

Interlink Between Food Expenditure Patterns And Food Security: A Study Among Scheduled Tribe Communities In Kerala

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Abstract

Access to nutritious food is crucial for inclusive growth. Marginalized communities, especially scheduled tribe families with lower living standards, often struggle with poor diets lacking essential nutrients. This leads to protein and micronutrient deficiencies, impacting overall well-being. Based on this background, the study examines the inter relationship between food expenditure patterns and food security among Scheduled Tribe communities in Kerala. Findings indicate that over 65% of household food expenditure is directed toward carbohydrate-rich staples, while nutrient-dense foods receive comparatively lower allocation. Correlation analysis highlights a positive association between food security and the consumption of nutrient-rich food. Using the Food Security Index based on Monthly Per Capita Food Expenditure (MPCFE), the study identifies disparities in food security among different tribal groups. Kurichiya and Malayaraya households demonstrate the highest levels of food security, whereas Paniya households experience severe food insecurity. The findings underscore the urgent need for targeted interventions to enhance access to diverse and nutritious foods, address nutritional gaps, and promote equitable food security.

Key Words: Food Security, Food Security Index, Monthly Per Capita Food Expenditure, Scheduled Tribes.

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I. Introduction

The food consumption habits of a region substantially influence the quality of life of its population, and it depends on the quantity, types, and variety of food intake and nutritional content of the food. Nutritional quality of food holds immense significance as it directly influences an individual's health, development, and overall quality of life (Drewnowski & Evans, 2001). A nutrient-rich diet promotes physical health, enhances cognitive function, strengthens the immune system, and helps prevent long-term diseases. Beyond individual health, nutritional quality has broader social and economic implications (Strauss & Thomas, 1998).

Ensuring access to high-quality, nutrient-dense food is vital for fostering inclusive growth. The nutritional quality of food and its affordability are critical components of food security, particularly for marginalized communities. However, the families from scheduled tribe communities, especially those with a low standard of living, have a relatively poor diet that is mainly deficient in milk, curd and fruits resulting in protein and other micronutrient deficiencies. As a consequence, Scheduled Tribe communities across India experience lower levels of nutrition and poor health status compared to other groups. Even though Kerala has made tremendous achievements in most of the human development indicators, this is not much reflected in the life of scheduled Tribes. As per NFHS 2019-21, in Kerala, 57.6% of children, 52.9% of women and 31.7% of men among scheduled tribes are anaemic of any kind. Also, 18.9 % of women and 13.6 % of men are underweight. In addition, children from tribal communities have the poorest nutritional status across almost all health indicators. Despite the various efforts made by the government to address the problems of malnutrition and hunger through food safety nets, the problems still persist.

II. Tribal Food Systems And Livelihood Challenges

The historical analysis of food consumption patterns and behaviour shows that Scheduled Tribes have their own food culture as distinct from non-tribal communities elsewhere in India (Wang et al., 2017). Subsistence farming and forestry were integral part of the indigenous food ecosystem and livelihood earning of Scheduled Tribes. (Rimal, 2001; Mishra et al., 2021). They collected various edible items like roots, fruits, bamboo rice, leafy vegetables, honey and other forest products rich in micronutrients and vitamins. They also preserved several forest products to meet the seasonal food shortage (Nayak and Waterson, 2019). Scheduled tribes are excellent cultivators with traditional knowledge of indigenous crop varieties and a history of practicing shifting cultivation.

For example, the Mivilan tribes of the Kasaragod district and Kurichiya tribes of the Wayanad district have rich knowledge of various varieties of paddy.

However, this self-sufficient and sustained nature of the food ecosystem was threatened by development initiatives, the rapid growth of the population in the state and changes in land use patterns. The displacement of Scheduled Tribes from their natural habitats, along with anti-tribal forest laws, has disrupted their traditional forest-dependent food culture, leading to severe food and nutrition insecurity (Das et al., 2016; Pati and Dash, 2002). In addition to this, environmental degradation due to deforestation, climatic variability and land degradation have made marked changes in the traditional food systems of Scheduled Tribes (Mishra et al., 2010). As a result of the increasing population and rampant exploitation of forests by outsiders or non-tribals, most of the food sources from the forest are growing scarce (Jha et al., 2017).

Tribes had a symbiotic relationship with nature that sustained their livelihood and existence. They sustain themselves by relying on forests and hilly regions, making use of locally available resources for their livelihood (Pandey, Tripathi, & Kumar, 2016). But once the non-tribal settlers began to inroads into their social habitat, the sustained well-being and livelihood were threatened, perpetuating poverty and dependency among tribes (Kunhaman, 2021). The decline in forest ecosystems and traditional cultivation among tribes shifted the habitual food consumption pattern, leading to the predominance of cereals over agroforestry products that are rich in nutrition (Ghosh-Jerath et al., 2021). In addition, factors like discrimination, cultural differences, interior habitation and limited access to public services added to their deprivation. Due to these unpropitious circumstances, scheduled Tribes in the state are prone to hunger, malnutrition and related issues.

III. Review Of Literature

The quality of life of a population is deeply shaped by its food consumption, which is influenced by the nutritional value, diversity, and types of food people eat. The dietary diversity of food consumption indirectly shows energy and nutrient intake and indicates the extent to which the nutritional needs of the households are being met (Kant, 2004). Higher expenditure on nutrient-rich foods enhances physical and cognitive development, especially in children. Communities with access to nutritious food experience lower healthcare costs, reduced poverty levels, and improved educational outcomes, creating a virtuous cycle of development (Perry et al., 2006). The lack of ability to access a minimum nutrition requirement has severe implications for human development (Ruia et al., 2018; Martorell, 2017; Alemu, 2020). Food insecurity and resulting protein and energy deficiencies affect physical and cognitive development in children and lead to higher morbidity and mortality rates among children and low labour productivity in the long run. Additionally, imbalanced food spending contributes to persistent malnutrition, anemia, and stunting, highlighting the need for equitable access to diverse and nutrient-dense diets (Black et al., 2008).

Consuming a diverse range of nutritious food in sufficient quantity and quality is crucial for maintaining good health. It supports overall development, prevents diseases across all life stages, and lowers the risk of chronic conditions such as heart disease, diabetes, and stroke. Nutritional adequacy plays a crucial role in enhancing health outcomes, as insufficient access to essential nutrients can lead to long-term health complications (Drewnowski & Evans, 2001). Merely having food available does not guarantee proper nutrition—factors such as quality, diversity, and dietary balance are essential in preventing malnutrition and associated diseases.

The dietary habits of the people are highly dependent on the demographics of the population (Parappurathu et al., 2015). Women and children in marginalized households often experience nutritional inequities, as they tend to receive lower-quality food than male family members. Empowering women in food-related decision-making can improve household nutrition to some extent (Kabeer, 1999). Lower food expenditure is associated with poor maternal nutrition, affecting both maternal and fetal health and underscores the need for targeted interventions and policy measures to improve nutritional outcomes during pregnancy (Sari, Sutyarso, & Bakri, 2020). Unlike other commodities, food is intrinsically tied to human survival, making equitable access a fundamental social issue. (Azetsop & Joy, 2013). Efforts to promote indigenous food systems and sustainable agricultural policies can bridge nutritional gaps in low-income communities. Strengthening local biodiversity, organic farming, and community-based food programs can enhance affordability and food and nutrition security (Altieri, 2009).

IV. Objectives Of The Study

1. To understand the status of Food Security among Scheduled Tribes in Kerala.
2. To analyse the relation between food expenditure pattern and food security among Scheduled Tribe communities in Kerala

V. Methodology Of The Study

The study was based on primary data collected from a sample of 391 households from six tribal communities across five districts—Thiruvananthapuram, Kottayam, Idukki, Palakkad, and Wayanad district. The

communities taken for the study include Paniya, Irular, Muthuvan, Kanikkar, Malayarayan, and Kurichiya, with the first three categorized as socio-economically backward and the latter three as forward communities. The selection of districts was based on the concentration of these Scheduled Tribe populations. Sample size of the population was calculated by Yamane formulae $n = N / (1 + e2N)$. The number of households selected from each community was determined using a stratified sampling technique, ensuring proportional representation based on the total sample of Scheduled Tribe households included in the study. From each community data were collected by simple a random sampling method through structured interviews, and supplemented by insights from Scheduled Tribe promoters and key informants.

VI. Scheduled Tribes In Kerala

The tribal communities of Kerala, known as Adivasis, primarily reside in the dense forests and mountainous regions of the Western Ghats, often remaining excluded from mainstream society. At present, Kerala has 37 recognized tribal communities with a population of 4.84 lakh, spread across 14 districts. Among these, the Paniyans form the largest tribal group, followed by Kurichyans, Irular, and Malayarayas. There are five primitive tribal communities in the state, namely Cholanaikkan, Kadar, Koraga, Kattunaikan and Kurumbas, (KIRTADS, 2013). The highest number of Scheduled Tribe populations is found in Wayanad (1,51,443) district followed by Idukki (55,815), Palakkad (48,972), and Kasaragod (48,857) districts. Despite Kerala's socio-economic progress, tribal communities continue to face significant challenges, including endemic poverty, poor health and nutrition, low literacy rates, limited access to developmental infrastructure, cultural erosion, and social discrimination. Spatial and ethnic variations influence their socio-economic status, further exacerbating their marginalization.

Profile of The Scheduled Tribe Households taken for the Study

District	Community						Total
	Kurichiya	Irular	Kanikkar	Malayara	Muthuvan	Paniya	
Thiruvananthapuram	0	0	43	0	0	0	43 (11%)
Palakkad	0	54	0	0	0	0	54 (13.8%)
Wayanad	57	0	0	0	0	148	205 (52.5%)
Kottayam	0	0	0	58	0	0	58 (14.8%)
Idukki	0	0	0	0	31	0	31 (7.9%)
Total	57 (14.6)	54 (13.8)	43 (11)	58 (14.8)	31 (7.9)	148 (37.9)	391 (100)

Source: Primary Data

VII. Data Analysis And Discussion

1. Food Security Status of Scheduled Tribe Households in the study area.

The Food Security status of Scheduled Tribes communities under study is determined using the Food Security Index, based on Monthly Per Capita Food Expenditure (Adepoju & Oyegoke, 2018). A household with a per capita monthly food expenditure (MPCFE) equal to or above this threshold is considered as food secure, while those spending less than two-thirds of the mean MPCFE are classified as food insecure (Omonona et al., 2007; Ifeoma & Agwu, 2014).

$$Fi = \frac{\text{Per capita food expenditure for the } i^{\text{th}} \text{ household}}{2/3 \text{ mean per capita food expenditure of all households}}$$

Where Fi = Food Security Index

When $Fi \geq 1$ = Food secure i^{th} household; $Fi < 1$ = Food insecure i^{th} household.

Based on the 391 samples taken for the study, the average monthly per capita food expenditure amounts to Rs. 2048.99 and MPCFE is Rs. 1366. Hence, households with food expenditure below Rs 1366 are classified as food insecure, while those with expenditures at or above Rs. 1366 are considered food secure. Table 1 shows the community wise Food Security Status of Households under study.

Table 1: Food Security Status- Community-wise

Table 1. Food Security Status- Community-wise				
Community	Food Security Index		Total	X² Value (p-Value)
	Insecure	Secure		
Kurichya	0	57 (100)	57 (100)	37.11 ($<.01$)
Irular	5 (9.3)	49 (90.7)	54 (100)	
Kanikkar	2 (4.7)	41 (95.3)	43 (100)	
Malayaraya	0	58 (100)	58 (100)	
Muthuvan	3 (9.7)	28 (90.3)	31 (100)	
Paniya	34 (23)	114 (77)	148 (100)	
Total	44 (11.3)	347 (88.7)	391 (100)	
Source: Computed				

The analysis indicates that 88.7% of households are food secure based on monthly per capita food expenditure. Kurichya and Malayaraya communities have the highest food security (100%), followed by Kanikkar (95.3%). Food insecurity is highest among Paniya (23%), followed by Muthuvan (9.7%) and Irular (9.3%). The result (p-Value <0.01) shows that there is significant difference in food security status among scheduled Tribe Communities under study.

Variations in food security status may stem from differences in socioeconomic status. Field survey observations indicate that food-secure households have regular and alternative income sources for food. Additionally, differences in domestic food cultivation and proper utilisation of food-based safety nets contribute to food security. For example, the Kurichyas, the most food-secure group, cultivate various food items for self-consumption, including rice, vegetables, and tubers like tapioca. They practice organic and joint farming and are highly aware of and effectively utilise government food and livelihood schemes. In contrast, the Paniyas, who have the least food security, are less likely to produce food domestically. Most families rely on rice from ration shops for daily needs. Lack of awareness, possibly due to low education levels, prevents many Scheduled Tribes from properly utilising government schemes.

Distribution of Monthly Food Expenditure of Tribal Communities on Various Food Basket

Dietary diversity, the number of different types of food items included in a food basket, has been positively linked with various dimensions of food security (Styen et al., 2006). An understanding of the variety of items included in the food basket of households will help to assess the dietary diversity and food security status of a given category of households. On the other hand, dietary diversity is influenced by various factors, including biodiversity in the region, consumption habits of the population, income levels, and demographic and socio-economic characteristics of households. Table 2 shows the percentage of average monthly food expenditure of Scheduled Tribe communities on different categories of food items.

Table 2: Average Monthly Food Expenditure of Tribal Communities

Food Basket	Kurichya	Irula	Kanikkar	Malayaraya	Muthuvan	Paniya	Total	F -Value 3.12 P -value 0.018
Cereals, Roots & Tubers	46.16	50.89	46.63	45.61	54.74	55.48	49.52	
Vegetables	6.23	6.41	5.37	5.37	5.61	4.85	5.46	
Fruits	6.27	5.67	6.40	6.19	4.87	4.11	5.37	
Fish meat & Egg	12.78	9.43	11.72	12.63	9.48	8.96	11.14	
Milk and Dairy Products	7.67	5.91	8.01	8.82	5.83	5.01	6.49	
Pulses and nuts	6.78	6.89	6.15	6.15	5.02	5.35	6.36	
Oil, sugar, sweets, spices and condiments	14.10	14.80	15.72	15.23	14.44	16.24	15.65	
Total	100.00	100.0	100.00	100.00	100.00	100.00	100	

Source: Computed from Primary Data

The distribution of average monthly food expenditure among Scheduled Tribes in the study area shows that the highest portion of the expenditure (49.52%) on food is for cereals, roots and tubers, followed by oil-sweet spices and condiments (15.65%). The expenditure on fish, meat and egg together constitutes 11.14 per cent of the

average monthly food expenditure. The expenditure on the nutrient composition of food shows that 5.46 per cent of food expenditure is on vegetables, 5.37 per cent on fruits, 6.49 per cent on milk and dairy products and 6.36 per cent on pulses and nuts. Analysis of monthly food expenditure among scheduled Tribe shows that more than 65 per cent of expenditure is allotted for carbohydrate-rich food, including cereals, roots, oil sugar and sweets. The expenditure on vitamin and micronutrient-rich food is below 35 per cent among food insecure category. Whereas expenditure on nutrient rich food is more than 45 per cent among the most food-secured category, that is, Kurichiya (46.16%) and Malayaraya (45.61%). The analysis suggests that (P -value = 0.018), there is statistically significant difference in the mean expenditures on different basket of food among the Scheduled Tribe communities under study.

Community-wise details of food expenditure show that more food insecure categories, that is, Paniya (55.48 %), Muthuvan (54.74 %), and Irular (50.89%), spend more than half of expenditure on cereals, roots and tubers. The expenditure on nutrient components is also comparatively low among these categories. This is clear from the expenditure trend of milk and dairy products, fish, meat and egg, vegetables and fruits. It is observed from the field survey that the Paniya category prefers to consume sweets and sugar as compared to other categories in the study area. One interesting observation from the field visit was that many of the Panias prefer to have hotel food, unlike Kurichiya families, who prefer food cooked in their own "Ooru". The low consumption of nutrient-rich food among scheduled Tribes may be due to their poor economic status and incapability to purchase nutrient-rich food because of its high price in the market. Based on the average expenditure on nutritional components, Kurichya and Malayaraya spends the most on nutritional components and Paniya, and Muthuvan spends the least. The observable differences in nutritional spending among the tribal communities in Kerala can be attributed to a myriad of factors including cultural preferences, economic disparities, geographic location, social and educational influences, environmental conditions, and policy impacts. The displacement of scheduled Tribes from their natural habitat and restrictions on forests, has reduced the dependency of tribes on forests for food items that are rich in nutrients. Additionally, due to their weak bargaining power, tribes often sell forest food items to non-tribal communities at low prices, further limiting their own consumption. This may be one of the reasons for the high dependence on carbohydrate- or energy-rich foods among Scheduled Tribes in the study area.

3. Food security and nutritional components of food expenditure

Poor health and nutrition status of Scheduled Tribes have adversely affected their human development (Shankar, 2004). This requires that in addition to ensuring an adequate quantity of food, it is essential to ensure the quality and dietary diversity of food to meet the nutrient requirements of the family. Table 3 examines the correlation between food security and expenditure on various food items based on household-level data from six sample Scheduled Tribe communities taken for the study.

Table 3: Correlation between Food Security Index and Nutritional Components

Food Basket	Pearson Correlation (p-value)
Total expense for Cereals	.130** (.010)
Roots and Tubers	.115* (.023)
Fat, Oil and Oil Seeds	.313** (.000)
Sugar and Sweets	.330** (.000)
Pulses and Nuts	.467** (.000)
Vegetables	.487** (.000)
Fruits	.433** (.000)
Condiments and Spices	.194** (.000)
Meat, Fish, Egg	.501** (.000)
Dairy Products	.522** (.000)
<p style="text-align: center;"><i>Source: Computed</i> **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).</p>	

The correlation analysis shows that all the nutritional components are positively and significantly correlated to the food security index. The highest correlation is for dairy products (0.522), followed by Meat, Fish and egg (0.501), vegetables (0.487), pulses and nuts (0.467). The lowest correlations were for roots and tubers (0.115, cereals (0.130) and Condiments and Spices (0.194).

VIII. Conclusion

The analysis of food security among Scheduled Tribe households in the study area highlights significant disparities in food consumption and nutritional spending. While the majority (88.7%) of households are categorized as food secure, variations exist among different tribal groups due to socioeconomic conditions, livelihood patterns, and access to food resources. Tribes with strong agricultural practices and awareness of government support systems, such as the Kurichiya and Malayaraya, exhibit higher food security, whereas groups like the Paniya face greater challenges in maintaining adequate nutrition. Tribes like the Kurichiya and Malayaraya exhibit the highest food security due to diversified agricultural practices and effective use of government schemes, while the Paniya struggle with food insecurity due to economic challenges and limited domestic food production. An analysis of food expenditure patterns reveals that more than 65% of total spending is allocated to carbohydrate-rich staples, while less is spent on nutrient-dense foods such as vegetables, dairy, and fruits. The correlation analysis confirms a positive link between food security and the consumption of nutrient-rich foods.

The study underscores the importance of targeted interventions, including livelihood support, nutrition awareness programs, and improved access to food-based safety nets, to enhance the food security and dietary diversity of Scheduled Tribes. Strengthening agricultural practices and ensuring better utilization of government schemes can help mitigate food insecurity and improve the overall nutritional status of Scheduled Tribe households in Kerala.

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