Assessing the Comparative Economics of Chickpea: FPOin Banda District of Bundelkhand Region

Abstract

This paper critically examineseconomics of the members and non-members chickpea growersof the FPOsin the Banda District of Bundelkhand region.Thestudy was designed to explore the feasibility of chickpea production in Banda district, whichencompasses eight blocks i.e. BadokharKhurd, Jaspura, Tindwari, Naraini, Mahuva, Baberu, Bisanda and Kamasin. Among these, Mahuwa block was selected purposively, because it had highest number of FPOs. In Mahuva block, out of eight FPOs,four FPOs were selected. From the selected FPOs,60 members who cultivated chickpea of their farm were sampled. 60 respondents who were not a member of any FPOs were selected from 4 villages.Total sample size were 120 respondents. The profitability analysis indicates that the total cost of cultivation for FPOs members was lower (Rs. 34821.03) per hectare and non-members was higher (Rs. 36186.01) per hectare. The analysis of return indicates about the total net return of FPOs members was Rs. 27542.72 per hectare and cost of production was estimated Rs.2161.45per qtl., while the total net return for the non-members was Rs. 12922.88 per hectare and cost of production was estimated Rs. 2631.70per qtl. The benefit cost ratio (BCR) for FPOs members was 1:1.79 whereas non-members were 1:1.35. This indicates that the FPOs members spends less and earns more in comparison to non-members of chickpea growers in the study area.

Key Words: ***Chickpea, FPOs member's and Non FPO member'sprofitability, Cost of cultivation etc.***

Introduction

Farmer producers'organizations (FPOs) are a well-knowntool for augmentingincome of Indian farmers through the market – oriented approach. The Producer Company was set up in 2002,known as authorized institution for farmers with thepurpose headed for refining the standard of living, position, betterincome augmentation and returns of the farmers and entrepreneur (*Dilip et al., 2022*). About 7374 Farmer's Producers Company (FPCs) are present in India which covers about 4.3 million farmers (*NABARD 2019*). However, the inherent strengths and capabilities of these organization have been considered an effective tool for improving the capabilities ofmarginal and small farmers such as improve the bargaining power to purchase and

sale of critical inputs and outputs (*Onumah et al., 2007; Barham &Chitemi 2009*). The FPO members are able to leverage collective strength and bargaining power to easy access financial and non-financial inputs, service and appropriate technologies, reduce the transaction cost and generate the farm and non-farm sector employment round the year (Kumar et al., 2015 & Singh et al., 2018).During the globalization and market liberalization,marginal and small farmers have faced several challenges and opportunities in agriculture sector. The weak and volatile market price and state support against the risks, especially formarginal and small farmerswithout access to reliable and affordable inputs, credits transport facilities have proved to be insufficient (Penrose – Buckley 2007).

High cost of production, low returns and poor market linkage of the marginal for small farmers has inhibited the growth of agriculture sector.The scenario of Indian agriculture sector is facing several challenges viz. declining per capita agricultural land availability (due to increased fragmentation of land holdings), declining natural resource base, increasing demand of land for non-agricultural purposes due to urbanization and industrialization, breaking of joint to nuclear families, disinterest or disenchantment of youth towards agriculture, lack of access to credit, lack of market information, higher input price change, low level of technological adoption etc. Currently more than 40 percent of farmer does not practice farming as a profession and now they could get the change of their agricultural practices as source of livelihood (*NSSO Report, 2014*).Beside, small and marginal farmers constitute the largest group of cultivators in the country. The share of land holding of small and marginal farmers in total holdings has increased from 80.80 per cent in 2000-01 to 85 per cent in 2010-11 due to increasing population and family fragmentation in land holdings. Further, the average size of land holding in country is 1.15 hectare and the current land holding is 1.08 hectares*(Alam, g., and Verma, d., 2007).*Hence, the state and central government has taken several initiatives for uplifting the income of small holder farmer through integrated approach PPOs is one of drivers which can increase the production, productivity of *(Janaiah et al., 2005).*

Bundelkhand region comprises seven district in southern UP i.e. Jhansi, Lalitpur, Jalaun, Hamirpur, Mahoba, Banda and Chitrakoot. Agriculture is the predominant occupation in the region and availability of land used for cultivation in the region is considerably of lower fertility than in other agriculture zones of the Uttar Pradesh. In the western UP, for instance, over 75 per cent of the total area is used for cultivation.The area of chickpea in Bundelkhand region of UP is about 2,77,336 hectares, while production was about 3,08,916 metric tonnes and average

productivity was 1045 kg/ha. Out of seven district of UP Bundelkhand region, Banda district covering the highest area 96,314 hectare and production 87,395 metric tonnes. Thus the Banda district has contributed 34.72 per cent area and 28.29 per cent in production of chickpea crop in UP Bundelkhand region.Apart from this, in Banda district, the number of marginal farmers were 1,64,721 and small farmers were 55,333. About 73,026 haof holding were owned by marginal farmers whereas about 77432 ha. of land holding was owed by the small farmers. The average income of a household was Rs. 45,230 for marginal farmers & Rs. 87,221 for small farmers (*DA&FW, 2015*). Though, in this region the land holding shrinking due to breakup of the farm family, the marginal and small size of holding associated with small marketable surpluses and facing the difficulties to access the critical inputs such as absence quality seed, poor communication network, big involvement of local traders and middlemen(*Negi et al., 2018*).In Bundelkhand region, utilizing the economies of scale through collective approach which is also known as FPOs has provided the self-sustaining holistic solution to the problem of farmers like bargaining power of input and sale of output (Kirsten & Sartorius2002). The collective approach of the farmers any organization can be easily resolve the issues and claim of crop production of member's farmers (*Imrankhan et al., 2023*).

Research Methodology

The profitability of chickpea FPOs members and Non- members was estimated according to CACPs methodology to work out the cost of cultivation used in fixing the supplied prices, CACP relies on the cost concept which covers all items of expenses during cultivation including imputed value of the own land interest on the working capital. The operational and fixed cost was worked out to estimate the cost of production of chickpea.

Cost of Production

The expenditure incurred in producing a unit quantity of output is called cost of production measured in the term of per quintal.

$$\text{Cost of production (Rs/qt.)} = \frac{Totalcost^{(Rs./a)}}{Mainproduct^{(qt/a)}}$$

Net Income

The net income was found out the gross income minus total cost of cultivation i.e., price of seed, manure and fertilizers, wages of hired labour and imputed value of unpaid family labour, depreciation, rent, interest on owned and working capital, managerial cost etc.

Net Income= Gross income – Cost C_3

Benefit Cost Ratio= $\frac{Gross\ Income}{Total\ COST}$

Results and Discussions

Table 01. Cost of cultivation of chickpea of FPOs members (Rs /ha)

S.No.	Item wise of cost of cultivation		Amount (Rs.)	Percentage (%)
i.	Human Labour	Family	5012.06	15.83
		Hired	1414.71	4.47
		Total	6426.77	20.30
ii.	Animal Labour	Hired	-	-
		Owned	769.5	2.42
		Total	769.5	2.42
iii.	Machine Labour	Hired	3033.09	9.58
		Owned	414.58	1.31
		Total	3447.67	10.89
iv.	Fertilizer & Manure		2132.14	6.73
v.	Seed		3080.66	9.73
vi.	Plant protection		405.58	1.32
vii.	Irrigation Charges		2421.87	7.65
viii.	Interest on Working Capital @7 per cent		372.53	1.17
1.	**Total Operational Cost**		19056.72	60.21
i.	Rental Value of Owned Land		10500	33.16
ii.	Rent Paid for Leased-in-Land (tax/revenue charge)		50.55	0.18
iii.	Depreciation on Implements & Farm Building @ 10 per cent		788.22	2.48

iv.	Interest on Fixed Capital@ 12 per cent	1260	3.97
2.	**Total Fixed Costs**	12598.77	39.79
3.	**Total cost[1+2]**	31655.49	90.00
	Managerial cost(10% of total cost)	3165.549	10.00
4.	**Total Cost of Cultivation**	34821.03	100

Per hectare operational cost and fixed cost incurred in the cultivation of Chickpea of member farmers of FPOwas estimated to beRs. 12598.77 and Rs. 12598.77 per ha respectively. The average total cost of cultivation per hectare was found to be Rs.34821.03Out of this, operational cost was Rs. 19056.72which accounted for 60.21per cent of the total cost. The fixed cost was Rs. 12598.77 which accounted for 39.79per cent of the total cost. Rental value of owned land was the largest component in the total cost contributing up to 33.16 per cent of the total cost followed by Human labour which was to the tune of 20.30 per cent. The interest on working capital, Depreciation on Implements & Farm Buildingand Plant Protection had very less contribution in the total cost which was 1.17 per cent,2.48 per cent and 1.32 per cent, respectively. The depreciation of building and farm management were as found to be Rs/ha. 788.22 per ha. of cultivated land area(Panday*et al.*,2021*)*.

Table 02. Cost of cultivation of chickpea for non-members (Rs. /ha)

S. No.	Item wise of cost of cultivation		Amount(Rs.)	Percentage (%)
i.	Human Labour	Family	5123.66	13.78
		Hired	1586.37	4.27
		Total	6710.03	18.05
ii.	Animal Labour	Hired	-	-
		Owned	837	2.56
		Total	837	2.56
iii.	Machine Labour	Hired	3329.86	9.17
		Owned	571.24	1.57
		Total	3901.1	10.74
iv.	Fertilizer & Manure		2332.92	6.38
v.	Seed		3414.05	9.34
vi.	Plant protection		466.46	1.27

vii.	Irrigation Charges	2331.63	6.37
viii.	Interest on Working Capital@7 per cent	400.68	1.09
1.	**Total Operational Cost**	20393.87	55.80
i.	Rental Value of Owned Land	10,500	28.72
ii.	Rent Paid For Leased-in Land(tax/revenue charge)	52.31	0.16
iii.	Depreciation on Implements & Farm Building	690.20	1.88
iv.	Interest on Fixed Capital @12 per cent	1260	3.44
2.	**Total fixed cost**	12502.51	34.20
3.	**Total Costs[1+2]**	32896.38	90.00
	Managerial cost(10% of total cost)	3289.638	10.0
4.	**Total Cost of cultivation**	**36186.01**	**100**

Per hectare operational cost and fixed cost incurred in the cultivation of chickpea of non-member farmers of FPO was estimated to beRs. 20393.87and Rs. 12502.51per ha respectively. the average total cost of cultivation per hectare was found to be Rs.36186.01 out of this, operational cost was Rs. 20393.87 which accounted for 55.80 per cent of the total cost. Fixed cost of non-member farmer was Rs. 12502.51 which accounted for 34.20per cent of the total cost(Kumar*et al.,* 2017). Rental value of owned land was the largest component in the total cost contributing up to 28.72 per cent of the total cost followed by Human labour which was to the tune of 18.05 per cent. Interest on working capital, depreciation on implements &farm buildingand plant protection had very less contribution in the total cost which was 1.09 per cent1.88 per cent and 1.27 per cent respectively. From the above observation it can be seen that the cost of cultivation of member farmers less than that non-member farmers of FPO (*Basumatarya et al., 2022*). This difference was due to FPO provided timely, chiefly and quality input for member farmers as well as technical services and provided improved technology and modern infrastructure.

Table 03. Returns in chickpea cultivation of FPOs members (Rs. /ha)

S.No.	Items	Amount (Rs. /ha.)	(%)
1.	Grossreturn:		

i.	Mainproduct	60576	95.31
ii.	Byproduct	1787.75	4.69
2.	TotalReturn	**62363.75**	100
3.	Costof cultivation	34821.03	-
Netreturn		**27542.72**	-
4.	Main Produce(Qtl/ha.)	12.62	-
5.	By Produce(Qtl/ha.)	3.49	-
6.	Cost of Production per quintal	2161.45	-
7.	Average sell Price main produce Per quintal	4800	-
8.	Average sell Price by produce Per quintal	512.25	-
9.	**Benefit cost ratio**	1:1.79	-

It was found that per hectare returns for FPO members from main product was Rs 60,576 which was also estimated 95.31 per cent of the total returns. Further the by-product yield was Rs. 1,787.75 per hectare and that is also contributing to the tune of 4.69per cent in the total returns. While the net return obtained by the farmers from chickpea production in the state was Rs. 27,542.72 per hectare(Dubey *et al.*, 2013).

Table04 Returns in chickpea cultivation of non-members (Rs. /ha)

S.No.	Items	Amount (Rs. /ha.)	(%)
1.	Gross return from		
i.	Main product	47608	96.36
ii.	By product	1500.89	3.64
2.	Total Return	**49,108.89**	100
3.	Cost of cultivation	36,186.01	-
Net return		**12,922.88**	-
4.	Main Produce (qtl/ha.)	10.82	
5.	By Produce (qtl/ha.)	2.93	
6.	Cost of Production per quintal	2631.70	-
7.	Average sell Price of main produce Per quintal	4400	-
8.	Average sell Price of by produce Per quintal	512.25	
9.	Benefit cost ratio	1:1.35	-

The per hectare returns analysis of FPOs member revealed that the member farmers return from main product was Rs 47,608 which formed 96.36 per cent of the total returns. Whereas the by-product return was Rs. 1500.89 per hectare and contributing to the tune of 3.64 per cent in the total returns. The net return obtained by the farmers from chickpea production in the state was Rs 11633.15 per hectare(Verma*et al.*,2015).

Table 05. Cost concept of chickpea FPOs members

S.No.	Cost concept	Amount(Rs/ha)	Percentage (%)
1.	Cost A_1	14,832.88	42.59
2.	Cost A_2	14,883.46	42.74
3.	Cost B_1	16,143.34	46.36
4.	Cost B_2	26,643.49	76.51
5.	Cost C_1	21,155.46	60.75
6.	Cost C_2	31,655.49	90.00
7.	Cost C_3(Total cost)	34,821.03	100

The according to CACP cost concept, various costs incurred by the respondent in chickpea cultivation *viz.*, Cost A_1 amount of 14,832.88 Rs/ha (per cent) followed by Cost A_2 amount of 14,883.46 Rs/ha (per cent), Cost B_1 amount of 16,143.34Rs/ha (per cent), Cost B_2 amount of 26,643.49 Rs/ha (per cent), Cost C_1 amount of 21,155.46 Rs/ha (per cent), Cost C_2 amount of 31,655.49Rs/ha (per cent) and at last the total cost of 34,821.03 Rs/ha (per cent) *viz.*,Cost C_3.

Table 06. Cost concept of chickpea producernon- member of FPOs

S. No.	Cost concept	Amount (Rs/ha)	Percentage (%)
1.	Cost A_1	15,960.41	44.10
2.	Cost A_2	16,012.72	44.25
3.	Cost B_1	17,272.72	47.73
4.	Cost B_2	27,772.72	76.74
5.	Cost C_1	22,396.38	64.65
6.	Cost C_2	32,896.38	90.00
7.	Cost C_3(Total cost)	36,186.01	100

TheCACP cost concept for nonFPOs membersincludes costs incurred on the chickpea cultivation *viz.,* Cost A_1 amount of 15,960.41 Rs/ha (per cent) followed by Cost A_2 amount of 16,012.72 Rs/ha (per cent), Cost B_1 amount of 17,272.72 Rs/ha (per cent), Cost B_2 amount of 27,772.72 Rs/ha (per cent), Cost C_1 amount of 22,396.38 Rs/ha (per cent), Cost C_2 amount of 32896.38 Rs/ha (per cent) and at last the total cost of 36,186.01 Rs/ha (per cent) *viz.,* Cost C_3

Conclusions and Suggestions

The present investigation concluded that the cost of cultivation of respondents who were not the member of any FPO was higher as compared to the cost of cultivation of respondents who were a member of an FPO. However, it was observed that the gross return of an FPO member was higher than those of non-members. Similarly, net return of an FPO member was more than twice than that of a farmer who was not the member of any FPO in the study area.This results of the Banda district of Bundelkhand region investigation suggested that as institution such as FPO has been very effective to collect very new information for chickpea crop management like quality seed, fertilizers, pesticide at cheaper price and getting remunerative prices for their produce. Resulted the FPO member are getting significant profit of form of income as compare to non-members in the study area.

Suggestions

1. During the survey it was found,FPO members has reported that the availability fundsdoes not provide timely that break the input service. Hence, it need to support and proper monitoring in Banda district in Bundelkhand region.
2. There were some farmers of member of FPO, but they do not know the member of any organization, in this, context proper record should be maintained as well as awareness and interest should be developed.
3. The formation of FPO on the basis of cropping pattern of the particular zone, area under crop, production etc., of crop and right tools should be identification of members should contribute significantly.
4. In the study area there is need to established the processing and value addition for chickpea along with from the various group such production, processing and marketing group and trend them. This expertise deals the situation better and enhance the income of FPO members.
5. Besides of theses, of all risks taking for arranging his produce to sell directly to long distance

market to get more profit avoided the exploitation by market intermediaries at any other platformof chickpea grower in study area.

References

Alam, G., and Verma, D. (2007). India, connecting small-scale farmers withdynamic markets: a case study of a successful supply chain inUttarakhand. Regoverning markets. 24-26.

Barham, J. &Chitemi, C. (2009). Collective action initiatives to improve marketing performance: lessons from farmer's groups in Tanzania. Food Policy, 34 (1): 53-59.

Basumatarya, M. M., Deka, R.S., Bezbaruah R. &Hoque, J. (2022). Productivity and Profitability of Toria through Frontline Demonstrations (CFLD) in Morigaon District. Asian J. of Agric. Ext., Eco. & Socio. 40(9): 202-208.

Chand, R. (2017) Doubling Farmers' Income Rationale, Strategy, Prospects and Action Plan. NITI, Aayog.

Department of Agriculture & Farmer's Welfare, Ministry of Agriculture & Farmers Welfare*(GOI)* 2015.

Dubey, L. R., Pal, H. R., & Singh, S. P. (2013). A Study of Costs and Returns for Rapeseed-Mustard on Sample Farms of Bharatpur District of Rajasthan. Agricultural Science Digest-A Research Journal. 34 (4): 257-262.

Hegde, N. G. (2010) Development of value chain for suitable agriculture. Financing Agriculture, 42 (7): 26-28.

Janaiah, A., Otsuka, K. & Hossain, M.(2005). Is the productivity impact of the green revolution in rice vanishing? Empirical evidence from TFP analysis. Econ. Polit. Wkly. 5596–5600.

Jiragala, I., GanesamoorthiS.,MohankumaraandT. L.&NarayanswamyC. (2023). Constraints and Suggestions of Beneficiary and Non-beneficiary of Farmers towards Pradhan MantriFasalBimaYojana in Kolar District of Karnataka. Asian J. of Agric. Ext., Eco. & Socio. 41(4): 55-61.

Kirsten & Sartorius K. (2002). Linking agribusiness and small-scale farmers in developing countries: is there a new role for contract farming? Development Southern Africa, 19 (4), 503-529.

Kumar, P., Singh, K. K., & Singh, S. P. (2017). Cost of Cultivation on Mustard (*Brassica olerasia*) in Meerut District of Western Uttar Pradesh, *India Plant Archives*, 17(2):1492-1494.

Kumar, V., Wankhede, K.G. &Gena, H.C. (2015). Role of cooperatives in improving livelihood of farmers on sustainable basis. American journal of Educational Research, 3(2): 1258-1266.

NABARD (2019). Farmer's Producer' Organization (FPOs): status, issues & suggested policy reforms. National Paper – PLP 2019-20.

National Sample Survey Office (NSSO) (2014). Ministry of Statistics and Programme Implementation (MOSPI), Government of India. IND-NSSO-SCES-2014-v1.0

Negi, D. S., Birthal, P. S., Roy, D. & Khan, M.T. (2018). Farmers' choice of market channels and producer prices in India: role of transportation and communication networks. Food Policy, 81: 106-121.

Onumah, G., Davis, J., Kleih, U. & Protector, F. (2007). Empowering stallholder farmers in markets: Changing agricultural marketing systems and innovative responses by producer organizations. MPRA Paper No. 25984.

Panday, H., Rai, R. K., &Gautam Y. (2021). Economic Analysis of Chickpea (*Cicer arietinum* L.) Production in Bundelkhand Region of Uttar Pradesh (India)52:2124-2128.

Penrose-Buckely, C. (2007). Producer Organization: a guide to developing collective rural enterprise. Oxford: Oxfarm.

Singh, G., Budhuiraja, P. &Vatta, K. (2018). Sustainability of farmer producer organizations and agricultural networks in India: a case of Punjab and Gujrat. Indian journal of Agricultural Economics, 73 (3): 70-85.

Vahoniya, D.R., Vahoniya, N. D., &Halpati, J. R. (2022). Farmer Producer Organisation (FPO): A Conceptual Study about Farmer Producer Company (FPC). Asian J. of Agric. Ext., Eco. & Socio.40 (10): 1185-1197.

Verma, A., Gupta, S., Singh, I. J., Singh, S. P. & Kumar, A. (2015). Study the Cost of Cultivation and Net Income of Mustard in Different Farm Size Groups on the Fields. *Plant Archives*, 15 (2): 841-842.