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Household management practices and dietary diversity among the tribal communities in kerala

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ABSTRACT

The present study was conducted from 2020 to 2023 in the three tribal districts of Kerala. A sample of 500 respondents, including individuals from the Paniya, Irula, and Kanikkar tribes, was purposively selected from three districts: Wayanad, Palakkad, and Thiruvananthapuram. This study investigates the dietary diversity, living conditions, and food security status of tribal populations in Kerala, India. Through structured interviews and secondary data analysis, the study examines various aspects of food habits, household food availability, housing conditions, water scarcity issues, and livestock management among tribal communities. Results reveal disparities in housing infrastructure, access to safe drinking water, and availability of essential food items, highlighting the need for targeted interventions to improve food security and nutritional well-being among tribal populations in Kerala. The findings indicated that there is a substantial difference in the consumption of food items across various districts.

Keywords : Household management, Tribals in Kerala, Dietary diversity, Food availability

INTRODUCTION

Tribal communities in India are a diverse group, with significant differences in terms of language, culture, and traditions. They range from patriarchal to matriarchal, monogamous to polygamous, nature worshippers to polytheists, etc. The tribes in Kerala, represent only 5 percent of the total population Tribal communities in Kerala possess unique cultural traditions and practices that are often closely intertwined with their household management and food practices. These communities often face unique challenges related to food security, nutrition, and living conditions due to socio-economic marginalization and geographical isolation. Despite initiatives to improve living standards, disparities persist, impacting the health and well-being of tribal populations. Understanding the household management practices of tribal communities provides insights into their socio-economic conditions, livelihood strategies, and resource management techniques. Studying these practices helps in documenting and preserving indigenous knowledge systems, traditional agricultural techniques, culinary traditions, and rituals associated with food preparation and consumption. This study aims to explore the dietary diversities, household food availability, housing conditions, and water scarcity issues among tribal communities in three districts of Kerala:

Wayanad, Attapaddy, and Thiruvananthapuram. By employing a mixed-methods approach, including structured interviews and secondary data analysis, the study seeks to provide insights into the socio-economic determinants of food security and identify opportunities for intervention to enhance the nutritional status and well-being of tribal populations.

METHODOLOGY

The study involved 500 tribals from three districts in Kerala, encompassing both genders. Sampling included selecting 200 respondents each from the Paniya tribe in Wayanad (40 percent) and the Irula tribe in Attapaddy (40 percent), alongside 100 respondents of Kanikkars (20 percent) from Thiruvananthapuram district. This distribution aimed to ensure a diverse representation of tribal populations across various geographical areas within the state. The selection of locales (tribal hamlet areas) and respondents was done using purposive sampling, prioritizing voluntary participation to ensure cooperation during interviews and focus group discussions. A comprehensive interview schedule was crafted, incorporating questions on dietary practices, food habits, household food preparation, meal patterns, preferences, nutrition, cultural significances, cooking practices, and food practices during different physiological conditions and occasions. These inquiries aimed to provide a holistic understanding of the food-related behaviors and practices of the selected tribal communities. Data collection employed both primary and secondary sources. Primary data was gathered through interviews conducted directly with the respondents, allowing for an in-depth exploration of their dietary practices and food-related behaviors. This approach facilitated the collection of first-hand insights from the tribal communities, enabling a deeper understanding of their food habits and cultural practices. Secondary data, comprising existing literature, reports, and studies, complemented the primary data, providing additional context for analysis.

RESULTS AND DISCUSSION

Ensuring equitable and respectful treatment of participants is an ethical obligation for researchers. For research to be reliable, valid, and ethically conducted, the living conditions of research samples must be taken into account and documented. It enables scholars to responsibly contribute to the growth of knowledge, reach significant conclusions, and offer well-informed advice. The housing and living arrangements of the tribals selected for the study were analyzed in detail with the help of observations, informal discussions, participant interactions, and interviews. It includes data regarding ownership of the houses, housing conditions, cooking place, sources of cooking and drinking water, sanitary arrangements, electricity connection, and methods of garbage disposal.

Table No 1 : Housing and Living arrangements of the Respondents

Variables		Count (n=500)	Percentage (%)
Ownership of the house	Own	103	20.60
	Rent	2	0.40
	Govt provided	393	78.60
	Inherited	2	0.40
Housing condition	Thatched walls and thatched roof	16	3.20
	Mud walls and thatched roof	10	2.00
	Tiled House	63	12.60
	Concrete House	369	73.80
	Asbestos House	12	2.40
	Metal sheets	19	3.80
	Bamboo made	11	2.20
Cooking place	Outside house	273	54.60
	Inside house	222	44.40
	Others	5	1.00
Source of cooking*	Cooking source	488	98.19
	Fire chulha	150	30.18
Sources of drinking water	Own wells	34	6.80
	Public well	96	19.20
	Public tap/hand pump	217	43.40
	River/pond	135	27.00
	Bore well	2	0.40
	Tanker water	16	3.20
Scarcity of water	No	112	22.40
	Yes	388	77.60
Sanitary Arrangements	Own	382	76.40
	Community toilet	43	8.60
	Defecation in open field	75	15.00
Electricity connection to the household	Electrified	471	94.20
	Un-electrified	29	5.80
Garbage disposal	Available	490	98.00
	Not available	10	2.00
	Total	**500**	**100.00**

*Indicates Multiple Response

The data from the above table reveals distinct patterns in house-ownership among the respondents. Currently, 393 of the 500 families' occupants are in government-provided homes, demonstrating a significant reliance on public housing projects. Such houses have a kitchen, a bedroom, and a hallway. Outside the buildings, toilets were constructed. Some of the dwellings have been added to, including rooms and tiled floors. The majority of the government-built houses, however, still have unfinished construction some have even been abandoned for months. The majority of the houses just had their main doors, leaving the windows, floors, and kitchen slabs unfixed.

The government is expected to rebuild their deteriorating houses as part of the LIFE Mission housing initiative. Each chosen tribal family is expected to receive Rs 6 lakh, including Rs 3 lakh from the Tribal Development Department, to build a house. After demolishing their old houses, the construction work is turned over to a private contractor. A few houses have been finished. Those who have completed the construction works are also in a fix as they have undertaken the work after borrowing huge amounts from micro-lenders and moneylenders, expecting financial assistance from the government in a time-bound manner. Meanwhile, 20.60 percent of respondents own their houses outright. Only 0.40 percent of the population lives in inherited or rented housing.

The housing conditions of the respondents in the tribal areas across Thiruvananthapuram, Wayanad, and Attapaddy, reveal a diverse range of structures. The majority, 73.80 percent, reside in concrete houses. Notably, Attapaddy stands out with the highest proportion of concrete houses (80 percent), largely due to government initiatives in housing development. Wayanad follows closely with 79 percent and Thiruvananthapuram, on the other hand, has a significant portion (51 percent) of concrete houses but also a notable presence (17 percent) of alternative housing materials, metal sheet structures or low-quality plastic sheets raised on the foundation of their unfinished concrete houses and bamboo houses are more common, while tiled houses are predominant in Wayanad (14%), indicating regional variations in construction preferences and availability of resources.

The majority of the families stopped the construction work, anticipating the remaining funds from the government agencies. A smaller proportion, 3.20 percent, have thatched walls and roofs, while 2.40 percent live in asbestos houses. Additionally, 2.20 percent of the respondents dwell in bamboo-made structures, and 2 percent reside in houses with mud walls and thatched roofs.

A clear pattern in the respondents' cooking places was also studied. Surpassingly, 54.60 percent of the respondents choose outdoor cooking spaces. Further, 44.40 percent of households have an indoor kitchen. It is interesting to note that even among those who have an indoor kitchen, a notable proportion choose to construct an additional cooking area adjacent to their house. The mud and bamboo structure with a thatched roof with a door and no windows or holes, cow dung applied on the floors, and lacked even the most basic facilities, externally looks very small and compact but internally very spacious. Their mud kitchens are kept pristine. The traditional cooking medium “Chulah” is made of mud mixed with straw/dry grasses and stones. Out of 500 households, 488 use fire chulah (wood,

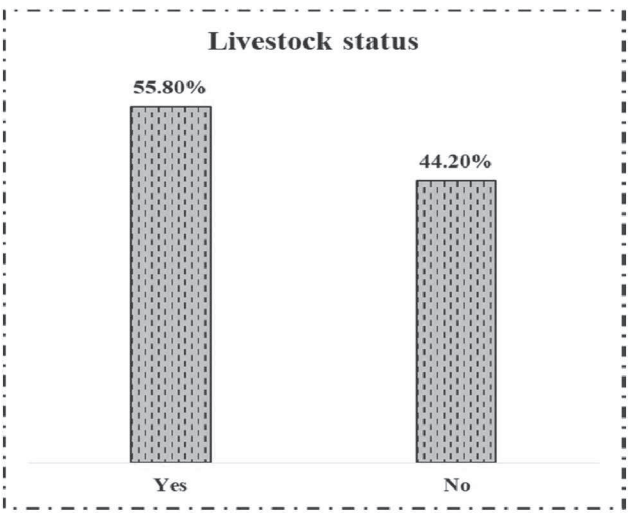
leaves, and straws) as a cooking medium, and 150 households have gas stove connections. All families opt for using chulah for cooking despite having a gas connection due to financial constraints.

The data also revealed that 77.60 percent of the respondents are experiencing extreme water scarcity, especially due to desertification-like situations in the regions of Attapaddy. Deficit rainfall during monsoon and massive deforestation had a significant impact on the availability of safe drinking water in these regions. The perennial rivers like Bhavani and Siruvani are their prime option. But ahead of the summer months, rivers have dried up. It has not only affected drinking water availability but also affected their cultivation and personal hygiene badly. Water is pumped directly without any effective treatment or purification, most of the households use untreated river water. Apart from that, the lack of proper water storage facilities in hamlets also makes the crisis severe.

Every tribal hamlet lacks proper pump facilities. Due to the lack of land availability digging wells is not possible for several families The Jalanidhi project of the government provides a drinking water supply to the hamlet but it is a big failure in the case of Attappady. A significant portion of households, 43.40 percent, rely on public tap/hand pumps as their primary source of drinking water. Further, 27 percent depend on rivers/ponds, while 19.20 percent utilize public wells. A smaller proportion, 6.80 percent, relies on their wells, and 3.20 percent depend on tanker water. Bore wells contribute the least.

Livestock and Poultry Management of the Respondents

Understanding the livestock possession of a household can be a useful tactic to increase and stabilize low-income families' incomes, diversify their sources of income, create job possibilities and manage hazards associated with drought. It will also help planners and policymakers to design livelihood opportunities based on that. An attempt was made to understand the status of livestock possession of the respondents which is depicted below.



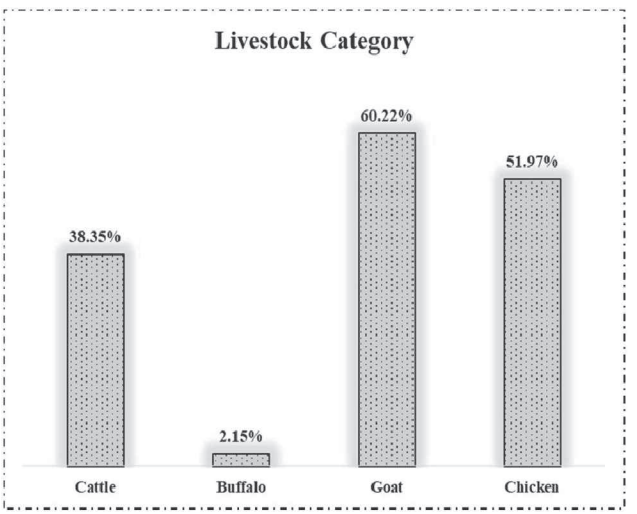


Fig. No. 1 & 2 : Livestock status and types among the respondents

The graphical illustration indicates that 55.80 percent of households own livestock. Among the respondents who own livestock, the distribution of livestock types is as follows: Goats/Sheep lead at 60.22 percent, followed by poultry rearing at 51.97 percent, Cattle at 38.35 percent, Buffalo at 2.15 percent, and Duck at 1.43 percent. A shift from agriculture to goat rearing is observed, due to its suitability for harsh environments and potential for high returns with low investment. Goats' ability to conceive and breed twice a year, often giving birth to twins, is a significant factor in households' income. However, despite being an income-generating activity, the potential for improving nutrition remains underutilized, as many tribal households rely on goat-rearing income. All households own goats, cattle, and poultry, but these animals' products are utilized for commercial rather than domestic purposes. So the diets were found to be grossly deficient in all nutrients. The challenge lies in addressing the severe shortage of fodder due to shrinking grazing lands.

Household Food Availability

The household food availability of the respondents was assessed and the details regarding the same are represented below.

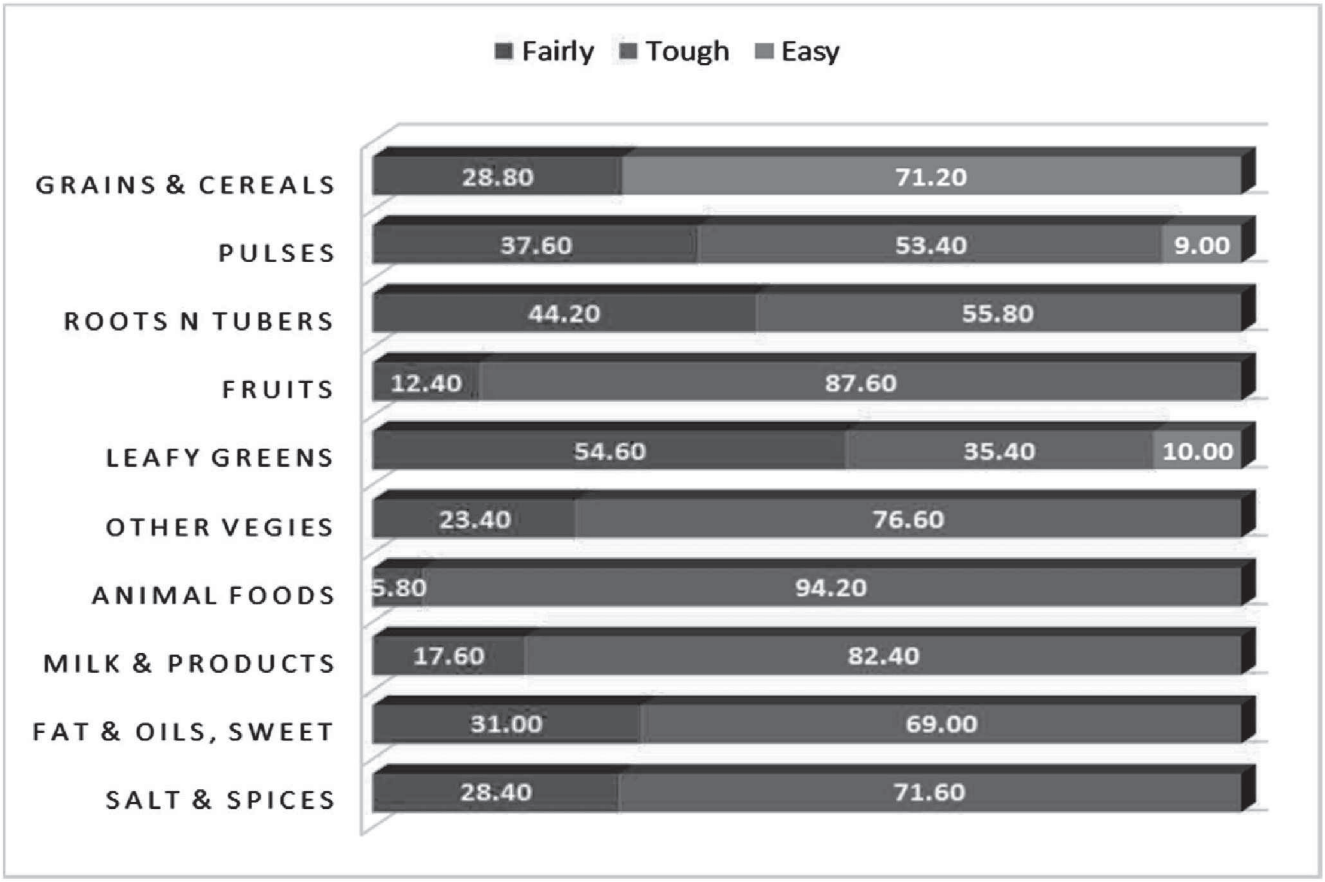


Fig No. 3 : Distribution of the respondents by level of household food availability

Based on the data provided, the distribution of household food availability varies across the districts. While comparing the tribal settlements from the three districts of Thiruvananthapuram, Attappady-Palakkad, and Wayanad certain trends emerged in terms of the non-availability of food items.

Regarding the consumption of fruits, Palakkad exhibited the highest non-availability of fruits (96.5 percent), followed by Wayanad (84.5 percent) and Thiruvananthapuram (76 percent). This suggests a significant lack of access to fruits, particularly in Attappady(Palakkad) and Wayanad. It also shows the scarcity of fruits grown in the forest regions. The price of the fruits in the market may also be one of the reasons for the non-incorporation of fruits in the daily diets of the tribals.

Regarding the consumption of animal-based foods, all three regions exhibited a significant scarcity, with both Attappady (Palakkad) and Wayanad at 93 percent, and Thiruvananthapuram slightly lower than that. Economic constraints compel individuals to restrict their intake of animal-derived food items.

In the case of consumption of Milk & its products, it was found that the Attapady region in Palakkad again demonstrated the highest non-availability (86.5 percent), followed by Wayanad (85.5 percent) and Thiruvananthapuram (68 percent). Attappady also reported the highest non-availability of other vegetables (70.5 percent), followed by Wayanad (82 percent) and Thiruvananthapuram (78 percent).

Overall, the Attapady region of Palakkad consistently shows higher percentages of tough accessibility across various food categories, indicating potential food security concerns in the district. Thiruvananthapuram and Wayanad, while facing challenges in specific items, generally have more balanced distribution patterns. This suggests a more pronounced food scarcity situation in the Attapady regions of Palakkad compared to the other two districts. The comparison highlights the need for targeted interventions to improve the availability of essential food items, especially fruits and animal food sources, in these regions to ensure better food security and nutrition for households.

Table No. 2 : Analysis of Variance (ANOVA) and Multivariate analysis of variance (MANOVA) for various food categories across three districts in Kerala

Food items	District			ANOVA		MANOVA	
	Thiruvananthapuram	Palakkad	Wayanad	F	Sig.	F	Sig.
Cereals and its products	29.71	29.71	29.71	0.000	1.000		
Pulses and legumes	28.44	22.33	8.16	168.674	0.000		
Roots and tubers	4.18	1.66	2.88	15.391	0.000		
Green leafy vegetables	14.14	11.80	15.83	5.201	0.006		

Other vegetables	14.40	12.06	14.40	2.104	0.123		
Fruits	0.95	0.68	0.79	1.877	0.154		
Fish	2.25	2.20	2.78	1.779	0.170		
Flesh meat	0.94	0.81	1.13	4.745	0.009		
Eggs	2.76	1.30	1.86	16.903	0.000		
Milk	5.57	3.14	3.88	3.576	0.029		
Curd	1.18	0.68	0.59	11.854	0.000		
Ghee	0.53	0.54	0.53	0.081	0.922	100.334	0.000*
Fats and oils	25.55	27.14	27.50	1.879	0.154		
Sugar	30	30	30	0.000	1.000		
Jaggery	0.88	1.02	0.59	1.371	0.255		
Honey	0.90	0.76	0.87	1.663	0.191		
Tea	28.81	29.11	1.26	2609.093	0.000		
Coffee	0.37	0.30	22.18	417.919	0.000		
Soft drinks and other energy drinks	0.21	1.11	0.23	49.048	0.000		
Fresh fruit juices	0.03	0.06	0.05	1.424	0.242		
Bakery food products	1.67	1.23	1.89	4.031	0.018		
Fast foods	1.06	1.02	1.16	0.768	0.465		

*Significant at 0.001 percent level

The table presents the results of the analysis of variance (ANOVA) and multivariate analysis of variance (MANOVA) for various food categories across three districts in Kerala. It also provides an insight into the variations in food consumption patterns among tribal communities across different districts of Kerala. Regarding the consumption of cereals and products, the ANOVA results indicate a significant difference ($F = 29.71$, $p < 0.001$) among the districts, suggesting variations in the consumption of cereals and their products. However, the MANOVA result is not significant ($F = 100.334$, $p = 1.000$), indicating that the overall consumption pattern across all food categories is not significantly different among the significant differences observed in the consumption of various food categories, including cereals, pulses, roots and tubers, green leafy vegetables, flesh meat, eggs, milk, curd, tea, coffee, soft drinks, bakery food products, and others. These differences may be attributed to socio-cultural preferences, dietary traditions, access to resources, and environmental factors prevalent in each district.

When the ANOVA significance level falls below 0.05, it indicates a substantial difference in the consumption of food items across various districts. Consumptions of Pulses and legumes, Roots and tubers, Eggs, Milk, and Curd exhibit a significant increase in Thiruvananthapuram. Consumptions of Tea and Soft drinks show a significant rise in Palakkad. Furthermore, the consumption of Green leafy vegetables,

Flesh meat, Coffee, Bakery food products, and Fast foods experiences a significant surge in Wayanad. The MANOVA results, with a significance level below 0.05, indicate that the consumption patterns of food items significantly differ among the sampled districts.

The significant findings underscore the importance of considering regional disparities and contextual factors in designing targeted interventions and policy measures to promote dietary diversity, food security, and nutritional well-being among tribal communities in Kerala. Furthermore, future research should explore the underlying determinants of food consumption patterns and their implications for health outcomes, livelihood sustainability, and community resilience among tribal populations in the region.

Factors determining Household Food Consumption

Household food consumption is influenced by an interplay of diverse factors. Paramount among these is family income, which dictates purchasing power. Food cost directly impacts choices, while individual preferences, likes, and dislikes shape dietary decisions. The availability of diverse food options, coupled with nutritional requirements, plays a pivotal role. Cultural and ethnic considerations contribute to food choices, as does the convenience of preparation and consumption. Together, these factors intricately shape the dynamic landscape of household food consumption.

Table No. 3 : Distribution of the respondents based on factors determining the household food consumption

Factors determining household food consumption	Districts						Total		Ranking
	Thiruvananthapuram		Palakkad		Wayanad				
	n	%	n	%	n	%	n	%	
Economy	100	100.00	199	99.50	198	99.00	497	99.40	2
Food cost	100	100.00	200	100.00	200	100.00	500	100.00	1
Likes/dislikes	9	9.00	36	18.00	18	9.00	63	12.60	4
Food availability	99	99.00	199	99.50	198	99.00	496	99.20	3
Food requirement	0	0.00	0	0.00	2	1.00	2	0.40	6
Ethnic concern	0	0.00	0	0.00	0	0.00	0	0.00	7
Convenience	5	5.00	19	9.50	34	17.00	58	11.60	5

Figures indicate Multiple responses

The table represents the distribution of factors influencing household food consumption across three districts: Thiruvananthapuram, Attappady (Palakkad), and Wayanad. In Thiruvananthapuram, family income and food cost are dominant factors, each constituting to 100 percent. Food availability follows closely at 99 percent. Food Likes/dislikes and convenience play minor roles at 9 and 5 percent, respectively.

In Attappady (Palakkad), food cost is again at 100 percent, with the economy closely following at 99.50 percent. Likes/dislikes and convenience contribute at 18 and 9.50 percent, respectively. In Wayanad district mirrors the pattern of the other districts, emphasizing family income and food costs. However, convenience is notably higher here, at 17 percent, while food requirement is at 1 percent, and ethnic concern is absent. Overall, the data underscores that food likes/dislikes, food requirements, ethnic concern, and convenience receive minimal attention across districts, with varying degrees of neglect, while economic factors and food cost in shaping household food consumption patterns.

Dietary Diversity of the Respondents

Studying the dietary practices of communities offers valuable insights into their culture, health, and sustainable living. Understanding what people eat, how they prepare their food, and the significance of certain dishes can shed light on historical traditions, economic factors, nutritional habits, and nutritional needs. By examining their diet, we can identify health risks, promote culturally appropriate interventions, and preserve indigenous knowledge.

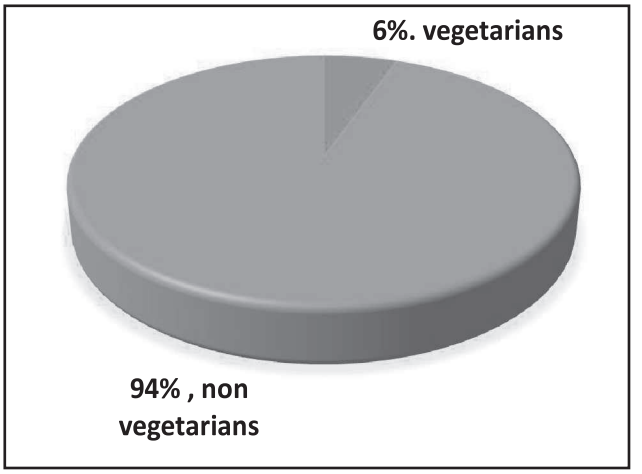


Fig No : 4 Dietary habits of the respondents

The above figure reveals a stark contrast in dietary preferences, with a vast majority, 94 percent, favoring a non-vegetarian diet compared to a mere 6 percent adhering to a vegetarian lifestyle. However, despite the prevalence of non-vegetarianism, the intake of animal-based foods such as fish and meat among respondents is remarkably low.

CONCLUSION

Tribal communities often experience food insecurity and nutritional deficiencies due to various factors such as limited access to resources, geographical isolation, and socio-economic marginalization. Studying their

food practices helps assess the availability, accessibility, and utilization of food resources within households. It also enables the identification of dietary patterns, nutritional gaps, and culturally appropriate interventions to address malnutrition and promote food security among tribal populations. Household management practices and food habits directly affect the health and well-being of tribal communities. Researchers can identify health risks, prevalent diseases, and hygiene-related issues by examining their dietary practices, cooking methods, and sanitation practices. This information is crucial for designing health promotion programs, sanitation initiatives, and interventions to improve overall health outcomes among tribal populations.

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