

Pricing Fish: A Study of the Economic and Behavioural Factors

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Fish marketing and its pricing are subjects that have seldom been seriously discussed in India. This is mainly because the species and size grades that cater to the domestic and export markets are quite distinct. Fish production in India is from three sources - marine, inland fresh water bodies and coastal aquaculture. While the major portion of fish that finds its way to the market is from the marine sector, coastal aquaculture stocks are the backbone of the export sector. Fresh water fishes also command a good local and international market (Krishnan and Birthal, 1997). But the new trade regime under the WTO has had a tremendous impact on the quantity and quality of seafood that is exported from the country. This paper examines the impacts from the angle of the availability of supply of fish for the domestic market, the quantity of fish that is exported as a proportion of fish that is landed, the prices of fish, the earnings from fishing as an avocation, the returns to investment in fishery and the estimated supply and demand projections as a tool to arrive at conclusions that would help determine the necessity of a price policy for fish.

Fish being a highly perishable commodity¹, price is not only a function of

supply and demand but also of preservation. Therefore a price policy for fish has to be analysed from the point of view of :

1. stocks that are preserved and exported and those that are domestically sold in the domestic market.
2. the supply position. The stocks that are destined for the domestic market and those that are exported. The relationship of supply that is available to the domestic market and the percentage of which is exported.
3. the wages that accrue to the fish workers
4. the cost benefit of marine/ aquaculture operations.
5. the projections of supply and demand for the future.

Marine Products and the Domestic Market

Extensive work has been conducted to conclude that the stocks that are exported are not at the expense of supplies to the domestic market (Krishnan and Sharma, 1996). Export of marine products does not affect domestic consumption. Of the total landings of shrimps, only 42 per cent is being exported leaving the major share of the produce for the domestic market (Table I).

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Table I
Shrimp Landings and Export

S.No. Year	Shrimp Landings (000 t)			Frozen Shrimp of Exports (000 t)	Percentage Shrimps Exported to Shrimps Landings
	Penacid	Non-Penacid	Total		
1. 1960	31.80	36.30	68.10	1.20	3.77
2. 1965	38.10	41.40	79.50	7.03	18.45
3. 1970	89.81	31.83	121.64	22.135	24.65
4. 1975	141.71	79.04	220.75	46.831	33.05
5. 1980	112.04	58.70	170.74	47.762	42.63
6. 1985	121.96	67.08	189.04	49.544	40.62
7. 1990	150.13	103.50	253.63	62.309	41.50
8. 1992	172.60	114.70	287.30	71.237	41.27
9. 1993	186.88	94.88	281.76	75.316	40.30

Source: R. Jayaraman, 1994

The 42 per cent of the shrimps exported is mostly tiger prawn (*P. Monodon*) and the other 58 per cent of the harvested shrimps available in the domestic market are mostly of less valuable species and of the stock unfit for exports both in terms of size and quality.

Again only a fifth of the total landings of fish is being exported (Table II). The total quantity of marine fish exported was 13,148 tonnes in 1986-87 of the estimated fish production of 171.6 lakh tonnes. Exports increased to 49,333 tonnes out of 244 lakh tonnes in 1992-93.

Table II
Share of Marine Fish Exports in Marine Fish Production

S.No. Year	Quantity (t)	Export Value (Rs. Cr)	Estimated Fish Production (lakh t)	Percentage of Exports to Production
1. 1987	13,148	22.29	171.6	7.66
2. 1988	14,904	30.23	171.3	8.70
3. 1989	11,234	-	165.8	8.78
4. 1990	21,129	28.45	181.7	11.63
5. 1991	42,209	48.07	227.5	18.55
6. 1992	49,119	90.53	230.0	21.36
7. 1993	49,333	143.19	244.0	20.22

Source: R. Jayaraman, 1994

Table III gives the share of marine products exports in marine fish production. It can be observed that less than 8 per cent of marine fish production is being exported.

Therefore any change in the domestic prices of fish is not because of unavailability of fish in the local market.

be observed that change in price index for fish is not consistent and is affected by externalities.

The prices prevailing in the domestic market are a function of local availability and demand. Kurup et al (1995) have conducted an extensive survey of species available in the Ernakulam market, Kerala, for one year

Table III
Share of Marine Products Exports in Marine Fish Production

S.No.	Year	Marine Fish Production (MFP)	Marine Products Exports	Exports as % of Indian MFP	Net Domestic Availability
1.	1960	281.7	16.3	5.79	265.4
2.	1965	507.1	15.5	3.06	491.6
3.	1970	670.5	37.2	5.55	633.3
4.	1975	783.6	53.4	6.81	730.2
5.	1980	999.2	74.5	7.45	924.7
6.	1985	1,090.1	80.6	7.30	1,009.5
7.	1990	2,202.3	133.7	6.07	2,068.6
8.	1991	2,386.8	162.9	6.83	2,223.9
9.	1992	2,603.9	191.3	6.83	2,412.6
10.	1993		239.9	-	-

Source: R. Jayaraman, 1994

Domestic Market Price Behaviour

An examination of the price index for fish 1992-1996 (1981-82 = 100) reveals that the changes in the index are marginal and are influenced mainly by the bounty of nature rather than consistent excessive demand or any substantial increase in prices of inputs that go into marketing fish.

Table IV gives the wholesale price index for the month of December 1992 to 1996. It can

Table IV
Wholesale Price Index of Fish (Month of December 1992-1996)

S.No.	Months	% Change (ratio)
1.	Dec 92/ Dec 91	47.40
2.	Dec 93/ Dec 92	12.50
3.	Dec 94/ Dec 93	28.10
4.	Dec 95/ Dec 94	-1.50
5.	Dec 96/ Dec 95	-14.52
6.	Dec 97/ Dec 96	27.50

Source: CMIE Monthly Reviews

Table V

Market Prices of Important Species of Fishes, Prawn, Crab and Mollusc from June 1988 to May 1989 and Domestic Prices July 1998 for Popular Species

Species	Price/ Kg in Rupees			July 1998	
	Min	Max	Ave	Min	Max
Fishes					
Mugil cephalus (Flat head grey mullet)	21	32	27	40	80
Liza parsia (Gold spot mullet)	18	28	22	25	40
Liza macrolepis (Borneo mullet)	18	28	22	35	45
Daysciaena albida	21	25	23		
Etroplus suratensis (Pearl spot)	24	29	26	100	150
Tachysurus subrostratus	07	14	10		
Tachysurus maculatus	08	14	11		
Megalops cyprinoides (Indo pacific tarpon)	16	22	17		
Hyporhamphus limbatus (Strong nose half beak)	08	12	09		
Hyporhamphus xanthopterus (Red tipped half bk.)	11	15	13		
Lates calcarifer (Sea bass)	08	35	21	80	120
Chanos chanos (Milk fish)	10	32	21	30	50
Ehirava fluviatilis	06	10	07		
Scatophagus argus (Shads)	08	27	15		
Gerres filamentosus (Silver biddies)	09	16	13		
Caranx ignobilis	18	12	16		
Leiognathus brevisrostris (Silver bellies)	06	08	07		
Sillago sihama (Sand whiting)	18	24	20		
Mystus gulio (Catfish)	08	12	16		
Glossogobius giurus (Gobids)	10	16	14		
Ambassis dayi	05	13	08		
Ambassis gymnocephalus (Naked head glassy perchlet)	03	08	06		
Amblypharyngodon mola	03	14	07		
Puntius filamentosus	06	11	08		
Puntius sarana	07	13	09		
Wallago attu (Freshwater shark)	13	22	18		
Penaeid Prawns					
Metapenaeus dobsoni	06	11	08		
Metapenaeus monoceros (Jumbo tiger shrimp)	10	22	18		
Penaeus monodon (Indian white shrimp)	15	113	46	500 per kg/30 cts.	
Penaeus indicus	20	34	28	300 per kg/60 cts.	
Palaemonid Prawns					
Macrobrachium rosenbergii (Giant freshwater prawn)	16	90	70		
Macrobrachium idella (Slender river prawn)	08	25	12		
Crab					
Scylla serrata (Mud crab)	08	13	10	15	25
Mollusc Villorita cyprinoides (Black clam meat)	03	08	05	10	20

(Table V). The approximation of prices of the same species for the current year has been given in the same table for July 1998. Only prices of popular and commercially important species were updated. It is apparent that there has been an escalation of around 2 to 4 times in the prices of the various species in ten years. This may primarily be attributed to the increased demand for fish and also due to the decline in landings. Adjusting for inflation the increase in prices for fish is justifiable.

of high wages (Table VI). Unlike commonly held belief, it is seen that extremely low wages and extremely high wages are not season determined. Both tend to concentrate in the same time segment (Annamalai and Kandoran, 1995).

Profitability Behaviour

The extent of mechanisation of crafts in the fisheries sector and the proliferation of number of crafts indicate that the sector has its potential for generating income to ensure

Table VI
Wage Realisation from Fisheries

Fishing craft	No. of Fishing	Wages Realised by Individual Fishermen of the Crew (Rs.)			
		Total	Ave	Highest	Lowest
A	49	2,380	48	313	0
B	185	13,759	73	600	0
C	145	5,694	39	260	0
D	126	4,077	32	300	0
E	160	12,478	78	1,150	0
F	194	12,912	67	675	0
G	45	2,512	56	300	0
Overall	904	53,812	59.5	1,150	0

Source: Annamalai and Kandoran, 1995

Wage Behaviour

Wages also clearly indicate any abnormal change in quality of life of the fishers. An examination of studies on wages to fish workers indicated that the average wage at Rs. 60 per trip of 8 to 10 hours duration is comparable to wages in other less organised primary sectors of agriculture related activities. The distribution of the wages over periods shows that there are long spells of low wages and very short spells

encouraging profitability. In a recent study, Senthilathiban et al. (1997) have estimated the fixed cost and variable cost per trip in Tamil Nadu to be Rs. 320.24 and Rs. 4,016.20 respectively. The mean gross returns was Rs. 6,738.57 and the mean net profit came to Rs. 2,402 (Table VII).

In another recent study (Annamalai and Kandoran, 1996), conducted in Kerala, based on the landing data for a period of sixty months

Table VII
Total Cost of Fishing per Trip, Fish Landings and Gross Returns, Net Profit and Operating Profit per Trip (Rs.)

Month	TFC	TVC	TC	Fish Landings (Kgs)	Gross Returns	Net Profit	Operating Profit
July 92	265.21	4,530.49	4,795.70	282.64	8,534.88	3,739.18	4,004.39
August	336.84	5,348.71	5,685.55	282.85	9,982.28	4,296.73	4,633.57
September	292.49	3,724.99	4,017.48	217.26	5,961.40	1,943.92	2,236.41
October	420.57	3,498.86	3,919.43	219.07	5,083.28	1,163.85	1,584.42
November	347.11	3,092.66	3,466.77	189.57	4,221.18	754.41	1,128.52
December	301.17	3,006.02	3,307.19	200.08	3,866.04	558.85	860.02
January 93	399.30	4,149.62	4,548.92	177.15	7,151.13	2,602.21	3,001.51
February	315.88	4,816.94	5,132.82	199.83	8,985.53	3,852.71	4,168.59
March	269.20	4,405.43	4,674.63	176.08	7,848.32	3,173.69	3,442.89
April	301.16	3,751.63	4,052.79	141.62	5,738.10	1,685.31	1,986.47
May	303.73	3,290.16	3,593.89	147.18	5,104.50	1,501.61	1,814.73
June	263.23	4,545.89	4,809.12	205.30	8,205.38	3,392.26	3,659.49
Mean	320.4	4,016.20	4,336.44	204.45	6,738.57	2,402.13	2,722.37
(%)	(7.38)	(92.62)	(100.00)	(7.38)	(92.62)	1.55(i/o)	1.66 (i/o)

Source: Senthilathiban et al, 1997

this study estimated the pattern and the extent of swings in the annual cycles of revenues earned in fisheries (Table VIII) the peak and trough in terms of their relative temporal length and the margin of difference in revenue. The short period trend shows a 69 % rise in revenue during the five year period.

period the average catch reached 1.75 mt with a CV 16.6%. This increase in catch is due to many factors like increased demand, increased effort, improved technology and so on. Similarly, for penaeid prawn, landings have also increased over years. From a catch of 66,910 t in 1956 it has increased to 186,330 t in 1991

Table VIII
Values of Average Revenue after Adjusting for Seasonal Variations

Years Months	1988	1989	1990	1991	1992
Jan	514	919	374	403	676
Feb	309	457	322	485	867
Mar	251	322	359	565	627
Apr	245	308	401	500	655
May	164	593	256	574	542
June	359	323	399	512	1,270
July	272	288	450	564	595
Aug	371	421	304	682	715
Sept	470	461	321	474	957
Oct	665	410	313	566	828
Nov	509	392	420	422	850
Dec	444	408	476	346	733

Source: Annamalai and Kandoran, 1996

Supply and Demand Behaviour

There is an increasing trend in total landing of marine fish from 1950 onwards. From a catch of mere 580,022 tonnes in 1950 it has increased to a maximum of 2.23 million tonnes in 1989. The average catch in 1950-60 period was 0.6566 million tonnes with a CV of 18.8%, in 1961-70 period the average catch rose to 0.8331 million tonnes with a CV 15.6%, in 1971-80 period it again increased to 1.27 million tonnes with a CV of 10.1% and in 1981-91

which is about three times. The average landings in the period 1961-70 was 57,884 t with CV 27.4% that in the period 1971-80 was 110,965 t with CV 19.6% and the average landings during 1981-91 was 137,115 with CV 19.7%. The increase in landings may be due to increased effort targeted to this species which has very high export value. Sathianandan and Srinath (1995) have concluded that production prospects of marine fish are bright to meet the future demand.

To meet the increasing demand of the fish consuming population, efforts should be taken to double the production by better farming practices. 56 per cent of the population consume fish and the per capita availability of fish was 9.85 Kgs. A production of five million tonnes would be required to sustain this by the year 2020. The growth rate of aqua farming in the country was 9.4 per cent per annum and out of the four varieties of fish consumed, one was from aqua farming. Inland fishing production had also gone up to 6 per cent per annum. World consumption of fish had fallen from 10.8 Kgs in 1984-85 to 10.7 Kgs. in 1994-95.

Fisheries had registered a growth of 5.64 per cent with a national catch of 2.28 million tonnes in 1996-97. The contribution of fisheries in the country to GDP was 1.28 per cent and to NDP was 1.29 per cent.

Thus projections of marine fish production appear to be in a position to meet demand projections.

Conclusions

India has proven comparative advantage in the production of fish. With its long coastline and its potential for developing aquaculture, the opportunities for increasing fish production is governed by only sensible policy development and implementation. Marine fish production potential is an extremely volatile phenomenon.

Long periods of poor landings may be followed by bountiful catches. Several natural phenomenon including national and international weather conditions and ocean temperatures and currents influence catches. The above analysis which has included the major factors both economic and behavioural for considering a domestic price policy for fish in India needs to be supplemented by several other data inputs including geography, oceanography, remote sensing etc. Further work in this area should also assess the future market, domestic market behaviour to value added products, packaging and presentation. The factors that have been considered for the formulation of the price policy from the economic point of view also indicate that the present status quo need not be presently disturbed. The National Fisheries Policy should aim at conservation, consolidation and enhancement of marine stock positions and aquaculture production for increased landings of fish and a firm price structure.

Notes

Export stock of fish is required to be frozen and packed at the earliest and 6 hours at the latest. Factory ships with on board freezing and processing facilities and the development of cold storage facilities at the harbours and landing centres will help improve the quality of the fish that is exported.

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