

RESEARCH PAPER

Economic Insights of Organic Finger Millet Cultivation in the Rainfed Tribal Zones of Attapady Hills, Kerala

Logeshwari, N.¹, Hema, M.^{1*}, Prema, A.¹, Neetha Rose, C.D.² and Sumiya, K.V.³

¹Department of Agricultural Economics, College of Agriculture, Vellanikkara, Kerala, India

²Regional Agricultural Research Station, Pattambi, Kerala, India

³Programme coordinator, KVK, Palakkad, Kerala Agricultural University, Thrissur, Kerala, India

*Corresponding author: hema.m@kau.in (ORCID ID: 0000-0003-3336-6968)

Received: 13-12-2024

Revised: 27-02-2025

Accepted: 05-03-2025

ABSTRACT

The study was conducted in Attapady block of Palakkad district of Kerala during 2023-24. Cultivating rainfed millets is one of the potential climate-smart practices in hilly tribal areas to fight malnutrition, climate uncertainties, and poverty, as millets are a rich source of nutrients. The Primary data were collected by using pre-structured interview schedules from 90 tribal rainfed farmers in Agali, Pudur, Sholaiyur panchayats of Attapady. The average cost of cultivation (cost C3) per hectare of finger millet was ₹ 62681, and gross returns were ₹ 44660. Cultivation of finger millet by tribal farmers organically in the region was found to be profitable over Cost A with a positive net return of ₹ 5541, and for every one rupee spent, the farmer realized a return of 1.14 rupees over cost A. Cobb-Douglas production function analysis and Data Envelopment Analysis were used to analyze the resource use efficiency of finger millet production and the technical, allocative, cost / economic efficiency of rainfed finger millet farms, respectively. The regression coefficients for labour (2.29) and manure (0.35) were positive and statistically significant, while for seed, it was negative (-0.19) and statistically significant. The ratio of MVP to MFC was less than unity in all the inputs, indicating scope for reallocation of expenditure among various resources. The average technical, allocative and cost/economic efficiencies were found to be 0.902, 0.876 and 0.789, respectively. Besides, the economic viability of the crop depends on external forces such as market prices of the produce and consistent demand.

HIGHLIGHTS

- ① Resource use efficiency analysis and Data envelopment analysis was employed to determine the efficient allocation of the resources by the tribal farmers in organic finger millet cultivation.
- ② Most sample farmers are technically efficient (0.9-1.0) but not economically efficient.
- ③ The rainfed finger millet production exhibits increasing returns to scale (2.95).

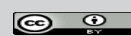
Keywords: Rainfed millet, tribe, Data envelopment analysis, economic optimum, resource use efficiency, economic efficiency

Millets are climate smart crops and nutrient rich grains. India is the largest producer as well as consumer of millets and contributes 41 per cent of global millet production. In India, during 2022-23, millets are cultivated majorly in 21 states in 12.69 million hectares, producing 17.32 million tonnes with a yield of 1352 kg/ha. Even though millet cultivation in Kerala accounts for only 0.03 lakh hectares, have an essential place in the nutritional

requirements of tribal communities in the state, and the cultivation is concentrated primarily among the two districts, Palakkad and Idukki. Among these districts, most of the cultivation is in Palakkad,

How to cite this article: Logeshwari, N., Hema, M., Prema, A., Neetha Rose, C.D. and Sumiya, K.V. (2025). Economic Insights of Organic Finger Millet Cultivation in the Rainfed Tribal Zones of Attapady Hills, Kerala. *Econ. Aff.*, 70(01): 57-64.

Source of Support: None; **Conflict of Interest:** None



particularly in the Attapady block, where the substantial tribal population in the state resides.

The tribal population in the Palakkad district is 10 per cent of the state's total tribal population. The tribal population is around 44 per cent of the total population in Attapady block (GOI, 2011). In 2013, there was a continuous reporting of infant deaths in the Attapady that brought significant public and government attention to the health issues faced by tribals. A total of 39 infant deaths have been reported from Attappady between April 2012 and May 2013 (Ekbal *et al.* 2013). Due to less productivity and profitability of millets, the tribals shifted from traditional method of cultivation named *Panchakkadu* which includes five crops such as finger millet, red gram, little millet, sorghum and lab to cash crops and other plantation crops and in turn, this shift among the tribal farmers perceived as one of the primary reasons for nutritional insecurity and thereby the infant deaths.

The Departments of Agricultural Development and Farmer's Welfare and Scheduled Tribes Development jointly implemented the Millet Village project in 2017 to rejuvenate traditional tribal agriculture in Attapady. The government of Kerala has identified and declared 192 tribal hamlets in Attapady as millet clusters, which was an important step towards increasing millet production in the state. In Attapady, millets are grown on approximately 2,000 hectares during two cropping seasons, with finger millet being the most widely cultivated in both area and production (Sreeni, 2023). Besides, finger millet is highly nutritious and a popular infant weaning food. Moreover, the government perceived that reviving finger millet cultivation improves the health of the tribal community and is promoted under the millet village project, part of the Rebuild Kerala Initiative, and the Kudumbashree projects. Given this background, the present study attempted to analyse the economic viability and estimate the cost, returns, and resource use efficiency in finger millet production.

METHODOLOGY

The study was conducted in Attapady block of Palakkad district in Kerala during 2023-2024 and the data collected pertained to the year of 2022-23. The Attapady terrain varies from steep slopes to gently undulating land, creating a picturesque landscape

dotted with agricultural fields and tribal settlements. Attapady block has mean annual temperature of 24.8°C, tropical climate with an annual rainfall of 1731 mm and finger millet is one such staple crop which is grown organically and rainfed in nature in the region. The finger millet was purposively selected based on area and production contributing to the total millet production in the state. The finger millet was cultivated in 226.4 and 202.3 hectares, respectively, in the first and second cropping seasons, with a yield of 147.2 and 131.5 metric tons. Attapady is the tribal development block in the Palakkad district, where millet promotion under the millet village project is intensive. The primary data was collected from a random sample of 90 tribal rainfed farmers, each 30 from Agali, Pudur and Sholaiyur panchayats of Attapady taluk who are cultivating millets were interviewed through a pretested interview schedule.

ANALYTICAL TOOLS

(I) Economic analysis

The economic analysis was done by using ABC cost concepts.

The measurement and definitions of various cost components were as follows:

- (i) **Cost A:** All kind of expenses (paid out costs) actually incurred by the finger millet farmers and which includes following expenditure items

- (a) *Wages of hired human labour*

Human labour was considerably hired by the finger millet farmers in the study area. The wages were at the rate of ₹ 600 and 400 per day for males and females, respectively. The value of human labour was obtained by multiplying the man days with the prevailing wage rate. Women's days were converted into men's days by multiplying it with the ratio of women's labour wages to that of men's labour (0.67). The labour was hired for various operations like precleaning, burning, weeding, harvesting and threshing.

- (b) *Charges for machine labour*

Machine labour, such as tractors, was hired mainly for ploughing, and land mowers were hired to clear the field. The average charges

were ₹ 900 per hour for land preparation using tractors and ₹ 350 per hour for land cleaning using land mowers.

(c) **Charges for animal labour**

Animal labour was used in some hilly terrain where tractors were inaccessible. The average bullock labour charges were ₹ 11,250 per hectare.

(d) **Market value for seed**

On average, the market value of finger millet seeds is ₹ 40 per kg.

(e) **Imputed value of farm yard manure (FYM)**

The market value of farm produced FYM was considered. The value was imputed at the market price (₹ 4/kg) in the study area as it was utilized in the finger millet farms.

(f) **Land revenue**

This constituted the study area's prevailing land revenue, which was ₹ 875 per hectare, collected by the Department of Revenue, Government of Kerala.

(g) **Interest on working capital**

The interest on working capital was calculated at the interest rate of 8 per cent, the prevailing interest rate of scheduled commercial banks.

(ii) **Cost A_2**

Cost A_2 = Cost A_1 + Rent paid for leased in land

No land was leased by the sample farmers in the study area

(iii) **Cost B**

Cost B = Cost A_2 + Interest on fixed capital excluding land + rental value of owned land

The rental value of owned land was calculated at ₹ 12,500 per hectare.

(iv) **Cost C**

Cost C = Cost B + imputed value of family labour

The imputed value of family labour was computed by multiplying man days with the prevailing wage rate in the study area. A substantial amount of family labour involved in finger millet production which is almost equal to hired labour and the participation

rate of women in finger millet farming was comparatively higher than that of men.

(v) **Cost C_3 = Cost C_2 + 10 per cent of cost C_2**

Cost C_3 is the total cost of cultivation which includes all cost items actual as well as imputed one.

Returns

Gross returns: Gross returns were calculated by multiplying the total product with its unit price.

Net returns: Net returns were calculated by deducting the total costs from the gross returns

(II) Efficiency

(i) **Cobb- Douglas production function**

Resource use efficiency in finger millet production was analyzed by applying Cobb-Douglas production functions to individual farm level data.

The specification of the equation was as follows:

$$Y = a X_1^{b_1} X_2^{b_2} X_3^{b_3} X_4^{b_4}$$

where,

Y = Yield (Qtls/ha)

X_1 = Human labour (man days/ha)

X_2 = Seeds (kgs/ha)

X_3 = Manure (t/ha)

X_4 = Land (hectares)

a = Constant

u = Random variable

b_1, b_2, b_3 and b_4 are the individual elasticity coefficients of different independent variables

$$\log Y = \log a + b_1 \log X_1 + b_2 \log X_2 + b_3 \log X_3 + b_4 \log X_4 + u \log e$$

Specification of variables

Marginal Value Product (MVP): The estimated individual coefficients from regression were used to calculate the MVP. The relative importance will be analyzed by studying the marginal value product of different inputs.

Table 1: Specification of variable for Cobb- Douglas production function Analysis

Variable Type	Variable Name	Description
Dependent Variable (Y)	Yield (Qtls/ha)	Obtained from finger millet cultivation per hectare
Independent Variables (X_1, X_2, X_3, X_4)	Human labour (man days/ha)	The quantity of human labour used per hectare
	Seeds (kg/ha)	Seeds used per hectare in the production of finger millet
	Manure (t/ha)	The quantity of manures used per hectare in finger millet production
	Land Area (hectares)	Area under finger millet cultivation measured in hectares

Table 2: Interpretation of r value and Resource use efficiency analysis

Case	Condition (r)	Interpretation	Implication
(i)	$r < 1$	Resource is excessively used or overutilized	Decreasing the quantity of resource used, increases profit
(ii)	$r > 1$	Resource is underused or being underutilized	Increasing the rate of input use will increase profit levels
(iii)	$r = 1$	Resource is efficiently used; optimum utilization achieved	Point of profit maximization

Marginal Value Product of X_i , the i^{th} input was estimated using the following formula,

$$MPP = b_i * G.M. (Y)$$

G.M. (X_i)

$$MVP = MPP * P_y$$

G.M. (Y) and G.M. (X_i) represent the geometric means of output and input respectively and b_i is the regression co-efficient of i^{th} input.

The model was estimated as follows,

$$r = MVP/MFC$$

Where, r = efficiency ratio

MVP = Marginal value product of variable input

MFC = Marginal factor cost (price per unit input)

Based on economic theory, a firm maximizes profits with respect to resource use when the ratio of the MVP to the MFC is one.

Data Envelopment analysis

Data envelopment analysis was used to work out farms' technical, allocative and economic efficiencies. Technical efficiency (TE) is the ability of a farm to produce the maximum possible output from the given input or the minimum possible resources used to produce a given output level. Allocative efficiency

(AE) refers to a technically efficient farm's ability to use resources appropriately to minimize production costs considering input prices. The product of TE and AE gives Economic efficiency (EE). Thus, if a farm is technically and allocatively efficient, it will be economically efficient, too. The popular method for estimating the efficiencies was data envelopment analysis (DEA), advocated by Charnes *et al.* (1978) and done using DEAP 2.1 Software.

DEA was performed by taking yield (kgs/ha) as output (Y) in the study, and total labour (man days/ha), seeds (kg/ha) and, FYM (kg/ha) and land (ha) were taken as explanatory variables.

RESULTS AND DISCUSSION

Socio-economic profile of the sample farmers

The average age of the sample farmers in the study area was 50 years, approximately 45 per cent of the sample farmers in Attapady were aged between 41 and 60 years. The average experience of tribal farmers in millet farming was 36 years. Annual household income of average family size of 4 among the sample farmers was around between 1 to 2 lakhs. Around 67 per cent of the sample farmers are illiterate, and only 23 per cent of farmers have undergone primary education. Most sample respondents are marginal farmers (51 per cent) whose land holding is less than one hectare, and the

average land allocated for finger millet cultivation is 0.71 ha. This clearly indicated that finger millet is cultivated by small and marginal farmers who are well-experienced in millet farming (Table 3).

Table 3: Socio-economic profile of sample farmers in the Attapady block

Particulars	Per cent
1. Age group (years)	
(a) 21-40	28.9
(b) 41-60	45.5
(c) >60	25.6
Average age	
2. Educational level	
(a) Illiterate	66.67
(b) Primary	23.33
(c) High school/Secondary	10.00
(d) Graduate	—
3. Average family size	
4. Size group	
(a) Small farmers	37.78
(b) Marginal farmers	51.11
(c) Semi-medium farmers	11.11
Particulars	Value
Average experience of farmers in millet farming (in years)	36
Average land holding (ha)	1.61
Average area under finger millet cultivation (ha)	0.70

Cost of cultivation and returns

The cost of cultivation of organic rainfed finger millet per hectare was ₹ 62680. In the total cost of cultivation, variable cost accounted for a major share of about 80.16 per cent of cost C_3 followed by fixed cost 10.72 per cent of cost C_3 . In the total variable cost, human labour (43.12 per cent) forms the highest proportion, followed by FYM (17.67 per cent), Machine labour (7.50 per cent) and bullock labour (6.58 per cent) (Table 3). These findings emphasized that finger millet cultivation requires minimum investment for seed and more labour intensive. The yield of main produce from finger millet cultivation is 7.05 qtl/ha and by product is 14.12 qtl/ha. The yield obtained is relatively lower compared to previous years because of reduced rainfall and increased wild animal and bird attacks in the field in 2023. Besides, the undulating

topography of the land and hilly nature of the study area altogether makes it difficult for the farmers to achieve the economic optimum production. The gross returns realized were ₹ 44,660 per hectare; however, farmers experienced a negative net return of approximately ₹ 18,021 when accounting for cost C_3 . Cultivation of finger millet was found to be profitable only over Cost A with a positive net return of ₹ 5541 and for every one rupee spent in rainfed finger millet cultivation farmer realized returns of 1.14 rupees over cost A, but it is not profitable over cost B, cost C and cost C_3 (Table 4). These results indicated that the gross returns realized were sufficient to cover only the variable costs and not the fixed costs, the rental value of owned land, or to compensate for family labour involved in millet farming.

Table 4: Yield and returns on different costs of organic rainfed finger millet cultivation (₹/ hectare)

Sl. No.	Particulars	Value
1	Cost of production (₹/qtl)	8916
2	Yield of main product (qtl/ha)	7.05
3	Yield of by-product (qtl/ha)	14.12
4	Selling price of main product (₹/qtl)	5133
5	Selling price of by-product (₹/qtl)	600
6	Returns from main product (₹)	36188
7	Returns from by-product (₹)	8472
8	Gross return	44660
	Cost A	5541
	Cost B	-1191
	Cost C	-12323
	Net return (₹/ha) – Over Cost C_3	-18021
	Cost A	1.14
	Cost B	0.97
	Cost C	0.78
	Cost C_3	0.71

Table 5: Details of cost of cultivation of organic rainfed finger millet in Attapady, Kerala (₹/ha)

Particulars	Cost (₹)	Percentage
Variable cost		
Human labour	27032	43.12
Bullock labour	4125	6.58
Machine labour	4707	7.50
Seed	413	0.65
FYM	11076	17.67
Total variable costs	47353	

Fixed costs		
Land revenue	438	0.69
Rental value of land	6250	9.97
Total fixed costs	6678	
Interest on working capital @ 8 per cent	2898	4.62
Interest on fixed capital @ 10 per cent	44	0.06
Cost C_2	56983	
Total cost of cultivation (Cost C_3)	62681	

Resource use efficiency of organic rainfed finger millet production

The coefficient of multiple determination (R^2) is 0.91, implying that 91 per cent variation in the dependent variable, i.e., Yield in quintals per hectare (Y), is explained by the explanatory variables which are included in the model. Returns to scale are 2.95; indicating that if all the inputs such as labour, land, seed and manures are increased simultaneously by one per cent, gross returns (Y) increase by 2.95 per cent, which exhibits increasing returns to scale. In rainfed finger millet, the regression coefficients for labour (2.29) and Manure (0.35) were positive and statistically significant, while for seed it was negative (-0.19) and also statistically significant. The size of the seed is very small, and tribal farmers typically broadcast the seeds in rainfed finger millet farming. As a result, the seed rate used per unit area is higher, leading to a situation known as weak disposability of inputs which means a higher seed rate not only increases costs for the farmer but also results in reduced output, ultimately results in reduced gross returns. Optimizing input usage helps the resource poor tribal farmers achieve increasing returns to scale, however inefficient allocation or overutilization of resources aggravates cost and reduces profit (Table 6).

The MVP-MFC ratio is less than one for labour, seeds and manure which indicates that all the inputs are over-utilised. In particular, the seed rate followed by the farmers is 9.45 kg/ha which is almost twice higher than the recommended rate (5kg/ha) and thereby, the yield is reduced because of competition among plants owing to less spacing between plants; more over farmers need to incur additional costs for weeding and thinning, which is reflected in the negative marginal value of the

product. FYM application rate among the farmers was 2.37t/ha while the recommendation was 5t/ha. The farm yard manure (FYM) usage by the tribal farmers in organic finger millet cultivation is less than the recommended rate, manure was not utilised at the optimum level as revealed by its marginal value product to marginal factor cost ratio of 0.01.

Table 6: Estimates of Cobb-Doughlas production function in organic rainfed finger millet production [Dependent variable (Y): yield in quintals per hectare]

Sl. No.	Variables	Parameters	Elasticity coefficients
1	Intercept	A	- 6.480 (7.37E ⁻⁰⁵)
2	Labour in man days/ ha (X_1)	b_1	2.296 (3E ⁻⁰⁸)
3	Seed in kg/ha (X_2)	b_2	-0.191 (0.00)
4	Manure in t/ha(X_3)	b_3	0.355 (0.00)
5	Land in hectare (X_4)	b_4	0.492 (1.39E ⁻⁰⁹)
6	Co-efficient of multiple determination (R^2)		0.91
7	F-value		106.85
8	Returns to Scale		2.95

Note: 1. Significant at 5 per cent 2. Figure in parentheses represent "P" value.

These results indicate seed rate can be reduced from the present level to optimise returns and application of manure at the optimum rate can be encouraged among the tribal farmers to achieve the economic optimum. It is evident that there exists a scope for reallocation of expenditure of these resources to maximise the profits and to attain economic optimal production of finger millet (Table 7).

Technical, allocative, and cost-efficiency of organic rainfed finger millet farms

The farm's efficiency was estimated using Data Envelopment Analysis (DEA) using DEAP 2.1 Software. The average technical, allocative, and cost/economic efficiency was 0.902, 0.876, and 0.789, respectively. Around 58 per cent of the rainfed finger millet farmers are technically efficient (0.9-1.0), and the average technical score is also quite impressive. About 42 per cent of farmers are in the range of allocative efficient score of 0.8-0.9, and only eight per cent are economically efficient (0.9-1.0). This showed that a majority of farmers are

Table 7: Resource use efficiency in organic rainfed finger millet production in Attapady

Independent variables used per hectare basis	Geometric mean level of use of input	Elasticity co-efficient	MVP (₹)	MFC (₹)	MVP/MFC	Remarks
Labour in man days/ha	53.60	2.296	17.04	600	0.02	Overuse
Seed in kg/ha	9.45	-0.191	-8.03	40	-0.20	Overuse
Manure in t/ha	2.37	0.355	59.42	4000	0.01	Overuse

Table 8: Technical, allocative, and cost-efficiency of organic rainfed finger millet farms in Attapady

Efficiency scores	Technical efficiency	Allocative efficiency	Economic/cost efficiency
0.5-0.6	—	—	—
0.6-0.7	2(2.22)	2(2.22)	18(20.00)
0.7-0.8	11(12.22)	14(15.56)	30(33.33)
0.8-0.9	25(27.78)	38(42.22)	35(38.89)
0.9-1.0	52(57.78)	36(40.00)	7(7.78)
Total	90(100.00)	90(100.00)	90(100.00)
Mean	0.902	0.876	0.789

technically efficient, and a considerable number are allocatively efficient; however, most are not economically efficient. Furthermore, only 2.22 per cent of the sample farmers have scores between 0.6 and 0.7 for technical and allocative efficiency and 18.89 per cent for economic efficiency. In the 0.7 to 0.8 range, technical efficiency is 12.22 per cent, allocative efficiency is 15.56 per cent, and economic efficiency is 33.33 per cent higher (Table 8).

The results indicate an urgent need for focused support and guidance for tribal farmers in farm management, particularly in adopting high yielding varieties and other productivity enhancing technologies to improve efficiency in finger millet cultivation. Production inefficiencies are largely attributed to limited technical knowledge among farmers, coupled with the predominance of subsistence over commercial finger millet production. To optimize economic outcomes, it is essential to provide education on resource allocation based on the marginal productivity of various inputs. Consequently, increased awareness and comprehensive field training programs on scientific cultivation practices are highly warranted.

CONCLUSION

Finger millet production in the Attapady region of Kerala faces economic challenges, as it is profitable only over Cost A and not Cost C_3 , compelling resource poor farmers to produce it primarily for

subsistence rather than commercially. The cost of cultivation (Cost C_3) is high for finger millet in the study area owing to the relatively high wage rate for agricultural labour following the state pattern, which inflates the overall cost of cultivation. Despite its significance for local food and nutritional security, the current practices in rainfed millet farming exhibit inefficient allocation of resources, evidenced by a marginal value product to marginal factor cost ratio of less than one, indicating suboptimal resource utilization due to low productivity levels. To address low productivity of finger millet in the tribal hilly areas where majority of people's nutritional security depends on millet, it is essential to introduce high-yielding varieties (HYVs) in the study area. The major constraint faced by the farmers was inadequate and untimely rainfall in millet production. The implementation of the long-pending Attapady Valley Irrigation Project needs to be prioritized by the Government of Kerala to provide life-saving irrigation hence farmers can improve crop resilience and their livelihoods. Attapady has the potential of produce millets organically and to tap the potential, the government policies should be tailored more specific towards increasing production and complementary infrastructure should be developed to support these policies. Focusing on these strategies, through suitable policies, can help the farmers improve the economic viability of finger millet production.

Limitations

Respondents showed a reluctance to share the information, since they had less exposure to non-tribal people. Hence, data collection has considerable difficulties and proceeded through the service of local tribal interpreters from millet village office. However, conscious efforts have been taken to minimize the errors by repeated cross checking of the data. The results of the study is very specific to the study area and cannot be generalized.

REFERENCES

- Amrutha, T. and Chandrakanth, M.G. 2018. Economics and resource use efficiency of little millet cultivation in central dry zone of Karnataka. *Mysore Journal of Agricultural Sciences*, **52**(3): 479-485.
- Bellundagi, V., Umesh, K.B., Sakamma, S., and Hamsa, K.R. 2017. Cost>Returns analysis and marketable surplus of ragi in central dry zone of Karnataka. *Journal of Agriculture and Veterinary Science*, **10**(10): 24-29.
- Bharathi, P., Samuel, A.D.V. and Masilamani, P. 2020. Resource Use Efficiency of Sorghum and Maize in Namakkal District of Tamil Nadu. *Indian Journal of Pure and Applied Biosciences*, **8**(5): 201-205.
- Ekbal, B. *et al.* 2013: Report on the visit to Attappadi by the medical team constituted by the CPI (M) Kerala State Committee, 18-21May, available at <http://www.republicofhunger.org/wp-content/uploads/2013/07/Attapadi-Report-E.pdf>.
- GoI [Government of India]. 2011. *Population census 2011* [online]. Available: <https://censusindia.gov.in> [20 August 2024].
- Hamsa, K.R., Murthy, P.S., Gaddi, G.M. and Rashmi, K.S. 2017. Resource use efficiency in cultivation of major food crops under rainfed conditions in central dry zone of Karnataka. *Economic Affairs*, **62**(2): 321-325.
- Menon, S.S. 2023. Response of High Yielding Variety of Finger Millet to NPK Nutrition in North Central Laterites of Kerala, India. *International Journal of Plant & Soil Science*, **35**(20): 946-953.
- Sreedhar, R., Kumar, R.S., Muralidharan, C. and Selvi, R.G. 2021. Economic analysis of pearl millet cultivation in rainfed ecosystem of Thoothukudi District, Tamil Nadu, India. *Asian Journal of Agricultural Extension, Economics and Sociology*, **39**(11): 468-473.
- Sreeni, K.R. 2023. Millet Village Attappady, Kerala: Choice for Healthy Food Consumption, Food Security, Livelihood, Income and Employment. *Journal of Food Science and Nutrition*, **9**(151): 2.