

## Study of production and marketing of papaya in Varanasi district of Uttar Pradesh

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**ABSTRACT** : The study reveals that average cost of cultivation of papaya crop in district Varanasi came to Rs. 38369/ha. It was lowest to Rs. 34931.59/ha. on marginal farms Rs. 38224.66/ha small and highest of Rs. 41540.44/ha on large size group of farms. The average return over cost C came to Rs. 99323.60/ha. which was lowest Rs. 71068.40/ha on marginal farmers, Rs. 92575.34/ha on small farms and highest Rs 110859.56/ha on large farms. Papaya crop gave an average benefit more the three times from the investment of Re 1 on all three size of group of farms, but large size group of farms fetch Rs. 3.36 as compared to small Rs. 3.42 and marginal Rs. 3.03 per rupee investment. The marketing of papaya reflects that 38.76% of marketed surplus of papaya disposed in channel–III followed by channel–II (34.42%) and channel–I (26.82%). The 51.38% of total producer’s surplus was accounted by large farmers 28.84 per cent by marginal farmers and 19.78% by small farmers. Minimum marketing cost, 2.80 per cent of consumer’s purchase price was incurred in channel-I while it was 16.84 per cent in channel-II and 33.90 per cent in channel-II and 33.90 per cent in channel-III. The net price received by producer (papaya grower) in channel-I, II and III was 97, 83.16 and 66.10 per cent respectively. It was apparent, that channel-I is more advantageous to producer as well as consumer for better margin and proper satisfaction to producer. Near about 31 per cent profit margin was distributed among number of intermediaries in channel–III severely affected to papaya growers as well as decreases in price spread to intermediaries. The producers/growers of papaya especially small and marginal may advised to sell their produce in rural market either directly to consumers or tie up with some retailer in their area with an agreement to supply a fixed quantum of papaya regularly. This will help to prevent the bulk supply in the rural market for better price incentive to papaya producer regularly as well as decreases the price spread into number of market intermediaries with better utility to the consumers’ rupee.

**Key Words** : Papaya (*Carica papaya* Linn.), production, different marketing channel, economic analysis.

Papaya belongs to the caricaceae family and scientifically known as (*Carica papaya* Linn.) basically papaya crop is native of topical America and particularly originated in South Mexico and Costa Rica. Papaya had come to India is very early stage and successfully grown all over country. The pre dominant papaya growing states are Andhra Pradesh, Gujarat, Karnataka, West Bengal, Madhya Pradesh, Maharashtra and Uttar Pradesh. The production of papaya 128 million tonnes with area 43.90 million hectare with productivity of 29.40 metric tonnes in the word. However, India is the second largest producer of fruits next to China, at present major production around 88.97 million tonnes of the papaya produce marked as a fresh fruits and about 10-15 per cent is available for preservation and processing industries reflect their need to papaya processing industries. Processed fruits had great demand in the country not only helpful in earning of foreign exchange but also create employment. The papaya fruits are highly perishable in nature and need of care full handling maintaining

colour and perishability of fruits. The 1.33 million hectare papaya growing area and 5.83 million tonnes production in U.P. have not necessary infrastructure like pre cooling, cold storage facilities and efficient transportation facilities. The Lucknow, Raibarely, Meerut, Sitapur and Varanasi are major papaya producing district of Uttar Pradesh. The area under papaya crop in Varanasi district was about 670 hectare with total production of 83750 metric tonnes during the year. In the Chiraigaon block covered about 85 per cent of total area (550 hectare) under papaya cultivation with 74 per cent of total production 62500 metric tonnes and 125 metric tonnes/hectare productivity as compared to the district area and production and productivity of papaya cultivation. The demand of papaya was still increasing and Chiraigaon block of Varanasi district have a potential of papaya cultivation. Therefore the present study has been carried out the following objectives to examine the economics of papaya crop on sample farms in the study area. (ii) To analysed the marketing pattern in the study area. (iii) To suggests suitable measures for the papaya growers in the

**Table-1** : Cost of cultivation of papaya per hectare on different size group of farms.

S. No.	Particulars	Size groups of farms			Average
		Marginal (> 1ha)	Small (1-2 ha.)	Large (< 2 ha)	
1.	Human Labour	3140.27 (8.90)	3520.57 (9.21)	4453.18 (10.71)	3732.02 (9.71)
a)	Hired human labour	2749.81 (7.88)	2428.52 (6.35)	2014.34 (4.85)	2382.14 (6.21)
b)	Family labour	2382.45 (7.88)	2585.20 (6.35)	2976.13 (4.85)	2660.29 (6.21)
2.	Tractor Power	2271.64 (6.82)	2513.95 (6.75)	2845.27 (7.17)	2437.07 (6.54)
3.	Value of seed	2271.64 (6.50)	2513.95 (6.58)	2845.27 (6.85)	2437.04 (6.36)
4.	Value of manure	3959.24 (4.33)	3343.16 (8.70)	2850.34 (8.43)	3354.47 (6.86)
5.	Value of Fertilizers	5581.11 (15.98)	8018.56 (20.98)	9106.42 (21.92)	7642.14 (19.95)
6.	Irrigation charges	3918.22 (11.21))	4254.18 (11.12)	4810.78 (11.65)	4346.31 (11.59)
7.	Interest on working capital	4000.45 (11.46)	4440.69 (11.61)	4842.74 (11.65)	4445.50 (11.59)
8.	Depreciation	127.40 (0.37)	195.85 (0.51)	278.51 (0.68)	203.72 (0.53)
9.	Rental value of own land	6587.00 (18.86)	6587.00 (17.23)	6587.00 (15.85)	6587.00 (17.18)
10.	Land revenue	-	-	152.75 (0.36)	54.09 (0.14)
11.	Interest on fixed capital	217.00 (0.16)	357.00 (0.93)	623.00 (1.50)	406.52 (1.06)
	Total	34931.59 (100.00)	38224.66 (100.00)	41540.44 (100.00)	38369.91 (100.00)

\* Figures in Parentheses bracket show the percentage of their respective total.

study area.

## Materials and Methods

The present study was carried out to evaluate the economics and marketing of papaya growing farmers in district Varanasi, Chiraigaon block was selected purposively. Two stage random sampling technique was used to select village and papaya growers, six village i.e. Khalishpur, Salarpur, Deenapur, Mustfabad, Dhannipur and Chandpur were selected randomly from the universe of all village of Chiraigaon block of Varanasi district. A list of all the papaya growers 48 respondents

were selected randomly on the proportion of farmers falling in each village under different size groups of farms. The data were collected from selected farmers with the help of schedule. Weighted mean was used to compare the data and economics of papaya cultivators. The Varanasi market was selected purposively for study of marketing margin and price spread because majority of produce disposed in the Varanasi market. The price spread, marketing cost marketing margin of various intermediaries involved were worked out by conventional analysis in the form of average and percentage (Sujatha and Eswara Prasad, 2004).

**Table-2** : Yield and gross income per hectare of papaya crop.

Sl.	Group of farms	Yield Papaya Crop (q/ha)	Gross income Rs. @ 400/q
1.	Marginal (> 1ha)	265	1,06,000.00
2.	Small (1-2 ha)	327	1,30,800.00
3.	Large (<2 ha)	381	1,52,400.00
4.	Average	327.75	1,30,700.00

**Table-3** : Measure of return from papaya and input-output ratio over different cost concept basis from papaya crop.

Sl.	Particulars	Size group of farms (in ha.)			Average
		Marginal (0>1)	Small (1- 2)	Large (< 2)	
1.	Cost A <sub>1</sub> /A <sub>2</sub>	28852.14	28852.14	32037.59	28895.51
2.	Cost B	32181.78	35796.14	39247.59	35889.03
3.	Cost C	34931.59	38224.66	41540.44	38369.91
4.	Gross Income	106000.00	130800.00	152400.00	130700.33
5.	Return over cost A (farm business income)	80619.22	101947.86	120362.41	101804.33
6.	Return over cost B (family labour income)	73818.22	99500.39	113152.61	96309.08
7.	Return over cost C (net farm income)	71068.41	92575.34	110859.56	92330.87
8.	Farm business income	77869.41	99519.34	118069.56	99323.60
9.	Input-output ratio				
	(a) Cost A	4.17	4.53	4.75	4.49
	(b) Cost B	3.29	3.65	3.88	3.61
	(c) Cost C	3.03	3.42	3.66	3.38

## Results and Discussion

The economics of papaya comprises cost of cultivation, per hectare (Table-1) yield and gross income per hectare worked out in (Table-2) and measure of profit per hectare (Table-3) from the all size group of sample farms.

Table-1 revealed that the average cost of cultivation per hectare of papaya came to Rs. 38369.91 it was lowest to Rs. 34931.59 on marginal farm, Rs. 34224.66 on small farm and the highest of Rs. 41540.44 on large size groups of farms. The cost with respect to items showed that highest cost in favour of human labour, manures and fertilizers followed by irrigation charges tractor power and value of seed. Costs with respect to size of farms showed that family labour and value of manures were higher of marginal farms and it was decreases with increases in the size of farms and rare trend was observed for hired human labour, tractor

power charges, value of seed and value of fertilizers and irrigation charges, these cost were increases with increases size of farm (Bhalerao and Kalicharan, 1966).

The Table-2 revealed that average yield on sample farms of the papaya came to Rs. 326.75 q/ha. The average value of output worked out which was lowest being Rs.1,06,000/hectare on marginal farms Rs. 1,30,800 on small farms and highest being Rs. 1,52,400 on large size of groups of farms. It reflects that the resource rich farmers managed their resources in big way to rise the level of output Weather marginal and small farmers can not attain the better productivity as compared to large farmers due to poor input availability with them.

The Table-3 revealed that the average return over cost A, cost B and cost C were calculated Rs. 101804.33/-, Rs. 96309.08/- and Rs. 92330.87/- respectively and all these income were positively related with size of farms. Input-output ratio reflects all the rate of return over the cost and it was calculated over cost A,

**Table-4** : Disposal pattern of papaya in different marketing channels.

Marketing Channels	No. of Farmer	Marketed Surplus (in q)	Size group of farms (in ha)					
			Marginal (0>1)		Small (1-2)		Large (<2)	
			No. of Farmer	Producer surplus (in q)	No. of Farmer	Producer surplus (in q)	No. of Farmer	Producer surplus (in q)
Channel I	25 (52.09)	237.85 (26.82)	13 (27.59)	120.00 (13.57)	07 (14.59)	78.20 (8.81)	05 (10.41)	39.40 (7.44)
Channel II	14 (29.17)	305.26 (34.42)	07 (14.58)	135.43 (15.27)	04 (8.33)	97.21 (10.97)	03 (6.26)	72.32 (8.18)
Channel III	09 (18.74)	343.63 (38.76)	00.00	00.00	0.00	00.00	09 (18.74)	343.63 (38.76)
Total	48 (100.00)	886.76 (100.00)	20.00 (41.67)	225.68 (28.84)	11.00 (22.92)	175.41 (19.78)	17 (35.41)	495.65 (51.38)

Figures in Parentheses bracket show the percentage of their respective total.

**Table-5** : Price Spread of Papaya in Varanasi Market of the Channel- I (Producer – Consumer).

Sl.	Particulars	Rs. /q.	% share
1.	Net Price Received by Producer	480.00	97.00
2.	Marketing Charges Incurred by Producer	13.80	2.80
3.	Total Marketing Cost	13.80	2.80
4.	Consumer Purchase Price	493.80	100.00

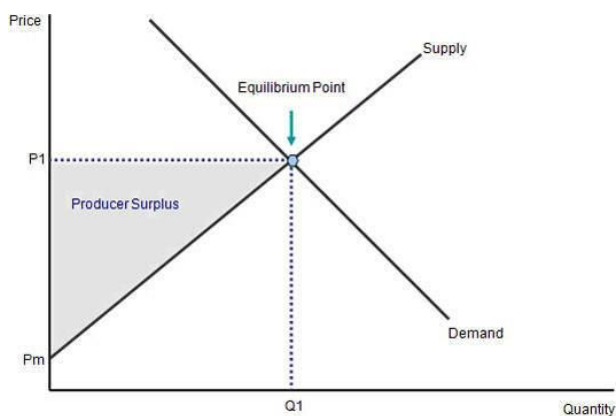
cost B and cost C were 4.49, 3.61 and 3.38, respectively. The economics of papaya cultivation reflects that this fruit crop fetch more than three times benefit over investment proved beneficial to the growers of the study area and able to improve the standard of life.

### Marketing Margin and Price Spread

The price spread refers to the difference between the price paid by the consumer and net price received by the producer and marketing margin refers to the difference between the price paid (including marketing charge) and price received by specific marketing agencies.

### Marketing Channels

A marketing channel is the people, organization and activities necessary to transfer the ownership of goods from the point of production to the point of consumption. It is the way products and services get to the end-user the consumer and are also known as distribution channel.

**Fig.-1** : Producer surplus.

Channel I	Producer – Consumer
Channel II	Producer – Retailer – Consumer
Channel III	Producer – Wholesaler – Retailer

**Table-6 :** Price Spread of Papaya in Varanasi Market of the Channel-II (Producer – Retailer – Consumer)

Sl. Particulars	Rs. /q	% share
1. Net Price Received by Producer	432.00	83.16
2. Marketing Charges Incurred by Producer	38.00	7.16
3. Producer Sailing Price / R.P.P.	470.00	90.47
4. Marketing Charges Paid by Retailer	20.25	3.89
5. Retailer Net Margin	29.25	5.63
6. Total Marketing Cost	87.50	16.84
7. Consumer Purchase Price	519.50	100.00

**Table-7 :** Price Spread of Papaya in Varanasi Market of the Channel-III (Producer-Wholesaler-Retailer-Consumer)

Sl. Particulars	Rs. /q	% share
1. Net Price Received by Producer	390.00	66.10
2. Marketing Charges Incurred by Producer	38.50	6.52
3. Producer Sailing Price / R.P.P.	428.50	72.62
4. Marketing Charges Paid by Wholesaler	21.50	3.64
5. Marketing Margin	68.00	11.52
6. Wholesaler Sale Price / R.P.P.	518.00	87.79
7. Marketing Charges Paid by Retailer	20.50	3.48
8. Retailer Net Margin	51.50	8.72
9. Total Marketing Cost	200.00	33.90
10. Consumer Purchase Price	590.00	100.00

### Producers Surplus

Producer surplus is defined as the difference between the amount the producer is willing to supply goods for and the actual amount received by him when he makes the trade. Producer surplus is a measure of producer welfare. It is shown graphically as the area above the supply curve and below the equilibrium price. Here producer surplus is shown in Fig.-1. As the price increases, thereby increasing produce surplus. A producer always tries to increase his producer surplus by trying to sell more and more at higher price. However, it is simply not possible to increase the producer surplus indefinitely since higher prices there might be very little or no demand for goods.

The (Table-4) revealed that the 38.76 per cent of total marketed surplus of papaya disposed in the channel-III followed by channel-II (34.42%) and channel-I (26.82%). The above table also reflects that marginal and small farmers used only channel-I and channel-II

whereas large farmers prefer all three channels for disposal of papaya. Table-4 further reveals that the 28.84 per cent of total producer surplus of papaya crop accounted by the marginal farmers 19.78 per cent by small farmers and 51.38 per cent by large farmers.

Table-5 revealed that the marketing channel-I represent that the cost paid by producer in consumer rupee was 2.80 per cent of the consumer purchase price. Net price received by the producer in consumer rupee was found 97.00 per cent. It is clear from the table that the producer obtained maximum share in consumer rupee this channel most profitable for producer (Apaté, 1960).

Table-6 revealed that the marketing cost paid by the producer in the consumer rupee was found 7.16 per cent under the channel-II. The marketing cost paid by the retailer was found 3.89 of the consumer's price. The net price received by the producer in consumer rupee was found 83.16 per cent while retailer obtain a margin of 3.89 per cent in consumer's rupee. It is clear from

the table that the number of intermediaries increases the percentage of share of producer in consumer's rupee trend to decline.

Table-7 reveals that the net price received by producer was found 66.10 per cent in consumer's rupee under the channel-III (P-W-R-C) the marketing cost paid by the producer, wholesaler, retailer were found 6.52, 3.64 and 3.48 per cent in consumer's rupee respectively. It is clear from the table that of market intermediaries increases the percentage share of producer decreases automatically (Das, 1979)

### Policy Implications

During the investigation it was observed that the majority of papaya growers preferred channel-III (Producer – Wholesaler - Retailer –Consumer) either himself or due to disguised market forces rather preferring channel-I (Producer – Consumer). The enhancement of length of marketing channel resulted in increases price spread and decreases the producer shares in consumer's rupee with decline with marketing efficiency too. Hence measures should be taken to de-

creases the number of intermediaries in marketing channel to increase the producer's share as well as to protect the consumer's rupee. An effective cooperative system can be introduced in production and marketing of papaya crop. Which would encourage the better productivity as well as the efficient marketing and quick disposal of papaya fruits of their members through channel-I.

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