

Production and Marketing Constraints Faced by Millet Cultivators: a Study with Reference to the Tribal Region of Attappady, Kerala

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Abstract—Cultivation of millets is an important agricultural practice among the tribals of Attappady in Kerala. However, millet farmers encounter some production and marketing constraints which hamper their production and earning ability. The current study seeks to explore the major production and marketing constraints encountered by millet farmers and the influencing factors behind them. The research is based on the collection of primary data from 100 millet farmers through structured questionnaires in the tribal area of Attappady. Methods of frequency, percentage, mean, ranking, correlation, regression and Chi-square analysis were employed for data analysis. It was found out that lack of rainfall and unpredictable rainfall is the major production constraint followed by wildlife attack and small land holding sizes. Low remuneration prices, lack of market linkage and dependence on intermediaries are the major marketing constraints faced by millet farmers. The research found that there is a significant relationship between production constraints and marketing outcomes in negative terms, while the educational level of the respondents is significantly associated with the severity of constraints.

Index Terms—Millet Cultivation, Production Constraints, Marketing challenges, Tribal Farmers, Attappady, Kerala.

I. INTRODUCTION

Millets are among the most ancient food crops and form an integral part of the dietary requirements and cultivation techniques of rural and tribal societies. Millets thrive in drought like environment, are less water intensive and less agronomic input-

intensive crops, and are nutritious. India is one of the largest producers of millets where the farming of the crop is mostly done by small and marginal farmers. However, there are many problems faced by the farmers including lack of access to quality seeds, irrigation, machinery, expertise, higher cost of labor, pests, diseases, and climate uncertainty. Attappady in the Palakkad district of Kerala is mainly a tribal and unique ecological area where millets have been cultivated since times immemorial. The livelihood and cultivation techniques of the tribal people of Attappady are intricately associated with traditional knowledge and ecology, but economic, climatic, technological, and infrastructural issues keep on affecting the productivity of millets and income of the farmers.

II. STATEMENT OF THE PROBLEM

Millet farming is a conventional agriculture practice among the tribals in Attappady, Kerala, offering nutritional, economic, and livelihood advantages. Yet, farmers are confronted with various production constraints such as labor costs, quality seed inadequacy, irrigation scarcity, pest and disease incidence, climatic uncertainties, lack of technology, and technical know-how. Also, farmers face marketing constraints like price variability, lack of market knowledge, middlemen dependency, poor transportation and storage, inadequate processing facilities, and lack of guaranteed markets. These challenges might result in low production, high cost of cultivation, and reduction in farmers' earnings.

Hence, the purpose of this study is to analyze the production and marketing constraints prevailing among millet growers in Attappady and find feasible measures to overcome them.

III. REVIEW OF LITERATURE.

Sangappa and Rafi (2026): This study investigated the constraints of farmers growing millet in Andhra Pradesh. It observed that poor access to quality seeds, inadequate technical assistance, lack of irrigation facility and market price fluctuations were the main constraints for growing millets.

Logeshwari et al. (2025): This study investigated the cultivation of organic finger millet among tribal farmers in Attappady, Kerala. This study observed that labour cost and input cost were important factors in production, whereas market price and demand became important factors in the economics of millet cultivation.

Ritu and Mercykutty (2025): This study investigated the value chain of millet cultivation among tribal farmers in Attappady. It observed that climate variability, wildlife attacks, infrastructure issues and market linkages were the main constraints of millet cultivation.

Pushpa and Arun Kumar (2023): This study identified the constraints of farmers growing millet in Madurai district. Main constraints included animal attacks, lack of knowledge about improved varieties, uncertain rainfall and inability to get remunerative price.

Prasanth and Murugan (2021): This study investigated the constraints of farmers growing finger millet in Tamil Nadu. Lack of technical knowledge, high input costs, labour cost and nutrient management were some of the main constraints.

IV. SCOPE OF THE STUDY

The current research work highlights the identification and analysis of the various production and marketing constraints encountered by the millet growers in the tribal area of Attappady in Kerala. The research work will deal with the issues related to the availability and cost of inputs, labour, irrigation, weather conditions, cultivation methods, productivity and agricultural support services, along with marketing concerns like price, transportation, storage,

market information, intermediary problems, and market availability. The research work will also look at the problems faced by millet growers in getting proper returns from their productions and will recommend appropriate strategies for better production and marketing performance.

V. OBJECTIVES OF THE STUDY

1. To study the main production problems faced by millet farmers in Attappady, Palakkad, Kerala.
2. To investigate the marketing practices and problems of millet farmers.
3. To study the factors affecting millet production and marketing.

VI. RESEARCH METHODOLOGY

Research Design: The research employs the descriptive research design in order to determine and analyze the constraints of production and marketing encountered by millet growers in the Attappady tribal area. It will help in identifying the socio-economic profile of respondents as well as the problems associated with millet production and marketing.

Sources of Data: The primary source of data in the research is primary data that is gathered from millet growers. The primary data consist of information pertaining to the socio- economic profile of respondents, production constraints, and marketing constraints. Secondary data are also consulted from the literature such as books, journals, research articles, government publications, and other sources related to millet cultivation and marketing.

Data Collection Method: The primary data are gathered with the help of a structured questionnaire designed specially for millet growers. The questionnaire consists of questions regarding the socio-economic profile of respondents, production constraints, and marketing constraints.

Sampling Technique and Size: In the current research, a convenient sampling technique is applied for selecting respondents in the tribal region of Attappady. Millet cultivators available and ready to supply information required for the research were selected. The sample size of the study includes 100 millet cultivators in the tribal region of Attappady. The respondents have been selected to get

information about their socio-economic characteristics as well as about production and marketing constraints faced by them. N = 100 is also applied in the uploaded analysis.

Area of Study: The study takes place in the tribal region of Attappady in Kerala that belongs to the Palakkad district. The tribal region of Attappady has been selected as an area of research due to the traditional importance of millet cultivation there. The study aims at researching the production and marketing problems of millet cultivators in this region.

Tools for Data Analysis: Frequency and percentage

analysis, mean, standard deviation, ranking analysis, Pearson correlation, regression analysis, and Chi-square test are applied for analysing the data gathered. The percentage analysis is used for presenting the socio-economic profile, whereas the mean score and ranking are used for identifying the major production and marketing constraints. The correlation and regression analysis are applied for researching the relationship and impact of production constraints on marketing results, and the Chi-square test is used for researching the associations between the selected variables.

VII. DATA ANALYSIS AND INTERPRETATION

Table No.1 Socio-Economic Profile of Respondents

S.No	Variable	Category	Frequency	Percentage (%)
1	Age	Below 30 years	12	12%
		30 – 45 years	35	35%
		45 – 60 years	38	38%
		Above 60 years	15	15%
		Total	100	100%
2	Gender	Male	38	38%
		Female	62	62%
		Total	100	100%
3	Education Level	Illiterate	40	40%
		Primary	35	35%
		Secondary	18	18%
		Above Secondary	7	7%
		Total	100	100%
4	Land Holding Size	Marginal (< 1 ha)	55	55%
		Small	30	30%
		Medium	10	10%
		Large	5	5%

		Total	100	100%
5	Farming Experience	Below 5 years	8	8%
		5 – 15 years	27	27%
		Above 15 years	65	65%
		Total	100	100%
6	Annual Income	Low	58	58%
		Medium	32	32%
		High	10	10%
		Total	100	100%
7	Type of Millet Cultivated	Ragi (Finger Millet)	52	52%
		Chama (Small Millet)	28	28%
		Cholam (Sorghum)	15	15%
		Others	5	5%
		Total	100	100%

Interpretation: From the above table, it can be clearly seen that the highest number of respondents falls in the age range 45–60 years, with 38%, whereas the age group 30–45 years comprises 35%. The female respondents are in larger numbers with 62%, whereas male respondents comprise 38%. Regarding education, 40% of the respondents are illiterate and 35% of the respondents have only primary level of education, thus showing low levels of education amongst the millet cultivators. With regard to

landholdings, 55% of the respondents hold marginal lands less than one hectare, thus indicating small-scale landholdings for growing millets. With regard to farming experience, 65% of the respondents have over 15 years of farming experience, thus showing that there is a considerable amount of traditional knowledge regarding the growing of millets. With regard to annual income, 58% are categorized as low income. Ragi is the commonest millet grown, with 52% of respondents, followed by Chama with 28%.

Table No. 2 Descriptive Statistics on Production and Marketing Constraints

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	Std. Deviation
Production Constraints							
Rainfall in this area is adequate for millet cultivation.	5	15	20	35	25	2.40	1.16
I have easy access to quality millet seeds.	8	17	25	32	18	2.65	1.19

Marketing Constraints							
I receive a fair price for my millet produce.	4	12	20	38	26	2.30	1.11
Storage and transport facilities for millets are adequate.	3	10	22	37	28	2.23	1.06

Interpretation: The table shows that respondents generally have an unfavourable perception of production and marketing conditions. The statement regarding adequate rainfall has a mean score of 2.40, indicating that many respondents do not consider rainfall conditions adequate for millet cultivation. Access to quality seeds has a mean score of 2.65, also indicating difficulty in obtaining suitable quality

seeds. The marketing-related statements show lower mean scores. The mean score for receiving a fair price is 2.30, suggesting dissatisfaction with the price received for millet produce. The lowest mean score of 2.23 is recorded for the adequacy of storage and transport facilities, indicating that these are important difficulties faced by respondents.

Table No. 3 Ranking of Production Constraints Faced by Millet Cultivators

S.No	Production Constraints	Mean Score	Rank
1	Uncertain / inadequate rainfall	4.42	1
2	Wildlife intrusion into farmland	4.10	2
3	Small / fragmented landholdings	3.82	3
4	Limited access to quality seeds	3.61	4
5	Lack of irrigation facilities	3.48	5
6	Low adoption of improved cultivation practices	3.21	6

Interpretation: As can be observed from the above table, lack of proper and adequate rainfall is the most pressing problem facing farmers because it has scored the highest mean value of 4.42. The second most important constraint is intrusion of wildlife with a mean value of 4.10. Smaller and fragmented farms come third with a mean value of 3.82, followed by

poor availability of quality seeds with a mean value of 3.61. Insufficiency of irrigation facilities ranks fifth, while the last major constraint is poor adoption of improved farming techniques with a mean value of 3.21. Thus, climate-related issues, intrusion by wildlife, and insufficiency of arable land are the major production-related problems.

Table No. 4 Ranking of Marketing Constraints Faced by Millet Cultivators

S.No	Marketing Constraints	Mean Score	Rank
1	Weak market linkages	4.25	2
2	Non-remunerative prices	4.32	1
3	Inadequate storage facilities	4.05	4
4	Lack of processing infrastructure	3.88	5
5	Dependence on intermediaries	4.12	3
6	Poor transportation facilities	3.76	6

Interpretation: It can be seen that non-remunerative prices have come to top in marketing constraints, whereas the highest mean score of 4.32 has been recorded for it. Weak market linkages have secured second position with a mean score of 4.25. Intermediaries come at third position, followed by

inadequate storage facilities. Inadequate processing facilities have got fifth position, whereas inadequate transportation facilities have secured sixth position. This shows that there are many problems being faced by the farmers to get the right price for their millet.

Table No. 5 Correlation between Production Constraints and Marketing Outcomes

H₀: There is no significant relationship between production constraints and marketing outcomes among millet cultivators.

		Production Constraints	Marketing Outcomes
Production Constraints	Pearson Correlation	1	-0.662
	Sig. (2-tailed)		0.000
	N	100	100
Marketing Outcomes	Pearson Correlation	-0.662	1
	Sig. (2-tailed)	0.000	
	N	100	100

Interpretation: The Pearson correlation coefficient of production constraint and marketing results is -0.662, revealing that there is a moderate to strong negative correlation between production constraint and marketing results. The significance value is 0.000, which is lower than the significance level of 0.05. This implies that the null hypothesis is rejected. Consequently, there is a statistically ANOVA

significant negative correlation between production constraint and marketing results.

Table No. 6 Regression Analysis of Production Constraints on Marketing Outcomes

H₀: Production constraints have no significant impact on marketing outcomes among millet cultivators.

Model		Sum of Squares	df	Mean Square	F / Sig.
1	Regression	16.613	1	16.613	76.502 / 0.000
	Residual	21.281	98	0.217	
	Total	37.894	99		

Coefficients

Model	Unstandardized B	Std. Error	Standardized Beta	t / Sig.
(Constant)	6.226	0.711		8.756 / 0.000
Production Constraints	-0.644	0.074	-0.662	-8.747 / 0.000

Interpretation: The regression analysis shows an F-value of 76.502 with a significance value of 0.000. Since the significance value is less than 0.05, the

regression model is statistically significant. The coefficient of production constraints is -0.644, indicating a negative impact of production constraints

on marketing outcomes. The standardized beta value of -0.662 further indicates that increases in production constraints are associated with decreases in marketing outcomes. The R^2 value is 0.438, indicating that approximately 43.8% of the variation

in marketing outcomes can be explained by production constraints in this dataset. Therefore, the null hypothesis is rejected, and it can be concluded that production constraints have a statistically significant impact on marketing outcomes.

Table No. 7 Chi-square test - Education Level and Severity of Constraints Faced

H₀: There is no significant association between education level and the severity of production/marketing constraints faced by millet cultivators.

Education Level	High Constraint	Moderate Constraint	Low Constraint	Total
Illiterate	28	10	2	40
Primary	12	18	5	35
Secondary	3	8	7	18
Above Secondary	1	2	4	7
Total	44	38	18	100

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	29.503	6	0.000
Likelihood Ratio	28.226	6	0.000
N of Valid Cases	100		

Interpretation: From the above table, it can be seen that respondents who lack higher education are more inclined toward the high constraint classification. Out of the 40 illiterate respondents, 28 respondents indicated high constraints. The value of Pearson Chi-square is 29.503 with a significance value of 0.000. As the significance value is below 0.05, the null hypothesis is rejected. Hence, it can be concluded that there is a significant relationship between the level of education and the level of constraints experienced by millet farmers

- Inadequate and uncertain rainfall is the major production constraint, followed by the problem of wildlife and small or fragmented land holdings.
- Low non-remunerative prices are the major marketing constraints, followed by poor market linkages and dependence on intermediaries.
- There is a negative relationship between the production constraints and the marketing outcome, and the Pearson correlation is -0.662

VIII. FINDINGS

- The 45-60 years age category accounts for the largest respondent group, and females predominate as cultivators.
- The respondents have low levels of education, with 55% having marginal land holdings, less than one hectare.
- Majority of respondents have more than 15 years' experience in farming, showing that there is a lot of traditional experience in millet production.

IX. SUGGESTIONS

- Ensure quality seed supply: Good quality locally adapted seeds of millet should be made available to the farmers through various organizations like government departments, seed banks and farmer groups.
- Improve irrigation infrastructure: Small scale irrigation facilities and water management structures should be constructed so as to counter the adverse effects of uncertain and insufficient rainfall.

- Wildlife menace management: Proper methods should be developed to prevent damage by wildlife in the millet fields since this is among the most prominent production constraints noted in the study.
- Ensure better price for produce: Procurement with assured minimum remunerative prices should be encouraged so as to ensure good returns from the millet produce.
- Strengthen marketing channels: Farmer Producer Organizations, cooperatives and tribal farmer associations should be strengthened so as to establish direct links between farmers and the market.
- Improve storage, processing and transport facilities: Storage, processing and transport facilities should be established at the community level in Attappady to minimize post-harvest losses and add value to the product.

X. CONCLUSION

In summary, the research shows that the cultivation of millets remains significant for the livelihood and agricultural tradition of tribal people of Attappady. Based on the findings of the study, it is observed that majority of the cultivators have substantial agricultural knowledge and experience, though they cultivate on small land holdings and have low educational qualification. Deficient and inadequate rainfall emerged as the primary production constraint, along with the problem of wildlife invasion and small land holding size. In the context of marketing, the major problems faced by the cultivators included low remunerative prices, poor market linkages, and the dependency on intermediaries. Statistical analysis indicates that there exists significant negative correlation between the production constraints and marketing, while there is a significant correlation between the educational level and the severity of production constraints. Therefore, improvement in millet cultivation in Attappady needs provision of good quality seeds, irrigation and water conservation measures, wildlife protection, technical support, good prices and remunerative prices, better market linkages, and improved storage and transportation facilities.

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