

GLOBAL JOURNAL OF BIOLOGY, AGRICULTURE & HEALTH SCIENCES (Published By: Global Institute for Research & Education)

# www.gifre.org

# ECONOMICS OF PRODUCTION OF PAPAYA IN MIDDLE GUJARAT REGION OF GUJARAT, INDIA

S. B. Sagar<sup>1</sup>, H. C. Parmar<sup>2</sup>&V. B. Darji<sup>3</sup>

<sup>1</sup>Teaching Associate, Agriculture Wing at Jabugam, Anand Agricultural University, Anand, Gujarat, India <sup>2</sup>Assistant Research Scientist, Agriculture Research Station, Jabugam, Anand Agricultural University, Anand, Gujarat, India <sup>3</sup>Associate Professor, Department of Agricultural Statistics, College of Agriculture Information Technology, Anand Agricultural University, Anand, Gujarat, India

## Abstract

The present investigation was undertaken with a view to study the costs, returns and constraints in production and marketing of papaya (*Carica papaya* L.) in Middle Gujarat. A multistage random sampling design was used for selecting the sample. The study covered 4 talukas, 12 villages and 120 papaya growers (37 marginal, 18 small, 25 medium and 40 large) from Anand and Vadodara districts of Gujarat in the year August-2009 to January-2012 to study the production of papaya in Middle Gujarat. Results of the study indicated that papaya was highly capital intensive crop and average cost of cultivation (Cost C<sub>2</sub>) per hectare was Rs. 176660. On an average cost A (paid out cost) formed 61.64 per cent, while cost B accounted for 87.38 per cent of total cost. The highest expensive item of the expenditure was rental value of owned land was ranked first with 17.35 per cent of the total cost followed by human labour cost (16.57 per cent), saplings cost (10.05 per cent), managerial costs (9.09 per cent), interest on working capital (9.05 per cent), interest on fixed capital (8.39 per cent), manures and cakes (7.47 per cent), irrigation charges (6.92 per cent) and fertilizers (6.37 per cent) on overall basis. The average yield of papaya per hectare was 810.97 quintals on sample farms which realized Rs. 492024, Rs. 383126, Rs. 337652 and Rs. 360838 as gross income, farm business income, family labour income and farm investment income, respectively. The net profit per hectare over Cost C<sub>2</sub> was Rs. 275.72 for papaya. On an average, the per quintal cost of production on the basis of Cost C<sub>2</sub> was Rs. 217.84.

Key Words: Papaya Cost of Cultivation, Cost of Production and Carica papaya L.

## Introduction

Papaya belongs to the genus Carica of the family Caricaceae with 48 species of all the species Carica papaya L. is the most important and best known. It is cultivated all over the world. The original home of papaya is Tropical America (Shivannavar, 2005). Papaya fruit is very popular with the farmers in general because it requires less area per plant, comes to fruiting in a year, easy to cultivate and provides more income per hectare. Papaya is a very wholesome, refreshing and delicious fruit. Green fruits are diuretic and mildly laxative and are used as vegetables. It has a high nutritive and medicinal value. Papain prepared from dried latex of its immature fruits is used in digestion of protein, removing skin blemishes, in treatment of stomach ulcer, diphtheria, in meat tenderizing, manufacture of chewing gum, cosmetics, for degumming natural silk and to give shrink resistance to wool. The ripe fruits are rich source of carbohydrates, minerals (Ca, P and Fe), Vitamin (carotene, thiamine, riboflavin, etc.) and ascorbic acid (Singh et al., 2010). Besides this, it is also used in pharmaceutical industries, textile and garment cleaning paper and adhesive manufacture etc. The ripe fresh papaya fruit is delicious and used as table fruit. It has a neutral taste that can be considerable improved by addition of flavors rich fruits to make soft drinks, jams and various preserves. Unripe fruits can be fermented into sauerkraut or cooked as a substitute for apple sauce. Because of all these reasons papaya is popularly known as common man's fruit. The importance of papaya to agricultural and the world's economy is demonstrated by its wide distribution. It has emerged from the status of a home garden crop to that of commercial orchards in many tropical countries.

In India papaya is grown on 0.957 lakh hectares and its production 39.14 lakh tonnes. Gujarat state has area of 15300 hectares under papaya crop with the production of 832900 tonnes. Since no serious attempt has been made to know costs, return, profitability, per quintal cost of production and constraints faced by growers in papaya cultivation. Keeping in view above, the investigation with respect to economics of production of papaya in Middle Gujarat was undertaken with following objectives:

- 1. To calculate the cost of cultivation and returns per hectare
- 2. To estimate the cost of production per quintal and input-output ratio
- 3. To identify production and marketing constraints faced by growers

## Methodology

Multistage random sampling was used to select district, talukas, villages and papaya growers. Anand and Vadodara districts were selected purposively on the highest area under papaya crop in Middle Gujarat region. Two talukas having highest area under papaya from each district *i.e.* Anand and Umreth talukas from Anand district and Vadodara and Savli talukas from Vadodara district were selected. Hence, total four talukas were selected for the study. In order to select the villages, the staff of taluka development officers was contacted and the various objectives of the study discussed. Then a list of the villages growing papaya was prepared. From the prepared list three villages were selected randomly from the each selected taluka. Thus, total 12 villages were selected for the study. From each of the villages ten papaya growers were randomly selected for the present study. They were then stratified in to four size groups viz., marginal (up to 1.00 hectare), small (>1.00 to 2.00 hectares), medium (>2.00 to 4 hectares) and large (above 4.00 hectares). Thus, in all 120 growers (37 marginal, 18 small, 25 medium and 40 large) were selected for the study. To study the production of papaya, required information were collected from farmer for the year August-2009 to January-2012 during the months of February-March 2012. The economic life of garden is up to two years.

The cost concepts like Cost A, Cost B, Cost C<sub>1</sub> and Cost C<sub>2</sub> were used for cost evaluation and to estimate the profitability in papaya cultivation. Data were converted to per hectare basis in tabular form. Statistical tools like mean, percentage and ratios were used for estimating the costs and return in papaya production. The various terms and concepts which were used in the study were as followed: Cost A refers to paid out cost or explicit cost. Cost B includes Cost A plus interest on fixed capital and rental value of land. Cost C<sub>1</sub> refers to Cost B plus imputed value of family labour. Cost C<sub>2</sub> refers to Cost C<sub>1</sub> plus 10 per cent of Cost C<sub>1</sub> as managerial charges. Cost of production per quintal refers to total cost (Cost C<sub>1</sub>) divided by main yield in quintal. Gross return refers to a sum of values from production. It is also known as gross income. Family business income includes gross income minus Cost A. Family labour income includes gross income fixed capital. Net income includes to gross income minus Cost C<sub>2</sub>, bulk line cost refers to the unit cost, which covers the cost of bulk production, *i.e.*, 85 per cent of the total production of a commodity.

#### **Results and Discussion**

#### Cost Structure

Papaya is one of the major fruit crop occupying a prominent place in the economy of cultivators and India is the leading country in the world for papaya production. Therefore, cost of papaya cultivation has paramount importance in determining the net income from it. The details about component wise costs for papaya cultivation on different size of farms per hectare are studied and the results are furnished in Table 1.

The table portray that the average total cost of cultivation per hectare of papaya farms was Rs. 176660.25. It was found that highest cost in small farms Rs. 199141.86 followed by in marginal farms (Rs. 190644.72), in medium farms (Rs. 170489.05) and in large farms (Rs. 169438.84). This was mainly on account of more investment on human labour and bullock labour and also on depreciation and interest on fixed capital incurred by small farmers as compared to other categories of farms. On an overall basis among the different items of cash expenditure, the cost of human labour ranked first with 16.57 per cent of the total cost because of papaya requires more number of labours for picking, weeding and also application of irrigation to the crop. The other per hectare expenditure were saplings cost (10.05 per cent), manures and cakes (7.47 per cent), irrigation charges (6.92 per cent), fertilizers (6.37 per cent), tractor charges (5.03 per cent), depreciation (2.25 per cent), miscellaneous (0.52 per cent), plant protection chemicals (0.39 per cent), growth regulators (0.28 per cent) and bullock labour (0.27 per cent). The share of sapling cost on all the categories was higher because seeds of Taiwan 786 variety of papaya are imported from other country at higher prices. The highest not payable but accounted expenditure was rental value of owned land (17.35 per cent) followed by managerial costs (9.09 per cent), interest on working capital (9.05 per cent) and interest on fixed capital (8.39 per cent). It was also apparent from the table that cost of human labour and bullock labour, manure and cakes and insecticides decline while the cost of tractor, sapling, irrigation and fertilizers were increased as the category of farm size changed from marginal to large. Similar findings were reported by Sharma and Singh (1990), Kumar and Sahu (1997), Asmatoddin and Pawar (2008) and Sharma et al. (2010).

#### **Estimates of Different Costs**

Estimates of different costs such as Cost A, Cost B, Cost C<sub>1</sub> and Cost C<sub>2</sub> were calculated and presented in Table 2. It could be inferred from the above table that overall per hectare Cost A came to Rs 108898.39. It was highest per hectare Cost A was Rs. 119284.09 on small farms and lowest Rs. 104436.66 on medium farms. The study also showed that Cost B and Cost C<sub>1</sub> accounted for about 87.38 and 90.91 per cent of the Cost C<sub>2</sub>. On an Overall, Cost C<sub>2</sub> came to Rs. 176660.25 per hectare which was highest on small farms (Rs. 199141.86 per hectare) and lowest on large farms (Rs. 169438.84 per hectare). Higher costs on small farms are associated with intensive use of human labour and bullock labour and also on depreciation and interest on fixed capital as compared to other categories of farms. Decreasing trend was observed as category of farms increased from marginal to large in total cost (Cost C<sub>2</sub>) except small category of papaya cultivators. It was might be due to adoption of new technical knowledge. Similar findings were reported by Gadre (1977), Sharma and Singh (1990), Kumar and Sahu (1997), Oad *et al.* (2001), Asmatoddin and Pawar (2008) and Sharma *et al.* (2010).

#### Yield, Price, Gross Income and Net Gains

Yield, farm harvest price and value of gross output from papaya production on different farm size groups are presented in Table 3. It is revealed that the average yield of papaya was 810.97 quintals per hectare. It ranged from 728.44 quintals on marginal farms to 841.62 quintals on large farms. Higher yield level on large farms may be due to optimum level of inputs utilized by them along with timely weeding operations, use of drip irrigation method, proper selection of varieties of papaya, which affect the output to a greater extent, as compared to other farms. The variation in the yield might be due to the different time of sowing, types of land and use of hybrid variety *etc*.

The results in Table 3 indicated that per quintal average farm harvest price received by the papaya growers was Rs. 606.71. The small size growers realized higher prices per quintal *i.e.* Rs. 639.72 followed by marginal (Rs. 621.62), large (Rs. 592.25) and on medium (Rs. 584.00) category of farms. Generally, small and marginal farm growers sell their produce at higher prices compared to large and medium farms, which was mainly due to time of sale and agencies to which the produce was sold.

The overall average gross returns per hectare on papaya farms amounted to Rs. 492024.85 and it varied from Rs. 452815.01 on marginal farms to Rs. 534711.20 on small farms. Thus gross income increased with an increase in size of the farms, except small farms.

A perusal of above Table 4 shows that per hectare net returns over operational cost (Cost A) was the highest (Rs. 415427.11) on small farms and the lowest (Rs. 341126.61) on marginal farms with on an average of Rs. 383126.46 on sample farms. Net returns from papaya farms on the basis of Cost B, Cost C<sub>1</sub> and cost C<sub>2</sub> was Rs. 337652.70, Rs. 331424.62 and Rs. 315364.60 per hectare, respectively. It is apparent from the table that per hectare net returns on papaya farms over Cost C<sub>2</sub> ranged from Rs. 262170.28 on marginal farms to Rs. 335569.34 on small farms with an average of Rs. 315364.60. Net income over different costs on papaya farms increased with increase in the size of farms.

The overall per hectare farm business income, family labour income and farm investment income (Table 5) were Rs. 383126.46, Rs. 337652.70 and Rs. 360838.36, respectively. The data indicated that the net profit per hectare (over Cost  $C_2$ ) was Rs. 315364.60 for all farms. It also revealed that farm business income, family labour income and farm investment as well as net profit increased as the category of farm changed from marginal to large, except small. It might be due to the more commercial adoption of papaya cultivation practices by upper categories of farms.

The results of the study are in close agreement with earlier findings of Gadre (1977), Sharma and Singh (1990), Kumar and Sahu (1997), Oad *et al.* (2001), Asmatoddin and Pawar (2008) and Sharma and Zote (2010).

#### Cost Per Quintal

It is the cost-price relationship (the cost-price ratio) that generally decides the economic prosperity and the degree of commercialization on these farms. Given the price, offered by the market mechanism to a unit of output, the farmers' prosperity depends upon his capacity to produce his output at a lesser cost than the market price.

The estimated cost of production per quintal of papaya is given in Table 6. The overall paid out cost (cost A) per quintal was Rs. 134.28, which was 61.64 per cent of the total cost. The overall cost B came to Rs. 190.35 per quintal which was 87.38 per cent of total cost. The overall total cost of production (cost  $C_2$ ) per quintal of papaya was about Rs. 218. It was highest on marginal farms (Rs. 261.72), followed by small farms (Rs. 238.25), medium farms (Rs. 216.05) and large category of farms (Rs. 201.33). As the category of farm increased the total cost per quintal was decline. It was mainly due to the higher productivity seen in papaya on higher category of farms.

Generally, the market price of papaya was observed ranged from Rs. 500 to Rs. 700 per quintal. So, it can be considered as quite considerable price. Therefore, it can be concluded that the papaya cultivation was quite remunerative even if the lowest market price is considered. Eventhough less farmers cultivated papaya due to its long (7 to 8 months) uneconomical period compared to other substitute crops. The results of the study are in corroboration with earlier findings of Sharma and Singh (1990), Kumar and Sahu (1997) and Asmatoddin and Pawar (2008).

#### Input-Output Ratio

The input-output ratio reflects the criteria for economic viability of the crop based on return per rupee invested. The input-output ratios were worked out on the basis of different cost concepts and the same are presented in Table 7.

The overall input output ratio was 1: 2.79 on the basis of  $\cos t C_2$  indicated that an investment worth Rs. 1 on all the inputs used in the cultivation of papaya yielded an output worth Rs. 2.79. The input output ratio was the lowest (1: 2.38) on marginal farms and the highest (1: 2.94) on large farms.

Further, it was observed that the input output ratio on the basis of cost A *i.e.* paid out cost, was highest (1:4.63) on large farms followed by small farms (1:4.48), medium farms (1:4.45) and lowest on medium farms (1:4.05). The inputoutput ratio over cost A, cost B, cost C<sub>1</sub> and cost C<sub>2</sub> were 4.52, 3.19, 3.06 and 2.79, respectively. Results indicated that on an average the farmers detained Rs. 4.52 as profit. The results of the study are in corroboration with earlier findings of Gadre (1977), Oad *et al.* (2001) and Sharma and Zote (2010).

#### **Bulk Line Cost**

The bulk line cost is the unit cost which covers the cost of bulk production. It indicates cost of papaya production incurred by the last sample producer making the bulk at 85 per cent level of production. The data presented in Table 8 indicated that the 'Bulk Line Cost' of papaya obtained at 85 per cent of total production was Rs. 275.72 per quintal of papaya. It covered 68.93 per cent of farms and 80.63 per cent of the total area. The details about the bulk line cost are given in Appendix I. The curve indicating bulk line cost, number of farms, area and production covered at 85 per cent of

production are exhibited in Fig. 1. Thus, the average harvest price was higher (Rs. 606.71 per quintal) than bulk line cost (Rs. 275.72 per quintal).

#### **Production and Marketing Constraints**

Due to perishable, seasonal and bulky nature of papaya, there might be number of constraints opined by the sample papaya growers in adoption of papaya production technology and marketing. Production and marketing constraints faced by papaya growers were presented in Table 9.

It was observed from table that the high cost of planting material (88.33 per cent), lack of knowledge about fertilizer application (75.83 per cent), Absence of regulated markets (74.17 per cent), non availability of high yielding variety seed of papaya (73.33 per cent), Lack knowledge about identifying pests (68.33 per cent), non availability of fertilizer in time (61.67 per cent), Long distant of market (60.83 per cent), non availability of labour in time (50.83 per cent), High cost of labour (48.33 per cent), Fluctuation in market prices (45.83 per cent), High cost of fertilizer (39.17 per cent), Un-even payment for sale (28.33 per cent) and Lack of knowledge about identifying the disease (25.83 per cent) were the major production and marketing constraints encountered by the sampled farmers.

It was also seen from the table that the problem of non availability of high yielding variety seed of papaya, non availability of fertilizer in time and non availability of labour in time observed most in small, marginal and large category of farms, respectively. Further, the results indicated that absence of regulated markets, long distant of market and fluctuation in market prices were the major marketing constraints realized by marginal, medium and small farmers, respectively.

Thus, it can be inferred from the above discussion that papaya farmers faced the problems of non availability of high yielding variety seed of papaya might be due to less research work done by breeders on papaya. They also faced the problem of Absence of regulated markets; it might be due non availability of regulated fruit markets by government and problems of high cost of planting material may be due to higher prices of seeds coupled with higher transportation cost when purchased from out of states. The results of this study are in corroboration with the findings of Singh *et al.* (2010).

## Conclusion

It had been found that cultivation of papaya involve high investment, but it as economically profitable and financially viable fruit crop. The average total cost of cultivation of papaya was Rs. 176660.25. On an average cost-A (paid out cost) formed 61.64 per cent of total cost, while cost B accounted for 87.38 per cent of total cost. The average farm harvest price received by the papaya growers was Rs. 606.71 per quintal. On an average gross income and net return per hectare were Rs. 492024.85 and Rs. 315364.60, respectively. The average per hectare farm business income, family labour income and farm investment income were Rs. 383126.46, Rs. 337652.70 and Rs. 360838.36, respectively on the sample farms. The overall input-output ratio was 1:2.79 on the basis of cost  $C_2$ . The average cost of production per quintal of papaya was about Rs. 217.84 which lower than the market price of papaya ranging from Rs. 500 to Rs. 700 per quintal. Bulk line cost was Rs. 275.72 per quintal for papaya at 85 percent production which covered 68.93 per cent of farms and 80.63 per cent of area. On an average high cost of planting material, lack of knowledge about fertilizer application, Absence of regulated markets, non availability of high yielding variety seed of papaya, Lack knowledge about identifying pests, non availability of fertilizer in time, Long distant of market, non availability of labour in time were the major production and marketing constraints faced by the papaya growers.

## Acknowledgement

My Parents and My wife, for their moral support and encouragement served as an immense inspiration to start and complete this piece of work; and Finally, to My Guide Dr. K. S. Jadav, Associate Professor, Dept. Of Agril. Economics. B. A. College of Agriculture, Anand Agricultural University, Anand, His guidance and blessings from start to completion of this research had been a profound help and immense joy.

#### Reference

Asmatoddin, M. and Pawar, B. R. (2008). Economics of Production of Papaya in Maharashtra, India, *International Journal of Agricultural Science*, **4(1)**: 95-98.

Gadre, N. A. (1977). Economics of production of papaya for papain production, PKV Res. J., 21: 142-145.

Kumar, S. and Sahu, D. (1997). Commercialising papaya cultivation as potential as agro industries, *Farmers and Parliament*, **37(10)**: 7-22.

Oad, F. C.; Lakho, A. A.; Khan, A.; Ansari, A. H.; Sheikh, F. M. and Khail, M. U. U. (2001). Economics of Papaya in Malir District, Karachi-Pakistan", *International Journal of Agriculture and Biology*, **3**(4): 477-481.

Sharma, C. K. and Singh, I. P. (1990). Tip of papaya growing for Tripura, Farmers and Parliament, 25(3): 17-25.

Sharma, S. K. and Zote, K. K. (2010). Effect of Adoption of Papaya Ring Spot Virus Management Technology on Economics of Papaya Cultivation, *Indian Journal of Horticulture*, **67(4)**: 456-462.

Sharma, S. K.; Zote, K. K.; Kadam, U. M.; Tomar, S. P. S. and Sonawane, A. U. (2010). Economics of Papaya Cultivation at Farmers' Fields, *Acta Horticulturae*, **851**: 53-60.

Shivannavar A. C. (2005). An Economic Analysis of Production and Marketing of Papaya in North Karnataka, An Unpublished *M.Sc.* (*Agri*) *Thesis*, Univ. Agric. Sci., Dharwad (India).

Singh, A.; Deka, B. C.; Prakash, J.; Patel, R. K. and Ojah, H. (2010). Problems and Prospects of Papaya Cultivation in Northeastern States of India, *Acta Horticulterae*, **851**: 61-66.

# Appendix



Fig. 1: Bulk Line Cost of Production of Papaya

Table 1: Break-up	of the Total	<b>Cost of Cultivation</b>	for Papaya	(Rs/hectare)
1			1.	· /

C. No	Itom	Category of farm							
Sr. 10.	nem	Marginal	Small	Medium	Large	Overall			
1	Human Labour	34518.70	38043.77	27037.70	26446.28	29268.82			
1	Human Labour	(18.11)	(19.10)	(15.86)	(15.61)	(16.57)			
		12721.82	7253.96	5938.22	3962.67	6228.08			
	(a) Family	(6.67)	(3.64)	(3.48)	(2.34)	(3.53)			
		21796.88	30789.81	21099.48	22483.61	23040.74			
	(b) Hired	(11.43)	(15.46)	(12.38)	(13.27)	(13.04)			
2	D-11-1-1-1	953.25	947.17	592.67	178.92	484.28			
2	Bullock labour	(0.50)	(0.48)	(0.35)	(0.11)	(0.27)			
		9197.40	8201.89	8902.62	8932.47	8886.24			
3	Tractor charges	(4.82)	(4.12)	(5.22)	(5.27)	(5.03)			
		16876.62	17058.49	18312.04	17975.48	17754.80			
4	Saplings charges	(8.85)	(8.57)	(10.74)	(10.61)	(10.05)			
-	Manager	15059.22	12332.08	12922.30	12877.42	13190.48			
5	Manures and cakes	(7.90)	(6.19)	(7.58)	(7.60)	(7.47)			
6	Irrigation charges	13031.17	12001.51	10885.86	12565.16	12228.12			
0		(6.84)	(6.03)	(6.38)	(7.42)	(6.92)			
7	Fortilizor	9513.31	11961.51	10396.23	12006.02	11246.09			
/	rentilizer	(4.99)	(6.01)	(6.10)	(7.09)	(6.37)			
8	Plant protection	959.22	727.17	673.09	588.04	684.28			
0	chemicals	(0.50)	(0.37)	(0.39)	(0.35)	(0.39)			
9	Growth Regulator	241.56	135.85	129.09	797.42	488.21			
	Growth Regulator	(0.13)	(0.07)	(0.08)	(0.47)	(0.28)			
10	Miscellaneous	952.99	1106.42	971.73	854.19	924.50			
10	1115contaneo as	(0.50)	(0.56)	(0.57)	(0.50)	(0.52)			
11	Depreciation	7125.01	6204.92	3669.62	2558.85	3980.06			
		(3.74)	(3.12)	(2.15)	(1.51)	(2.25)			
12	Interest on working	15981.98	17817.28	15089.17	15947.28	15990.58			
	capital	(8.38)	(8.95)	(8.85)	(9.41)	(9.05)			
13	Interest on fixed	18366.37	22223.27	15743.99	11571.55	14816.55			
	capital	(9.63)	(11.16)	(9.23)	(6.83)	(8.39)			
14	Rental value of	30536.80	32276.73	29663.18	30736.20	30657.21			
	owned land	(16.02)	(16.21)	(17.40)	(18.14)	(17.35)			
15	Managerial cost	1/331.34	18103.81	15499.00	15403.53	16060.02			
		(9.09)	(9.09)	(9.09)	(9.09)	(9.09)			
16	Total	190644.72	199141.86	170489.05	169438.84	176660.25			
		(100.00)	(100.00)	(100.00)	(100.00)	(100.00)			

Note : Figures in parentheses indicate percentage to total.

Catagony of form	Different costs (Rs per hectare)							
Category of farm	Cost A	Cost B	Cost C <sub>1</sub>	Cost C <sub>2</sub>				
Marginal	111688.40	160591.57	173313.39	190644.72				
warginar	(58.58)	(84.24)	(90.91)	(100.00)				
Gravel1	119284.09	173784.09	181038.05	199141.86				
Sillali	(59.90)	(87.27)	(90.91)	(100.00)				
Modium	103644.66	149051.82	154990.04	170489.05				
Medium	(60.79)	(87.43)	(90.91)	(100.00)				
Largo	107764.89	150072.64	154035.31	169438.84				
Large	(63.60)	(88.57)	(90.91)	(100.00)				
Overall	108898.39	154372.15	160600.23	176660.25				
	(61.64)	(87.38)	(90.91)	(100.00)				

**Table 2: Estimation of different costs** 

Figure in parenthesis indicate percentages to Cost-C2.

Tuble 51 Theu level, I alle full (cot I field und Groops meetine per meetine	Table	3:	Yield	level,	Farm	Harvest	Price and	Gross	Income	per hectare
------------------------------------------------------------------------------	-------	----	-------	--------	------	---------	-----------	-------	--------	-------------

Category of farm	Yield (quintal)	Harvest price (Rs./quintal)	Value of gross output (Rs.)
Marginal	728.44	621.62	452815.01
Small	835.85	639.72	534711.20
Medium	789.10	584.00	460835.32
Large	841.62	592.25	498447.79
Overall	810.97	606.71	492024.85

# Table 4: Net gains over different costs per hectare

Cotogowy of form	Net gains over different costs (Rs./hectare)								
Category of farm	Cost A	Cost B	Cost C <sub>1</sub>	Cost C <sub>2</sub>					
Marginal	341126.61	292223.44	279501.62	262170.28					
Small	415427.11	360927.11	353673.14	335569.34					
Medium	357190.66	311783.50	305845.28	290346.27					
Large	390682.90	348375.15	344412.48	329008.95					
Overall	383126.46	337652.70	331424.62	315364.60					

# Table 5: Farm Business Income, Family Labour Income, Farm Investment Income and Net Profit over Cost-C2 (Rs. /hectare)

Particulars	Category of farm									
	Marginal	Small	Medium	Large	Overall					
Farm business income	341126.61	415427.11	357190.66	390682.90	383126.46					
Family labour income	292223.44	360927.11	311783.50	348375.15	337652.70					
Farm investment income	311073.45	390069.34	335753.44	371316.71	360838.36					
Net profit	262170.28	335569.34	290346.27	329008.95	315364.60					

# Table 6: Cost of Production per Quintal on the basis of different cost concepts

Catagory of form	Different costs (Rs. per quintal)							
Category of farm	Cost A	Cost B	Cost C <sub>1</sub>	Cost C <sub>2</sub>				
Marginal	153.33	220.46	237.92	261.72				
warginar	(58.59)	(84.24)	(90.91)	(100.00)				
Small	142.71	207.91	216.59	238.25				
Sillali	(59.90)	(87.27)	(90.91)	(100.00)				
Madium	131.35	188.89	196.41	216.05				
Medium	(60.80)	(87.43)	(90.91)	(100.00)				
Larga	128.05	178.31	183.02	201.33				
Large	(63.60)	(88.57)	(90.91)	(100.00)				
Overell	134.28	190.35	198.03	217.84				
Overall	(61.64)	(87.38)	(90.91)	(100.00)				

Note : Figures in parentheses indicate the percentages to Cost-C2.

Category of farm	Cost A	Cost B	Cost C <sub>1</sub>	Cost C <sub>2</sub>						
Marginal	1:4.05	1:2.82	1:2.61	1:2.38						
Small	1:4.48	1:3.08	1:2.95	1:2.69						
Medium	1:4.45	1:3.09	1:2.97	1:2.70						
Large	1:4.63	1:3.32	1:3.24	1:2.94						
Overall	1:4.52	1:3.19	1:3.06	1:2.79						

# Table 7: Input-Output Ratio

# Table 8: Bulk Line Cost

<b>S</b> .,	Cost	No. of	Area	Production	Pe	rcentage to	Total	Cumulative			
Sr. No	range	farms	covered	covered	Farms	Area	Production		percentage		
110.	(Rs./qtl.)	covered	(in ha.)	(qtl.)	covered	covered	covered	Farms	Area	Production	
1.	Up to 160	4	4.25	4714	3.33	3.71	5.08	3.33	3.71	5.08	
2.	160 - 200	35	46.375	41337.8	29.17	40.50	44.52	32.50	44.21	49.60	
3.	201 - 240	27	29.00	23734	22.50	25.33	25.56	55.00	69.54	75.16	
4.	241 - 280	18	14.125	10359	15.00	12.34	11.16	70.00	81.88	86.32	
5.	281 - 320	19	10.75	6804.5	15.83	9.39	7.33	85.83	91.27	93.65	
6.	321 - 360	7	4.5	2933	5.83	3.93	3.16	91.66	95.20	96.81	
7.	361 - 400	8	4.625	2464	6.67	4.04	2.64	98.33	99.24	99.45	
8.	Above 400	2	0.875	510	1.67	0.76	0.55	100.00	100.00	100.00	
]	Fotal:	120	114.50	92856.30	100.00	100.00	100.00	ı. I.			

# Table 9: Bulk-line cost (Percentage)

No. of farms covered	68.93
Area covered	80.63
Production covered	85.00

Sr. No.	Problem/Constraints	Marginal 37	Small 18	Medium 25	Large 40	Overall 120					
Production Constraints											
1	Non availability of High Yielding variety seed of papaya	28 (75.68)	16 (88.89)	19 (76.00)	25 (76.00)	88 (73.33)					
2	Non availability of fertilizer in time	24 (64.86)	11 (61.11)	16 (64.00)	23 (57.50)	74 (61.67)					
3	Non availability of labour in time	15 (40.54)	6 (33.33)	15 (60.00)	25 (62.50)	61 (50.83)					
4	High cost of planting material	35 (94.59)	17 (94.44)	21 (84.00)	33 (82.50)	106 (88.33)					
5	High cost of labour	12 (32.43)	8 (44.44)	12 (48.00)	26 (65.00)	58 (48.33)					
6	High cost of fertilizer	9 (24.32)	6 (33.33)	10 (40.00)	22 (55.00)	47 (39.17)					
7	Lack of knowledge about fertilizer application	26 (70.27)	16 (88.89)	20 (80.00)	29 (72.50)	91 (75.83)					
8	Lack of knowledge about identifying the disease	13 (35.14)	3 (16.67)	6 (24.00)	9 (22.50)	31 (25.83)					
9	Lack knowledge about identifying pests	22 (59.46)	11 (61.11)	22 (88.00)	27 (67.50)	82 (68.33)					
10	Fluctuation in market prices	16 (43.24)	10 (55.56)	11 (44.00)	18 (45.00)	55 (45.83)					
11	Absence of regulated markets	29 (78.39)	13 (72.22)	18 (72.00)	29 (72.50)	89 (74.17)					
12	Long distant of market	22 (59.46)	8 (44.44)	18 (72.00)	25 (62.50)	73 (60.83)					
13	Un-even payment for sale	10 (27.03)	8 (44.44)	7 (28.00)	9 (22.50)	34 (28.33)					

# Table 10: Production and Marketing Constraints faced by Papaya Growers

Note : Figure in parentheses indicate per cent to total respondents in each category.