.82	11415.1	5.3
5. cyprinids	350.00	116.0	0.3	1430.40	1150.0	0.8	409.00	641.5	1.6
6. tilapia	1680.02	1006.0	0.6	33895.44	80240.0	2.4	6362.52	61995.8	9.7
7. hilsa		-		150.00	20.0	0.1			
8. shrimps/prawn		-							
9. others	5562.34	4884.0	0.9	51220.82	44076.1	0.9	6490.74	31506.1	5.3
10. all	6418.20	17940.0	2.8	61635.94	589344.2	9.6	7003.04	172625.4	24.7

Table (20) (contd.) : Quantity of fish caught from impounded water units and the area from which catch obtained by variety during the reference periods related to the four different visits.

District : Madurai

variety	visit 4			all visits		
	area (acres)	catch (kg.)	catch(kg) per unit area	area (acres)	catch (kg.)	catch(kg) per unit area
(1)	(11)	(12)	(13)	(14)	(15)	(16)
1. carps	230.50	666.7	2.9	65324.18	196062.3	3.0
2. cat fish	230.50	33.3	0.1	59103.66	80048.4	1.4
3. murrels				65429.62	142198.2	2.2
4. barbus species				55736.92	133665.2	2.4
5. cyprinus	350.00	150.0	0.4	1489.40	207.5	1.4
6. tilapia	580.50	1715.0	3.0	41468.48	144956.8	3.5
7. hilsa				150.00	20.0	0.1
8. shrimps/prawn						
9. others	230.50	66.7	0.3	63477.30	83532.9	1.3
10. all	580.50	2631.7	4.5	74590.58	782541.3	10.5

k
k d

Table (21) : Quantity and value of fish caught, consumed and sold fresh from impounded water units by variety.

District : Madurai

variety	total catch		consumed		sold fresh	
	quantity (kg.)	value (Rs.)	quantity (kg.)	value (Rs.)	quantity (kg.)	value (Rs.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. carps	196062.3	316631.10	18301.2	69084.30	139259.1	261533.70
2. cat fish	80048.4	122285.30	26834.1	31813.30	51112.0	86546.80
3. murrels	112198.2	106976.80	25753.3	85039.60	112344.9	376835.20
4. carbus species	133665.2	115610.56	36102.0	26059.50	19905.2	56695.12
5. cyprinus	2057.5	4989.00	475.0	1175.00	1582.5	3511.00
6. tilapia	141954.8	121333.00	19812.6	13610.20	92976.5	85137.90
7. hilsa	20.0	20.00	20.0	20.00	-	-
8. prawn/shrimps	-	-	-	-	-	-
9. others	83532.9	86365.70	27588.3	20508.80	52864.0	61202.20
10. total	782541.3	1204211.76	185299.8	251110.70	500364.5	931764.92

k
k d

Table (22) : Quantity of total fish sold fresh by place of sale for each size class of impounded water units.

District : Madurai

size class of water units (acres)	total catch (kg.)	quantity of fish sold (kg.) by place of sale						total
		at site	at local markets	distant markets (within district)	exported to other places		others	
					outside district but within state	outside state		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. 0.00 - 0.99	1120.0	1740.0	-					1740.0
2. 1.00 - 2.49	14521.2	2950.0	2790.0					5740.0
3. 2.50 - .99	19291.0	4340.0	756.0				321.0	5120.0
4. 5.00 - 7.49	30175.0	9166.0	1440.0					10626.0
5. 7.50 - 9.99	19691.0	8570.0	1440.0					10010.0
6. 10.00 - 14.99	20502.0	1620.0	-	4446.0				9066.0
7. 15.00 - 19.99	51718.0	15694.0	-	12960.0				28654.0
8. 20.00 - 29.99	72916.0	8520.0	-	11076.0				19596.0
9. 30.00 - 39.99	78121.4	9465.1	-	52578.0				62043.1
10. 50.00 - 99.99	13,881.7	11898.7	810.0					11979.7
11. 100.00 & above	333267.0	179678.3	18000.0					197678.3
12. all classes	782541.3	363744.1	25236.0	111060.0			321.0	500364.1

Table (23) : Quantity of total fish sold fresh by agency to which sold for each size class of impounded water units.

District : Madurai

size class of water units (acres)	total catch (kg.)	quantity of fish sold (kg.) by agency to which sold					total
		hawking	retailers	whole-salers	co-operative societies or government	others	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. 0.00 - 0.99	1120.0	890.0	850.0			-	1740.0
2. 1.00 - 2.49	14524.2	1440.0	230.0			4070.0	5740.0
3. 2.50 - 4.99	19294.0	864.0	4556.0			-	5420.0
4. 5.00 - 7.9	30476.0	2996.0	1450.0			6180.0	10626.0
5. 7.50 - 9.99	19691.0	-	-			10010.0	10010.0
6. 10.00 - 14.99	20502.0	810.0	1736.0	3960.0		2560.0	9066.0
7. 15.00 - 19.99	54748.0	-	-	-		28654.0	28654.0
8. 20.00 - 29.99	72916.0	1700.0	-	41076.0		6820.0	49596.0
9. 30.00 - 49.99	78121.4	-	4665.1	52578.0		4800.0	62043.1
10. 50.00 - 99.99	134881.7	59420.0	44601.7			15769.0	119790.7
11. 100.00 & above	333267.0	100833.3	83345.0			13500.0	197678.3
12. all classes	782541.3	168953.3	141433.8	97614.0		92363.0	500364.1

78

k
k d

Table (24) : Amount of assistance received by type of assistance for fishing in impounded water units during 1972-73 and 1973-74 (unestimated).

District : Madurai

type of assistance	1972 - 73			1973 - 74		
	no. of operators	amt. of assistance (%)	assistance per opt. (Rs.)	no. of operators	amt. of assistance (Rs.)	assistance per opt. (Rs.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. grant	1	7500.00	7500.00			
2. money on loan						
3. subsidised spawn/fry	1	2145.00	2145.00	3	230.00	76.67
4. technical advice & service						
5. others						
6. total	2	9645.00	4822.50	3	230.00	76.67

Table (25) : Average number of operators engaged in river fishing and average number of fishing days in a year per river fishing unit (unestimated).

District : Madurai

i t e m s		estimates
(1)		(2)
1.	number of operators per river fishing unit	2.89
2.	no. of fishing days in a year per river fishing unit	121

Table (26) : Number of owned-nets by type of net and type of fibre used in river fishing for different visits

District : Madurai

Type of net	visit 1			visit 2			visit 3			visit 4		
	cotton	synthetic	all	cotton	synthetic	all	cotton	synthetic	all	cotton	synthetic	all
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. long net	215		216	196		196	202		202	175		175
2. cast net	142		142	51		51	192		192	191		191
3. gill net	178		178	8		8	7		7	8		8
4. long net	18		18									
5. long net												
6. long net	4562		4562	4500		4500	4500		4500	4500		4500
7. long net												
8. all types	5116		5116	4755		4755	4901		4901	4874		4874

Table (27) : Number of owned-nets by type of net and type of fibre used only in river fishing for different visits.

District : Madurai

type of net	visit 1			visit 2			visit 3			visit 4		
	cotton	synthetic	all	cotton	synthetic	all	cotton	synthetic	all	cotton	synthetic	all
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. drag net	70		70	176		176	202		202	175		175
2. cast net	102		102	2		2	192		192	191		191
3. gill net	178		178	8		8	7		7	8		8
4. fixed net	18		18									
5. seines												
6. scoop net	52		52	4500		4500	4500		4500	4500		4500
7. other nets												
8. all types	470		470	4686		4686	4901		4901	4874		4874

bg

Table (20) : Number of owned-nets by type of net and type of fibre used in river fishing for different visits and average area per net (unestimated)

District : Madurai

type of net	f i b r e t y p e												average area per net (sq. metres)		
	c o t t o n				s y n t h e t i c				all fibre types				cotton	synthe- tic	all
	visit 1	visit 2	visit 3	visit 4	visit 1	visit 2	visit 3	visit 4	visit 1	visit 2	visit 3	visit 4			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1. drag net	28	28	28	28					28	28	28	28	20.16		20.16
2. cast net	21	21	20	20					21	21	20	20	11.49		11.49
3. gill net	11	11	8	4					11	11	8	4	68.24		68.24
4. fixed net	1	1	-	-					1	1	-	-	15.00		15.00
5. seines	-	-	-	-					-	-	-	-			
6. scoop net	266	266	266	266					266	266	266	266	2.48		2.48
7. other nets															
8. all types	327	327	322	318					327	327	322	318	6.32		6.32

Table (29) : Percentage distribution of owned-nets by type of net and fibre type used in river fishing (unestimated)

District : Madurai

type of net	c o t t o n				s y n t h e t i c				a l l f i b r e t y p e s			
	p r o c u r e m e n t t y p e											
	home made	first hand purchase	second hand purchase	all	home made	first hand purchase	second hand purchase	all	home made	first hand purchase	second hand purchase	all
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. drag net	2.5	5.6	0.6	8.7					2.5	5.6	0.6	8.7
2. cast net	0.6	5.7		6.3					0.6	5.7		6.3
3. gill net	2.0	0.3	0.3	2.6					2.0	0.3	0.3	2.6
4. fixed net	0.2			0.2					0.2			0.2
5. seines												
6. scoop net	78.8	3.4		82.2					78.8	3.4		82.2
7. other nets												
8. all types	84.1	15.0	0.9	100.0					84.1	15.0	0.9	100.0

Table (30) : Average cost (Rs.) of owned-nets by type of net, fibre type and type of procurement used in river fishing (unestimated)

District : Madurai

type of net	fibre type											
	cotton			synthetic				all fibre types				
	procurement type											
	home made		first hand	second hand	home made		first hand	second hand	home made		first hand	second hand
cost of raw materials and making charges	man-days spent	purchase	purchase	cost of raw materials and making charges	man-days spent	purchase	purchase	cost of raw materials and making charges	man-days spent	purchase	purchase	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. drag net	29.88	9.50	90.00	104.17					29.88	9.50	90.00	104.17
2. cast net	156.25	182.50	53.49						156.25	182.50	53.49	
3. gill net	45.13	23.31	120.00	75.00					45.13	23.31	120.00	75.00
4. fixed net	30.00	25.00							30.00	25.00		
5. seines									5.00	2.27	14.45	
6. scoop net	5.00	2.27	14.45									
7. other nets												
8. all types	7.85	4.35	59.56	94.44					7.85	4.35	59.56	94.44

Table (31) : Average expenditure on repairs and maintenance and average life (expected) of an owned-net by type of net and fibre type used in river fishing (unestimated)

District : Madurai

t y p e o f n e t	f i b r e t y p e																
	c o t t o n								s y n t h e t i c								
	home made		first hand purchase		second hand purchase		total		home made		first hand purchase		second hand purchase		total		
	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
1. drag net	18.88	10.0	18.33	7.7		5.4	17.18	8.2									
2. cast net	33.37	11.3	23.21	15.0			24.21	14.6									
3. gill net	17.61	6.9	22.00	9.8		5.9	16.41	7.1									
4. fixed net	40.00	3.8					40.00	3.8									
5. seines																	
6. scoop net	1.04	10.3	8.54	12.0			1.35	10.3									
7. other nets																	
8. all types	2.45	10.2	18.05	11.5		5.6	4.77	10.3									

Table (31) (contd.) : Average expenditure on repairs and maintenance and average life (expected) of an owned-net by type of net and fibre type used in river fishing (unestimated)

District : Madurai

type of net	f i b r e t y p e							
	h o w e r		c o a r s e		f i n e		t y p e	
	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)	expenditure on repairs and maintenance (Rs.)	expected life (years)
(1)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
1. drag net	18.88	10.0	18.33	7.7		5.4	17.18	8.2
2. cast net	33.37	11.3	23.21	15.0			24.21	14.6
3. gill net	11.31	6.9	22.0	9.8		5.9	16.41	7.1
4. fixed net	40.00	3.8					40.00	3.8
5. seines								
6. scoop net	1.04	10.3	8.54	12.0			1.35	10.3
7. other nets								
8. all types	2.45	10.2	18.05	11.5		5.5	4.77	10.3

Table (32) : Number of mandays spent in fishing and charges paid for river fishing

		District : Madurai
i t e m		estimated
(1)		(2)
1. number of mandays spent in fishing from river fishing unit		54245.4
2. number of mandays spent in fishing from hired labour		440.0
3. total number of mandays spent in fishing		54685.4
4. charges paid to the hired men in cash (Rs.)		1180.00
5. charges paid to the hired men in kind (Rs.)		-
6. total charges paid to hired men (Rs.)		1180.00
7. other charges paid (Rs.)		870.00
8. total charges paid (Rs.)		2050.00

Table (33) : Quantity of fish caught and disposed by variety for river fishing

District : Madurai							
quantity of fish (kg.)							
variety	total catch	disposal type					
		consumed	sold fresh	wages in kind	salted & dried	waste	others
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. carps	50660.6	8136.6	41360.6	-	563.4	-	-
2. cat fish	19210.6	3096.6	15684.0	-	450.0	-	-
3. murrels	11070.0	1048.0	9860.0	-	162.0	-	-
4. barbun species	21320.0	4450.0	16870.0	-	-	-	-
5. cyprinus	25.0	5.0	20.0	-	-	-	-
6. tilapia	35395.0	3417.0	31978.0	-	-	-	-
7. hilsa	-	-	-	-	-	-	-
8. prawn/shrimps	-	-	-	-	-	-	-
9. others	31019.4	10350.0	20399.4	-	270.0	-	-
total	168720.6	30503.2	136772.0	-	1445.4	-	-

Table (3A) : Quantity and value of fish caught, consumed and sold fresh
by variety for river fishing

District : Madurai

v a r i e t y	total catch		consumed		sold fresh	
	quantity (kg.)	value (Rs.)	quantity (kg.)	value (Rs.)	quantity (kg.)	value (Rs.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. carps	50660.6	67355.06	8156.6	10199.06	41960.6	56565.06
2. cat fish	12330.6	21623.00	3096.6	3883.00	15684.0	16390.00
3. mussels	11070.0	30950.00	1228.0	2244.00	9860.0	28220.00
4. barbus species	21320.0	20565.00	4450.0	4590.00	16870.0	15975.00
5. typhoidus	25.0	50.00	5.0	10.00	20.0	40.00
6. tilapia	35295.0	41141.20	417.0	5069.80	31978.0	36070.50
7. hilsa	-	-	-	-	-	-
8. prawn/shrimps	-	-	-	-	-	-
9. others	31019.4	28455.06	3350.0	10125.00	20392.4	17970.06
total	169780.6	210139.32	30503.2	36120.86	136772.0	171230.62

Table (35) : Quantity of total fish sold fresh by place of sale for river fishing

District : Madurai

i t e m s	quantity of fish (kg.)
(1)	(2)
1. sold at site	92904.5
2. sold at local markets	137.5
3. sold at district markets within district	-
4. exported to places outside district but within state	-
5. exported to places outside state	-
6. sold at other sources	43730.0
7. total sold	136772.0
8. total catch	168720.6

Table (36) : Quantity of total fish sold fresh by agency to which sold for river fishing

District : Madurai

i t e m s	quantity of fish (kg.)
(1)	(2)
1. sold by hawking	45910.0
2. sold to retailers	3400.0
3. sold to wholesalers	-
4. sold to co-operative societies or government	-
5. sold to other agencies	87462.0
6. total sold	136772.0
7. total catch	168720.6

Table (37) : Number of days spent in fishing and charges paid per catch for each size class of impounded water units based on physical observation (unestimated)

District : Madurai

size class of water units (acres)	no. of catches observed	no. of man-days spent in fishing per catch			charges paid to the hired men per catch (Rs.)			other days paid per catch (Rs.)	total charges paid per catch (Rs.)
		house-hold labour	hired labour	total	house-hold labour	hired labour	total		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. upto 0.99	-	-	-	-	-	-	-	-	-
2. 1.00 - 2.49	1	1.0	3.0	4.0	12.00	-	12.00	2.00	14.00
3. 2.50 - 4.99	6	-	6.0	6.0	18.00	-	18.00	-	18.00
4. 5.00 - 7.49	1	-	3.0	3.0	-	18.00	18.00	5.00	23.00
5. 7.50 - 9.99	-	-	-	-	-	-	-	-	-
6. 10.00 - 14.99	-	-	-	-	-	-	-	-	-
7. 15.00 - 19.99	-	-	-	-	-	-	-	-	-
8. 20.00 - 29.99	1	4.0	-	4.0	-	-	-	-	-
9. 30.00 - 49.99	-	-	-	-	-	-	-	-	-
10. 50.00 - 99.99	5	0.4	31.0	31.4	122.00	-	122.00	30.00	152.00
11. 100.00 & above	4	37.2	1.0	38.2	3.00	-	3.00	3.50	6.50
12. all classes	18	8.7	11.2	19.9	41.22	1.00	42.22	9.50	51.72

Table (38) : Quantity of fish caught by variety per catch for each size class of impounded water units based on physical observation (unestimated)

District : Madurai

size class of water units (acres)	no. of catches observed	quantity of fish (kg.) caught per catch by variety									
		carps	cat-fish	murrels	barbus species	cypri-nus	tila-pia	hilsa	prawn/shrimps	others	all varieties
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. upto 0.99	-	-	-	-	-	-	-	-	-	-	-
2. 1.00 - 2.49	1	-	5.0	5.0	5.0	-	5.0	-	-	-	20.0
3. 2.50 - 4.99	6	7.0	12.0	3.5	2.3	-	-	-	-	1.5	26.3
4. 5.00 - 7.49	1	50.0	10.0	20.0	-	-	-	-	-	5.0	85.0
5. 7.50 - 9.99	-	-	-	-	-	-	-	-	-	-	-
6. 10.00 - 14.99	-	-	-	-	-	-	-	-	-	-	-
7. 15.00 - 19.99	-	-	-	-	-	-	-	-	-	-	-
8. 20.00 - 29.99	1	40.0	-	-	27.0	-	-	-	-	15.0	82.0
9. 30.00 - 49.99	-	-	-	-	-	-	-	-	-	-	-
10. 50.00 - 99.99	5	10.3	22.0	50.0	60.0	0.2	60.4	-	-	13.0	215.9
11. 100.00 & above	4	8.8	14.2	13.0	26.2	-	7.5	-	-	6.2	75.9
12. all classes	18	12.1	14.1	19.3	25.1	0.0	18.7	-	-	6.6	95.9

Table (39) : Number of mandays spent in fishing and charges paid per catch for river fishing based on physical observation (unestimated)

District : Madurai

i t e m s	estimate per catch
(1)	(2)
1. no. of mandays spent from river fishing unit	1.0
2. no. of mandays spent from hired labour	0.6
3. no. of total mandays spent	1.6
4. charges paid to hired men in cash (Rs.)	-
5. charges paid to hired men in kind (Rs.)	2.40
6. total charges paid to hired men (Rs.)	2.40
7. other charges paid (Rs.)	1.60
8. total charges paid (Rs.)	4.00

no. of catches observed : 5

Table (40) : Quantity of fish caught per catch by variety for river fishing based on physical observation (unestimated)

District : Madurai

fish caught by variety	quantity/ per catch (kg.)
(1)	(2)
1. carps	6.0
2. cat-fish	6.8
3. murrels	2.8
4. barbus species	2.8
5. cyprinus	-
6. tilapia	7.0
7. hilsa	-
8. prawn/shrimps	-
9. others	2.3
10. all varieties	27.7

no. of catches observed : 5

Table (41) : Unestimated count of the number of assembly points and dealing agents within the two village sample clusters and listed within 16 k.m. of the sample clusters.

District : Madurai

location	number of										dealing agent per assembly point
	assembly points					dealing agents					
	visit-1	visit-2	visit-3	visit-4	all	visit-1	visit-2	visit-3	visit-4	all	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. within the sample cluster	1.00	1.00	1.00	1.00	4.00	1.00	1.00	1.00	1.00	4.00	1.00
2. within 16 k.m. of the sample cluster	5.00	5.00	11.00	13.00	34.00	5.00	5.00	13.00	17.00	40.00	1.18
3. total	6.00	6.00	12.00	14.00	38.00	6.00	6.00	14.00	18.00	44.00	1.16

Table (42) : Percentage distribution of assembly points and dealing agents with number of dealing agents per assembly point by type of assembly points (unestimated)

type of assembly point	District		no. of dealing agents per assembly point
	percentage of assembly points	percentage of dealing agents	
(1)	(2)	(3)	(4)
1. spot with no regular market	21.05	18.18	1.00
2. wholesale market	36.81	45.46	1.43
3. retail market	42.11	36.36	1.00
4. total	100.00	100.00	1.16

Table (43) : Quantity per assembly point of total catch arrival and arrival from the sample clusters to the assembly points (unestimated)

District : Madurai

source	catch arrival per assembly point (kg.)
(1)	(2)
1. total arrival from :	
(i) impounded water units	7229.3
(ii) riverine areas	350.0
(iii) impounded water units and riverine areas	7579.3
2. arrival from those of clusters :	
(i) impounded water units	30.1
(ii) riverine areas	87.5
(iii) impounded water units and riverine areas	117.6
3. percentage of cluster catch arrival to total arrival from impounded water units	0.42
4. percentage of cluster catch arrival to total arrival from riverine areas	25.00
5. percentage of cluster catch arrival to total arrival from impounded water units and river areas	1.55

Table (44) : Quantity (kg.) per Assembly point of catch arrival at the assembly points for each variety of fish (unestimated).

District : Madurai

variety	quantity (kg.) per assembly point										
	from within district			from outside district				total			
	impounded water units	riverine areas	impounded water units and riverine areas	impounded water units	riverine areas	impounded water units and riverine areas	marine catch	impounded water units	riverine areas	impounded water units and riverine areas	marine catch
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. carps	1657.3	133.4	1790.7	-	-	-	-	1657.3	133.4	1790.7	-
2. cat fish	220.9	58.3	279.2	-	-	-	-	220.9	58.3	279.2	-
3. mussels	361.7	33.3	395.0	-	-	-	-	361.7	33.3	395.0	-
4. barbus species	-	-	-	-	-	-	-	-	-	-	-
5. cyprinus	-	-	-	-	-	-	-	-	-	-	-
6. tilapia	4778.0	41.7	4819.7	-	-	-	-	4778.0	41.7	4819.7	-
7. nilsa	-	-	-	-	-	-	-	-	-	-	-
8. prawn/shrimps	-	-	-	-	-	-	-	-	-	-	-
9. others	211.5	83.3	294.8	-	-	-	-	211.5	83.3	294.8	-
10. all varieties	7229.4	390.0	7579.4	-	-	-	-	7229.4	390.0	7579.4	-

Table (45) : Quantity (kg.) per assembly point of disposal of catch at the assembly points by type of disposal for each variety of fish (unestimated)

District : Madurai

type of disposal	quantity (kg.) of disposal by variety									
	carps	cat- fish	murr- els	bar- spe- cies	pu- ri- mus	tila- pia	hi- lse	prawn/ shri- mps	others	all varieties
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. at site										
1.1. impounded water units	1180.1	215.5	14.6	-	-	3330.7	-	-	59.6	4800.5
1.2. riverine areas	96.7	41.7	20.0	-	-	20.8	-	-	50.0	229.2
1.3. total inland	1276.8	257.2	34.6	-	-	3351.5	-	-	109.6	5029.7
1.4. marine	-	-	-	-	-	-	-	-	-	-
1.5. total	1276.8	257.2	34.6	-	-	3351.5	-	-	109.6	5029.7
2. at local markets										
2.1. impounded water units	-	-	-	-	-	8.3	-	-	0.2	8.5
2.2. riverine areas	-	-	-	-	-	-	-	-	-	-
2.3. total inland	-	-	-	-	-	8.3	-	-	0.2	8.5
2.4. marine	-	-	-	-	-	-	-	-	-	-
2.5. total	-	-	-	-	-	8.3	-	-	0.2	8.5
3. at distant markets (within district)										
3.1. impounded water units	477.1	5.4	347.1	-	-	1439.2	-	-	151.7	2420.5
3.2. riverine areas	36.7	16.7	13.3	-	-	20.8	-	-	33.3	120.8
3.3. total inland	513.8	22.1	360.4	-	-	1460.0	-	-	185.0	2541.3
3.4. marine	-	-	-	-	-	-	-	-	-	-
3.5. total	513.8	22.1	360.4	-	-	1460.0	-	-	185.0	2541.3
4. at distant markets (outside district)										
4.1. impounded water units	-	-	-	-	-	-	-	-	-	-
4.2. riverine areas	-	-	-	-	-	-	-	-	-	-
4.3. total inland	-	-	-	-	-	-	-	-	-	-
4.4. marine	-	-	-	-	-	-	-	-	-	-
4.5. total	-	-	-	-	-	-	-	-	-	-
5. total										
5.1. impounded water units	1657.2	220.9	361.7	-	-	4778.2	-	-	211.5	7229.5
5.2. riverine areas	133.4	58.4	33.3	-	-	41.6	-	-	83.3	350.0
5.3. total inland	1790.6	279.3	395.0	-	-	4819.8	-	-	294.8	7579.5
5.4. marine	-	-	-	-	-	-	-	-	-	-
5.5. total	1790.6	279.3	395.0	-	-	4819.8	-	-	294.8	7579.5

Appendix - 2

Facsimile of Schedules

[2] general village particulars

Item	village-1			village-2		
	no. of persons			no. of persons		
1. name of village						
2. number of households						
3. number of hrs. with active fishing as i) principal occupation						
ii) subsidiary occupation						
4. number of hrs. with pisciculture as i) principal occupation						
ii) subsidiary occupation						
5. number of hrs. with active fishing and or pisciculture as i) principal occupation						
ii) subsidiary occupation						
6. number of assembly points in the village						
7. assembly point particulars	a.p-1 ()	a.p-2 ()	a.p-3 ()	a.p-4 ()	a.p-5 ()	a.p-6 ()
i) percentage of cluster catch arrival to the total arrival at the a.p. from a) impounded water units						
b) riverine areas						
c) total						
ii) percentage of cluster catch arrival at the a.p. to the total cluster catch from a) impounded water units						
b) riverine areas						
c) total						
8. if no a.p. in the cluster, location of nearest a.p.						
9. distance of a.p. from the sample cluster						
10. i) percentage of cluster catch arrival to the total arrival at the a.p. from a) impounded water units						
b) riverine areas						
c) total						
ii) percentage of cluster catch arrival at the a.p. to the total cluster catch from a) impounded water units						
b) riverine areas						
c) total						

[4] general particulars of the impounded water unit

1. type of water unit (a)					
2. source of supply of water (b)					
3. area of the water unit in (0.00) acres (i) gross					
(ii) at the time of visit					
4. is there any inlet and/or outlet? (yes-1, no-2)					
5. seasonality of water unit (c)					
6. soil type (d)					
7. extent of silting (e)					
8. colour of water (f)					
9. extent of floating weeds (g)					
10. extent of submerged weeds (g)					
11. how used? (h)					
12. number of operators					
13. type of possession (i)					
14. if leased in					
(i) from whom? 1. government/2. public bodies/3. others					
(ii) annual rent (0.00 Rs.)					
(iii) rent paid during last quarter/last 4 months (0.00 Rs.)					
15. dates of future major catches (next six months)					
16. expenditure in (0.00 Rs.) during last quarter/last 4 months on the water unit for					
i) rent		ix) spawn fry etc. qt. (0.00 kg)		number	value
ii) repairs & renovation of embankments				(000)	(0.00 Rs.)
iii) desilting & dewatering		(a) spawn			
iv) dewatering		(b) fry			
v) other maintenance cost		(c) fingerlings			
vi) total (ii-v)		(d) total (a-c)			
vii) preparation of bed		x) other pisciculture cost			
viii) liming & manuring		xi) total (vii-x)			

codes: (a) tank, pond-1, lake, reservoir-2, heel, bael, hoar etc.-3
swamp-4, others (specify)-5

(b) rain fed-1, river or channels-2, spring-3, others (specify)-4

(c) perennial-1, water for: 9 to less than 12 months-2, 6 to less than 9 months-3, 4 to less than 6 months-4, less than 4 months-5.

(d) loamy-1, sandy-2, alluvial-3, clay-4, others (specify)-5

(e) not silted-1, partially silted-2, badly silted-3

(f) bluish-1, greenish-2, brownish-3, turbid-4, others (specify)-5.

(g) no weeds-1, covers less than 50%-2, covers more than 50%-3

(h) mainly used for fish cultivation-1; mainly used for irrigation but also used for fish cultivation-2, mainly for other uses-but also used for fish cultivation-3, other uses only (specify)-4

(i) owned-1, leased in on annual basis-2, leased in on long term basis-3, others (specify)-4.

5 inventory of fishing gear and crafts possessed by (in custody of) the different operators of the water unit and expenditure on purchase and maintenance of them : (i) operator no. (ii) name

net/gear/craft no.	type of net/gear (e)	mesh size of net (0.00m)	fibre type (b)	size of net/boat (0.00 metres)		if owned					if rented		expenditure on repairs & maintenance during last quarter/last 4 months (0.00 Rs.)	expected life since date of survey (0.0 years)	number of days used for			number of joint possessors		
				length	breadth	if home made	if purchased			annual rent (0.00 Rs.)	rent paid during last quarter/last 4 months (0.00 Rs.)	impounded water unit under survey			other impounded water units	riverine areas				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1. details of fishing nets																				
2. details of other fishing gears																				
		X																		
		X																		
		X																		
3. details of fishing crafts																				
	X	X	X																	
	X	X	X																	
	X	X	X																	
	X	X	X																	

codes : (a) drag net-1, cast net-2, gill net-3, fixed net-4, seines-5, scoop net-6, other nets (specify)-7, hooks and lines-8, traps-9, other gears (specify)-10
 (b) cotton-1, synthetic-2*, others (specify)-3
 (c) first hand purchase-1, second hand purchase (a) in good condition-2, (b) not in good condition-3.

* The year number will be given in brackets after entering the codes with a comma in between.

[6A] particulars of catches and their disposal during last 7 days, last month and last quarter/last 4 months (when operated singly) i) operator no..... ii) name of operator iii) reference period of catch*.....(date.....)

3.1 type of nets used (a)		5. no. of men engaged	i) of operator h.h.
3.2 if hired, charges paid (0.00 Rs.)			ii) hired
4.1 whether boats used or not (yes-1, no-2)			iii) total
4.2 if hired, charges paid (0.00 Rs.)		6. charges paid to the hired men	i) in cash (0.00 Rs.)
			ii) in kind
			a) quantity (0.0 kg.)
7. catch and disposal			b) value (0.00 Rs.)

variety	total catch		disposal type										
			consumed		sold fresh		wages in kind		salted & dried		waste		others
	quantity (0.0 kg)	value (0.00Rs)	quantity (0.0 kg.)	value (0.00Rs)	quantity (0.0 kg)	value (0.00 Rs)	quantity (0.0 kg)	value (0.00 Rs)	quantity (0.0 kg)	value (0.00 Rs)	quantity (0.0 kg)	value (0.00 Rs)	quantity (0.0 kg)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1. carps													
2. cat fishes													
3. murrels													
4. barbus species													
5. cyprinus													
6. tilapia													
7. hilsa													
8. prawn/shrimps													
9. others (specify)													
10. all													

type of sale (b)	10. agency to which sold (d)
place of sale (c)	11. was dewatering done? (yes-1, no-2)

codes : (a) drag net-1, cast net-2, gill net-3, fixed net-4, seines-5, scoop net-6, others (specify)-7
 (b) sale before sharing-1, sale after sharing-2
 (c) sale at site-1, sale at local markets-2, sale at distant markets (within district)-3, exported to other places outside district within state-4, outside state-5; others(specify)-6.
 (d) hawking-1, sold to retailers-2, sold to whole salers-3, sold to co-operative societies or government-4, others(specify)-5.

reference periods are : 7th day, 6th day, 5th day, 4th day, 3rd day, 2nd day, 1st day, last month, last quarter/last 4 months.

[63] particulars of catches and their disposal during last quarter/last 4 months (when operated jointly)
 i) operator nos. ii) names of operators iii) percentage share iv) reference period of catch* (date...)

1. no. of operators involved in the catch		5. no. of men engaged	i) of operator bh.
2. names of operators			ii) hired
3.1 type of nets used (a)			iii) total
3.2 if hired, charges paid (0.00 Rs.)		6. charges paid to the hired men	i) in cash (0.00 Rs.)
4.1 whether boats used or not? (yes-1, no-2)			ii) in kind
4.2 if hired, charges paid (0.00 Rs.)			a) quantity (0.0 kg.)
			b) value (0.00 Rs.)

variety	total catch		disposal type											
	quantity (0.0 kg)	value (0.00 Rs)	consumed		sold fresh		wages in kind		salted & dried		waste		others	
			quantity (0.0 kg)	value (0.00 Rs)	quantity (0.0 kg)	value (0.00 Rs)	quantity (0.0 kg)	value (0.00 Rs)	quantity (0.0 kg)	value (0.00 Rs)	quantity (0.0 kg)	value (0.00 Rs)	quantity (0.0 kg)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
1. carps														
2. cat fishes														
3. murrels														
4. barbus species														
5. cyprinus														
6. tilapia														
7. hilsa														
8. prawn/shrimps														
9. others (specify)														
0. all														
8 type of sale (b)			(10) agency to which sold (d)											
9 place of sale (c)			(11) was dewatering done? (yes-1, no-2)											

codes : (a) drag net-1, cast net-2, gill net-3, fixed net-4, seines-5, scoopnet-6, others(specify)-7
 (b) sale before sharing-1, sale after sharing-2
 (c) sale at site-1, sale at local markets-2, sale at distant markets (within district)-3,
 exported to other places outside district within state-4, outside state-5, others(specify)-6.
 (d) hawking-1, sold to retailers-2, sold to whole sellers-3, sold to co-operative societies or government-4,
 others (specify)-5
 * reference periods were: 7th day, 6th day last day, last month, last quarter/last 4 months.

[7] particulars of assistance received from government during last year

i t e m	operator number			
	(1)	(2)	(3)	(4)
1. name of operator				
2. type of assistance received(a)				
3. value of assistance received (0.00 Rs.)				
4. i) amount of loan taken from other than government(0.00 Rs.)				
ii) terms (b)				
5. if cotton nets are used why not nylon nets? (describe)				
6. views on assistance needed or received (describe)				

codes (a) no assistance-1, grant-2, money on loan-3, subsidised spawn/fry etc.-4, technical advices and services-5, others (specify)-6.

(b) free of interest-1, on interest-2, advance against produce-3, others (specify)-4.

NATIONAL SAMPLE SURVEY ORGANISATION

Pilot Study on Estimation of Catch of Inland Fish : 1973

District : Karimnagar (Andhra Pradesh/Madurai (Tamil Nadu)/Murshidabad (West Bengal)*

Schedule FR : Particulars of riverine area and fish catch from them

visit no :

[1] identification particulars

1. serial no. of sample cluster					
2. particulars of sample villages		village - 1		village - 2	
2.1 name					
2.2 village no./j.l.no.					
2.3 area (0.00 acres)					
2.4 population (1971)					
3. sub-sample	4. stratum	5. sub-stratum	6. taluka/police station		
7. name of village in which the r.f.u. is located					
8. river fishing unit (r.f.u.) no.					
9. no. of operating households in the r.f.u.					
10. no. of operators in the r.f.u.					
11. names and addresses of operators					
12. name(s) of river(s)					
13. length of river in the sample villages (0.0 km)					
i) village - 1					
ii) village - 2					
14. area of river in the sample villages (0.00 acres)					
i) village - 1					
ii) village - 2					

[2] investigation particulars

1.1 name of investigating officer	
1.2 dates of survey	1.3 signature
2.1 name of supervising officer	
2.2 dates of supervision	2.3 signature

* delete whichever is inapplicable.

[3] e m a r k s

[The body of the page contains a large grid of horizontal lines, which is mostly blank or contains very faint, illegible text.]

[4] inventory of mounds, nets and boats possessed by (in custody of) the different operators of the river fishing unit and expenditure on purchase and maintenance of them : (i) operator no. (ii) name

net/gear/craft no.	type of net/gear (a)	mesh size of net (0.0 cm.)	fibre type (b)	size of net/boat (0.00 metres)		if owned							if rented		expenditure on repairs and maintenance during last quarter/last 4 months (0.00 Rs.)	expected life since date of survey (0.0 years)	number of days used for			number of joint possessors
				length	breadth	if home made			if purchased				annual rent (0.00 Rs.)	rent paid during last quarter/last 4 months (0.00 Rs.)			sampled part(s) of the river(s)	other river areas	impounded water, units	
						date of completion	cost of raw materials (0.00 Rs.)	making charges if any (0.00 Rs.)	number of man days spent (0.0)	date of purchase	condition at purchase (c)	cost (0.00 Rs.)								
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1. details of fishing nets																				
2. details of other fishing gears																				
3. details of fishing crafts																				

- (a) drag net-1, cast net-2, gill net-3, fixed net-4, seines-5, scoop net-6, other nets (specify)-7, hooks and lines-8, traps-9, other gears (specify)-10
- (b) cotton-1, synthetic-2*, others (specify)-3
- (c) first hand purchase-1, second hand purchase (a) in good condition-2, (b) not in good condition-3.

* the yarn number will be given in brackets after entering the code with a comma in between.

[5] particulars of catches and their disposal during the last 7 days, last month and last quarter/last 4 months
 i) names of the operators of the r.f.u. ii) reference period* (date

1. no. of fishing days			5. no. of men engaged			i) of the r.f.u.							
2. no. of operators in the r.f.u.						ii) hired							
3.1 type of nets used (a)						iii) total							
3.2 if hired, charges paid (0.00 Rs.)						6. charges paid to the hired men							
4.1 whether boats used? (yes-1, no-2)						i) in cash (0.00 Rs.)							
4.2 if hired, charges paid (0.00 Rs.)						ii) in kind (a) quantity (0.00 kg.)							
						(b) value (0.00 Rs.)							
7. catch and disposal													
variety	total catch		disposal type										
	quantity (0.0 kg)	value (0.00Rs.)	consumed		sold fresh		wages in kind		salted & dried		waste		others
(1)	(2)	(3)	quantity (0.0 kg)	value (0.00 Rs.)	quantity (0.0 kg)	value (0.00Rs)	quantity (0.0 kg)	value (0.00 Rs)	quantity (0.0 kg)	value (0.00 Rs)	quantity (0.0 kg)	value (0.00 Rs)	quantity (0.0 kg)
1. carps													
2. cat fishes													
3. murrels													
4. barbus species													
5. cyprinus													
6. tilapia													
7. hilsa-													
8. prawn/shrimps													
9. others													
10. all													
8. type of sale (b)							10 agency to which sold (d)						
9 place of sale (c)							11 was dewatering done (yes-1, no-2)						

codes : (a) drag net-1, cast net-2, gill net-3, fixed-net-4, seines-5, scoopnet-6, others (specify)-7

(b) sale before sharing-1, sale after sharing-2

(c) sale at site-1, sale at local markets-2, sale at distant markets (within district)-3, exported to other places outside-district within state-4, outside state-5, others (specify)-6.

(d) hawking-1, sold to retailers-2, sold to whole salers-3, sold to co-operative societies or government-4, others (specify)-5

*reference periods are : 7th day, 6th day, 5th day, 4th day, 3rd day, 2nd day, 1st day, last month and last quarter/last 4 months.

[6] particulars of assistance received from government during last year

i t e m	operator no.			
	(1)	(2)	(3)	(4)
1. name of operator				
2. type of assistance received (a)				
3. value of assistance received (0.00 Rs.)				
4. i) amount of loan taken from other than government (0.00 Rs.)				
ii) terms (b)				
5. if cotton nets are used why not nylon nets (describe)				
6. views on assistance needed or received (describe)				

codes (a) no assistance - 1, grant - 2, money on loan - 3, subsidised spawn/fry etc. - 4, technical advices and services - 5, others (specify) - 6.

(b) free of interest - 1, on interest - 2, advance against produce - 3, others(specify) - 4.

[4] particulars of catches by observation	
i t e m	catch particulars
(0)	(1)
1. date of catch	
2. no. of operators involved in the catch	
3.1. type of nets used (a)	
3.2. if any hired, charges paid (0.00 Rs.)	
4.1. no. of crafts used	
4.2. if any hired, charges paid (0.00 Rs.)	
5. no. of men engaged	
i) of operating hrs./of river fishing unit	
ii) hired	
iii) total men engaged	
6. charges paid to the hired men i) in cash (0.00 Rs.)	
ii) in kind (a) quantity (0.0 kg.)	
(b) value (0.00 Rs.)	
7. fish caught by varieties	
variety	quantity (0.0 kg.)
1. carps	
2. cat fishes	
3. murrels	
4. barbous species	
5. cyprinids	
6. tilapia	
7. hilsa	
8. prawn/shrimps	
9. others (specify)	
10. all	
8. how sorting done? (b)	
9. how sold? (sold by bulk-1, sold not by bulk-2)	
10. type of sale (c)	
11. place of sale (d)	
12. agency to which sold (e)	
13. was dewatering done? (yes-1, no-2)	

- (a) drag net-1, cast net-2, gill net-3, fixed net-4, seines-5, scoopnet-6, others (specify)-7.
- (b) by weight-1, others (specify)-2.
- (c) sale before sharing-1, sale after sharing-2.
- (d) sale at site-1, sale elsewhere-2.
- (e) hawked-1, sold to retailers-2, sold to wholesalers-3, sold to co-operative societies or government-4, others (specify)-5.

NATIONAL SAMPLE SURVEY ORGANISATION

Pilot Study on Estimation of Catch of Inland-Fish : 1973

District : Karimnagar (Andhra Pradesh) / Madurai (Tamil Nadu) / Murshidabad (West Bengal)

Schedule A : Particulars of arrivals and primary disposal of fish at assembly points

name of A.P.

visit no.

[1] identification particulars

1. serial no. of sample cluster			
2. particulars of sample villages		village - 1	village - 2
2.1 name			
2.2 village no./j.l. no.			
2.3 area (0.00 acres)			
2.4 population (1971)			
3. sub-sample	4. stratum	5. sub-stratum	6. taluka/police station
7. name of village in which the assembly point is located			
(village no./j.l. no.)			
8. if not in the sample cluster distance (0.0 km.)			
9. number of dealing agents in the a.p.		10. type of assembly point (a)	
11. percentage of cluster catch arrival at the a.p. to the total arrival at the a.p. from			
i) impounded units			
ii) riverine areas			
iii) total			
12. percentage of cluster catch arrival at the a.p. to the total cluster catch from			
i) impounded units			
ii) riverine areas			
iii) total			

[2] investigation particulars

1.1 name of investigating officer	
1.2 dates of survey	1.3 signature
2.1 name of supervising officer	
2.2 dates of supervision	2.3 signature

Codes : (a) spot with no regular marketing - 1, whole sale market - 2, retail market - 3, others - 4.

* delete whichever is inapplicable.

i) date of catch species
 ii) reference (date)

variety	quantity of the catch received				details of disposal of catch											
	quantity (0.0 kg.)			value (0.00 Rs.)	at site		at local markets		at distant markets within district		exported outside district		others		total	
	from within district	from outside district	total		quantity (0.0 kg.)	value (0.00 Rs.)	quantity (0.0 kg.)	value (0.00 Rs.)	quantity (0.0 kg.)	value (0.00 Rs.)	quantity (0.0 kg.)	value (0.00 Rs.)	quantity (0.0 kg.)	value (0.00 Rs.)	quantity (0.0 kg.)	value (0.00 Rs.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
I. source of exploitation : irrigated water units																
1. carps																
2. cat fishes																
3. murrel																
4. barbus species																
5. cyprinus																
6. tilapia																
7. mlsa																
8. prawn/shrimps																
9. others (specify)																
10. all																
II source of exploitation : riverine areas																
1. carps																
2. cat fishes																
3. murrel																
4. barbus species																
5. cyprinus																
6. tilapia																
7. mlsa																
8. prawn/shrimps																
9. others (specify)																
10. all																

* reference periods are : 7th day, 6th day, 5th day, 4th day, 3rd day, 2nd day, 1st day, last month and last quarter/last 4 months.

[4] details of catch, arrivals and their disposal during last 7 days, last month and last quarter/last 4 months (contd.)

1) name of dealing agent

ii) reference period *

variety	details of catch arrived				details of disposal of catch											
	quantity (0.0 kg.)			value (0.00 Rs.)	at site		at local markets		at distant markets with-in district		exported out-side district		others		total	
	from within district	from outside district	total		quantity (0.0 kg.)	value (0.00 Rs.)	quantity (0.0 kg.)	value (0.00 Rs.)	quantity (0.0 kg.)	value (0.00 Rs.)	quantity (0.0 kg.)	value (0.00 Rs.)	quantity (0.00 Rs.)	value (0.00 Rs.)	quantity (0.0 kg.)	value (0.00 Rs.)
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)

III source of exploitation : unpounded water units and riverine areas

1. carps																
2. cat fishes																
3. murrels																
4. barbus species																
5. cyprinus																
6. tilapia																
7. hilsa																
8. prawn/shrimps																
9. others (specify)																
10. all																

IV. source of exploitation : sea

1. carps																
2. cat fishes																
3. murrels																
4. barbus species																
5. cyprinus																
6. tilapia																
7. hilsa																
8. prawn/shrimps																
9. others (specify)																
10. all																

* reference periods are : 7th day, 6th day, 5th day, 4th day, 3rd day, 2nd day, 1st day, last month and last quarter/last 4 months.