Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

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Production and marketing of patato in Jaunpur district of U.P

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Abstract
Potato is one of the most important crop of India and ranked fourth in total production in the world, India has third largest producer of the world in this way the potato used in every day of consumption district Jaunpur of U.P. state has significant importance in the economy. Multi stage purposive random sampling method were used in selection of district, block villages and respondents reason behind the selection of said things is higher concentration of potato growers present in Jaunpur. Cost of cultivation on various size group farmers like Marginal, Small, Medium and Large farms were observed and their production in rupees were 39,041.24Rs,37,103.60Rs, 380.5334Rs etc. respectively. On an average, gross return, net return, family labour income farm investment income and farm business income came to Rs. 96,965.28, Rs. 60,424.02, Rs. 67,676.25 and Rs.44,858.12 Respectevily. Functional analysis for resources use efficiency revealed that production process of potato is characterized by decreasing return to scale.

Keywords: potato growers, marketing, knowledge

Introduction
Potato is one of the most important food crop and fourth in total production among food crops in the world.

India is the 3rd largest potato producer in the world. The production of potato in the world is approximately 311.4 million tones with an area under potato 19.22 million hectare. Average productivity of potato is 16.20 tonnes/hectare, while in India production of potato was about 24 million tones with an area of 1.2 million hectares and productivity of 19.7 tonnes/bectare (Singh and Kumar, 2004).

The main potato producing states, in order of importance, are Uttar Pradesh, Bihar, West Bengal, Assam, Punjab, Madhya Pradesh, Himachal Pradesh, Haryana, Maharashtra, Karnataka, Meghalaya and Tamil Nadu. In U.P., potato is cultivated in about 0.432 million hectares with the production of about of 7.68 million tones. The productivity of potato in U.P. is 17.78 tonnes/hectare (Singh and Kumar, 2004).

Potato is one of the most important cash crop of distric Jaunpur (U.P.) and has significant importance in the economy of the district, 2.56. Area under potato is the district during 2001-02 was 0.117 Lakh hectare while total production was 2.56 lakh metric tones the productivity of potato in Jaunpur District was 21.82 tonnes/hectares but so far no any systematic study on economics of potato production has been conducted.

Methodology
Multi-stage purposive cum-random sampling technique was used to select district, block, villages and respondents. Jaunpur district of eastern U.P. was purposively selected because of higher concentration of area and production of potato in this district. Out of 19 block of the district one block namely Shahganj block was selected for the study because of higher concentration of potato production in this block as compared to other blocks.

A list of all villages of Shahganj block was prepared according to acreage under potato cultivation. Two nucleus village were selected (one near city and another 20 km away from city) to farm clusters with four surrounding villages of each nucleus villages. Thus, 10 villages were selected for this study. A list of all the potato growers of 10 selected villages were prepared and classified into marginal (below 1 ha), small (1-2 ha), medium (2-3 ha) and large (3 & above ha). Further 10 farmers from each selected villages were randomly selected in proportion to their size groups of farm selected. Finally, 100 farmers (44 marginal, 26 small, 18 medium and 12 large) were selected for detailed study.

Tabular and functional analysis were used to fulfill the objectives of the study. To work out resource use efficiency, Cobb-Douglas production function was used the form of function is

b_1 b_2 b_n

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$$Y= aX_1 X_2 \ldots\ldots\ldots X_n e$$

Where

Y	= dependent variable (output values in Rs./ha)
X_i	= I th independent variable (input values in Rs./ha)
a	= constant
b_i	= production elasticity with respect to X_i
e	= error term

Marketing efficiency was measured by using the formulae Shepherd's following expression

$$ME \frac{V}{I} - 1$$

Where,

ME	=	Marketing efficiency
V	=	Consumer price
I	=	Total marketing cost

Results and Discussion
Measures of costs and returns of potato

Costs and returns of potato under different size group of sample farms are presented in Table 1. The cost C_1 was accounted for Rs. 35,241.24, Rs. 33,303.60, Rs. 30,580.53 and Rs. 29,282.21 on marginal, small medium and large size of sample farms, respectively with an average of Rs. 33,193.44 for first cluster whereas, it was Rs. 35,413.68, Rs. 31,611.90, Rs. 30,192.41 and Rs. 28,027.87 on marginal, small medium and large size of sample farms respectively with an average of Rs. 32,599.09 for second cluster. Overall C_1 was observed Rs. 32,891.27 for both the clusters.

Similarly, cost C2 was worked out Rs. 39,041.23, Rs. 37,103.60, Rs. 34,380.53 and 33,082.21 on marginal, small, medium and large size of sample farms respectively with an average of Rs. 36,983.44 for first cluster, whereas, it was worked out Rs. 38,913.68, Rs. 35,111.90, Rs. 33,692.41 and Rs. 31,527.87 on marginal, small, medium and large size of sample farms respectively with and average of Rs. 36,099.09 for second cluster. Overall cost C_2 was observed Rs. 36,541.27 for both the clusters.

Overall, cost of cultivation of potato per hectare on cost A_1/A_2 was worked out Rs. 20,971.18, cost B_1 Rs. 25,639.04, cost B_2 Rs. 29,289.04, cost C_1 Rs. 32,891.27 and cost C_2 Rs. 36,541.27, respectively.

It was observed that farm production of potato gross return was more on marginal farms than that of small, medium and large farms in case of both clusters, because of more use of variable inputs by these formers as compared to other. On an average, gross returns came to Rs. 97,366.04 and Rs. 96,564.52 for first and second cluster while overall gross returns came to Rs. 96,965.28. Net return over cost C_1 and C_2 were calculated Rs. 64,182.60 and Rs. 60,382.60 for first cluster and Rs. 63,965.43 and Rs. 60,465.43 for second cluster. Overall it came to Rs. 64,074.02 and Rs. 60,424.02 per hectare, respectively.

Similarly, family labour income, farm investment income and farm business income were worked out Rs. 67,455.83, Rs. 45,093.25 and Rs. 75,565.64, respectively in case of first cluster and Rs. 67,896.66, Rs. 44,624.99 and Rs. 76,422.56, respectively in case of second cluster. The overall it was observed to Rs. 67,676.25, Rs. 44,859.12 and Rs. 75,994.10 respectively.

Cost of production per quintal of potato was computed Rs. 176.88 in case of first cluster and Rs. 174.02 for second cluster. Overall cost of production/quintal was computed to Rs. 157.91 and Rs. 175.45, respectively. On an average, input-output ratio on the basis of cost A_1/A_2, cost B_1, cost B_2, cost C_1 and cost C_2 were worked out 4.99, 3.73, 3.26, 2.94 and 2.64, respectively for Ist cluster whereas in case of second cluster, it came 4.80, 3.84, 3.37, 2.98 and 2.69, respectively. On an overall basis input-output ratio were 4.65, 3.79, 3.32, 2.96 and 2.67 respectively.

Resource use efficiency of potato production

Cob-Douglas production function was applied for arriving at the resource-use efficiency of various factors of production use in producing potato crop. Return to scale was found 0.6768 indicates that the production process is of decreasing return to scale. Coefficient of multiple determination (R^2) was found more than 0.90 in case of all categories of farms. High value of R^2 reflects that included input factors were explaining more than 90% of variation in production of potato crop in the study area. In some cases, MVP of resources were found less than one while in some cases more than one. Less than one value of MVP revealed that these factors were excessively used while vice-vers more than one value of MVP for factors. It is concluded that there is scope of further readjustment resources of obtain optimum yield of potato crop in the study area.

Table 3 focused the price spread of potato in Shahganj market for both cluster under different marketing channels. In case of first cluster, producer's share in consumer's rupee were 89.73%, 69.33% and 59.75% for Ist, IInd and IIIrd channels, respectively. Same trend for producer's share inn consumer's rupee were observed in IInd cluster too. It is concluded that producer's share in consumer's rupee decreases with increase in number of intermediaries engaged in marketing system. Gross marketing margin increases with increase in number of intermediaries. It was found that direct selling (channel-1) method is most efficient and convenient for both producer's and consumer's point of view. The value of marketing efficiency of each channel is presented in Table-4 indicated that marketing efficiency was inverse. As the number of intermediaries increased, costs and margins increased and inverse was the marketing efficiency at both clusters.

It is suggested that for boosting the profit of potato growers there must be a well-developed infrastructural marketing network for prompt disposal of potato and suitable govt. policy that can safeguard the interest of producers, as well as consumers of potato.

Table 1: Per hectare cost of different inputs used on different size group of potato (Rs.)

Items	Ist cluster					IInd cluster					Overall
	Marginal	Small	Medium	Large	Avarage	Marginal	Small	Medium	Large	Average	
Family labour	8980.27 (27.12)	6720.87 (20.39)	5070.54 (15.87)	3848.24 (12.20)	7073.23 (21.65)	8796.73 (27.56)	7416.52 (24.00)	6113.97 (20.26)	4432.19 (14.93)	7431.23 (23.92)	7252.23 (22.75)
Hired Labour	112.60 (0.34)	1062.26 (3.22)	2228.56 (6.98)	3025.27 (9.59)	1089.90 (3.34)	120.88 (0.38)	1160.15 (3.75)	1748.91 (5.80)	2740.76 (9.91)	1022.52 (3.29)	1056.21 (3.31)
Bullock Power	1120.39 (3.38)	845.95 (2.57)	520.17 (1.63)	247.00 (0.78)	836.20 (2.56)	913.68 (2.86)	698.68 (2.26)	602.48 (2.00)	298.85 (1.01)	727.76 (2.34)	781.98 (2.45)

	Ist cluster					IInd cluster					Overall
Tractor & Machineries	586.43 (1.77)	1075.64 (3.26)	1198.82 (3.75)	1390.00 (4.41)	920.28 (2.82)	657.54 (2.06)	827.23 (2.68)	1243.57 (4.12)	1334.56 (4.50)	888.40 (2.86)	904.34 (2.84)
Seed cost	13425.38 (40.55)	14105.37 (42.81)	14120.90 (44.20)	14180.28 (44.94)	13817.97 (42.29)	12899.48 (40.41)	12137.21 (39.27)	12116.33 (40.16)	12520.97 (42.18)	12514.90 (40.28)	13166.43 (41.32)
Manure & fertilizer	2682.36 (8.10)	2837.56 (8.61)	2515.33 (7.87)	2580.40 (8.18)	2680.41 (8.20)	2627.52 (8.23)	2662.17 (8.61)	2410.18 (7.99)	2218.89 (7.48)	2548.37 (8.20)	2614.39 (8.20)
Irrigation charges	1310.81 (1.51)	1312.24 (3.98)	1185.18 (3.71)	1098.17 (3.48)	1263.05 (3.86)	1448.78 (4.54)	1421.57 (4.61)	1218.35 (4.04)	1208.23 (4.07)	1371.36 (4.41)	1317.21 (4.13)
Plant protection	498.38 (1.51)	545.21 (1.65)	634.33 (1.99)	686.83 (2.17)	557.64 (1.71)	368.39 (1.15)	498.51 (1.61)	620.14 (2.06)	594.75 (62.00)	474.70 (1.53)	516.17 (1.62)
Interest on working capital	592.09 (1.79)	653.53 (1.98)	672.10 (2.10)	696.24 (2.21)	634.96 (1.94)	588.14 (1.84)	582.17 (1.88)	598.80 (1.98)	633.51 (2.13)	593.95 (1.91)	614.46 (1.93)
Rental value of owned land	3800.00 (11.48)	3800.00 (11.53)	3800.00 (11.90)	3800.00 (12.04)	3800.00 (11.63)	3500.00 (10.97)	3500.00 (11.33)	3500.00 (11.59)	3500.00 (11.79)	3500.00 (11.26)	3650.00 (11.45)
Total	33108.71	32958.63	31945.93	31552.43	32673.64	31920.63	30904.21	30172.73	29682.71	31073.19	31873.42

(Value in parentheses denote percentage)

Table 2: Measures of per hectare costs and returns of potato (Rs.)

S. No.	Items	Ist cluster					IInd cluster					Overall
		Marginal	Small	Medium	Large	Average	Marginal	Small	Medium	Large	Average	
1.	Cost A_1/A_2	20328.44	22437.76	23075.39	23904.19	21800.40	19623.90	19987.69	20558.78	21750.52	20141.96	20971.18
2.	Cost B_1	262160.97	26582.73	25509.99	25433.97	26110.21	26616.95	24195.38	24078.44	23595.68	25167.86	25639.04
3.	Cost B_2	30060.97	30382.73	29309.99	29233.97	29910.21	30116.95	27695.38	275478.44	27095.68	28667.86	29289.04
4.	Cost C_1	34241.24	33303.60	30580.53	29282.21	33183.44	35413.68	31611.90	30192.41	28027.87	32599.09	32891.27
5.	Cost C_2	39041.24	37103.60	34380.53	33082.21	36983.44	38913.68	35111.90	33692.41	31527.87	36099.09	36541.27
6.	Gross income	98792.00	97394.00	95996.00	94132.00	97366.04	98326.00	96928.00	94598.00	92268.00	96564.52	96965.28
7.	New return over cost C_4	63550.76	64090.40	65415.47	64849.79	64182.60	62912.32	65316.10	64405.59	64240.13	63965.43	64074.02
8.	New return over cost C^2	59750.76	60290.40	61615.47	61049.79	60382.60	59412.32	61816.10	60905.59	60740.13	60465.43	60424.02
9.	Family labour income	68731.03	67011.27	66686.01	64898.03	67455.83	68209.05	69232.62	67019.56	65172.32	67896.66	67676.25
10.	Farm investment income	48773.77	45048.57	40615.13	38411.99	45093.25	49406.73	42819.59	40712.07	36873.03	44624.99	44859.12
11.	Farm business income	78463.56	74956.24	72920.61	70227.81	75565.64	78702.10	76940.31	74039.22	70517.48	76422.56	75994.10
12.	Cost of quintal production/											
	C_1	166.23	159.35	148.45	144.96	158.69	167.84	151098	148.73	141.55	157.12	157.91
	C_2	184.16	177.53	166.90	163.77	176.43	184.43	168.81	165.97	159.23	174.02	175.45
13.	Input-output ratio											
(a)	On cost A_1/A_2' basis	4.86	4.34	4.16	3.94	4.49	5.01	4.85	4.60	4.24	4.80	4.65
(b)	On cost 'B_1' basis	3.76	3.66	3.76	3.70	3.73	3.69	4.01	3.93	3.91	3.84	3.79
(c)	On cost 'B_2' basis	3.29	3.21	3.28	3.22	3.26	3.26	3.50	3.43	3.41	3.37	3.32
(d)	On cost 'C_1' basis	2.80	2.92	3.14	3.21	2.94	2.78	3.07	3.13	3.29	2.98	2.96
(e)	On cost 'C_2' basis	2.53	2.62	2.79	2.85	2.64	2.53	2.76	2.81	2.93	2.69	2.67
14.	Yield	212	209	206	202	208.94	211	208	203	198	207.22	208.08

Table 3: Marketable and marketed surplus of potato (q.)

Particulars	Ist cluster					IInd cluster					Overall
	Marginal	Small	Medium	Large	Average	Marginal	Small	Medium	Large	Average	
Production	15.23	41.48	62.94	171.17	49.37	15.11	29.99	57.52	148.27	42.59	45.98
Family consumption	2.02 (13.24)	3.59 (8.58)	2.33 (3.70)	4.44 (2.59)	2.77 (5.61)	2.18 (14.43)	2.53 (8.44)	2.77 (4.82)	4.57 (3.08)	2.66 (6.25)	2.72 (5.91)
Seed	1.51 (9.89)	2.77 (6.68)	6.22 (9.88)	8.50 (4.47)	3.52 (7.13)	1.25 (8.27)	2.92 (9.74)	5.17 (8.99)	14.37 (9.69)	3.96 (9.31)	3.74 (8.13)
Wages	0.71 (4.65)	1.57 (3.78)	3.06 (4.86)	3.13 (1.83)	1.65 (3.34)	0.71 (4.70)	1.59 (5.30)	2.28 (3.96)	3.08 (2.08)	1.50 (3.53)	1.58 (3.43)
Losses	0.33 (2.16)	1.26 (3.04)	1.81 (2.88)	2.82 (1.65)	1.14 (2.31)	0.45 (2.98)	1.83 (6.10)	2.27 (3.95)	4.53 (3.06)	1.63 (3.83)	1.39 (3.02)
Marketable surplus	11.02 (72.22)	33.58 (80.96)	51.33 (81.55)	155.10 (90.61)	41.43 (83.92)	10.97 (72.60)	22.95 (76.52)	47.30 (82.23)	126.25 (85.15)	34.46 (80.91)	37.95 (82.53)
Marketed surplus	10.69 (70.06)	32.32 (77.92)	49.52 (78.68)	152.28 (88.96)	40.29 (81.61)	10.52 (69.62)	21.12 (70.42)	45.03 (78.28)	121.72 (82.09)	32.83 (77.08)	36.56 (79.51)

(Values in parentheses denote percentage)
**Overall

Table 4: Marketing efficiency of different marketing channels

Channel	Ist cluster			IInd cluster		
	Values of good sold (consumer's price) Rs/q	Total marketing cost Rs./q	Marketing efficiency	Values of good sold (consumer's price) Rs/q	Total marketing cost Rs./q	Marketing efficiency
I	450.25	46.25	8.74	445.85	52.85	7.44
II	552.45	113.40	3.87	532.68	128.10	3.16
III	658.92	186.67	2.53	661.72	189.97	2.48

Conclusion

The present study on "Production and marketing of potato in Jaunpur district of U.P." has been undertaken with specific objectives viz., to workout the costs and returns of potato production on various categories of farms and resource use efficiency of potato and to work out price spread of potato in Shahganj market of Jaunpur. The study is based on intensive enquiry of 100 farmers selected from two clusters and various groups viz., marginal, small, medium and large, 'Shahganj' was found major market for disposal of potato by the growers of study area. Tabular and functional analyses both were applied for this study. Cob-Douglas production function was used to study the resource-use efficiency.

Cost of cultivation of potato on various size group farms i.e. marginal, small, medium and large farms were observed Rs. 39,041.24, Rs. 37,103.60, Rs. 34,380.53 and Rs. 33,082.21, respectively for first cluster and Rs. 38,913.68, Rs. 35,111.90, Rs. 33,692.41 and Rs. 31,527.87, respectively second cluster. The study revealed that there is inverse relationship between size group of farms and cost of cultivation of potato.

On an average, gross return, net return, family labour income, farm investment income and farm business income came to Rs. 96,965.28, Rs. 60,424.02, Rs. 67,676.25 and Rs. 44,859.12, respectively. Overall, cost of production per quintal on the basis of cost C_1 and C_2 was found Rs. 157.91 and Rs. 175.45, respectively. On an overall average, input-output ratio was found 2.67 per cent. It indicates that output is multiplied by 2.67% of input application for potato crop in the study area.

Functional analysis for resource use efficiency revealed that production process of potato crop is characterized by decreasing return to scale. High value of R2 is obtained for the fitted function indicates that included factor are explaining the maximum variation in yield of potato crop. Less than unity and more than unity value of MVP indicates that there is further scope of readjustment resources to realizing the optimum yield of potato crop in the study area.

Producer's share in consumer's rupee was highest in direct selling i.e. channel-I (producer to consumer) followed by channel-II (Producer to retailer to consumer) and channel-III (Producer to wholesaler to retailer to consumer) in the study area. It is concluded that producer's share in consumer's rupee decrease with the increase in number of intermediaries.

References
1. Chotha IS, Sidhu DS. Production and marketing of potato in Pubjab state. Report, Department of Economics and Sociology, P.A.U., Ludhiana, 1980, 66-73.
2. Dahiya PS, Pandey NK. Economics of potato production and marketing in Himachal Pradesh. Seed and Farms. 1992; 18(1-3):3-8.
3. Kerur NM, Gumgolmath KC, Karmool NN, Dodmani MT. Costs and returns of potato marketing in Dharwad district, Karnataka. Karnataka Journal of Agricultural Sciences. 1998; 11(2):426-431.
4. Krishna M. Some emerging aspects of production and marketing of vegetable in Bihar. Indian Journal of Agricultural Marketing special Issue, 1994, 144-147.
5. Navappanavar SR, Bavur SB. The Marketing Problems of Potato: A study in Dharwad district of Karnataka. The Bihar Journal of Agricultural Marketing. 1998; 4(2):154-159.
6. Pandit A, Pandey NK, Rana RK, Kumar NR, Pandey SK, Singh Brajesh. Potato production and marketing impediments in West Bengal. Journal of the Indian Potato Association. 2003; 30(1-2):207-208