

Economics of Papaya in Malir District, Karachi–Pakistan

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ABSTRACT

An investigation on input-output analysis of papaya production in Malir District, Karachi, Pakistan was performed during the crop season of 1999-2000. A total of 30 growers were selected through random sampling technique for collection of detailed information. It was found that papaya growers on an average earned Rs. 543121.05 ha⁻¹ after spending Rs. 195784.12 ha⁻¹ as cost of production. Thus, net return averaged to Rs. 347336.94 ha⁻¹ in Malir District, Karachi during the crop season of 1999-2000. The input- output ratio was calculated to be in the proportion of 1:1.72.

Key Words: Papaya; Economic analysis; Pakistan

INTRODUCTION

The importance of papaya to agriculture and the world's economy is demonstrated by its wide distribution and substantial production in the tropical countries. It has long been known and cultivated in the home gardens by the people of tropics because it is one of the few fruits, which throughout the year gives quick returns and adopts itself to diverse soil and climatic conditions. It is the fruit native to tropical America, is now commercially grown in many parts of the world. It has emerged from the status of a home garden crop to that of commercial orchards in Hawaii, India, Ceylon, South Africa, Tropical America, Indonesia and Philippines. It gives one of the highest productions in terms of fruit and net return next to banana.

Papaya is cultivated firstly for its nutritive values, which are consumed as the table fruits both in the fresh and processed forms. The fruits are an important and economical source of certain vitamins and minerals. Besides the table uses it is highly priced for its medicinal properties. In Pakistan, province of Punjab and Sindh possess lush green orchards of papaya. Malir area of Karachi and Coastal areas of Sindh province have been growing papaya on commercial scale. Papaya grown in Thatta and Malir Districts of Sindh are known for their palatability and size. Yet, papaya is highly perishable fruit and rate of spoilage in transport is high. Other fruits like banana, guava and mango are competing well with papaya as regards to net-returns occurred to orchardists. In Malir area of Karachi, two varieties of papaya (Bombay & Sindhi) are grown commercially.

Papaya seed is planted during the month of March to raise nursery and transplanting is made during the month of April. However, the papaya crop attempts 18 months to produce fruits. The fruiting period are 1st fruit (December to June), 2nd fruit (August to October) and 3rd fruit (November

& December). Keeping the above facts in view an attempt was made to assess the input-output analysis of papaya production in Malir District of Karachi.

MATERIALS AND METHODS

Survey method was adopted to perform this study. To fulfill the conditions of purposive sampling, primary survey of farms cultivating papaya in commercial scale was carried out around Malir area of Karachi. It was investigated during the survey that 75 farmers are growing papaya on commercial basis. About, 30 growers were selected through random sampling technique. To record the interviews of selected papaya growers a comprehensive questionnaire was prepared. The questionnaire contained queries regarding qualitative and quantitative aspects of inputs, costs incurred on the acquisition of various inputs, yield harvested and cash income obtained by producers. Frequent visits were paid to each selected sample farm to collect desired information. Data so collected were tabulated, analysed and interpreted.

RESULTS AND DISCUSSION

Cost of production. Cost of production refers to the outlays, which are necessarily incurred by the entrepreneurs to acquire various factors of production. These costs are generally classified into categories known as fixed cost and variable cost. While, the fixed cost does not change according to the magnitude of production, the variable costs vary according to the scale of production. However, all fixed costs become variable in long run. Since fixed costs are incurred for the use in entire farm, they have little contribution in the production of the specific crop. Therefore, various costs as incurred by the papaya growers were not classified as fixed and variable costs. All costs were considered as variable.

Fixed costs. The cost, which do not vary according to the magnitude of the production and remain the same whether the output is large or small are known a fixed cost. The cost includes the means of production like the cost of maintaining the land, building, equipments and salaries of permanent labours. It also includes taxes, insurances and depreciation. Fixed costs are also known as sunk costs. In present study fixed cost, employed to produce papaya on selected farms examined in Malir area of Karachi, includes rent of land, water charges and usher (Table I).

Variable cost. Variable costs are those items of expenditure that have a direct bearing on production starting from the primary tillage operation to the last operation i.e. marketing the produce. These costs are incurred on the payment of wages for contingent labours and purchase of farm supplies. The results of present study are displayed in Table I.

Capital inputs. The selected papaya growers in Malir area, Karachi incurred capital inputs on various commodities such as purchase of seed, F.Y.M., crates, commercial fertilizer (N and P) and repair of farm implements. The capital inputs incurred by the selected papaya growers in Malir District have been shown in Table I.

Marketing cost. Almost all the papaya growers marketed the papaya in Karachi market where wholesaler from different parts assembles to make purchases. It involved certain cost of packing, transportation, octroi tax and commission charges. Packing was done in wooden crates. The transportation cost includes loading and un-loading charges. The data collected on various items of marketing costs are summarized in Table I.

Productivity of papaya farms. Efficiency of any farm enterprise depends largely on the productively which determines level of returns as its output or value productivity which reflects returns incurred to the entrepreneur. Since returns or productivity is received as payment for use of resources or input, the production process is said to be efficient when it yields maximum output per unit of input. Therefore, it becomes imperative to investigate productivity or the value of output transformed by the combination of various resources. This is why that farmers are always found interested to increase productivity of crops and the returns. It can be done either by harvesting higher per hectare yield or by selling the output on higher prices or by reducing per hectare cost of production. After evaluation of resources

Table I. Cost of production incurred by the selected papaya growers in Malir District, Karachi during 1999-2000

Farm No.	Area sown (ha).	Fixed cost (Rs.)	Capital input (Rs.)	Labour cost (Rs.)	Marketing cost (Rs.)	Total (Rs.)
1.	1.21	57780	16517	61260	115831	251388
2.	5.26	240630	35500	336630	518160	1130920
3.	3.03	75825	22065	175020	249382	522290
4.	3.84	175845	24528	246280	335902	782555
5.	4.65	221490	35925	283140	431286	971841
6.	5.26	250380	39303	343140	456524	1089347
7.	2.02	47700	19320	129360	188715	385095
8.	0.80	38570	10165	50880	73837	173452
9.	1.61	35140	14545	74980	141977	266642
10.	2.42	111050	20040	150840	231528	513458
11.	3.43	163685	24311	172860	311590	672446
12.	1.01	21975	12905	44980	69983	149843
13.	4.85	231120	35100	336960	480265	1083445
14.	1.21	57780	11660	64380	118695	893170
15.	4.04	185100	18300	283500	406270	893170
16.	1.82	86670	14460	78540	148345	328015
17.	4.85	231120	38165	352404	497127	1118816
18.	2.63	125190	20980	117240	251880	515290
19.	4.04	185100	33235	243660	402590	864585
20.	3.23	154080	24580	203820	290760	673240
21.	5.66	259140	40375	420240	515530	1235285
22.	1.41	64785	14472	69880	123377	272514
23.	6.07	277650	52300	424490	556765	1311205
24.	2.02	92550	18602	155250	190572	456974
25.	2.83	134820	23805	137615	213270	509510
26.	1.61	77040	16805	80220	141265	315330
27.	3.64	166590	28170	220740	336551	752051
28.	4.45	203610	29615	292380	399321	924926
29.	1.01	21975	9025	52660	77935	161595
30.	3.23	154080	27145	192780	295880	669885
Per farm	3.10	138282	24397	193204	285704	662943
Per Hectare	1.00	44540	7858	62230	92024	2135369

used in the production of papaya, it is essential to determine returns occurred to farmers from papaya. This study of return is concerned with the physical and value productivity.

Physical and revenue productivity. Physical productivity is commonly expressed in terms of a unit weight of the product obtained from a specific crop. It includes the total yield of principal crop and its by products. In the present study, yields of papaya fruit form the physical productivity is shown in Table II.

Revenue productivity can well be termed as income from a specific enterprise. It is expressed in terms of money. It is classified by multiplying physical productivity with the price and is commonly expressed in terms of money. It includes the output when valued by multiplying productivity with the price. Value productivity is of paramount importance in measuring the efficiency of various inputs employed to produce a commodity. The smooth running of any enterprise depends upon the amount of value productivity of income from farm enterprises by selling farm products at the possible maximum prices. Therefore, prices lay a great impact on revenue productivity (Table II).

Inferential analysis. Inferential analysis is referred to examine various criteria relating to the efficiency and economic behaviour of some enterprise. It asks for keeping out the generalization of a specific problem examined minutely and keenly. The inferential analysis deals with the relationship that exists between resources and commodities. The relationship provides the tools by means of which problems of any production unit can well be examined thoroughly. The mean objective of such an analysis is to judge the efficiency of a production unit.

The measurement of efficiency of a farm unit is complex because the entrepreneur of a farm performs numerous functions in different capacities. He works on the farm as its manager, organizer, investor, labourer. Agricultural economist devised various criteria to examine efficiency of farm business but these all do not suit for all the purposes all the time combined. With a view to examine the efficiency of papaya farms, the well-known measures include determination of net returns and estimation of input-output ratio.

Net returns. Net return is considered as the most important

Table II. Physical and revenue productivity obtain by the selected papaya growers in Malir District, Karachi during 1999-2000

Farm No	Area sown (ha)	Total yield (kg)	Total quantity(crate)	Rate crate ¹ (Rs.)	Amount (Rs.)
1.	1.21	105000	2625		255669375
2.	5.26	423800	10595	285	3019575
3.	3.03	213000	5325	270	1437750
4.	3.84	293360	7334	300	2200200
5.	4.65	331200	8280	310	2566800
6.	5.26	426400	10660	270	2878200
7.	2.02	165000	4125	260	1072500
8.	0.80	68400	1710	275	470250
9.	1.61	127200	3180	295	938100
10.	2.42	193200	4830	280	1352400
11.	3.43	272000	6800	250	1700000
12.	1.01	396000	1490	310	461900
13.	4.85	396000	9900	285	2821500
14.	1.21	108000	2700	255	688500
15.	4.04	340000	8500	290	2465000
16.	1.82	131400	3285	290	952650
17.	4.85	400800	10020	305	3056100
18.	2.63	208000	5200	295	1534000
19.	4.04	340000	8500	290	2465000
20.	3.23	256000	6400	275	1760000
21.	5.66	420000	10500	285	2992500
22.	1.41	127400	3185	250	796250
23.	6.07	441000	11025	280	3087000
24.	2.02	155000	3875	290	1123750
25.	2.83	196000	4900	250	1225000
26.	1.61	387000	3340	275	918500
27.	3.64	387000	9675	265	2563875
28.	4.45	343200	8580	285	2445300
29.	1.01	71000	1775	300	532500
30.	3.23	256000	6400	265	1696000
Per farm	3.10	265945	6157	280	1705833
Per hectare	1.00	2855	1983	-	549441

¹ Crate = 40 Kilogram (kg)

criteria to examine the efficiency of farm business. The farmers as well as the economists commonly speak high of net returns. The farmer enterprise which yields highest net returns is always considered a remunerative enterprise. The net returns could be optimized either by minimizing the cost of production or by increasing the income by using both the measures.

The net returns are calculated by subtracting the cost of production or resource use from gross income or output. In the present study, the average per hectare cost of production was subtracted from the revenue productivity to arrive net returns of papaya in Malir area Karachi during the year 1999-2000. The calculation have been made and presented in Table III.

Input-output ratio. The efficiency of any agricultural enterprise can also be measured or judged through input-output ratio availed from it (Bishop & Toussant, 1958). Any enterprise is said to be economically efficient when it yields greater rate of output in relation to the rate of input used to produce it. Input-output ratios indicated the income accrued to the entrepreneur on per rupee expenses.

Therefore, it was concluded appropriate to compute input-output ratios as accrued to the sample of papaya growers in Malir area during the year of study by using the following formula.

$$\text{IOr} = \text{Ahot} / \text{Ahit}$$

In the above formula "IOr" denotes input-output ratios occurred from papaya. "Ahot" stands for average per hectare output and "Ahit" shows average per hectare input. In the present study, the average per hectare revenue productivity occurred to growers from papaya was assumed as average per hectare output. Whereas, average per hectare cost of production was considered as average per hectare input. Accordingly, input-output ratios for papaya enterprise were calculated and indicated in Table III. Research conducted earlier by Gadre (1977) reported that the per hectare cost and cost of cultivating pawpaws was Rs. 16018.10 and 31902.20, respectively, whereas the per hectare gross income was Rs. 81302.62, of which Rs. 55208.17 was from papian and Rs. 26094.45 from papaw fruits. The net return

Table III. Per hectare net returns and input-output ratio realized by the selected papaya growers in Malir District, Karachi during 1999-2000

Farm No.	Gross income (Rs. ha ⁻¹)	Total expenditure (Rs. ha ⁻¹)	Net return (Rs. ha ⁻¹)	Input:output ratio (C.B.R.)
	(a)	(b)	(a-b=c)	(c-b=z)
1.	553202.48	207758.68	345443.80	1:1.66
2.	574063.69	215003.80	359059.89	1:1.67
3.	474504.95	258268.98	216235.97	1:0.84
4.	572968.75	203790.36	369178.39	1:1.81
5.	552000.00	208998.06	343001.94	1:1.64
6.	547186.31	207100.00	340086.31	1:1.64
7.	530940.59	190641.09	340299.50	1:1.57
8.	470250.00	173452.00	296798.00	1:0.63
9.	582670.81	165616.15	417054.66	1:2.52
10.	558842.98	212172.73	346670.25	1:1.63
11.	495626.82	196048.40	299578.42	1:1.53
12.	457326.73	148359.41	308967.32	1:2.08
13.	581752.58	223390.72	358361.86	1:1.60
14.	569008.26	208690.08	360318.18	1:1.73
15.	610148.51	221081.68	389066.83	1:1.76
16.	523434.07	180228.02	343206.05	1:1.90
17.	630123.71	23054.85	607068.86	1:2.63
18.	583269.96	195927.76	387342.20	1:1.98
19.	610148.51	214006.19	396142.32	1:1.85
20.	544891.64	208433.44	336458.20	1:1.61
21.	528710.25	218248.23	310462.02	1:1.42
22.	564716.31	193272.34	371443.97	1:1.92
23.	508566.72	216014.00	292552.72	1:1.35
24.	556311.88	226224.75	330087.13	1:1.46
25.	432862.19	180038.87	252823.32	1:1.40
26.	570496.89	195857.14	374639.75	1:1.91
27.	507795.33	206607.42	301187.91	1:2.41
28.	549505.62	207848.54	341657.08	1:1.64
29.	527227.72	159995.05	367232.67	1:2.30
30.	525077.40	207394.74	317682.66	1:1.53
Mean	543121.05	195784.12	347336.94	1:1.72

from intercropping was Rs. 14835.18, and the net cost of papaw cultivation was Rs. 17067.02 ha. The input-output ratio was 1:4.76, indicating that the cultivation of papaws for papain is financially viable. However, Soomro (1987) stated that papaya producers on an average spent Rs. 2540.54 per acre on producing Rs. 15135.30 kilograms of papaya. Thus, production cost averaged to Rs.0.28 per kg of papaya in Karachi area during 1985. The orchardists sold papaya at Rs. 1.45 per kg, which fetched Rs. 2.20 per kg in wholesale and Rs. 4.12 per kg in retail markets. Thus, farm retail price spreads average to Rs. 2.67 kg of papaya in Karachi market during 1985. The marketing costs averaged to Rs. 0.94 per kg which included Rs. 0.44 per kg spent by growers, Rs. 0.34 per kg spent by wholesalers and Rs. 0.16 per kg spent by retailers.

The margins earned by wholesalers and retailers averaged to 34.09 and 46.09%, respectively; whereas, they earned markup at the rates of 51.72 and 87.27%, respectively. Net margins earned by various risk assuming

agencies averaged to Rs. 0.73 per kg papaya to growers Rs. 0.41 to wholesaler and Rs. 1.76 to retailer. The farmers were paid back 24% of consumer's expenditure on papaya whereas middlemen retained 76%. The farmers spent 6% of consumer's expenditure on papaya out of their share and enjoyed only 18%. The intermediaries earned abnormal margins squeezing producer's returns including the retail prices of papaya as well.

REFERENCES

- Bishop, C.E. and W.D. Toussant, 1958. *Introduction to Agric. Econ. Analysis*, p. 66. John Wiley and Sons, New York.
- Gadre, N.A., 1977. Economics of production of papaya for papain production. *PKV Res. J.*, 21: 142-5.
- Soomro, M.D., 1987. Determination of price spreads and margins of papaya marketing in Karachi area. *M.Sc. Thesis Agric. Econ.*, Sindh Agriculture University, Tando Jam-Pakistan.

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