

RESEARCH ARTICLE :

Economic performance of pigeonpea in Raigarh district of Chhattisgarh state

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SUMMARY : The present study was conducted in the Raigarh district of Chhattisgarh. Hundred farmers were selected randomly from five blocks namely Dharamjaigarh, Lailunga, Pusour, Baramkela and Sarangarh. The primary data were collected for the year 2013-14. The major findings of this study revealed that the average size of holding of the sample households was 3.19. Cost of production per quintal of pigeonpea showed decreasing trend with the increase in farm size, whereas cost of cultivation increased with the increase in farm size. Per hectare pigeonpea production and input-output ratio increased with the increase in farm size. The two marketing channels were identified for the marketing of pigeonpea: Channel-I: Producer – Village merchant. Channels-II: Producer – consumer. The major constraints pertaining to cultivation of pigeonpea were low adoption of recommended package practices of crops, followed by lack of technical knowledge and lack of financing. Constraints of marketing of pigeonpea were lack of regulated or co-operative market followed by lack of market intelligence and lack of storage facility. Study suggested establishing the regulated or co-operative market in Raigarh district and imparting the technical knowledge and extension support so that farmers can adopt improved technologies with assured irrigation facilities. It is essential to adopt the production system approach by linking the production technology, credit and marketing of pigeonpea, the study suggested.

KEY WORDS:

Pigeonpea, Cost and Return, Marketing Pattern, Constraints

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BACKGROUND AND OBJECTIVES

Pulse crop is important protein source for the majority of the people of India. It contains protein about twice as much as cereals. It also contains amino acid lysine, which is generally deficit in food grains (Elias, 1986). Pulse bran is also used as quality feed for animals. Apart from these, the ability to fix nitrogen and addition of organic matter to the soil are important factors in maintaining

soil fertility (Senanayake *et al.*, 1987 and Zapata *et al.*, 1987). In the existing cropping systems, pulses fit well due to its short duration, low input, minimum care required and drought tolerant nature. Among the food legumes grown, lathyrus, lentil, chickpea, blackgram, and mungbean are the major and they contribute more than 95% to the total pulses production in the country (Rahman, 1998).

India is largest producer of pulses in the world with 25 per cent share in global

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production. Chickpea, pigeonpea, mungbean, uradbean, lentil, and fieldpea are important pulses crop contributing 39 per cent, 21 per cent, 11 per cent, 10 per cent, 7 per cent and 5 per cent to the total production of pulses in the country. The total production was estimated 14.56 million tonnes and an area of 23.63 million hectares with average productivity 625 kg/ha. Climate change will surely have an adverse impact on productivity on account of reduction of total crop cycle duration. Most of the pulses like mungbean and urdbean short duration crop.

Pigeonpea [*Cajanus cajan* (L.) Millsp.] is a grain legume belonging to the *Cajaninae* sub-tribe of the economically important leguminous tribe *Phaseoleae*. Pigeonpea crop can be described as unique because it is a legume and a woody shrub. It has an inherent ability to withstand environmental stresses (especially drought) making it one of the most sought after crops in plant introduction trials aimed at bringing new areas under cultivation (Okiror, 1986).

India is the world's largest pigeonpea producer and grows over 70% of the total world production. Pigeonpea is now reported to be grown in 50 countries of Asia, Africa and the Caribbean, where its name "pigeonpea" is thought to have originated. The global annual production of pigeonpea was 3.7 million tonnes in 2010 (FAOSTAT, 2012).

Presently, the yield of pigeonpea as other pulses is well below the optimum level. The average yield of pigeonpea is low not only in India (780 kg/ha) but in entire tropical and sub tropical Asia. Pigeonpea is most important pulse crop of the Chhattisgarh state. Pigeonpea presently occupies an area of 0.528 million hectare with a production of 0.24 million tonnes. The major pigeonpea growing districts are Surguja, Koriya, Bilaspur and Rajnandgaon. Higher productivity of pigeonpea is obtained in Raigarh and Surguja district (524 kg per hectare).

The Raigarh district occupies second largest pulse acreage 31100 hectare (12.02 %) (25688 hectare in *Kharif* and 5420 hectare in *Rabi*), and fourth largest in production which is 8920 metric ton (9.64 %) (6640 metric ton in *Kharif* and 2280 metric ton in *Rabi*) with average productivity of 286.81 kg per hectare. Keeping in view the economic importance of pulses in the study area, the present enquiry related to production and marketing of pigeonpea has been undertaken in Raigarh district of Chhattisgarh. The findings of present enquiry

would be of great significance to the policy makers for enhancing the profitability of pigeonpea substantially.

Pigeonpea under this study constitutes emerging crops in Chhattisgarh and the economic aspects of pigeonpea production and marketing are not adequately known to narrow down the productivity gap. The present study was undertaken Raigarh district of ten villages of Lailunga, Dharamjaygarh, Baramkela, Sarangarh and Pusour blocks with following objectives.

- To workout the cost and returns of pigeonpea.
- To examine the marketing pattern of pigeonpea.
- To identifying the constraints in production and marketing of pigeonpea and suggest suitable measures to overcome them.

RESOURCES AND METHODS

To accomplish the objective of the study multi stage stratified random sampling has been used. Accordingly five blocks of the district, namely Dharamjaygarh, Lailunga, Pusour, Baramkela and Sarangarh block were purposively selected. Accordingly ten villages were selected randomly from each block for the study. From each of the selected villages, ten number of pigeonpea growers and total 100 pigeonpea growers were considered for the present study. The Primary data were collected from the farmers through personal interview with the help of well prepared schedule and questionnaire. These farmers were classified into different categories based on their land holding *i.e.* marginal (upto 1.00 ha), small (1.01 ha to 2.00 ha), medium (2.01 ha to 4.00 ha) and large (above 4.00 ha) farmers. The whole information was related to the crop year 2013-2014.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads:

Economics of pigeonpea crop :

The economics of pigeonpea crop is presented in Table 1. It clearly shows that the cost of cultivation per hectare of pigeonpea was higher on large farms as compared to marginal farms. Over all, on an average the cost of cultivation per hectare of pigeonpea was found to be Rs. 15578.51 per hectare. The cost of cultivation in case of large farm was higher (Rs. 16308/ha) as

compared to small (Rs.14993.38/ha) and medium farms (Rs. 16126.38/ha). The cost of cultivation of pigeonpea was found to be undifferentiated across medium and large farm groups. This could be due to similar response to this pulse crop by the sampled farmers. The cost of cultivation per hectare showed a marginal rising trend with the increase in size of farm. It was due to the fact that the large farmers incurred more expenditure on modern farm input like quality seed, fertilizer, plant protection material, hired labour etc. as a result of borrowing from credit institutions and better economic status compared to small farmers.

The cost of cultivation was estimated to be very less which is due to the fact that the pigeonpea growers in sampled farm groups did not follow recommended cultivation practices for growing the crop. It returns less production; therefore, extension work is being needed to improve the knowledge of farmers about recommended cultivation practices of pigeonpea.

Table 2 indicates that the average yield per hectare of pigeonpea was 5.66 quintal on the sample farms. The cost of production per quintal of pigeonpea on an average was worked out to Rs. 2762.93. It came to Rs. 2894, Rs. 2643 and Rs. 2588.68 for small, medium and large farm size, respectively. The cost of production was very high due to less production as compare to cost of cultivation. Therefore, it is needed to increase the

productivity of pulses by providing high yielding varieties of pigeonpea, creating and strengthen irrigation facilities, extension support to pigeonpea growers by way of training and skill development in adoption of recommended package and practices for pigeonpea cultivation. The cost of production decreased with the increased in the size of farm due to higher yields in return to the cost of cultivation on the large farm. The average value of production per hectare came to Rs. 33036.51. It was Rs. 30608, Rs. 35032 and Rs. 36786 on small, medium and large farm, respectively. The higher value of output on large farms was associated with the higher expenditure incurred on modern farm inputs.

The Table 3 indicates that, on an average the value of net average family labour income and farm business income per hectare came to Rs. 22224.03 and Rs. 23098.78, respectively, on the sample farms of different sizes. Overall, on an average the input-output ratio of pigeonpea came to 1: 2.31 on the sample farms. It was observed to be highest increase of large pigeonpea growers. However, the input output ratio was more or less equal in case of small and medium farmers.

Marketing pattern :

In Raigarh district there was no regulated market for pulses, that's why the study for marketing of pigeonpea was conducted at farmer's level. It was that

Table 1 : Economics of pigeonpea on different size groups of farms (Rs./ha)

Sr. No.	Particulars	Farm size			Average (Rs./ha)
		Small	Medium	Large	
Variable cost					
1.	Family human labour	4843 (32.30)	2400 (14.88)	1333 (8.17)	3488.3 (21.88)
2.	Hired human labour	2914 (19.44)	6650 (41.24)	7800 (47.83)	4919.15 (30.85)
3.	Total human labour	7757 (51.74)	9050 (56.12)	9133 (56.00)	8407.52 (52.73)
4.	Bullock labour	2096 (13.98)	1000 (6.20)	370 (2.27)	1467.40 (9.20)
5.	Tractor power	1533 (10.22)	2774 (17.20)	2886 (17.70)	2161.82 (13.56)
6.	Seed cost	1310 (8.74)	852 (5.28)	513 (7.49)	1134.53 (7.11)
7.	Plant protection material	150 (1.00)	270 (1.67)	513 (3.15)	242.83 (1.52)
8.	Manure and fertilizer	-	-	1110 (6.81)	153.10 (0.96)
9.	Interest on working capital	385.38 (2.57)	418.38 (2.59)	423.69 (2.60)	402.42 (2.52)
	Total variable cost	13231.38 (88.25)	14364.38 (89.07)	14546.69 (89.20)	13816.51 (86.64)
Fixed cost					
1.	Rental value of land	1750 (11.67)	1750 (10.85)	1750 (10.73)	1750 (10.97)
2.	Land revenue	12 (0.08)	12 (0.07)	12 (0.07)	12 (0.08)
3.	Total fixed cost	1762 (11.75)	1762 (10.93)	1762 (10.80)	1762 (11.05)
	Gross cost = (A+B)	14993.38 (100)	16126.38 (100)	16308.69 (100)	15578.51 (100)

Note: Figures in parentheses indicate per cent of total input cost.

only one market functionary was engaged in marketing of pigeonpea in the study area that was village merchant. In view of this, the pigeonpea growers sold their produce directly to the consumers in the village market. Keeping this in mind it is suggested that regulated market for pulses in the study area needed to be established.

The following two widely used marketing channels for marketing of pigeonpea were identified.

Channel – I:

Producer - Village merchant- consumer

Channel – II:

Producer - consumer (village market)

Marketable surplus of pigeonpea :

Marketable surplus of pigeonpea was observed to

be very low for all the sample farms. This less marketable surplus was due to traditional cultivation which led to very less production of pigeonpea. The major reason for less marketable surplus was that the sample farmers lacked any regulated or cooperative market in the study area to sell their produce. The farmers cultivated pigeonpea mainly for own consumption purpose instead of commercial purpose, which resulted in less marketable surplus for all the major pulses in the study area. Table 4 indicates the marketable surplus in pigeonpea was 2.66, 3.65 and 3.73 quintal per farm constituting 51.35, 58.84 and 58.93 per cent to their total production. On an average the marketable surplus in pigeonpea was worked out 3.35 quintal constituting 56.97 per cent.

The total quantum of marketable surplus of small size group was found to be less as compared to farms of

Table 2 : Per hectare yield, value of output and cost of production per quintal of pigeonpea

Sr. No.	Particulars	Farm size			Average
		Small	Medium	Large	
1.	Input cost (Rs.)	14993.38	16126.38	16308.69	15946.13
2.	Production (q)				
	Main product	5.18	6.1	6.3	5.66
	By product	6.25	7.7	8.8	7.12
3.	Value of production				
	Main product	30395	34770	36540	32801.49
	By product	213	262	246	235.01
	Total value of production	30608	35032	36786	33036.51
4.	Cost of production (Rs./q)	2894.47	2643.67	2588.68	2762.93

Table 3 : Cost and return of pigeonpea on the sample farms for different group of farms (Rs./ha)

Sr. No.	Particulars	Farm size			Average
		Small	Medium	Large	
1.	Input cost	14993.38	16126.38	16308.69	15946.13
2.	Output value	30608	35032	36786	33036.51
3.	Net income	17345	19833	21000	18735.67
4.	Family labour income	22188	22233	22333	22224.03
5.	Farm business income	22593	23474	23984	23098.78
6.	Input output ratio	1:2.31	1:2.30	1:2.36	1:2.31

Table 4 : Marketable surplus of pigeonpea at sample farms (q/ha)

Sr. No.	Particulars	Size groups			Average
		Small	Medium	Large	
1.	Total quantity produced	5.18 (100)	6.1 (100)	6.3 (100)	5.66 (100)
2.	Quantity retained for the seed	0.37 (7.14)	0.35 (5.74)	0.44 (6.95)	0.37 (6.54)
3.	Consumption and others	2.14 (41.31)	2.1 (34.43)	2.16 (34.12)	2.13 (37.63)
4.	Total quantity utilized	2.52 (48.65)	2.45 (40.16)	2.60 (41.07)	2.51 (44.35)
5.	Marketable surplus	2.66 (51.35)	3.65 (58.84)	3.73 (58.93)	3.16 (55.83)

Note: Figures in parentheses indicate percentages to total quantity produced

large size group. The increasing trend of marketable surplus as percentages to total production with the increase in the size of farms for pigeonpea was due to the fact that proportion of retained quantity of pigeonpea for various purposes on the farms decreased with the increase in production of pigeonpea crops as the farm size increased.

Constraints in production and marketing of pigeonpea :

Under major constraints pertaining to cultivation of pigeonpea, lack of adoption of recommended package and practices of pigeonpea crop was the most problem as reported by 96 per cent pigeonpea growers, constituting 100, 97.73, 93.55 and 91.67 per cent in marginal, small, medium and large farms, respectively. In view of this, there is a strong need to strengthen extension services against the green gram growers in study area.

The second most important constraint faced by the pigeonpea growers was problem of lack of resources, like quality seeds, chemicals, and scarcity of land (72 %), constituting 92.31, 90.91, 61.29 and 8.33 per cent in marginal, small, medium and large farm, respectively.

The other most important constraints reported by the pigeonpea growers were lack of irrigation facility (63 %), constituting 76.92, 75.00, 61.29 and 8.33 per cent in marginal, small, medium and large farm, respectively. The other constraints was lack of technical knowledge (56 %), mostly faced by marginal farmers (84.62 %), lack of financing (52 %) and lack of HYV seeds (42 %). The last two were also faced by marginal farmers as 92.31 and 76.92 per cent, respectively.

Looking to the problem faced by the pigeonpea grower in the study area, it is pertinent to address these constraints. Accordingly, need to impart training skills to the pulse grower on production aspect through extension support such as on farm training, demonstration etc. to enhance the adoption of recommended package and practices for pulse cultivation and technical knowledge. Credit support should be made more accessible and still affordable to the pigeonpea growers in the region, in order to solve the lack of resource problems. Irrigation facilities are to be created and developed in the proper way so that farmers can adopt improved technologies. Quality seeds or HYV seeds should be provided at very low price by Government agencies which will meet out the HYV seed requirement by the pigeonpea growers.

Under major constraints pertaining to marketing of pigeonpea, lack of regulated and cooperative market was the most important problem as reported by 100 per cent pigeonpea growers. The second most important constraints reported by the growers was small marketable surplus (85 %), marginal and small farmers reported 100 per cent. Lack of market intelligence (80 %), mostly reported by marginal farmers (92.31 %) followed by medium and small farmers. Lack of storage facility (65 %), mostly reported by large farmers (91.67 %) and lack of transportation (52 %) were the other prominent constraints reported by the pulse producers in sampled areas.

The pulse growers encountered many problems in marketing of pigeonpea. Looking to this, there is a need to establish regulated market in the study area and storage facilities in the storage area. Increased extension effort is required to enhance marketing news, information and intelligence on different aspects of production and marketing of pigeonpea.

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REFERENCES

- Baldev, B.** (1988). *Cropping pattern in pulse crop* (Grain Legumes), Eds Baldev B, Ramanujam S, Jain HK. Oxford & IBH Publishing Co. Pvt. Ltd. p. 513-557
- Deshmukh, M.K.** (2008). Production and marketing of soybean Rajnandgaon District of Chhattisgarh". M.Sc. (Agri. Eco.) IGAU-T-2143_2008, Thesis, Indira Gandhi Agricultural University, Raipur, C.G (India).
- Elias, S.M.,** Hossain, M.S., Sikder, F.S., Ahmed, Juber and Rezaul Karim, M. (1986). Identification of constraints to pulse production with special reference to present farming systems. Annual Report of the Agricultural Economics Division, BARI, Joydebpur, p-I.
- Kumar, Sunit** and Bourai, V.A. (2012). Economic analysis of pulses production there benefits and constraints (A case study of sample village of Assan Valley of Uttarakhand)", *IOSR J. Humanities & Soc. Sci.*, **1** (4) : 41-53.
- Okiror, M.A.** (1986). Breeding for resistance to *Fusarium* wilt. Ph.D. Thesis, University of Nairobi.
- Rahman, M.M.** (1998). Technology information on lentil, blackgram and mungbean , Lecture note, Training Workshop

on Lentil, Blackgram and Mungbean at BARI, Joydebpur, Gazipur, February 22-23

Senanayake, L., Knieval, D.P. and Stevena, S.E. (1987). Nodulation and symbiotic nitrogen fixation of cowpea (*Vigna unguiculata* L.). *Plant Soil*, **99** : 435-439.

Shrivastava, S. (1990). Analysis of growth trend in area production and productivity of redgram (Arhar). *IJPR*, **3** (1) :

97-98.

Zapata, F., Danso, S.K.A., Hardarson, G. and Fried, M. (1987). Nitrogen fixation and translocation in field-grown fababean. *Agron. J.*, **79** : 505-509.

WEBLIOGRAPHY

FAOSTAT (2012). <http://faostat.fao.org/faostat/collections?version=ext&hasbulk0&subset=agriculture>.

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