

## CHAPTER V

### INCOME FROM FISHERY

The estimates of income from 'fishery' sector for post-1950-51 years, as published in various issues of the 'Estimates of National Income', were prepared generally on the lines indicated in the Final Report of the NIC (paragraphs 2.119 to 2.124). The source material used in these estimates were, however, deficient in quantity and quality both. Certain new and more up-to-date data were collected by the NTU during the past two years making it possible to revise the existing estimates. The NTU has also kept in view the growing demand for State-wise estimates of national income and made efforts to build up the estimates at State level. The revised estimates together with methodological details and a brief critical review of the available data on the subject are presented in the following paragraphs.

2. Of the three methods of estimation, viz. (i) the income approach, (ii) the expenditure approach and (iii) the value added approach, use has been made of the last one. This comprises of estimating the gross value of production and then deducting from it the value of all inputs such as cost of materials, service charges paid to alien sectors, expenditure on current repair and maintenance of boats, nets, fishing tackle etc., and the amount of depreciation on all types of fixed capital equipment.

2.1. The scope of 'production' in 'fishery' sector includes the following :

(i) Ocean and coastal water fishing ; fishing in ocean, coastal and off-shore waters, river estuaries and back waters; also includes gathering of sea weeds, sea shells, pearls, sponges and other ocean and coastal water products.

(ii) Inland water fishing : catching, taking and gathering of fresh water fish from rivers, irrigation and other canals, lakes, tanks, inundated tracts, jhils etc; also exploitation of uncultivated plant life in inland waters and artificial ponds.

(iii) Fish curing, e.g. salting and sundrying of fish and

(iv) subsistence fishing and angling by all classes of people other than professional fishermen.

3. As the choice of methods of estimation generally depends on the available source material, a brief account of the same is given below with a view to examine their usefulness in the present context.

3.1. One of the most comprehensive sources, though out-of-date now, is still the Report on the Marketing of Fish in the Indian Union published by the DMI in 1951. The report contains data on the total estimated landings of marine fish, marketable surplus of fresh water fish, prices prevailing in some important centres in producing as well as consuming areas by popular varieties of fish and by States,<sup>1</sup>

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<sup>1</sup> Data are given according to set-up prior to integration of States in 1949-50.

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gross distributive margins, purpose-wise utilisation of fish, e.g. fish consumed in fresh form, fish used for salting and sundrying, fish used as manure etc. The year of reference, though not explicitly stated anywhere in the Report, is understood to be 1948. These data on total landings of marine fish or marketable surplus of fresh fish are not based on any scientifically planned surveys but mostly on trade enquiries and similar other evidence<sup>2</sup>. The Report also contains estimates of value of marine and fresh water fish, which were adopted as such by the NIC in their Final Report.

3.1.1. No regular data for post-1948-49 period are available on similar lines in published form. The DMI has, however, collected similar data for the year 1956-57. The detailed follow-up report on the subject is under preparation and is likely to become available in the near future. Certain advance data, useful for national income estimation, were supplied by the DMI on special request and reference to these has been made in para 4.2 of this chapter.

3.2. Statistics on the catch of marine fisheries have been developed from the year 1950 onwards by the Central Marine Fisheries Research Station, Mandapam (CMFRS). It has a network of selected observation centres, each operating under a fishery survey assistant, spread on the east and west coasts of India which form the main source of supply of marine fish. The data collected at these centres on actual catch, the trends of annual changes in fisheries and the fluctuations therein, are used for estimating the annual marine fish landings<sup>3</sup>. The estimates of fish landings are framed zone-wise<sup>4</sup> by important species of fish. These data are analysed in great detail and published annually in the Indian Journal of Fisheries. Data on fish landings by composition are, however, published at all-India level only<sup>5</sup>. Statistics are also maintained on total effort in man-hours expended in each zone and catch in kilograms per man-hour. For years prior to 1955, the report used to give catch per fisherman and per indigenous boat as well. The data on catch are maintained on monthly basis. The Journal gives statements on percentage distribution of total landings by months of each calendar year.

3.3. Data on (i) fish catch and landings by groups of species and (ii) disposition of fish catch, are also published annually in the Statistical Abstract of India<sup>6</sup>.

<sup>2</sup> "In the case of sea-fish, these estimates have been made after taking into account (i) fish curing yard figures, (ii) the approximate number of fishing boats in use, (iii) the number of adult fishermen engaged in fishing, (iv) published and unpublished fish statistics of the Madras Province, (v) the imports of fresh fish into West Bengal from East Pakistan, (vi) import and export figures of preserved fish and fish products in the publications issued by the Director General, Commercial Intelligence Statistics, (vii) figures of movements of fish by rail and (viii) figures of arrivals of fish in municipal markets, *bunders* (ports) etc. in the principal cities. As regards freshwater fish, the estimates are mainly based on information supplied by local officers, the trade and municipalities as no exact data of any kind are available." cf. Report on the Marketing of Fish in the Indian Union, pp. 18-19.

<sup>3</sup> These include the landings from mechanised vessels also.

<sup>4</sup> "As a result of the recommendations of the *ad hoc* Fisheries Committee (1954) the fishery survey programme was expanded considerably in 1957-58 with the number of zones increasing from 12 to 20 thus making each zone more compact with a more or less homogeneous fisheries represented in it. The number of villages selected in the sample was increased to 185 by bringing in another 50 fish landing centres consisting of 92 fishing villages under observation during the year" cf. Annual Report of the Central Marine Fisheries Research Station, Mandapam, published in October, 1959 issue of the Indian Journal of Fisheries.

<sup>5</sup> Except for the year 1955 where the figures are available zone-wise in the Indian Journal of Fisheries, December, 1957.

<sup>6</sup> The latest issue relating to 1957-58 contains data up to 1957 on calendar year basis.

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These are obtained from the Fisheries Development Adviser (FDA), Ministry of Food and Agriculture. As regards marine fish their primary source happens to be the CMFRS, as described above. For fresh water fish, however, the FDA estimates the same, using the proportions<sup>7</sup> of marketable surplus of inland fish to total landings of marine fish, as given in the Report on the Marketing of Fish in the Indian Union. In other words the MR figures of fresh water fish are carried forward using the annual trends of landings of marine fish. These estimates are, therefore, open to doubt as the factors governing the resources of inland and marine fisheries and their actual exploitation may differ considerably. "Taking the figures given in the MR as the base, the production index in 1956 is 191, which shows that the total landings (of marine fish) have almost doubled during the last 7 years."<sup>8</sup> On the other hand, the marketable surplus of fresh water fish according to advance information received from DMI have risen by only 17.2 per cent during the same period.

3.4. Information on average wholesale prices of fish are available for some States by important centres in statistical supplements to State Gazettes as also in the monthly/quarterly Bulletins of State Bureaus. The States thus covered are (i) Bombay, (ii) Madhya Pradesh, (iii) Madras, (iv) Orissa, (v) West Bengal, (vi) Delhi and (vii) Andaman and Nicobar Islands. These prices, being wholesale prices prevailing mostly in consuming centres, include considerably high margins of trade and transport charges. Moreover, except for Madras and Delhi the prices quoted do not make any distinction between marine and inland fish. The latter, as is well known, is costlier than its counterpart from sea. As the evaluation has to be done separately for marine and inland fish, and these prices do not have adequate source specifications, no direct use can be made of them for purposes of national income estimation. They can, however, be used to build up State-wise price indices of fish which in turn could be used for projecting any suitable bench-mark prices.

3.4.1. The Statistical Abstract of Orissa, published by the State Bureau of Economics and Statistics gives figures of export of fish from Chilka Lake for the years 1955 to 1957. These are based on statements received from various co-operative societies and fish merchants engaged in export of fish from Chilka Lake. Being export figures and that too from Chilka Lake only, the magnitudes give very little indication of total production or its variation from year to year. These exports amount to 3 to 6 thousand tons per year as compared to the total estimated marketable surplus of inland fish, which according to the DMI, comes to nearly 23 thousand tons for the year 1956. The Quarterly Bulletin of Statistics, Orissa, gives data on quantity of fish sold in municipal markets of Orissa and the average price per unit sold. These prices are apparently retail prices and hence have limited use for estimation purposes.

3.4.2 Fisheries statistics in Madras enjoy a unique position owing to the fact that there exist a very large number of government curing yards, the staff in

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<sup>7</sup> According to this the marketable surplus of fresh water fish formed 40.8 per cent of total marine fish landed during the year of reference (approximately 1948-49).

<sup>8</sup> A note on the General Trend of Marine Fish Catch in India by S. K. Banerjee and A. V. V. Satyanarayanan (Indian Journal of Fisheries, April, 1958).

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charge of which are regularly maintaining comprehensive accounts and statistics on species-wise daily catches of fish at landing centres lying within the jurisdiction of these yards. Similarly chank fishery in the Gulf of Mannar being a government monopoly, sufficiently reliable data regarding chanks fished are available with the State fisheries department. The State department has also been exploring possibilities of conducting surveys in respect of inland fisheries since 1945. The data collected relate to survey of inland waters, statistics of fish caught, census of fishermen, fishing craft and tackle and statistics of fish sold in markets and *mandis*. Such data, collected during the course of the developmental work in the State, have only limited use as they relate to selected areas only. Data collected in such exploratory studies as also the curing-yard statistics, are published in the Annual Report of the Fisheries Department. An *ad hoc* publication of the Department of Statistics, Madras, entitled 'Statistics for the Re-organised State of Madras (1959)' contains fisheries statistics pertaining to (i) intensive (fish) seed collection and distribution, (ii) working of Departmental Fishing Vessels (under Deep Sea Fishing Scheme), (iii) fish-curing transactions and (iv) shark liver oil production in the re-organised Madras State for the year 1956-57. These data relate only to the fish cured within the government curing yards and are not therefore, comprehensive in character and as such, have limited use for estimating value added by salting and sundrying.

3.4.3. Fisheries statistics on a number of aspects for Bombay state are maintained by the State Department of Fisheries and the more important of these are published in its Annual Report. The department recently conducted a preliminary sample survey of fish landings in the districts of Thana, Ratnagiri and Bombay suburban. The survey was of an exploratory character. In this survey information was also collected in respect of composition of fishing units according to fishery and dimensions of fishing craft and gear. The latest available report of the department contains data on (i) maritime and estuarine fishing craft according to tonnage and type of power for the maritime districts of Bombay, (ii) month-wise and species-wise composition of fish landed by mechanised vessels, (iii) accounts for the fish-curing yards with allied fish-curing statistics, e.g. quantity of fish removed and receipts and expenditure of various yards, (iv) fresh fish brought to Bombay City by carrier launches, (v) quantity of fresh fish brought from fishing centres in Saurashtra and landed at Versova (Greater Bombay), (vi) fish landed and related information for Saurashtra and Kutch regions etc. These data, cannot also be relied on exclusively for purposes of national income estimation. The weighted average prices implicit in the Report have, however, proved quite useful.

3.4.4. The Directorate of Economics and Statistics of 'Himachal Pradesh Administration has recently built up estimates<sup>9</sup> of fish caught for the years 1950-51 to 1955-56 on the basis of information supplied to it by the State Deputy Warden of Fisheries, who maintains regular data on (i) number of licensed fishermen in the Pradesh

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<sup>9</sup> These were framed in connection with State-income estimation work. A full note on the subject appeared in the Quarterly Bulletin of Statistics (Quarter ending December, 1957) issued by the Directorate of Economics and Statistics.

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and (ii) average annual catch per fisherman. These data relate to fish caught by licensed professional fishermen and obviously exclude unauthorized catch and angling of fish by non-professional persons. The overall estimates, however, compare favourably with the figures of marketable surplus of fresh fish as estimated by the DMI. Apart from the *ad hoc* estimates framed by the State Directorate of Economics and Statistics, the Pradesh Fisheries Department maintains data on (i) number of licensed fishermen registered, (ii) number of fishing offences detected and the amount of compensation realised thereon, (iii) total receipts of the Department of Fisheries, (iv) daily average catch of a fisherman, (v) production and its approximate value, (vi) fish sanctuaries established, (vii) fishery rescued, (viii) brown trout ova produced and fry raised and (ix) number of spawning grounds located. These data are published in the Pradesh Quarterly Bulletin of Statistics.

3.4.5. There are few other sources which provide any reliable data useful for estimating income from this sector. Certain States such as Uttar Pradesh, Madhya Pradesh and Himachal Pradesh have also built up *ad hoc* estimates of outturn of fish etc. for measuring State income but the methods of estimation of such figures of outturn, particularly in respect of fresh water fish (estimates of marine fish are built up by the CMFRS, Mandapam), differ from State to State. Besides, the coverage of the basic data, on which the State estimates are built up, also vary from State to State. The Technical Committee on Co-ordination of Fisheries Statistics, set up by the Ministry of Agriculture in 1959, went into detail about the then existing position of the fisheries statistics in the country. The Committee also formulated a number of recommendations with a view to placing the task of collection of fisheries statistics on a uniform and regular basis. Such State estimates, as are at present available in various draft reports on the subject are often tentative and lack the essential details necessary to enable their meaningful comparison with the DMI estimates.

4. Estimates of gross value of fish have been separately prepared for marine and inland fish at State level whereas (i) the imputed value of subsistence fishing, (ii) value added by salting and sundrying, (iii) net income of gatherers of pearls and chanks etc. and (iv) value added by fishery sector as a whole, have been estimated at all-India level. The actual methods and sources used are described below.

4.1. Data on estimated landings of marine fish by re-organised States on financial year basis<sup>10</sup> have been directly obtained from the CMFRS, Mandapam. Figures published in the Indian Journal of Fisheries, however, relate to calendar years and are given by coastal zones. The zones are so chosen that each of the coastal States comprises of one or more of these coastal zones. The data used in this note are the latest available on the subject.

4.2. Data on annual production of inland fish are available with the FDA. The limitations of these estimates have already been described in para 3.3 above.

<sup>10</sup> Estimates were hitherto built up on all-India level by averaging calendar year figures of two successive years by assigning weights proportional to 3 : 1 to the figures of the first and the second years respectively, cf. Final Report of the NIC (para 2.124 (vi), p. 60).

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As stated earlier, the DMI have recently conducted an *ad hoc* survey on marketing of fish during the year 1956. Advance estimates of the available marketable surplus of fresh water fish by re-organised set-up of States were obtained from the DMI. These figures relating to the year 1956 together with the corresponding figures for the year 1948 (the latter being published in the MR on the subject) were used to interpolate and extrapolate the figures of marketable surplus of fresh water fish for all other years. This interpolation and extrapolation were done linearly on all-India level as the published figures of 1948-49 are available on the basis of old set-up of States. For State-wise distribution of the overall figures, the percentage distribution of total marketable surplus by States, implicit in the unpublished data supplied by the DMI, was made use of for each of the post-1956 years. The estimate of quantum of marketable surplus thus obtained, were used for purposes of State-wise evaluation of this part of inland fish. It may be stated here that the percentage rise in the estimated marketable surplus of fresh water fish over the eight-year period 1948 to 1956, compares very favourably with the estimated percentage rise in the total human population of India over the same period, which seems to suggest that there has been no appreciable change in the *per capita* availability of fresh water fish in the country. The figures thus obtained are, however, very different from those supplied by the FDA and published in the Statistical Abstract, India, 1958-59. A comparative picture of the estimated marketable supply of inland fish can be had from Table 5.1.

TABLE 5.1: ESTIMATED MARKETABLE SURPLUS\*  
OF INLAND FISH IN INDIA ACCORDING TO  
FDA AND DMI

(in 000 metric tons)		
year	estimate I (FDA)	estimate II (DMI)
(1)	(2)	(3)
1950	236.8	160.90
1951	218.0	164.22
1952	215.8	167.54
1953	237.4	170.85
1954	240.3	174.16
1955	239.7	177.49
1956	293.5	180.80
1957	357.5	184.11
1958	308.7	187.43
1959	220.7	190.74

\* Figures under column 2 relate to calendar years and have been estimated by FDA, whereas figures under column 3 relate to financial years and have been interpolated and extrapolated on the basis of 1948 and 1956 figures supplied by the DMI.

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4.2.1. As regards the retention of inland fish by professional fishermen for their own consumption, no direct estimates are available in any published form. Certain data in this regard were collected by the DMI as part of the earlier market survey in 1948. These data were obtained by the NIC and used for estimation purposes in their Final Report<sup>11</sup>. In the absence of similar data for the year 1956, the same data have been used with slight adjustments to suit the re-organised set-up of States. Remembering that as much as 82 per cent of the total production of fresh water fish comes from the four eastern States of Assam, West Bengal, Bihar and Orissa, the effect of slight adjustments in these percentages of marketable surplus to total production in respect of the States affected by re-organisation, will be very negligible. Thus these adjusted percentages<sup>12</sup> have been applied on the figures of estimated marketable surplus for each year and for each State separately. The estimates of marine fish, marketable surplus of inland fish and producers' retention of inland fish for own consumption, thus derived, are presented in Table 5.2 whereas State-wise figures are given in Appendix 5.1.

TABLE 5.2: ESTIMATED PRODUCTION OF FISH IN INDIA

(in 000 metric tons)

year	marine fish : total	inland fish caught by professional fishermen			total col. (2) + col. (5)
		marketable surplus	retention of own use	total col. (3) + col. (4)	
(1)	(2)	(3)	(4)	(5)	(6)
1948-49	376.52*	154.27	80.89	235.16	611.68
1949-50	387.54*	157.58	82.63	240.21	627.76
1950-51	538.90	160.90	84.36	245.26	723.22
1951-52	549.51	164.22	86.12	250.33	799.85
1952-53	552.22	167.64	87.35	255.39	807.61
1953-54	518.69	170.35	89.69	260.44	779.13
1954-55	588.23*	174.16	91.33	265.49	853.72
1955-56	581.49	177.49	93.08	270.56	852.05
1956-57	751.24	180.80	94.80	275.60	1026.84
1957-58	884.60	184.11	96.54	280.65	1175.25
1958-59	737.63	187.43	98.31	285.74	1023.37
1959-60	540.16	190.74	100.03	290.77	830.93

\* Calendar year figures repeated.

<sup>11</sup> The data were in the form of percentages of marketable surplus to total estimated production and related to the set-up of States before integration in 1949-50.

<sup>12</sup> The NIC applied these percentages to the State value figures of marketable surplus for deriving the all-India weighted percentage. This percentage was repeated year after year in the conventional series. As value is a function of the quantity marketed and the price per unit realised, the all-India weighted average (of marketable surplus to total production) for the base year must change with uneven price movements over States.

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4.3. *Evaluation of Output*: The output estimates thus derived have been evaluated at prices accruing to producers, viz. the fishermen. As stated earlier, the wholesale and retail prices are available in various statistical supplements to the State Gazettes, in State Monthly/Quarterly Statistical Bulletins and in some cases in the Annual Reports of the State Fisheries Departments. A short review of these sources has already been given in Section 3 of this note. Besides these, an effort was made by the NIU to collect some data from the State Fisheries Departments on 'prices paid to fishermen' in respect of marine fish. The data collected thus covered practically all the maritime States except Kerala, Mysore and Orissa.

4.3.1. The DMI also furnished a fairly comprehensive but hitherto unpublished data on (i) 'average seasonal wholesale prices of main groups of sea fish' and (ii) the 'annual average wholesale prices of main groups of fresh water fish' in producing areas of various States of India. These data related to the calendar year 1957 and covered almost all the important States. Being wholesale prices in producing areas, where the producers generally dispose of the major part of their surplus directly to the dealers or their commission agents, these would very nearly represent the producers' prices. In the case of fish it is also observed that some portion of the marketable surplus is also sold by fishermen directly to the consumers. The price realised per unit would thus be higher than in the case of catch sold in the wholesale assembling markets. There is, however, no evidence readily available on the relative portions sold in either way. As such no allowance has been made to adjust the DMI prices either for the incidental charges incurred by the fishermen in transporting the catch from the landing ghat to the assembling centre in the producing areas or for the higher price per unit realised for the part directly sold to the consumer. The only adjustment effected in the DMI prices relates to their being carried forward from the calendar year 1957 to the financial year 1957-58 by means of State-wise wholesale price indices for the two periods. The indices were specially worked out from the relevant records available with the EA's office.

4.3.2. The initial prices, as stated earlier, were supplied by the DMI separately by main varieties of marine as well as inland fish. As such these had to be suitably averaged to arrive at the composite prices of marine and inland fish for the State as a whole. For inland fish the weights assigned were proportional to the corresponding quantities as given in the MR referred to above. The data thus utilised related to 1948 only. It may, however, be noted here that the overall pattern of distribution by varieties in respect of inland fish does not seem to have undergone any appreciable change. This fact is amply corroborated by the unpublished data on the species-wise production of inland fish which, as stated earlier, were made available by the DMI. In respect of the marine fish, however, the State-wise pattern of distribution by varieties has undergone a significant change over the period 1948 to 1957<sup>13</sup>. As such, actual information on State-wise outturn of marine fish by different

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<sup>13</sup> This is revealed by a detailed study undertaken by S. K. Banerjee and A. V. V. Satvanarayan, the results of which have been published by them in "A note on the General Trend of Marine Fish Catches in India", in the Indian Journal of Fisheries (April 1958).



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species was obtained from the CMFRS, Mandapam, who have specially compiled these data for our use for the year 1957-58.

4.3.3. The prices received directly from the State Fisheries Departments relate to the prices paid to fishermen at the landing sites. Compared to the adjusted DMI prices, they appear to be generally higher. Besides, these prices relate only to marine fish. As such, for purpose of estimating the producer's value of inland and marine fish, we have used the DMI prices with suitable adjustments, as described above. The DMI prices are sufficiently comprehensive, covering a large number of centres within each of the important States. The centres covered are mainly from the producing areas of fish. The DMI are presently being requested to make suitable arrangements to provide similar data on a continuing basis. For years prior to 1957-58, as also for 1958-59, the DMI prices have been projected, backward and forward, with the help of State-wise index numbers of wholesale prices of fish. The latter have been specially compiled from the basic records on wholesale price indices, available with the EA's office

4.3.4. Over and above the prices discussed above, the NIU also obtained some State-wise average prices received by (maritime) fishermen at landing centres directly from the office of the FDA. These related to the year 1958: On examination, however, the prices furnished by the FDA were observed to be very high, compared with the prices supplied by either the State Fisheries Departments or by the DMI. Besides, the office of the FDA do not propose to collect such price data on a continuous basis. These prices, as learnt from the FDA, had been obtained by them on an *ad hoc* basis in connection with their own requirements. We have not, therefore, made any use of them.

4.3.5. The values of total marine fish and marketable surplus of inland fish have been obtained directly by evaluating the corresponding quantities at the State average prices worked out in the manner described above. As regards the quantities of inland fish retained by professional fishermen for their own consumption, these have also been evaluated at prices relevant for the corresponding marketed portions. All these estimates have been worked out at State level and results presented in Appendix 5.2.

4.4. *Value added by salting and sundrying*: The State-wise data on the quantities of fish (marine and inland combined) utilised for purposes of salting and sundrying have been obtained from the DMI. These data relate to the year 1956. Quantities for other years were estimated by applying the ratios of quantities cured to total production of fish, as is implicit in the corresponding estimate of 1956. As regards the value added per ton of fish salted or sundried, the basic data related to the year 1948.<sup>14</sup> To arrive at the estimates of value added by 'salting and sundrying', we have first estimated the gross income from fish curing, viz. salting and sundrying by assuming that the gross return per ton of fish cured has changed in proportion to the change in price of marine fish. From this the value of fish cured at producers' prices of marine

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<sup>14</sup> These had been obtained by the NIC in connection with their estimates for the period 1948-49 to 1950-51

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fish and the estimated value of salt used for curing have been subtracted to arrive at the 'value added' by salting and sundrying. The quantities of salt required for such processing were estimated on the basis of data pertaining to the year 1948 by assuming a constant rate of salt used per ton of fish cured. It will be seen that the estimates thus worked out are very rough so far as this item is concerned. Due to extreme paucity of data no attempt has been made to work out the estimates at State level.

4.5. *Subsistence Fishing* : In the absence of any information on the quantum of fish caught by non-professional fishermen and angling by other persons, we have projected the 1948-49 figures, implicit in the NIC's estimates for the year. For purposes of projections for the post-1948-49 period, it was assumed that the quantum of subsistence production of fish moved parallel to the total production<sup>14</sup> of inland fish caught by professional fishermen. Incidentally, the estimates thus obtained appear to follow the same rate of growth as that of human population during the period under reference. In other words, the implicit *per capita* availability of subsistence fishing seems to remain constant. As for evaluating the quantities of subsistence production, we have used the average price implicit in the figures of value and production of marketable surplus of inland and marine fish taken together. Evaluation of the subsistence production at inland fish prices would result in considerable overestimation of the overall price per unit. As the State-wise estimates of subsistence production are very difficult to obtain, no attempt has been made to present the estimates in respect of this item at State level. In this connection it may be stated that some efforts are being made by the NIU to get certain special tabulations made by the ISI of the NSS data on consumption expenditure, whereby it may be possible to determine what part of the consumption of fresh fish should accrue from subsistence fishing. For example, from per capita physical intake of fresh fish it will be possible to determine the total human consumption of fresh fish. Subtracting the reported production of fish, as derived in Table 5, it should be possible to derive the quantum of subsistence fishing as a residue. The estimates presented here may, therefore, undergo slight revisions as and when the results of such special tabulations become available.

4.6. *Income from collection of pearls, chanks, oysters and sea-weeds* : The paucity of data on the production and value of various sea products mentioned earlier, makes it very difficult to effect any special improvement in the methods adopted earlier by the NIC. The estimates of total net income have, therefore, been arrived at by multiplying the estimated number of persons engaged in such activities by the estimated net output per fisherman. As regards the latter, the CMFRS, Mandapam has roughly assessed the gross income of a fisherman at Rs. 400 per year. Assuming the net income to be 95% of the gross income, the net output works out at Rs. 380/- per annum. As regards the employment of pearl gatherers and other sea-product gatherers, the same have been arrived at by linear extrapolation of figures estimated for the years 1941 and 1951. Some scanty information on the number of pearl gatherers

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<sup>14</sup> Total production includes both (i) marketable surplus and (ii) quantity retained for own consumption.

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and divers in respect of Tuticorn chank fishery, and pearl gathering in the Gulf of Mannar are available in the Annual Reports of the Fisheries Departments of the concerned States. But these data are *ad hoc* in nature and are not comprehensive in character and as such it has not been possible to press these into use for preparing any estimates. It is hoped that the 1961 Census results may provide sufficiently reliable data on the number of pearl gatherers etc. which would go a long way in improving the present estimates of net output from these activities.

4.6.1. There are a number of other inland water products such as waternuts, lotus stalks, lotus seeds and such other types of plants which are generally used as cattle feed. In the absence of any information on their total production or their value no attempt has been made to prepare any estimates separately for them. To that extent, therefore, the present estimates suffer from underestimation.

5. *Net output from fishery*: The availability of data in respect of the cost of production of fishing industry has not undergone any change since the time the NIC submitted their Final Report. The DMI has, however, brought up to date the data on the inventory of crafts and vessels used for fishing in India. These have been included in the Report on Marketing of Fish in India, 1957 (unpublished). Unless detailed data on the number of various kinds of fishing equipment, e.g. boats, nets, sails, tackle etc., together with the average value of each of these items and the expected life span of each kind of equipment are available, it would not be possible to arrive at the estimates of current costs on repair and maintenance of boats and other equipment nor will it be possible to prepare any estimates of their depreciation. The Inland Fisheries Research Station at Barrackpore has recently initiated some studies in this direction. Recently it has collected data on (i) inventory of craft and tackle, (ii) active fisherman censuses, (iii) monthly catch statistics according to species and on a number of items relevant for determining certain costs of production. These data which are at the moment being processed, cover certain important fishing areas, viz. (i) estuaries of Hoogly, Matish and Mahanad rivers, (ii) Ganga, Jamuna, Narmada, Krishna and Godavari rivers and (iii) Lake Chilka. As soon as these data become available it may be possible to base our estimates of net output on firmer basis. In the meantime we have continued with the overall netting percentages adopted by the NIC with some minor modifications. Thus the cost of materials and depreciation in the case of marine and inland fish has been estimated at a flat rate of 5 p.c. of the total value of output, as adopted by the NIC, whereas in the case of subsistence fishing the percentage deduction for such costs, viz. the cost of materials and depreciation, has been placed at 1 per cent. The latter has been adopted from the Draft Report on Inter-Industry Table: 1953-54, which has been prepared by the ISI. It may also be observed that lack of any detailed data in this regard has not permitted the preparation of the net value estimates at State level.

6. *The Estimates*. The all-India estimates of quantity and value of marine and inland fish, value added by salting and sundrying, value of subsistence production of fish, net income of pearl gatherers etc., and the total net output from 'fishery' sector, obtained as described above, have been presented in Table 5.4.

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TABLE 5.4: NET OUTPUT FROM FISHERY SECTOR: 1955-56 TO 1959-60

	(at current prices)				production: (000) metric tons value: lakh rupees
(1)	1955-56	1956-57	1957-58	1958-59	1959-60
(1)	(2)	(3)	(4)	(5)	(6)
1. inland fish					
a) production	270.56	275.60	280.65	265.72	290.77
b) value	2787	2910	3060	3424	3611
2. marine fish					
a) production	581.49	751.24	894.60	737.63	540.16
b) value	1585	2181	2807	2346	1832
3. total commercial fishing					
a) gross value	4372	3091	5867	5770	5443
b) net value	4153	4836	5573	5482	5171
4. subsistence fishing					
a) gross value	864	862	895	1009	1186
b) net value	855	853	886	999	1174
5. value added by curing					
a) salting	139	181	238	240	184
b) sundrying	141	193	265	236	183
c) total	280	374	503	476	367
6. net income of gatherers of pearls chanks etc.	47	47	47	47	47
7. total net output	5335	6110	7009	7004	6759

7. *Comparison of revised estimates with conventional estimates*: The conventional estimates and revised estimates for the years 1955-56 to 1958-59 have been given together in Table 5.5. Differences in the two series result mainly from differences in estimates of outturn of inland fish and average price per unit of fish (both marine and inland) used for preparing these estimates.

7.1. *Commercial fishing*: The estimates of production of inland fish have undergone downward revision as a result of (i) availability of latest data on marketable surplus of inland fish from the DMI (the limitations of conventional estimates prepared by the FDA have been explained in para 3.3) and (ii) the downward revision of estimated retention of inland fish by professional fishermen because of applying the relevant percentage ratios to quantity figures rather than the value figures of marketable surplus of inland fish (vide para 4.2.1 and footnote 12 of this chapter). Although the production has fallen, the value has undergone upward revision. This is mainly due to the revision of prices in upward direction. The practice previously followed was to project the base year all-India prices, implicit in the quantity and value figures given in the MR on Fish and used by the NIC, by EA's wholesale price index of fish. Due to the availability of large mass of data on prices from published and unpublished

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sources, it has been possible to widen the empirical coverage of prices considerably. For the present series use has been made of the DMI price data to arrive at State-wise producers' prices of marine and inland fish<sup>16</sup>. Although these prices work out higher than those used in the conventional series, they are the lowest compared to prices given in various other sources, such as those supplied by the FDA's office and the State fisheries departments.

**TABLE 5.5: COMPARISON OF THE PRESENT ESTIMATES WITH THE CONVENTIONAL ESTIMATES : 1955-56 TO 1958-59**

item	(at current prices)			production : 000 tons
	1955-56	1956-57	1957-58	value : lakh rupees
(1)	(2)	(3)	(4)	(5)
<b>1. commercial fishing</b>				
<b>(a) production</b>				
(i) conventional estimates	1055.63	1277.08	1424.79	1273.52
(ii) revised estimates	852.05	1026.84	1175.25	1023.35
<b>(b) value</b>				
(i) conventional estimates	4279	5074	5629	5622
(ii) revised estimates	4372	5091	5667	5770
<b>(c) net value</b>				
(i) conventional estimates	4065	4821	5347	5341
(ii) revised estimates	4153	4836	5573	5482
<b>2. Net output from subsistence fishing :</b>				
(i) conventional estimates	1016	1205	1337	1335
(ii) revised estimates	855	853	886	999
<b>3. Value added by curing :</b>				
(i) conventional estimates	305	360	398	408
(ii) revised estimates	280	374	503	476
<b>4. Net income of gatherers of pearls, chanks :</b>				
(i) conventional estimates	91	108	120	119
(ii) revised estimates	47	47	47	47
<b>5. Total net output from fishery :</b>				
(i) conventional estimates	5477	6494	7202	7203
(ii) revised estimates	5335	6110	7009	7004

\* For 1958-59, the conventional estimates are the preliminary ones published in the 'Estimates of National Income : 1948-49 to 1959-60'.

<sup>16</sup> For further details reference may be made to paras 4.3.1. and 4.3.2. (page 84).

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7.2.1. *Subsistence fishing* : Hitherto the value of subsistence fishing was for each year assumed to form 25 p. c. of the net value from commercial fishing, which involved the assumption that the movement of the former was parallel to the year to year movement of production of marine fish, which can hardly be considered as satisfactory. For the revised series the estimates have been obtained by projecting the base year figures implicit in the NIC estimates, by relating it with the movement of marketable surplus of inland fish, which has been re-assessed by the DMI.

7.3.1. *Value added by curing* : The change in the conventional estimates results mainly from (i) the revision of rates of utilisation of fish for salt-curing and sundrying supplied recently by the DMI, and (ii) the upward revision of prices already explained above.

7.4. *Net income from gatherers of pearls etc*: The estimates have undergone downward revision in the light of availability of independent estimates of 'gross income per (maritime) fisherman'<sup>17</sup>. Other available evidence also shows that the figures used in the conventional series<sup>18</sup> were considerably higher.

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<sup>17</sup> CMFRS, Mandapam. See also para 4.6 of this chapter.

<sup>18</sup> The conventional figure was estimated by dividing the total net income from commercial fishing by the estimated gainful employment therein. The latter, being based on extrapolation of 1941-51 census economic data contains an unknown margin of error.