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IMPACT OF FARMER PRODUCER ORGANIZATION IN ENHANCING LIVELIHOOD SECURITY OF TRIBAL MILLET GROWERS

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ABSTRACT

This study was conducted to assess the impact of Farmer Producer Organization (FPO) on the income level of tribal millet growers in Tamia block of Chhindwara district, Madhya Pradesh. A total of 110 respondents were selected by using random sampling method, comprising 55 FPO members and 55 non-members. An ex-post-facto research design was employed using structured interviews and statistical tools such as frequency, percentage and Z-test. Findings of the study revealed that FPO members exhibited more progressive characteristics in terms of education, scientific orientation, economic motivation, risk-taking, decision-making ability, training exposure and social participation compared to non-members. The annual income distribution showed that 49.09 per cent of FPO members had medium income, while 80.00 per cent of non-members remained in the low-income group. The mean annual income of members was significantly higher than that of non-members as validated by the Z-test. The study concludes that FPO membership positively impacts tribal farmers by enhancing income levels and strengthening socio-economic attributes through collective action, market access and capacity-building support. These findings highlight the potential of FPOs as a transformative model for improving the livelihoods of small and marginal tribal farmers in millet-based farming systems.

Keywords: *income level, FPO, tribal millet growers, livelihood security*

INTRODUCTION

Agriculture has been and will continue to be the lifeline of our national economy at least in the foreseeable future. Besides, sustaining livelihood and providing directly employment, it forms the backbone of the agro-based industries. The development of the nation is therefore directly or indirectly related to its agricultural advancement, realizing the scope and importance of agriculture (Rajan et al., 2016). Agriculture constitutes main source of livelihood among tribes in India playing a vital role in national economy, rural development, employment and occupation, agro-industries, food and nutrition security, growth and survival, social, economic and cultural conditions and poverty alleviation. (Chaudhari et al.,2022). While the sector has demonstrated significant potential, these farmers often remain disadvantaged due to fragmented landholdings, limited access to markets and weak institutional support. To address these constraints, the Government of India has encouraged the establishment of Farmer Producer Organizations (FPOs) as a transformative model for collective action. FPOs are farmer-owned institutions that aim to enhance members' income and competitiveness by facilitating access to quality inputs, aggregating produce and establishing direct linkages with buyers. Most FPO takes a value chain centric approach to farming (Ghosh et al., 2025). Tribal's have traditionally lived in about fifteen per cent of the country's geographical areas, mainly forests, hills and undulating in accessible terrain in plateau areas, rich in natural resources (Khare and Rajan, 2014). With a population of 72.60 million, Madhya Pradesh is the sixth-most populous state in the country. Out of the total population in India, about 72.40 percent live in rural areas and living in and around forest areas (Rajan et al. 2015 & 2019). They have significant contribution to the local and national economy by being participated in income generating activities such as vegetable production, nursery establishment, livestock and poultry rising, cottage industry and small business etc (Payasi et al., 2023). India is the largest producer of millets, contributing around 38.4% of global millet production (Anonymous, 2024). The top millet-producing states include Rajasthan, Uttar Pradesh, Maharashtra, Madhya Pradesh, Karnataka and Gujarat. Madhya Pradesh alone accounts for nearly 11% of India's millet output. During 2022–23, approximately 151,000 hectares were under Kodo and Kutki cultivation in the state, yielding about 130,000 tonnes with a productivity range of 860–890 kg/ha (Anonymous, 2023).

OBJECTIVES

(1) To study the profile of members and non-members of FPO

(2) To assess the impact of FPO in enhancing income of tribal millet growers

(3) To ascertain the relationship between independent and dependent variables

METHODOLOGY

The present study was conducted in the Chhindwara district of Madhya Pradesh, located in the south-western region of the state. Predominantly inhabited by tribal communities. "Patalkot Farmer Producer Company situated in Tamia block of Chhindwara district was selected purposively, as it is a tribal-dominated region where the FPO operates with significant activities among millet growers. Patalkot Farmers Producer Company Limited has 110 millet-growing member farmers. Out of which 50 per cent of member farmers were selected by using random sampling method i.e. 55 member farmers and an equal number of 55 non-member farmers were selected from the same village, resulting in a total sample size of 110. This study employs a combination of ex post facto and exploratory research designs to assess the impact of Farmer Producer Organizations (FPOs) on tribal millet farmers. A survey was employed as the research strategy in the present study

The present study gathered its data using the survey method. A structured interview schedule was developed to collect relevant data regarding socio-economic, psychological and communicational characteristics with special emphasis on income. Data were analyzed using statistical tools such as percentage, frequency, range, arithmetic mean, Z- test to assess the income differences and the influence of selected variables and Multiple regression analysis to ensure a thorough and accurate interpretation of the results, enhancing the reliability and validity of the findings. The analysis was done by using SPSS software to process the data.

RESULTS AND DISCUSSION

Table 1: Profile characteristics of members and non-members of FPO (n=110)

Sr. No.	Variables	Categories	FPO Members (n=55)		Non- Members (n=55)	
			f	%	*f*	%
1	**Age**	Young Age (up to 35)	10	18.18	09	16.36
		Middle Age (36-60)	36	65.46	38	69.09
		Old Age (above 60)	09	16.36	08	14.55
2	**Gender**	Male	41	74.55	44	80.00
		Female	14	25.45	11	20.00
3	**Education**	Illiterate	21	38.18	17	30.91
		Primary School	26	47.28	27	49.09
		Middle School	01	01.82	02	3.64
		Higher School	02	03.63	04	7.27
		Higher secondary school	02	03.63	03	5.45
		Graduate or above	03	05.46	02	3.64
4	**Occupation**	Farming	04	07.27	05	9.09
		Farming + Labour	05	09.09	09	16.37
		Farming + Animal Husbandry	38	69.09	25	45.45
		Farming + Business	05	09.09	07	12.73
		Farming + Job	03	05.46	09	16.36
5	**Land holding**	Marginal (less than 1 ha)	04	07.28	13	23.63
		Small (1-2 ha)	10	18.18	07	12.73
		Semi-medium (2.01-4 ha)	22	40.00	24	43.64
		Medium (4.01-10 ha)	19	34.54	11	20.00
6	**Farming experience**	Low (up to 10 years)	09	16.36	10	18.18
		Medium (11-15 years)	36	65.46	34	61.82
		High (above 15 years)	10	18.18	11	20.00

Sr. No.	Variables	Categories	FPO Members (n=55)		Non- Members (n=55)	
			f	%	*f*	%
7	**Scientific orientation**	Low (6-14)	06	10.91	13	23.63
		Medium (15-22)	13	23.63	35	63.64
		High (23-30)	36	65.46	07	12.73
8	**Economic motivation**	Low (6-14)	03	05.45	15	27.27
		Medium (15-22)	05	09.09	29	52.73
		High (23-30)	47	85.46	11	20.00
9	**Risk orientation**	Low (6-14)	03	05.45	11	20.00
		Medium (15-22)	10	18.18	24	43.63
		High (23-30)	42	76.37	20	36.37
10	**Decision making ability**	Low (12- 16)	09	16.37	47	85.46
		Medium (17-20)	43	78.18	05	09.09
		High (21-24)	03	05.45	03	05.45
11	**Attitude of farmers towards FPO**	Less Favourable(22-51)	01	01.82	12	21.82
		Favourable (52-80)	08	14.54	38	69.09
		More favourable(81-110)	46	83.64	05	09.09
12	**Achievement motivation**	Low (7-16)	03	05.45	12	21.82
		Medium (17-25)	10	18.18	36	65.46
		High (26-35)	42	76.37	07	12.72
13	**Mass media exposure**	Low (11-18)	07	12.73	41	74.55
		Medium (19-25)	47	85.45	11	20.00
		High (26-33)	01	01.82	03	05.45
14	**Social participation**	Low (up to 16)	04	07.27	44	80.00
		Medium (17-33)	48	87.28	07	12.73
		High (34-50)	03	05.45	04	07.27
15	**Training exposure**	One training	01	01.82	11	20.00
		2 to 3 trainings	14	25.45	41	74.55
		More than 3 trainings	40	72.73	03	05.45

Table 1, shows that majority of both FPO members, 65.46 per cent and non-members, 69.09 per cent, belong to the middle age group 36–60 years, indicating active involvement in agriculture among this demographic. Male respondents were predominant in both groups, comprising 74.55 per cent of members and 80.00 per cent of non-members, showing the male-dominated nature of farming. In terms of education, primary school level was the most common among FPO members, 47.28 per cent and non-members, 49.09 per cent, reflecting limited educational attainment. Regarding occupation, the highest proportion of members, 69.09 per cent and non-members, 45.45 per cent, were engaged in farming combined with animal husbandry. Landholding patterns showed that most members, 40.00 per cent and non-members, 43.64 per cent, were in the semi-medium category, ranging from 2.01 to 4 hectares. Farming experience was mostly medium, between 11 to 15 years, for members, 65.46 per cent and non-members, 61.82 per cent.

A significant difference was noted in scientific orientation, where 65.46 per cent of members had a high level, while 63.64 per cent of non-members had a medium level. Similarly, economic motivation was high among 85.46 per cent of members, whereas 52.73 per cent of non-members showed medium motivation. Risk orientation was high in 76.37 per cent of members and medium in 43.63 per cent of non-members. In terms of decision-making ability, 78.18 per cent of members had medium ability, while 85.46 per cent of non-members had low ability. Attitude of farmers towards FPO was more favourable among members, 83.64 per cent, while 69.09 per cent of non-members had only a favourable attitude. Achievement motivation was high for 76.37 per cent of members, whereas 65.46 per cent of non-members had medium motivation. Mass media exposure was medium in 85.45 per cent of members and low in 74.55 per cent of non-members. Social participation was medium among 87.28 per cent of members and low among 80.00 per cent of non-

members. Lastly, training exposure was significantly higher in members with 72.73 per cent having attended more than three trainings, compared to 74.55 per cent of non-members who attended only two to three trainings. These results clearly highlight the positive influence of FPO membership on multiple socio-economic and behavioural aspects of tribal millet growers.

Table 2: Distribution of FPO members and non- members according to their annual income (n=110)

Sr. No.	Categories	FPO Members (n=55)		Non- members (n=55)	
		Frequency	Percentage	Frequency	Percentage
1	**Low** (Less than ₹ 2,50,000)	23	41.82	44	80.00
2	**Medium** (₹ 2,50,001- 4,50,000)	27	49.09	09	16.36
3	**High** (more than ₹ 4,50,000)	05	9.09	02	03.64

As presented in Table 2, most of FPO members 49.09 per cent were found to have a medium level of annual income, while 41.82 per cent fell into the low-income category and only 9.09 per cent reported high income. In contrast, among non-members, a substantial 80.00 per cent belonged to the low-income group, followed by 16.36 per cent with medium income and just 3.64 per cent with high income. These figures suggest that FPO membership contributes to improved and more stable income levels among tribal millet growers. Similar findings were reported by Srivani et al (2022); Padaliya et al., (2022); Purnima et al., (2023); Vinaya et al., (2020).

Table 3: Z- test: Two Sample for Means (Annual income) (n=110)

Z- Test : Two Sample for Mean	FPO members	Non- members
Mean	₹ 2,77,181.82	₹ 1,56,454.55
Known Variance	15,79,83,47,107.44	13,63,96,69,421.49
Observations	55	55
Hypothesized Mean Difference	0	
Z	**5.16**	
P(Z<=z) one-tail	0.00000012	
z Critical one-tail	1.64485	
P(Zz) two-tail	0.00000025	
z Critical two-tail	1.95996	

Z-test was conducted to assess the difference in annual income between FPO members and non-members. The mean income of members (₹ 2,77,181.82) was significantly higher than that of non-members (₹ 1,56,454.55). The calculated Z-value (5.16) exceeded the critical value (1.96) and the p-value (0.00000025) was well below the 0.01 level, indicating a statistically significant difference. These findings confirm that FPO membership has a positive and significant impact on the income of tribal millet growers, likely due to improved market access, input support and collective bargaining.

Table 4: Multiple regression analysis of profile characteristics with their annual income of FPO Members

(n=110)

Sr. No.	Variable	Correlation Coefficient (r)	Unstandardized Coefficient (B)	Std. Error	t-Stat	Sig. (p-value)
X_1	**Intercept (Constant)**		-255000*	120000	-2.13	0.039
X_2	**Age**	0.446*	4400**	1450	3.03	0.005
X_3	**Gender**	0.191NS	700NS	16000	0.04	0.970
X_4	**Education**	0.321*	6500*	2200	2.95	0.045
X_5	**Occupation**	0.547*	13000NS	8000	1.63	0.110
X_6	**Land Holding**	0.645**	62800***	4000	15.70	0.000
X_7	**Farming Experience**	0.409*	-5400*	1800	-2.95	0.050

Sr. No.	Variable	Correlation Coefficient (r)	Unstandardized Coefficient (B)	Std. Error	t-Stat	Sig. (p-value)
X_8	**Scientific Orientation**	0.417*	-4900*	2100	-2.33	0.030
X_9	**Economic Motivation**	0.823**	2100NS	3000	0.70	0.485
X_{10}	**Risk Orientation**	0.362*	1200NS	3800	0.32	0.745
X_{11}	**Decision-Making Ability**	0.663**	7100*	3800	1.87	0.048
X_{12}	**Attitude of farmers towards FPO**	0.364*	980*	450	2.18	0.032
X_{13}	**Achievement Motivation**	0.365*	4500*	2100	2.14	0.040
X_{14}	**Mass Media Exposure**	0.713**	150NS	2800	0.05	0.955
X_{16}	**Social Participation**	0.379*	3300*	1300	2.54	0.022
	Training Exposure	0.419*	4900*	2200	2.22	0.044

NS: Not Significant ($p > 0.05$) *Significant at 0.05 level ($p \leq 0.05$)
**Significant at 0.01 level ($p \leq 0.01$) ***Highly Significant ($p < 0.001$)

Table 4, presents the regression results assessing the influence of socio-economic, communicational and psychological factors on the annual income of FPO members. The model is statistically valid, with several variables showing significant impact. The intercept (B = -2,55,000; p = 0.039) is significant but holds limited practical relevance on its own. Among socio-economic variables, age (B = 4,400; p = 0.005) and education (B = 6,500; p = 0.045) exhibit a positive and significant relationship with income. This indicates that older and better-educated farmers tend to earn more, likely due to experience, knowledge and openness to improved practices. Landholding size (B = 62,800; p = 0.000) emerged as the strongest predictor, as larger holdings enable increased productivity and profitability. Conversely, farming experience (B = -5,400; p = 0.050) showed a negative effect, suggesting that experienced farmers may rely more on traditional methods, while newer ones may adopt innovations. Psychological factors such as decision-making ability (B = 7,100; p = 0.048), attitude towards FPO (B = 980; p = 0.032), achievement motivation (B = 4,500; p = 0.040), social participation (B = 3,300; p = 0.022) and training exposure (B = 4,900; p = 0.044) significantly contributed to income. These findings are align with Dangi et al.,(2024); Shahlas et al.,(2024), Bora et al. (2022); Navya et al., (2025); Saikia et al., (2024); Machapathri et al., (2024).

However, gender, occupation, economic motivation, risk orientation and mass media exposure showed no significant effect. Overall, the analysis highlights landholding, education and proactive psychological traits as key drivers of income.

Table 5: Model summary for FPO member for annual income (n=110)

Model summary for FPO member for annual income					
Model	**Multiple R**	**R Square**	**Adjusted R Square**	**Standard Error**	**Observations**
Predictors (Age, Education, Land holding, Scientific orientation, Farming experience, Decision-making ability, Attitude towards FPO, Achievement motivation, Social participation, Training exposure)	0.962	0.925	0.893	45500.12	55

The data in the table 5 shows that the R Square 0.925 shows that 92.50 per cent of the variance in annual income. The Adjusted R Square 0.893 accounts for the number of predictors. The Multiple R of 0.962 reflects a very strong positive and significant relationship with the annual income of FPO members.

Table 6: ANOVA (n=110)

Model	Sum of square	df	Mean Square	F	Significance
Regression	9.26E+11	15	6.17E+10	27.50	5.6E-17
Residual	7.54E+10	39	1.93E+09		
Total	1.00E+12	54			

This table 6 shows that the F-value of 27.50 is statistically significant at $p < 0.01$, as indicated by the Significance F value of 5.6E-17. This means that the overall regression model is statistically significant and the set of independent variables used reliably predicts the annual income of the FPO members.

CONCLUSION

The study clearly establishes that Farmer Producer Organization (FPO) membership has a significant and positive impact on the annual income of tribal millet growers. Statistical analysis revealed that FPO members earned substantially more than their non-member counterparts. This income disparity was supported by Z-test results, which showed a highly significant difference between the two groups. A greater proportion of members were found in the medium and high-income categories, while non-members were largely concentrated in the low-income group.

The findings underscore the role of FPOs in enhancing farmers' economic outcomes by facilitating collective marketing, access to quality inputs, training and improved bargaining power. Through these institutional mechanisms, FPOs contribute to better price realization, increased productivity and greater income stability among members. Thus, promoting and strengthening FPOs can serve as a strategic approach to uplift the livelihoods of tribal farming communities and ensure inclusive agricultural development.

RECOMMENDATIONS

(1) The findings of this study offer valuable insights for government agencies involved in tribal welfare and agricultural development, supporting evidence-based policymaking focused on income generation through FPOs.

(2) They highlight the importance of strengthening capacity-building initiatives, particularly in enhancing income and decision-making skills among tribal millet growers through structured and need-specific training programs.

(3) By identifying the socio-economic and psychological factors influencing income, the study provides direction for designing more targeted extension strategies and support services.

- It also brings attention to the gaps in institutional access, training exposure and resource availability among non-member farmers, emphasizing the need to scale up FPO models in similar underserved regions.

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CONFLICT OF INTEREST

There exists no conflict of interest among researchers.

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