

An Empirical Analysis of Marketing Challenges, Constrains and Opportunities Among Tribal Millet Farmers in Attappady Region, Palakkad District

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Abstract — The present study titled aims to examine the Socio-Economic profile of tribal millet farmers, identify the major marketing constraints faced by them, and analyze the relationship between market access factors and income improvement. The study is based on a descriptive research design using both primary and secondary data. Primary data were collected from 85 tribal millet farmers in Attappady through a structured questionnaire. The collected data were analyzed using statistical tools such as frequency and percentage analysis, descriptive statistics, factor analysis, and correlation analysis with the help of SPSS software. The findings of the study reveal that most farmers belong to small and marginal categories with limited resources and depend on traditional marketing channels. Factor analysis identified three major dimensions of marketing constraints, namely Information Constraints, Infrastructure Constraints, and Market and Financial Constraints, with information-related issues emerging as the most significant factor. The correlation analysis indicates a positive and significant relationship between market access factors and farmer income improvement, highlighting the importance of effective market connectivity. The study concludes that strengthening market information systems, improving infrastructure facilities, and enhancing institutional support can significantly improve the marketing efficiency and income levels of tribal millet farmers in the study area.

Keywords: Tribal Millet Farmers, Marketing Constraints, Market Access, Income Improvement

I. INTRODUCTION

Millets have re-emerged as an important group of climate-resilient crops that contribute significantly to food security, nutritional well-being, and sustainable agriculture. In India, tribal communities play a major role in millet cultivation, particularly in ecologically sensitive regions where traditional farming practices continue to be followed. Attappady in Palakkad District, Kerala, is one such region where tribal millet farming remains a vital source of livelihood for indigenous households. The major millet varieties cultivated by tribal farmers in this region include Ragi (Finger Millet), Foxtail Millet, Little Millet, and Mixed Millets. Among these, mixed millet cultivation, which involves the simultaneous cultivation of two or more millet varieties in the same field, is widely practiced as a traditional farming system. This method helps farmers minimize production risks, conserve biodiversity, ensure household nutritional security, and adapt to changing climatic conditions. Despite their importance, tribal millet farmers face several challenges in bringing their produce to profitable markets. Issues such as lack of access to reliable market information, inadequate transportation facilities, dependence on intermediaries, price fluctuations, limited value addition, and weak institutional support restrict their market

participation and income generation. These constraints not only reduce the profitability of millet cultivation but also discourage farmers from continuing traditional farming practices. In the case of mixed millets, marketing becomes even more complex due to the absence of standardized grading, packaging, and separate market channels for different millet varieties. In this context, understanding the marketing constraints and market access issues becomes essential for improving the economic conditions of tribal millet farmers. The present study focuses on analysing the key marketing challenges, constraints, and opportunities faced by millet farmers in Attappady and examining the relationship between market access factors and income improvement. The study also aims to identify the major dimensions of marketing constraints using statistical tools such as factor analysis and correlation, thereby providing insights for effective policy interventions and market development strategies that can enhance the sustainability and profitability of traditional millet farming systems in the region.

II. REVIEW OF LITERATURE

Rao et al. (2019) studied millet cultivation among tribal farmers and observed that inadequate market infrastructure and lack of price information significantly reduced farmers' income, highlighting the importance of strong market linkage systems. Suresh and Prasad (2020) examined agricultural marketing constraints in tribal regions and found that intermediaries and transportation difficulties were major barriers to fair price realization. Kumar et al. (2021) reported that millet farmers face limited access to storage facilities and institutional support, leading to post-harvest losses and reduced profitability. Nithya and Balaji (2022) identified that weak market connectivity and low bargaining power are key issues affecting income stability among small farmers. Verma (2023) emphasized that Farmer Producer Organizations (FPOs) play a significant role in improving market access and enhancing farmers' income levels. Reddy and Sharma (2018) highlighted that price fluctuations and dependence on middlemen are persistent marketing constraints in tribal agricultural systems. Arun and Devi (2020) found that poor transportation facilities result in delayed market access and distress sales among tribal farmers.

III. STATEMENT OF THE PROBLEM

Tribal millet farmers in Attappady, Palakkad District largely depend on traditional farming systems for their livelihood, yet they continue to face significant challenges in accessing remunerative markets for their produce. Even though millets have gained increasing attention for their nutritional and ecological benefits, farmers are unable to fully benefit from market opportunities due to several structural and operational

constraints. Main issues such as inadequate market information, poor transportation facilities, lack of storage infrastructure, dependence on intermediaries, and unstable pricing systems restrict their ability to sell produce at fair prices. These barriers reduce their bargaining power and limit income generation, thereby affecting overall livelihood security. In addition, weak institutional support and limited market linkages further widen the gap between production and profitable marketing. As a result, there is a clear need to systematically analyze the marketing constraints and market access issues faced by tribal millet farmers in Attappady. Understanding these problems in a structured manner will help identify the major factors affecting market participation and provide a foundation for developing suitable strategies to improve their marketing efficiency and income levels.

IV. SCOPE OF THE STUDY

The present study focuses on analysing the marketing constraints and market access issues faced by tribal millet farmers in Attappady, Palakkad District. It covers selected tribal farming households engaged in millet cultivation and examines their socio-economic conditions, marketing practices, and challenges in accessing markets. The study is limited to identifying the major factors influencing marketing difficulties such as information gaps, infrastructure limitations, dependence on intermediaries, and price fluctuations. It also explores the relationship between market access variables and income improvement using statistical tools like factor analysis and correlation analysis. The findings of the study are useful for understanding the current marketing situation of tribal millet farmers and for suggesting practical measures to improve market connectivity and income levels. However, the results are specific to the selected study area and may not be fully generalized to other regions with different agro-economic conditions.

V. OBJECTIVES OF THE STUDY

- 1) To examine the socio-economic conditions and millet cultivation practices of tribal farmers in Attappady, Palakkad District.
- 2) To identify and analyze the major marketing constraints and market access issues faced by tribal millet farmers in the production and sale of millet products.
- 3) To explore and assess the marketing opportunities available for tribal millet farmers and suggest suitable strategies for improving their market prospects and income.

VI. RESEARCH METHODOLOGY

The study adopts a descriptive research design to examine the socio-economic conditions of tribal millet farmers and to identify the major marketing constraints and market access issues faced by them. The study is based on both primary and secondary data sources. Primary data were collected directly from tribal millet farmers in Attappady using a structured questionnaire, while secondary data were gathered from books, journals, government reports, and relevant research publications. The sample size of the study consists of 85 tribal millet farmers selected from the study area. The questionnaire was designed to capture information related to socio-economic profile, marketing constraints, and market access factors influencing income levels. The collected data were systematically coded and analyzed using statistical tools with the help of SPSS software. For data analysis, techniques such as frequency and percentage analysis, descriptive statistics, factor analysis, and correlation analysis were applied. Factor analysis was used to identify the major dimensions of marketing constraints, while correlation analysis was employed to examine the relationship between market access variables and income improvement among farmers. The study is confined to the Attappady region of Palakkad District and focuses specifically on millet cultivation among tribal farmers, and the findings are interpreted based on the responses obtained from the selected sample.

VII. DATA ANALYSIS AND INTERPRETATION

Variables	Category	Frequency	Percentage (%)
Age (Years)	Below 30	18	21.2
	31–40	24	28.2
	41–50	22	25.9
	Above 50	21	24.7
	Total	85	100.0
Gender	Male	49	57.6
	Female	36	42.4
	Total	85	100.0
Educational Qualification	Illiterate	19	22.4
	Primary School	26	30.6
	Secondary School	21	24.7
	Higher Secondary	12	14.1
	Graduate and Above	7	8.2
	Total	85	100.0
Farming Experience	Below 5 Years	15	17.6
	5–10 Years	28	32.9
	11–15 Years	24	28.2
	Above 15 Years	18	21.2

	Total	85	100.0
Land Holding Size	Below 1 Acre	29	34.1
	1–2 Acres	31	36.5
	2–3 Acres	15	17.6
	Above 3 Acres	10	11.8
	Total	85	100.0
Type of Millet Cultivated	Ragi	33	38.8
	Foxtail Millet	21	24.7
	Little Millet	18	21.2
	Mixed Millets	13	15.3
	Total	85	100.0

Table No: 1 Socio-Economic Profile of Tribal Millet Farmers

Source: Primary Data

Descriptive Statistics Table

Variable	Mean	Std. Deviation
Age (Years)	42.65	10.84
Farming Experience (Years)	11.28	5.73
Land Holding (Acres)	1.74	0.92
Annual Income (in Lakhs)	1.86	0.78

INTERPRETATION

The results indicate that the majority of the tribal millet farmers (28.2%) belong to the age group of 31–40 years, while 57.6% are male respondents. Most of the farmers (30.6%) have completed primary education, and 32.9% possess 5–10 years of farming experience. Regarding land ownership, 36.5% of the respondents own between 1 and 2

acres of land. Ragi is the most commonly cultivated millet, accounting for 38.8% of the respondents. The average age of the farmers is 42.65 years, with an average farming experience of 11.28 years and an average landholding size of 1.74 acres. These findings suggest that millet cultivation in Attappady is predominantly carried out by middle-aged farmers with small and marginal landholdings.

Factor Analysis: Major Marketing Constraints Faced by Tribal Millet Farmers in Attappady, Palakkad District.

Test	Value
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	0.781
Bartlett's Test of Sphericity Approx. Chi-Square	428.564
df	45
Sig.	0.000

Table No: 2 (A) KMO and Bartlett's Test

Component	Initial Eigenvalues	% of Variance	Cumulative %
1	3.254	32.540	32.540
2	1.986	19.860	52.400
3	1.412	14.120	66.520
4	0.874	8.740	75.260
5	0.695	6.950	82.210
6	0.542	5.420	87.630
7	0.486	4.860	92.490
8	0.332	3.320	95.810
9	0.246	2.460	98.270
10	0.173	1.730	100.000

Table No: 2 (B) Total Variance Explained

Marketing Constraints	Information Constraints	Infrastructure Constraints	Market and Financial Constraints
Lack of market information	0.812		
Inadequate market intelligence	0.794		
Limited awareness of prevailing prices	0.769		
Poor transportation facilities		0.843	
High transportation cost		0.811	
Inadequate storage facilities		0.726	
Low bargaining power			0.841
Price fluctuations			0.808
Dependence on intermediaries			0.752
Delayed payment from buyers			0.689

Table No: 2 (C) Rotated Component Matrix

INTERPRETATION:

The KMO value of 0.781 indicates that the sample data are adequate for conducting factor analysis. The significant Bartlett's Test value ($p = 0.000$) confirms that the variables are sufficiently correlated and suitable for factor extraction. The analysis extracted three factors with Eigenvalues greater than one, explaining 66.52% of the total variance. This indicates that the identified factors account for a substantial

proportion of the marketing constraints experienced by tribal millet farmers. The rotated component matrix shows that the variables are grouped into three distinct factors based on their factor loadings. The highest loadings indicate strong associations between variables and their respective factors, helping to identify the major dimensions of marketing constraints.

H_0 : There is no significant relationship between market access factors and income improvement among tribal millet farmers.

Variables	Market Information Access	Transportation Access	Institutional Support	Market Linkage	Farmer Income Improvement
Market Information Access	1.000				
Transportation Access	.528**	1.000			
Institutional Support	.462**	.417**	1.000		
Market Linkage	.594**	.489**	.553**	1.000	
Farmer Income Improvement	.673**	.581**	.624**	.718**	1.000

Table No: 3 Correlation Matrix Showing the Relationship Between Market Access Factors and Farmer Income Improvement
** Correlation is significant at the 0.01 level (2-tailed).

INTERPRETATION

The correlation analysis reveals a positive and significant relationship between all market access factors and farmer income improvement. Market linkage exhibits the strongest positive correlation with income improvement ($r = 0.718$, $p < 0.01$), followed by market information access ($r = 0.673$, $p < 0.01$), institutional support ($r = 0.624$, $p < 0.01$), and transportation access ($r = 0.581$, $p < 0.01$). The findings

indicate that better access to market information, transportation facilities, institutional assistance, and stronger market linkages contribute significantly to improving the income levels of tribal millet farmers in Attappady. Therefore, the null hypothesis is rejected, and it is concluded that market access factors have a significant influence on farmers' income improvement.

S. No	Marketing Opportunity	R1 (5)	R2 (4)	R3 (3)	R4 (2)	R5 (1)	Total Score	Final Rank
1	Government support & subsidies	30	22	18	10	5	300	II
2	Organic millet market demand	35	25	15	7	3	327	I
3	Direct marketing / farmers market	10	18	25	20	12	240	IV
4	Value-added millet products	12	20	22	18	13	244	III
5	Digital marketing / online sales	5	10	15	25	30	190	VI
6	Cooperative / FPO support	8	12	20	22	23	217	V

Table No: 4 Ranking Analysis of Marketing Opportunities Among Tribal Millet Farmers In Attappady Region

INTERPRETATION

The ranking analysis shows that organic millet market demand holds the first rank with the highest score, indicating strong market preference and growth potential. Government support and subsidies secure the second rank, highlighting their crucial role in supporting tribal millet farming. Value-added millet products and direct marketing/farmers' markets occupy middle ranks, showing moderate but improving opportunities. Cooperative/FPO support and digital marketing rank lower, indicating the need for greater awareness and capacity building in these areas.

VIII. FINDINGS

- The descriptive analysis revealed that the majority of the tribal millet farmers belong to the age group of 31–40 years and are predominantly male. Most respondents possess primary-level education, have 5–10 years of farming experience, and cultivate millet on small and marginal landholdings.
- The factor analysis identified three major dimensions of marketing constraints faced by tribal millet farmers, namely Information Constraints, Infrastructure Constraints, and Market and Financial Constraints, which together explained 66.52% of the total variance.

Among these, Information Constraints emerged as the most influential factor, indicating that inadequate market information and price awareness are the primary challenges affecting farmers' market access and marketing performance.

- The correlation analysis showed a positive and significant relationship between market access factors and farmer income improvement. Market linkage exhibited the strongest association with income improvement, followed by market information access, institutional support, and transportation facilities.
- The findings indicate that improving market information systems, transportation infrastructure, institutional support, and direct market linkages can significantly enhance the income and marketing opportunities of tribal millet farmers in Attappady. Overall, better market access is closely associated with improved economic outcomes for the farming community.
- The ranking analysis reveals that organic millet market demand is the most significant marketing opportunity perceived by tribal farmers in Attappady. Digital marketing and online sales were found to be the least important, indicating low awareness of modern marketing channels among respondents.

IX. SUGGESTIONS

- Strengthening of direct marketing channels such as farmers' markets and local sales outlets enhances price realization and reduces dependency on middlemen in millet marketing.
- Improvement of cooperative society functioning through transparent procurement, timely payment systems, and better market linkage support increases efficiency in marketing operations.
- Development of effective market information systems through mobile alerts, extension services, and local information centres ensures timely access to price and demand details.
- Promotion of Farmer Producer Organizations (FPOs) improves collective bargaining power, expands market access, and reduces marketing risks for tribal millet farmers.
- Expansion of export opportunities for millets creates access to international markets driven by rising demand for organic and health foods, improving income and market stability.

X. CONCLUSION

The present study on marketing constraints and market access issues among tribal millet farmers in Attappady, Palakkad District highlights that millet cultivation is predominantly carried out by small and marginal tribal farmers with limited socio-economic resources. The analysis confirms that marketing constraints are multidimensional, with Information Constraints, Infrastructure Constraints, and Market and Financial Constraints playing a major role in restricting effective market participation. Factor analysis reveals that lack of reliable market information and price awareness remains the most critical challenge, followed by inadequate transportation, storage facilities, and weak market linkages. The correlation analysis further establishes a strong positive relationship between market access factors and farmers' income improvement, indicating that better market connectivity directly influences economic outcomes. Overall, the study emphasizes that strengthening market information systems, improving infrastructure, and enhancing institutional and market linkages can significantly improve the marketing efficiency and income levels of tribal millet farmers. The findings reflect the need for integrated market support systems to ensure sustainable livelihood development in the tribal farming community of Attappady.

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