Estimation of Fish Catch Supply Function of Fishing Community in Allahabad (U.P)

Anil Kumar Singh	Department of Agril. Economics & Management, SVPUA&T, Meerut (U.P.)
S.P. Singh	Division of Agril. Economics & Statistics, SKUAST-J, Jammu (J&K)
M. C. Dwivedi	Division of Agronomy, SKUAST-Jammu (J&K)
Chandan Kumar	Division of Agril. Economics & Statistics, SKUAST-J, Jammu (J&K)
Alka Guddi	MABM BHU Varanasi (U.P)

ABSTRACT   This paper dealt with estimation of catch fish supply function of fishing community in Allahabad. Fish supply means the quantity of fish or services offered by fisherman for sale at different uint prices in given market at point of time. It is willingness of the supplier to offer the fish for sale at different unit prices. The fish supply function for important fish species viz. Rohu, Tengra, Chelwa and Backery were estimated using liner as well as cob. Douglas type of functional forms. The supply function model is proposed to be developed to understand the responsiveness of explanatory factor on the quantity of fish supply in the market. The supply function was specified and estimated for overall fish delivery in the market and also separately for Rohu, Tengra, Chelwa, and Backery. The estimate model will provide, the estimates of supply elasticity. When the price of Rohu will increase by 1 per cent, the quantity of Rohu supplied in the market will increase by 4 percent. When the average price of fish will increase by 1 percent, the quantity of fish supplied in the market will increase by 3.55 per cent.

Introduction

Fish supply means the quantity of fish or services offered by fisherman for sale at different unit prices in given market at point of time. It is willingness of the supplier to offer the fish for sale at different unit prices More specifically, fish supply is defined as schedule that shows the amount of product or services, sellers are willing to sell at each unit price in a set of possible price during some specified period of time in a specific market. The low of supply indicates the functional relationship between quantity supplied of a commodity and its unit price. The low signifies the positive relationship that is as the price of commodity rises is supply extends and as the price falls its supply contracts with other thins remains same. Producers normally tend to increases the supplies in the wake of rising prices and reduce the same when the price are lower side. The question of fisherman's response to change in price in developing has proved on interesting subject in enquiry for research works in the field of fishery economics.

Main objectives were undertaken as follows:

1. To Estimate liner fish supply function.
2. To Estimate non liner fish supply function
3. To Estimate the effect of price of substitute commodity on fish supply function.

Methodology

For the purpose of conducting producer survey, the various landing points of the Allahabad district was purposively selected. These landing points are Daraganj, Jhansi, Salari, Rasulabad and Karialbag. Total 60 producers were indentified for the servey from these landing centers. Distributions of number of producer against different landing centers are given in table 1.

The data was collected from well designed schedule develop for this purpose. The information of supply of different fish species like quantity of fish supply to the market , price of fish in domestic and international market, price of substitute commodity, time devoted in fishing (fishing efforts), different type of technologies adopted for fish catch and parameters of ecology were collected from different landing points and from fishing community. The nature and extent of adoption of different technologies of fish catch alone with constraints thereof were also collected. The fishing employment problem faced by fishermen and important parameters effecting fish production in inland water viz construction of dam, sewage outfall, pollutants, siltation and water velocity were also noted.

Model of fish supply function

The fish supply function for important fish species viz Rohu, Tengra, Chelwa and Backery were estimated using linear as well as cobb. Douglas type of functional forms. The specification of the fish supply function model are given below.

$$Y = A + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + U$$

$$Y = AX_1^{b1}X_2^{b2}X_3^{b3}X_4^{b4}X_5^{b5}E^u$$

Where,

Y = Quantity of fish supply in the market during the year (kg)

X_1 = Price of Rohu in the market per kg. (Rs.)

X_2 = Price of Tengra in the market per kg. (Rs.)

X_3 = Price of Chelwa in the market per kg. (Rs.)

X_4 = Price of Backery in the market per kg. (Rs.)

X_5 = Average price of fish overall in the market per kg (Rs.)

b_{is} = co- efficient of explanatory variable

The supply function model is proposed to be developed to understand the responsiveness of explanatory factor on the quantity of fish supply in the market. The supply function was specified and estimated for overall fish delivery in the market and also separately for rohu, Tengra, Chelwa and Backery. The estimated model will provide the estimates of supply elasticity.

Discussion

The descriptive statistics of overall supply function are given in table 2. It can be observed that annual supply of fish in market was found to 2025 kg. The magnitude of explanatory variable like of Rohu, Price of Tengra, Price of Tengra, Price of Chelwa and Price Backery were rupees 51 per kg, rupees 50 per kg., rupees 14 per kg., and rupees 52 per kg. respectively. The average price is fish in the market was computed to be rupees 42 per kg. The magnitude of the substitute commodity included in the model like price of mutton (rupees 104 per kg). Price of chicken (rupees 56 per kg). and price of egg (rupees 1.80 per unit) was noted. The magnitude of other explanatory variable like boat technology, season and fishing efforts were rupees

14066, 0.50 and 106 man days, respectively. The liner as well as C-D type supply function was estimated using the values of the above explanatory variable. The estimated co- efficient of the parameter of overall liner supply function is given in table 3. The price of Chelwa and the fishing efforts were found to be statistically signification at 1 percent level. The result shows that when the price of chelwa will increase by 1 unit. The quantity supplied will also increase by 104 units. Fishing employment has emerged as one of the most important variable affecting the supply of fish in the market. It can be noted that when fishing employment will increase by 1 unit the quantity of fish supplied in the market will increase 28 units. The value of co-efficient the multiple determination was estimated at 0.548 indicating there by that 54 percent variation in dependent variable is on account of explanatory variables included in the model. The model could not consider the average price of fish during the process of estimation. The estimated co- efficient of CD-type supply function with the above explanatory variable are given in table 4. Table 4 reveals that the price of Rohu, price of tengra, average price of fish and fishing employment were those variables affecting significantly the supply of fish in the market. It can be inferred that the price of Rohu will increase by 1 per cent, the quantity of Rohu supplied in the market will increase by 4 percent. The co-efficient of average price of fish was found to 3.55 indicating there by when average price of fish will increase by 1 per cent the quantity of fish supplied in the market will increase by 3.55 percent. The value of co-efficient of multiple determination (adjusted R2) was estimated to be 0.34 explaining their by total variation in dependent variable on account of explanatory variables included in the model. Here it may be made clear that despite the higher value of R in liner supply function as compare to C-D type, the estimated co-efficient of average price of fish in case of later (C-D type) will be taken for computation of economic surpluses.

Conclusion

It is concluded that when the price will increase by one unit, the quantity supplied will also increase by 104 unit. Fishing employment has emerged as one of the most important variable affecting the supply of fish in the market. It can be noted that when fishing employment will increase by 1 unit the quantity of fish supplied in the market will increase 28 units. The value of co-efficient the multiple determination was estimated at 0.548, indicating there by that 54 percent variation in dependent variable is on account of explanatory variable included in the model. The model could not consider the average price of fish during the process of estimation. When the price of Rohu will increase by 1 per cent, the quantity of Rohu supplied in the market will increase by 4 percent. When the average price of fish will increase by 1 percent, the quantity of fish supplied in the market will increase by 3.55 per cent.

Table 1: Selection of fisherman from different landing centers

S.No.	Landing Centers	Number
1	Daraganj	18
2	Jhusi	8
3	Salori	10
4	Rasulabad	10
5	Karilbag	14
	Total	60

Table 2: Descriptive statistic of overall supply function

Particulars	Mean	Std. Deviation
Supply function overall annual	2025.49	2120.23
Price of Rohu	51.17	12.16
Price of Tengra	50.17	130.65
Price of Chelwa	13.93	6.26
Price of Baackery	52.67	13.29
Average variable price of fish	41.98	10.10
Price of mutton	104.47	9.75
Price of Chicken	56.00	10.13
Price of eggs Rs./unit	1.82	0.29
Boat Technology	14066.67	10431.74
Season	0.50	0.50
Fish employment (in mandays)	106.60	55.79

Table 3: Estimated co-efficient of parameters of overall linear supply function

Model	Un standardized co-efficient		Standardized Co-efficient	T	Significant
	B	Std. error	Beta		
Constant	-5616.207	5555.626	-	-1.011	0.317
Price of Rohu	-7.996	25.468	-0.046	-0.314	0.755
Price of Tengra	-11.845	25.202	-0.076	-0.470	0.640
Price of Chelwa	104.305	64.581	0.308	1.165	0.113
Price of Backery	-22.439	34.529	-0.141	-0.650	0.519
Price of mutton	30.580	26.952	0.141	1.135	0.262
Price of chicken	390120	48.336	0.187	0.809	0.422
Price of eggs Rs./unit	-226.647	752.049	-0.031	-0.301	0.764
Boat Technology	-1.412	0.019	-0.069	-0.736	0.465
Season	1088.822	1651.184	1651.184	0.659	0.513
Fish employment (in mandays)	28.749	3.767	3.767	7.632	0.000
Adjusted R^2	0.548				

Table 4: Estimated co-efficient of overall C-D type supply function

Parameters	Estimate	Asymptotic Std. error	Asymptotic 95% confidence interval	
			Lower	Upper
Constant	1.320640000	2.214730000	-4.320960000	4.585080000
Price of Rohu	4.039189316	0.000000000	4.039189316	4.039189316
Price of Tengra	-2.891706578	0.413520561	-3.723145391	-2.060267764
Price of Chelwa	1.046373042	4.365340543	-7.730732383	9.823478467
Price of Backery	0.696609810	7.575323678	-1.453459928	15.927818896
Average variable piece of fish Rs./kg	3.547686599	2.274910143	-1.026326804	8.12170003
Price of mutton	3.776153838	1.523042337	0.713871977	6.838435698
Price of chicken	-8.084828891	1.765921536	-3.635452110	3.465794329
Price of eggs Rs./ unit	-2.227266116	0.397076467	-3.025641863	-1.428890369
Boat Technology	0.321096108	7.675935076	-15.11240575	15.754567968
Season	0.004000000	7.694226107	-15.46627844	15.474278443
Fish employment (in mandays)	1.248901142	24.385766349	47.78196827	50.2797770555
Adjusted R^2	0.34641			

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