

INTRODUCTORY ADDRESS

By

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I have great pleasure in delivering the Introductory address at this Symposium. The question of Ceylon's fish resources is a matter of public interest and I am glad that the Ceylon Association for the Advancement of Science has taken the initiative in holding this Symposium.

In considering the term "productivity" we should note that it is used in two senses. In one sense it refers to the total volume of fish produced or sustained by nature in a given area. This term is also used to denote the total volume of fish that could be harvested from a given area. In what follows I propose to use the term in the latter sense.

Before we consider the potential productivity of our seas it would be useful to focus our attention on the volume of fish actually produced in the recent past. The Director of Fisheries in his Annual Administration Report publishes data relating to fish production in the various reporting areas round the Island. The production figures given in the Administration Report pertaining to the years 1963/64, 1954 and the best year of production of the last 10 years of each of the reporting areas is given in Table I.

To enable us to calculate production per square mile the square area in respect of each of these reporting areas is also given in Table 1. In calculating the square area I have assumed that all the fish has been caught within a distance of five miles from shore. In making this assumption I have been guided by the fact that the present type of craft used in the fishing industry generally catch most of the fish within this distance. It should however be borne in mind that:

- (1) The catches landed in a particular reporting area are not necessarily all caught in the area related to that reporting area in the Table. This would therefore lead to either under-estimation or over-estimation unless there are compensatory adjustments in adjacent reporting areas.
- (2) To the extent that some fish has been caught beyond five miles from the shore the figures would give over-estimations.
- (3) To the extent that in a particular reporting area most of the fish is caught within a shorter distance off the shore than five miles, the figures would give an under-estimation.
- (4) To the extent that the data provided in the Administration Report are not accurate there could be either under-estimations or over-estimations.
- (5) There are no landings of fish on the coast within the Yala Game Sanctuary. This is referred to as Gap A in Table 1.

Subject to these qualifications these figures help us to place in proper perspective the current harvest of fish. The results arrived at in Table 1 should be regarded only as indications of magnitude rather than absolute values.

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TABLE 1.
Ceylon Fish Production Analysis

(1) Reporting Area	(2) Area of Continental Shelf Sq. mls.	(3) Area of Sea 5 Mls. from coast Sq. mls.	Western		Eastern		(4) Catch Oct. 63 to Mar. 64 (Tons)	(5) Catch April 64 to Sept. 64 (Tons)	(6) + (3)		(5) + (3)		(6) + (7)		(9) Year	(10) Catch (Tons)	BEST YEAR		(14) Catch 1954 Tons	(15) 1954 Catch per Square Mile (Tons)
			(4) Catch Oct. 63 to Mar. 64 (Tons)	(5) Catch April 64 to Sept. 64 (Tons)	(6) Oct. 63-Mar. 64 Catch per Sq. mile	(7) Apr. 64-Sept. 64 Catch per Square mile			(8) 1963/64 Catch per Sq. mile	Western		Eastern								
										(11) Oct.-Mar. Catch per Sq. Mile	(12) Apr.-Sept. Catch per Sq. mile	(11) + (12) Catch per Sq. Mile (Tons)								
19. Kalpitiya ..	256	160	966	531	6.0	3.3	9.3	1957	4,186	—	—	—	—	—	1961/62	3,500	26.1	3,500	22.0	
20. Mundel ..	243	160	2,473	1,166	15.4	7.3	22.7	1961/62	7,472	—	—	—	—	—	1961/62	1,318	46.7	1,318	8.2	
21. Chilaw ..	256	83	2,538	842	30.5	10.1	40.6	1963/64	3,380	—	—	—	—	—	1963/64	2,037	40.6	2,037	24.5	
22. Negombo ..	339	128	992	701	7.7	5.4	13.1	1962/63	1,963	—	—	—	—	—	1962/63	949	15.3	949	7.4	
1. Colombo— Moratuwa	410	115	430	87	3.7	.8	4.5	1960/61	1,977	—	—	—	—	—	1960/61	296	17.2	296	2.6	
2. Beruwela ..	337	128	1,538	42	12.0	.3	12.3	1962/63	2,372	—	—	—	—	—	1962/63	447	18.5	447	3.5	
4. Balapitiya ..	256	83	1,596	260	19.2	3.1	22.3	1962/63	6,157	—	—	—	—	—	1962/63	1,167	74.2	1,167	14.0	
5. Dodanduwa	121	42	159	69	3.8	1.6	5.4	1963/64	228	—	—	—	—	—	1963/64	184	5.4	184	4.4	
6. Galle ..	268	64	202	45	3.1	.7	3.8	1960	787	—	—	—	—	—	1960	64	12.3	64	1.0	
7. Matara ..	256	153	657	139	4.3	.9	5.2	1961/62	6,698	—	—	—	—	—	1961/62	1,636	43.8	1,636	10.6	
8. Tangalle ..	326	128	1,047	250	8.2	1.9	10.1	1960/61	4,038	—	—	—	—	—	1960/61	1,067	31.5	1,067	8.3	
Gap. A	1,378	460																		
18. Kalmunai ..	320	218	7,166	5,780	33.0	26.5	59.5	1963/64	12,946	—	—	—	—	—	1963/64	4,111	59.5	4,111	18.8	
17. Batticaloa ..	474	224	3,732	6,318	16.6	28.4	45.0	1962/63	13,356	—	—	—	—	—	1962/63	2,208	59.6	2,208	10.0	
16. Mutur ..	570	224	248	393	1.1	1.7	2.8	1962/63	1,088	—	—	—	—	—	1962/63	426	4.8	426	1.9	
15. Trincomalee	254	173	1,007	1,426	6.0	8.2	14.2	1962/63	2,529	—	—	—	—	—	1962/63	616	14.5	616	3.5	
14. Mullaitivu ..	750	283	594	4,800	2.1	17.0	19.1	1961/62	6,369	—	—	—	—	—	1961/62	668	22.5	668	2.3	
11. Point Pedro	811*	231	1,058	1,428	4.6	6.2	10.8	1959	3,696	—	—	—	—	—	1959	470	16.0	470	2.0	
10. K. K. S.	775*	230	1,180	2,114	5.1	9.1	14.2	1963/64	3,294	—	—	—	—	—	1963/64	1,190	14.2	1,190	5.1	
9. Jaffna ..	1,777*	597	8,892	12,766	15.0	21.4	36.4	1963/64	21,658	—	—	—	—	—	1963/64	3,897	36.4	3,897	6.5	
12. Mannar ..	945*	346	4,041	4,458	11.6	13.0	24.6	1963/64	8,499	—	—	—	—	—	1963/64	970	24.6	970	2.8	
13. Arippu ..	678	155	1,701	928	11.0	6.0	17.0	1963/64	2,629	—	—	—	—	—	1963/64	653	17.0	653	4.2	
Total..	11,800	4,385	42,277	45,502	11.0	11.0	22.0	—	—	—	—	—	—	—	—	27,874	—	27,874	7.4	

* Up to midway line between Ceylon and India.

The detailed analysis of Table 1 is set out in Appendix. In brief the analysis shows that in 1963/64 over the entire five mile area the average production was around 22 tons per square mile. The production per square mile varied from 59.5 tons per square mile in Kalmunai to 2.8 tons per square mile in Muttur. It would be observed that the high and the low in production are both off the east-coast of Ceylon fairly near to each other. It would appear from this that the reasons for this difference lie not so much in the productivity of the sea as in other special factors which relate to fishing operations in these two areas.

Due primarily to the type of craft used at present in the fishing industry we have two fishing seasons in the Island which are related to the monsoonal weather conditions encountered at sea. These fishing seasons are generally taken to be April to September and October to March. However it should be noted that the actual fishing season in each reporting area is not strictly limited to these months.

It might be noted that the highest per square mile catch recorded was one of 74.2 tons in Balapitiya in the year 1962/63. In this reporting area in 1963/64 the catch was only 22.3 tons.

In 1954 the highest per square mile catch recorded was at Chilaw which had a figure of 24.5 tons per square mile as against 40.6 tons per square mile in 1963-64. The all-island average for 1954 was 7.4 tons per square mile.

With this background in regard to the actual production of fish in the recent past it would now be pertinent to consider the various estimates of productivity that have been made. The Ceylon Fisheries Corporation made an estimate in its Draft Ten-Year Plan for the Development of the Fishing Industry. Dr. A. C. J. Weerakoon has made an estimate in the Paper entitled "Ceylon Fisheries: Past and Future" published in the Bulletin of the Fisheries Research Station (Vo. 17, No. 2) in December, 1964, at Page 253. Dr. N. N. de Silva, a Research Officer of the Department of Fisheries has made an estimate of productivity in his Manuscript Report on the "Development of Fisheries in Ceylon" (unpublished).

In this introductory talk on the subject of fish resources I believe it would be appropriate to place these various estimates in their proper perspective. This is all the more necessary since I find on analysis that there is not very much of a divergence between these estimates.

In April this year the Ceylon Fisheries Corporation in its Draft Ten-Year Plan for the Development of the Fishing Industry made the following estimate of productivity:—

	<i>Area</i> (Sq. Miles)	<i>Productivity</i> per sq. mile (Tons)	<i>Total</i> <i>Productivity</i> (Tons)
Up to 8 fathoms	4,615	75	346,125
Between 8 and 10 fathoms	785	60	47,100
Between 10 and 50 fathoms	3,970	30	119,100
Between 50 and 100 fathoms	2,430	15	36,450
Between 100 fathoms and 5 miles beyond	3,480	10	34,800
	<hr/> 15,280 <hr/>		<hr/> 583,575 <hr/>

Before we consider the estimates in detail it is necessary that we are clear about the sources from which we get our harvest of fish. Fish could be obtained from the following sources:—

Fresh Water Fishery	—	Inland Water Bodies
Brackish Water Fishery	—	Brackish Water Bodies
Marine Fishery	—	Sea
(a) In-shore Continental Shelf up to 100 fathoms depth	—	Coast to about 15 miles off-shore
(b) Off-shore Fisheries	—	15 to 100 miles off-shore
(c) Deep Sea or Oceanic Fishery	—	Beyond 100 miles off-shore

The above classification of the Marine Fishery is more or less on the lines suggested by Dr. K. Sivasubramaniam in a Paper entitled "Off-shore and Deep Sea Fisheries for larger Scombroids in the Indian Ocean".¹ In this Paper he states: "I am sub-dividing the fisheries for Scombroids into the in-shore, off-shore and the deep sea or oceanic; in-shore being limited to the Continental Shelf, off-shore is the region between 15 and 100 miles from shore and the deep-sea or oceanic region is the vast open mass of waters beyond these".

The Corporation has sub-divided the in-shore fishery into four areas with varying depths. As regards the off-shore fishery, the Corporation has included in its productivity figures an estimate *only* for the area which is five miles beyond the Continental Shelf. I propose to examine the estimate of the Corporation in relation to the other estimates of productivity.

Since the area of the Continental Shelf, the area of the 8 fathom depth, the area of sea 5 miles and 15 miles from the coast would be relevant to our discussions, I have given these figures by catch reporting areas of the Department of Fisheries in Table 2.

TABLE 2
Ceylon Fisheries

Reporting Area	Area of 8 Fathom Depth	Area of Sea 5 miles from coast	Area of Continental Shelf up to 100 fathoms	Area of Sea 15 mls. from Coast
	Sq. Mls.	Sq. Mls.	Sq. Mls.	Sq. Mls.
Kalpitiya	240	160	256	480
Mundel	160	160	243	480
Chilaw	70	83	256	249
Negombo	70	128	339	384
Colombo-Moratuwa	35	115	410	345
Beruwela	25	128	337	384
Balapitiya	15	83	256	249
Dodanduwa	8	42	121	126
Galle	15	64	268	192
Matara	30	153	256	459
Tangalla	20	128	326	384
Gap A	110	460	1,378	1,380
Kalmunai	50	218	320	654
Batticaloa	70	224	474	672
Mutur	100	224	570	672
Trincomalee	50	173	254	519
Mullaitivu	120	283	750	849
Point Pedro	290	231	811*	693
K.K.S.	720	230	775*	690
Jaffna	1,280	597	1,777*	1,791
Mannar	720	346	945*	1,038
Arippu	420	155	678	465
	4,618	4,385	11,800	13,155

* Up to midway line between Ceylon and India.

Estimates of Dr. A. C. J. Weerakoon

The estimates of the Fisheries Corporation may be compared with the estimates made by Dr. A. C. J. Weerakoon in the Paper entitled "Ceylon's Fisheries: Past and Future" published in the Bulletin of the Fisheries Station—December, 1964. On Page 253 of the Bulletin Dr. Weerakoon makes two estimates regarding productivity. In the first estimate Dr. Weerakoon states "I find that the potential harvest from a narrow strip of coastal sea about 6½ miles

¹ Page 283 in *Bulletin of Fisheries Research Station*, Vol. 17, No. 2, Dec., 1964.

wide all round this Island is between 267,000 and 382,000 tons per year. Our actual catch in 1963 from coastal waters was 84,000 tons. This means that between 183,000 and 298,000 tons of the potential harvest that year must have been left unharvested". This estimate seems to refer more to harvestability than to productivity.

Dr. Weerakoon makes another estimate of productivity. In his own words " From Prasad & Nair's figures I have also made an estimate of the Indian potential coastal catch (in the region studied) on a per square mile basis. This is approximately 90 to 120 short tons per square mile per year. To give you an idea of how modest an estimate this is I must point out that it is roughly equivalent to 260-370 lbs. per acre per year, or about 1 lb. per acre per day. On this estimate a strip 5 miles wide around Ceylon's 850 miles of coast line should yield between 380 and 510 thousand tons of fish each year. On the basis of this estimate it will be at least 30 probably 50 years before we shall have attained the potential yield from our coastal waters. Since, however, nearly half of this length of coast line is very considerably deeper than $7\frac{1}{2}$ fathoms at 5 miles off-shore and the productivity may therefore be lower and since a great many assumptions are included in any determination of primary production and of potential fish production, it will not be safe to take any but the lowest of these estimates, namely 267,000 tons per year—at least until actual commercial or exploratory fishing has indicated that the figure should be higher".

Normally a range is given " since a great many assumptions are included in any determination of primary production and of potential fish production " but I cannot agree that because of this factor " it will not be safe to take any but the lowest of these estimates".

Dr. Weerakoon thus makes two estimates each with a minimum and maximum figure. In the first estimate he calculates the productivity from a strip of coastal sea about $6\frac{1}{2}$ miles wide to be between 267,000 and 382,000 tons per year. In the second estimate he calculates the productivity from an even narrower strip 5 miles wide to be between 380,000 and 510,000 tons of fish per year. Dr. Weerakoon however is inclined to deflate this estimate since " nearly half of this length of coast line is very considerably deeper than $7\frac{1}{2}$ fathoms at 5 miles off shore and the productivity may therefore be lower and since a great many assumptions are included in any determination of primary production ". The relevance of the $7\frac{1}{2}$ fathoms is that Prasad & Nair's observations which form the basis of Dr. Weerakoon's second estimate relate to this depth. Dr. Weerakoon therefore introduces two restrictions to the area he is dealing with:

(i) 5 miles width

(ii) $7\frac{1}{2}$ fathom depth within this 5 mile limit.

Having got on to the $7\frac{1}{2}$ fathom basis it is difficult to understand why Dr. Weerakoon finds it necessary to still adhere to the 5 mile width restriction. What is relevant is the total area of the Continental Shelf within the $7\frac{1}{2}$ fathom contour whether it be within a 5 mile strip or without it. The Corporation has actually calculated the area within the 8 fathom depth and finds that it is 4,615 square miles. Applying Dr. Weerakoon's figures for productivity of 90-120 short tons per square mile, which in his own words is a modest estimate, to this area, within the 8 fathom depth, the productivity works out to between 415,000 to 654,000 tons per year. It would be observed that this result is greater than the productivity of 380,000 to 510,000 tons per year obtained by Dr. Weerakoon when he applies his figure of per square mile productivity to an area 5 miles wide around Ceylon's 850 miles of coast line. Dr. Weerakoon's arithmetical calculation is (5×850 sq. mls. \times 90 tons for the minimum estimate and 120 tons for the maximum estimate). Hence it would be seen that there is no necessity to deflate Dr. Weerakoon's second estimate when one changes the basis from a width of 5 miles to a depth of 8 fathoms because the square area of 5 miles width is 4,250 square miles according to Dr. Weerakoon's calculation and the square area of sea within an 8 fathom depth is 4,615 miles. Dr. Weerakoon's error appears to be that he did not take account of the large area of the Continental Shelf below 8 fathoms in depth, which lies outside the 5 mile range in the Gulf of Mannar and the Palk Strait and which more than compensates for the deeper area lying within the 5 mile limit in the other parts of the coast.

Dr. Weerakoon finally decides that the safe estimate of productivity is 267,000 tons per year. This it will be noted is the minimum of his first estimate and there have been attempts made to compare this figure of 267,000 tons with the estimate given in the Corporation's Development Plan of 584,000 tons. These figures are not comparable at all because as will be seen from the above discussions Dr. Weerakoon's estimates relate to an area of sea within a depth of $7\frac{1}{2}$ fathoms or 5 miles wide whichever is less, while the Corporation's estimate relates to an area of sea covered by the entire Continental Shelf up to a depth of 100 fathoms and also to an additional area 5 miles beyond the extreme edge of the Continental Shelf. In terms of width this would approximate to about 20 miles. The Corporation's figure which is to some extent comparable with Dr. Weerakoon's figure is the Corporation's estimate of productivity of 346,000 tons within an area up to a depth of 8 fathoms. Even this is not strictly comparable because of Dr. Weerakoon's double restriction of depth and width. As regards the balance area dealt with in the Corporation estimates there is no estimate of Dr. Weerakoon for purposes of comparison. It would therefore appear that there is no substantial difference between Dr. Weerakoon's estimate with the relevant part of the Corporation's estimate.

The Corporation estimate for a depth of sea up to 8 fathoms is 346,000 tons. This figure is based on productivity of 84 short tons per square mile which is less than the minimum of 90 tons which itself is a modest estimate according to Dr. Weerakoon. In an estimate of this nature which is based on so many assumptions I do not think that the difference of 79,000 tons between the Corporation's estimate and Dr. Weerakoon's lowest estimate is sufficient to warrant controversy.

Estimate of Dr. N. N. de Silva

Dr. N. N. de Silva, a Research Officer of the Department of Fisheries has also made an estimate of productivity in his Manuscript Report on the "Development of Fisheries in Ceylon". On the basis of historical evidence, primary productivity studies and fishing trials he makes the following estimates:—

"Ceylon has a coastal line of about 850 miles. Its coastal fishery is restricted to a distance of about 20 miles from the shore. Thus its coastal fishable area (in contrast to deep sea fishing) is about 17,000 square miles. Thus with an approximate productivity placed at around 50 tons/square mile/year the annual production from this source alone will be about 850,000 tons per year. Thus really double the estimated self-sufficiency target can be achieved from the coastal fishery alone. Added to this the resources of the trawler fishery on the Wadge Bank as well as the Pedro Bank, the potential Tuna fishery particularly for skipjack as well as the almost ideal conditions prevailing in this country for inland fish culture, there is hardly any justification for despondency for future fisheries development on the basis of a lack of resources."

Dr. N. N. de Silva states as follows in regard to the data obtained from the fishing trials:

"Fishing trials. The third body of data (which supplements calculations based on primary production studies and in some ways confirm them) on the fisheries resources of our waters is obtained from fishing trials. The following comparison of the available figures with those using similar fishing gear in the temperate waters indicated that the former are equal to or better than the latter in productivity."

Area	Catch/Hour Lbs.	Author
Palk Strait	456.0 ..	Malpas, 1926
Pedro Bank	126.3 ..	Pearson, 1926
Pedro Bank	538.0 ..	Medcof, 1960
Wadge Bank	195.3 ..	Pearson, 1926
Wadge Bank	1,000.0 ..	Medcof, 1960
Gu'f of Mannar	2,000.0 ..	Weerakoon, 1963
Average for Ceylon Seas	719.2	
Average for North Sea	279.4	

Dr. N. N. de Silva estimates productivity at 50 tons per square mile per year within the area of sea 20 miles from the coast. Unlike Dr. Weerakoon Dr. Silva does not restrict himself to an 8-fathom depth or a 5-mile limit but ventures to form an estimate for the entire area of the Continental Shelf and even beyond. The area covered by Dr. Silva's estimate corresponds more or less to the area covered by the Corporation's estimate and hence Dr. Silva's figure of 850,000 tons per year is comparable to the Corporation's estimate of 584,000 tons per year. In terms of tons per square mile the Corporation estimates works out to only 38 tons as compared to the 50 tons in Dr. Silva's estimate.

The Corporation's estimates and estimate made by Dr. N. N. de Silva and Dr. Weerakoon are shown in Table 3.

TABLE 3

AREA	Corporation's Estimate (Tons)	Dr. N.N. de Silva's Estimate (Tons)	Dr. Weerakoon's Estimate (Tons)		
			Minimum	Maximum	
<i>In-shore</i>					
Up to 8 fathoms ..	346,125	850,000	267,000	510,000	
Between 8 fathoms and 100 fathoms	202,650		Not estimated for		
<i>Off-shore</i>					
100 fathoms to 5 miles beyond ..	34,800				
5 miles beyond to 100 miles beyond ..	—	—	—	—	
<i>Deep-sea</i> ..	126,000	—	—	—	

In comparing the three estimates it would be observed that in relation to the 8-fathom limit the Corporation's estimate is only 79,000 tons more than Dr. Weerakoon's lowest estimate, in relation to the entire area of the Continental Shelf and 5 miles beyond Dr. N. N. de Silva's estimate exceeds that of the Corporation by 266,000 tons.

However, as I mentioned earlier in estimates of this nature these differences are to be expected and it would be foolish to engage in any serious controversy regarding these matters in the context of our limited knowledge of the resources of our seas. The more practical approach to this question would be to ensure that the productivity of the seas is adequate for fishing operations planned by the Corporation in the immediate future and also to provide that the necessary data collected during the course of the Corporation's fishing activities are analysed and studied by the Corporation and Research Scientists so as to enable us to make better estimates on the basis of greater knowledge.

In this connection I would like in particular to point out that the projected activities of the Corporation in its Draft Ten-Year Plan assumed productivity of 270,000 tons of fish from the entire coastal fishery only in the year 1970-71. Hence even if Dr. Weerakoon's lowest estimate is taken to apply beyond the confines of the 7½-fathoms depth and 5-mile width to the entire coastal fishery the resources of our seas would appear to be adequate to support the activities of the Corporation until 1971. It would therefore appear that the first five years of operation of the Corporation are beyond controversy as far as resources are concerned. This period of 5 years would give us ample opportunity by means of commercial and exploratory fishing to obtain more data on our fishery resources.

The estimates of both Dr. Weerakoon and Dr. N. N. de Silva are more in the nature of guesses than estimates based on adequate data. The only firm basis that we could go on is the present productivity of our seas which as suggested is around 22 tons per square mile. We would be in a position to reach a target of 270,000 tons from our coastal fishery by 1970-71 if we succeed in harvesting 17/18 tons of fish from the entire area of 15,280 square miles for which the Corporation has made an estimate. To achieve its figure of 584,000 tons it would have to increase the per square mile catch by a little more than 50 per cent. of the present average of 22 tons. In the years to come experience and research will show whether these targets are realizable or not.

Discussions in regard to productivity have been based on the tacit assumption that the plans of the Corporation are inflexible. The Fisheries Corporation in its Draft Plan in Page 7 has referred to this aspect of the matter as follows:—"It is obvious that the figures in these Tables cannot be taken as absolutely firm for the entire duration of the plan period. They are relatively firm for the first few years but are only indications of magnitude and perspective for the later years. They must necessarily be subject to change on the basis of knowledge and experience gained over the years. At each stage of the planning due regard has been paid to the fact that flexibility is an all-important consideration in a Plan of this nature".

I am very glad that today there is more interest in fisheries and fisheries development than in the past and I am confident that with the implementation of definite plans for fisheries development we would be in a position to utilize our fish resources fully. I have no doubt that the exchange of views at this Symposium will considerably assist in the development of knowledge regarding our fisheries.

I thank the Ceylon Association for Advancement of Science for giving me this opportunity of participating in the Symposium.

APPENDIX

Analysis of Ceylon's Fish Production

It would be observed that—

- (1) The average 1963/64 all-Island catch is around 22 tons per square mile.
- (2) Although we have two distinct fishing seasons determined by Monsoon conditions the average catch for each season in 1963/64 is around 11 tons per square mile per half year.
- (3) The following areas recorded catches above the all-island average of 22 tons per square mile in 1963 :—

			<i>Tons Per Sq. Mile</i>
Kalmunai	..	..	59.5
Batticaloa	..	..	45.0
Chilaw	..	..	40.6
Jaffna	..	..	36.4
Mannar	..	..	24.6
Mundel	..	..	22.7
Balapitiya	..	..	22.3

- (4) During the October, 1963 to March, 1964 fishing season catches above the seasonal average of 11 tons per square mile were reported from the following areas :—

			<i>Tons Per Sq. Mile</i>
Kalmunai	..	..	33
Chilaw	..	..	30.5
Balapitiya	..	..	19.2
Batticaloa	..	..	16.6
Mundel	..	..	15.4
Jaffna	..	..	15.0
Beruwala	..	..	12.0
Mannar	..	..	11.6

(5) In the fishing season April, 1964 to September, 1964 catches above the seasonal average of 11 tons per square mile were reported from the following :—

			<i>Tons Per Sq. Mile</i>
Batticaloa	..	..	28.4
Kalmunai	..	..	26.5
Jaffna	..	..	21.4
Mullaitivu	..	..	17.0
Mannar	..	..	13.0

In the Table an analysis was also made of the best year of each of the reporting areas during the last 10 years, By a comparison of the 1963/64 figures and the best year figures it would be observed that—

(i) the following reporting areas in their best year had obtained catches which were higher than the 1963/64 average catch of 22 tons per square mile :—

			<i>Tons Per Sq. Mile</i>
Balapitiya	..	..	74.2
Batticaloa	..	..	59.6
Kalmunai	..	..	59.5
Mundel	..	..	46.7
Matara	..	..	43.8
Chilaw	..	..	40.6
Jaffna	..	..	36.4
Tangalla	..	..	31.5
Kalpitiya	..	..	26.1
Mannar	..	..	24.6
Mullaitivu	..	..	22.5

(ii) If we compare the six-monthly average catch per square mile of 11 tons in 1963/64 with the best year figures, we get the following results for the two seasons :—

(a) *October to March*

			<i>Tons Per Sq. Mile</i>
Balapitiya	..	..	68
Mundel	..	..	42
Kalmunai	..	..	33
Matara	..	..	31
Chilaw	..	..	30.5
Tangalla	..	..	28.8
Batticaloa	..	..	18.0
Beruwala	..	..	16.3
Jaffna	..	..	15.0
Mannar	..	..	11.6

(b) *April to September*

Batticaloa	..	..	41.6
Kalmunai	..	..	26.5
Jaffna	..	..	21.4
Mullaitivu	..	..	18.7
Mannar	..	..	13.0
Matara	..	..	12.8

(6) It would also be observed that if we compare the 1954 catch per square mile with the 1963/64 catch of 22 tons, only the following reporting areas had higher catches than 22 tons :—

			<i>Tons Per Sq. Mile</i>
Chilaw	..	..	24.5
Kalpitiya	..	..	22.0