

Project Report

Dietary Habits of Tribals of J&K And Its Contribution Towards Child Nutrition

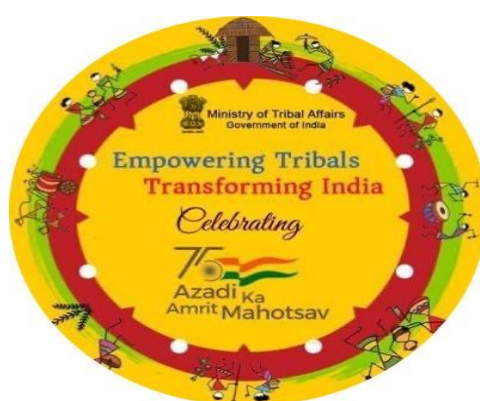
Submitted by

Zanoor Ul Ashraf

Under the Supervision of

Dr. Shahid Iqbal Choudhary, IAS (Director, TRI) Dr.

Abdul Khabir, JKAS (Deputy Director, TRI)



TRIBAL RESEARCH INSTITUTE,
Jammu and Kashmir.

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**Tribal Research
Institute**
Tribal Affairs Department,
Govt of Jammu & Kashmir

Objective of the Project

Objective 1: To study the health status and identify the socio-medical factors which influence health of scheduled tribe children.

Objective 2: To examine the utilisation of child care services for scheduled tribe children during development and growth period.

Objective 3: To access the relationship between nutritional status and child health of scheduled tribe children.

Objective 4: To design food-based interventions and develop value added product associated with child growth and development.

Report of the work done since its inception with particular emphasis on the following

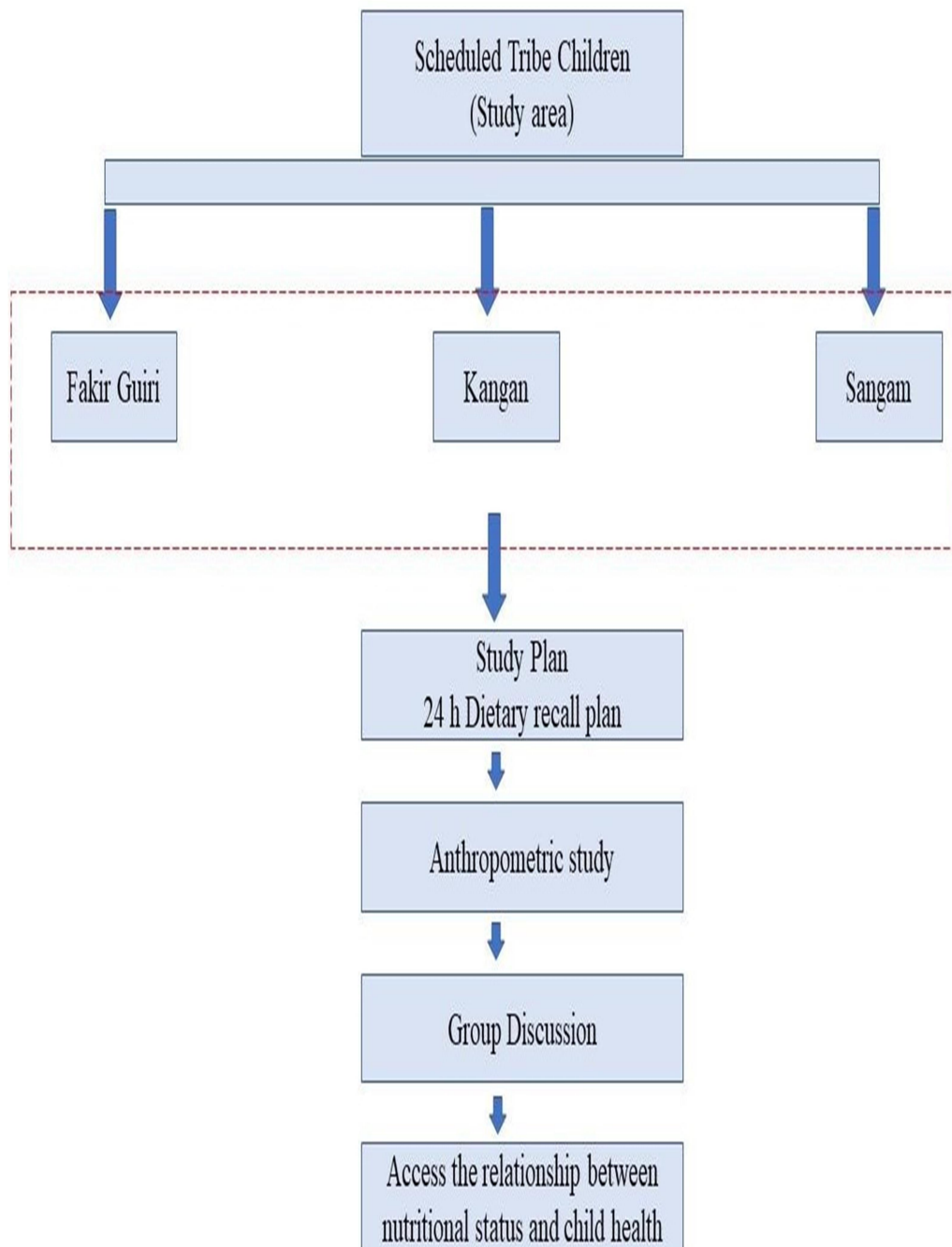
The tribal population and its group in Jammu and Kashmir including India enjoy a special status with respect to social and health scenarios. Jammu and Kashmir constitute about 11.9 % of the total Indian population according to the 2011 census out of which Srinagar constitutes 0.60 %, Ganderbal 4.09%, Badgam 1.60%, Anantnag 7.77 %, Kulgam 1.78%, Pulwama 1.51%, Shopian 0.46%, Baramulla 2.52%, Bandipora 5.05% and Kupwara 4.71(Tribal research department J&K). Nevertheless, Gujjars and Bakerwal constitute the most popular tribe constituting about 69% of the population of J&K union territory. Gujjars is the largest tribe which are migrants in the 9th and 10th centuries from plain areas however, bakarwal is the second largest tribe which are nomadic pastoral tribe recognized for livestock farming as the chief source of livelihood. The tribal population lives mostly in dispersed groups across hilly, inaccessible terrains because of which they are not well developed and deprived of basic services like access to pure drinking water, healthcare, and education subsequent in the tremendously poor socio-economic conditions as a result face inferior health (Abdullah et al., 2014; Sarika et al. 2021). Besides, tribes have also been suffering from different social discrimination and political isolation (Sharma et al. 1995) but there is a significant shortage of data on this population As per NIMS , Indian Council of Medical Research (ICMR) and United Nations International Children's

Emergency Fund (UNICEF) a child born to a Scheduled Tribe family has a 19 % are at higher risk of dying in the neonatal period and 45 % risk of dying in the post-neonatal period compared with other social classes. Also, energy deficiency can be seen among school-going children, adolescent boys and girls. Around 70-80% of the tribal population seem to suffer from various stages of anemia – mild, moderate, or severe (Xaxa, 2011). These crises arise due to economic backwardness and insecure livelihood

The three villages of Srinagar and Ganderbal from Jammu and Kashmir were chosen for the study i.e Fakir Gujri, kangan and Sangam. They are located on the outskirts of Srinagar. It was found these villages are underdeveloped and economically backward. The chief source of livelihood in these regions is agriculture. From the survey it was found that the children of scheduled tribe were facing problems of malnutrition, undernutrition as compared to the other sections. Research on their nutritional behaviour and dietary habits is scanty. Knowing which dietary habits are associated with child growth could lead to better long-term health outcomes and improve the design of food-based interventions. We aimed to identify dietary habits of tribals of J& K that are associated with the growth and development of children living in tribes. There has therefore been great interest in identifying, isolating, and characterizing functional ingredients from botanical sources from the tribal region especially terrians as it has a rich diversity of plants which are good source of bioactive compounds and their incorporation into food systems will add to the health

benefits of the food. The main impetus for functional foods has been to mitigate health and disease conditions using bioactive nutrients contained in foods.

Schematic diagram of the project



Objectives achieved

Objective 1: To study the health status and identify the socio-medical factors which influence health of scheduled tribe children.

Methodology

The present work was conducted in two villages of Srinagar district (Fakir Gujri and Sangam) and one village of District Ganderbal (Kangan)

Sample size

The group of 244 scheduled tribe children from target population were chosen from the three villages of Srinagar and Ganderbal district

Tools for data collection

Interview Schedule

Interview schedule was used to investigate the nutritional status, social and demographic profile. The 24 hour food recall for assessment of nutrient intake was used to investigate the dietary habits of scheduled tribe children.

Anthropometric study

The Body Mass Index (BMI) pattern was used to evaluate the nutritional status. The weight and height of the sample population was taken and BMI was calculated as the ratio of weight to square of height of the child

BMI = —

Where W= weight of children and H= height of children.

Group discussion

Group discussions about health care awareness services available for the children and relationship between nutritional status and child health were organized.

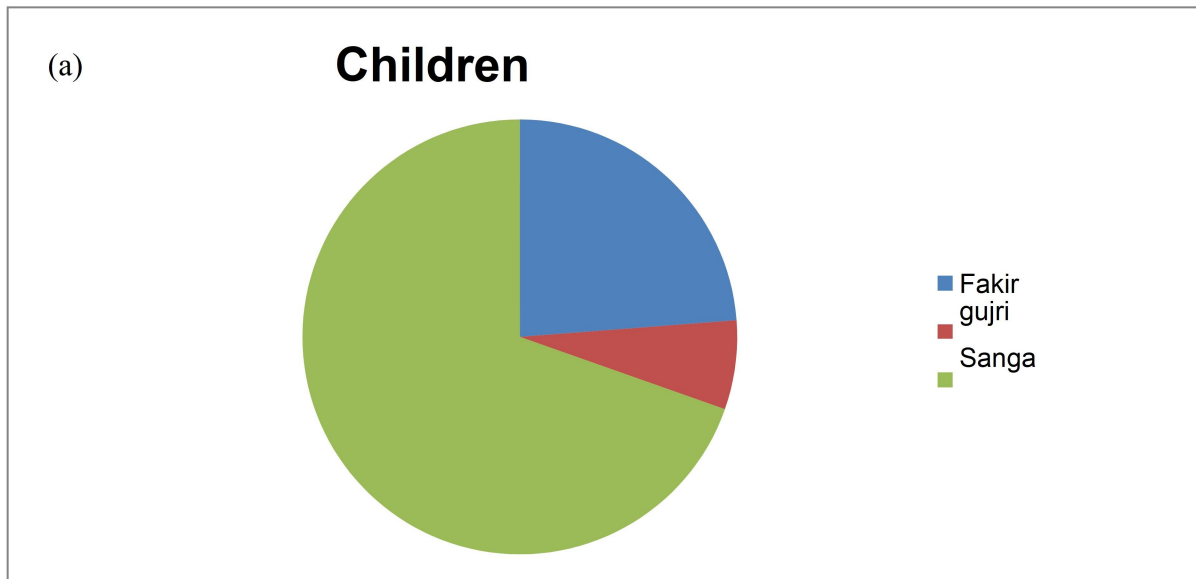
Statistical analysis

The data collected was subjected to statistical tests to enable easy interpretation using Statistical Package for Social Science (SPSS 11.0 for windows, SPSS Inc., Chicago, IL, USA) for descriptive analysis and statistical tests like mean, standard deviation and chi square test

Results and discussion

Sample identification

The three villages of Srinagar and Ganderbal district i.e. Fakir Gujri, Kangan and Sangam constitute the children population of 1837, 53788 and 511 as shown in **Figure 1a**. The children population varied significantly between the three villages. A total of 244 tribal children were interviewed from the target population. The respondents were mostly mothers of the schedule tribe children (**Figure 1b**).



Fakir Gujri (b)



Fakir Gujri (c)



Kangan (d)

Figure1: Population of scheduled tribe children in three villages and the representative digital image of the respondent.

1.2 Age of sample children

The age of sample children selected for the present study from the schedule tribe of three villages of Srinagar and Ganderbal district Srinagar (Fakir gijri and Sangam) and one village of district Gandarbal (Kangan) are presented in Table.1

Age (years)	Number of Children		
	Fakir gujri	Sangam	Kangan
3-4	18	14	33
5-6	24	36	28
6-9	21	24	46
Total	63	74	127

Dietary intake assessment

The dietary intake of meal pattern of children was analysed using 24 h dietary recall method. Table 2 represents the dietary intake of the selected scheduled tribe children. The mean calorie intake was found to be of 905 ± 0.65 Kcal, with the mean protein intake of 14 ± 0.65 to 16.5 g and mean calcium intake 325 ± 0.34 mg among the respondents of three villages. Mean deficiency of 33%, 31% and 50% for energy, protein and calcium, respectively was noted compared to the recommended guidelines by ICMR. Hence, the diet of scheduled tribe children of the three selected villages was deficit in the essential nutrient varying from micronutrient to macronutrient intake. From personal interview assessment it was found that breakfast was not taken on a regular basis. The vegetables and cereals were not consumed collectively in a single meal however, they were taken as optional. Majority of the times the tribal children were found to skip evening snacks. Based on the overall analysis of the diet it was found the tribal

children did not take balanced diet with regular meal timings. As a result tribal children are malnourished and their dietary energy intake is not adequate to compensate their growing needs of body (Bisai et al, 2011)

Table:2 Dietary intake assessment 24 h nutrient intake by food recall method with percentage deficiency

Nutrient Intake	RDA	Mean daily intake	Mean Deficiency (%)
Energy (Kcal)	1350±0	905±0.65	32.96±0.2
Proteins (g)	20.3±0	14±0.65	31.03±03
Calcium (mg)	650±0	325±0.34	50±00.2

Anthropometric study

The anthropometric study of the scheduled tribe children were studied using Body Mass Index (BMI). It is a simple tool used to categorise moderately undernourished, normal and severely malnourished individuals. Based on the analysis 26.6% children from the scheduled tribe were found to be undernourished, 25.8% were found to be normal and 38.04% were found to be malnourished. The values vary significantly between the scheduled children of three villages. The reason for malnutrition and under nutrition includes poverty, poor access to adequate diet, inadequate health facilities which are the leading cause of these crises. High prevalence of malnutrition and under nutrition was found among majority of children which is due to inadequate nutritional intake.

Table 3: Anthropometric study of Schedule tribe children

	BMI			
	Fakir Gujri	Sangam	Kangan	Percent (%)
Moderately undernourished	18±0.3	19±0.2	28±0.2	26.6
Normal	24±0.5	28±2.2	11±0.2	25.8
Severely Malnourished	21±32	26±0.7	29±0.2	38.04

Food consumption pattern

The diet of scheduled tribe children comprises of cereals, pulses, vegetables, and product from the animal sources such as milk and milk products including kalari, churpi and kudan in the families having milch animals (Figure 2). However, the consumption of pulses such as kidney beans, seasonal vegetables and fruits are very low and are consumed only if grown in the backyard or forests. The consumption of oil/ghee was also found to be low. The consumption of meat among the tribal population is considered a privilege and hence mostly consumed on special occasions such as festivals and ceremonies. The principle crops grown there is maize, rice, gram. Based on the personal interaction with the tribal women it was found that cooking method was not scientific which resulted in decreased nutritional value of the food. For instance, the soaking of pulses and dals is important step for inactivating the anti-nutritional factor such as trypsin inhibitor etc but this practice is not followed among tribals as a result instead of providing health benefits these pulses add in

decreasing the nutritive value of food. Besides this they use the laborious method for preparation of traditional foods (Fig. 2). Since ages tribal people have been living in the vicinity of the forests, co-habiting with the wildlife. However, the implementation of the new wildlife conservation laws by governments has drastic impact on the daily lives of tribes. As they are gradually losing their land and therefore unable to access medicines and traditional food as they did in past.



Figure 2: Food preparation and cooking by tribal women

Objective 2: To examine the utilisation of child care services for scheduled tribe children during development and growth period.

Tools used

A standard dietary health status as framed by NFHS-3 “National family health survey” with slight modifications as per requirement was used to collect data (questionnaire). The various sections were as follows

➤ **Assessment of child health**

Based on the survey maximum tribal children from fakir gujri kangan and sangam area were reported to have an under and malnutrition. The mean consumption of protein, carbohydrate, calcium and essential nutrients are less as compared to recommended level. The nutritional deficiency was reported among the scheduled tribe children (Fig 3). The study revealed calcium deficiency, obesity, stunted growth Vitamin A and vitamin C deficiency. The reason behind the nutritional deficiency includes geographical isolation faced by tribal children which is responsible for poor access to essential and balanced diet. (Gandhi Manav Kalyan Society, 2007). As reported from the literature the dietary pattern of the tribe children is devoted with a lot of complication entangled with socio-cultural beliefs and practices. Besides this ecology also plays a dominant role in creating structures of health and prosperity among scheduled tribe children. Children under 5-6 years are most vulnerable to vitamin deficiency. From the interview pattern it was revealed that the tribal women do not follow a strict diet schedule for their children. Their eating pattern includes consumption of pulses and cereals only however, the consumption of eggs, meat and fish is very scanty. They occasionally consume green vegetables, milk and juicy fruits. Furthermore the land-holding pattern of

the tribal population is very low, a lot of tribal families cannot survive whole year on food crops they produce on their land. It is due to dearth of sufficient quantity of land and also absence of suitable land to their access. Further, gap between food grain requirement and food grain production has lot of effect on tribal people in the studied areas.



Figure 3: Representative image of the Tribal children facing various deficiencies

➤ **Assessment of child care services**

The selected sample population were evaluated for the availability and utilisation of the child care services provide by the government unde various schemes such as ICDS, POSHAN Abhiyaan and National Health Mission (NHM) for scheduled tribe children. Maximum population were aware of mid-day meal however the difficult living conditions, and hard-to-reach terrain pose difficulty in the supply chain organization of government- supported schemes like Public Distribution System (PDS), ICDS, health care in addition exploring and teaching new livelihood skills to the tribal is also hindered. Equally precarious are the underlying factors that drive at the household level which include food security, nurture-care for the mother and child and a healthy environment, including safe drinking water, hygiene and sanitation, shelter and accessible healthcare. Ultimately, whether these basic rights are available or not to individuals and households depend on the social and economic arrangement that determines access to resources and the ability to effectively use these resources.

Assessment of awareness about nutritious diet

The group discussion was and counselling session arranged to create the general awareness about the role of nutrition in the growth and development of children. The awareness was about the role of balanced diet in improving the general health, wellbeing of children, accelerate the physical growth and mental

development of children, and improve the academic performance and learning abilities of children



Figure 3: Awareness session about nutritious food

Objective 3: To access the relationship between nutritional status and child health of scheduled tribe children.

From the study it was revealed that the diet has a strong correlation with the health in general and good dietary habits manifest into good health. The dietary pattern of the tribe children is devoted with a lot of complication entangled with socio-cultural beliefs and practices. Children under 5-6 years are most vulnerable to vitamin deficiency. From the interview pattern it was revealed that the tribal women do not follow a strict diet schedule for their children. Their eating pattern includes consumption of pulses and cereals only; however, the consumption of eggs, meat and fish is very scanty. They occasionally consume green vegetables, milk and juicy fruits. Furthermore, the land-holding pattern of

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2. Conclusion

Nutrition, indisputably, is most significant for a child's wellbeing bright future. Dietary deficiencies, inadequate feeding practices, poor hygiene and sanitation, chronic infections, poor health and nutrition, exposure to violence, jeopardize a child's chance to reach their full potential and increase the risk that poor health and poverty will follow that child into adulthood. Published data reported that around 94.3% of tribal population was below the low-income group with an annual income of < 25000 per annum and 61% of tribal subjects lack access to pure drinking water (WHO). These data indicate that there is need for nutritional intervention and value addition of the diet of tribal community to have a positive impact on child health. Since independence, multiple government policies and programmes sought to develop tribal communities by focusing on their livelihood, education and health. Despite seven decades of special treatment, even today, tribal people continue to be the most undernourished segment of the society. Research on their nutritional behaviour and dietary habits is scanty. Knowing which dietary habits are associated with child growth could lead to better long-term health outcomes and improve the

design of food-based interventions. We aimed to identify dietary habits of tribals of J& K that are associated with the growth and development of children living in tribes. The three villages of Srinagar and Ganderbal i.e. Fakir Gujri, Kangan and Sangam were selected for the sample study 244 children were taken for the study. The mean calorie intake among the respondents of three villages was found to be lower than the recommended values by ICMR. Based on the analysis children from the scheduled tribe were found to be undernourished and malnourished. The study revealed malnutrition, under- nutrition, obesity, stunted growth, calcium, Vitamin A and vitamin C deficiency. These health problems faced by the tribal groups, is seen as the direct consequence of socio-economic disorganization of tribal societies. The results indicate that there is need for nutritional intervention and value addition of the diet of tribal community to have a positive impact on child health. Food-based interventions and value added product associated with child growth is the need of an the hour. Besides the advancement in food and nutritional science, custom made foods need to be designed for various age groups to meet their specific physiological needs in order to combat various non-communicable diseases.

Applied value of the project:

Awareness about the nutritional value of the locally available food product which has high demand in the Himalayan region of J&K. Apart from it, the active compounds present in wild berries and fruits is considered as natural remedy for certain ailment. These products are so far confined only to the

remote areas where these products are traditionally used. The assumption drawn from this study was based on data collection from randomly selected tribal child from three villages of the Srinagar and Gandarbal district of Jammu and Kashmir i.e Fakir Gujri, Sangam and Kangan. A total of 244 tribal children were interviewed from the target population. The mean intake calorie, anthropometric analyses were carried out and study revealed calcium deficiency, obesity, stunted growth vitamin A and vitamin C deficiency. The study calls for immediate measures to be taken to ensure access to nutritious food and balanced diet. One approach could be to utilize already existing goods, value addition to the available food that is economical and easily accessible to them so that food can act as medicine. The current proposal targets promoting novel initiatives in the form of scientific interventions for sustainable livelihood by developing and demonstrating the nutritional food products. The developed product can be the effective way of the livelihood options and employment generation. The regular consumption of a nutraceutical-rich diet may have beneficial effects on human health and well-being of scheduled tribe children.

Future work to be undertaken

Objective :To design food-based interventions and develop value added product associated with child growth and development

There is need to develop value added food products from locally available ingredients and to sensitize the tribal people about the consequences of balanced and nutritious diet on child health and wellbeing. Using the locally

available ingredients will be sustainable and will boost to the local economy. Therefore, special focus needs to be imparted to identify, characterize and utilize the locally produced food ingredients and to develop functional foods with enhanced health benefits. It will target promoting novel initiatives in the form of scientific interventions for sustainable livelihood by developing and demonstrating the developed functional food. The demonstration of the processes developed may lead to the implementation of these innovations in the product manufacturing which will help in solving the problem of

- Livelihood
- Employment generation
- Food and nutritional security

Future prospectus

- The nutritional and health issue of scheduled tribal inhabitant's children need to be addressed and campaigns to involve the active participation of tribal in managing health of the communities where they live.
- Create an awareness of dietary diversity in ensuring good health
- Examine the role of indigenous knowledge and traditional food practices in contributing towards dietary diversity.
- Critically examine gender inequality within household in terms of access to food and nutrition

- Understand the role of traditional knowledge in contributing towards food/nutrition security and sustainability
- Reflect on food choices and practices that can promote sustainable food system
- Purchasing capacity of people in remote tribal region needs to increase to eradicate and erase malnutrition and health issues in the tribal region. All health, nutrition, livelihood and development schemes have to be dovetailed and converged under a single umbrella
- Awareness among the locals about the scientifically designed and mechanized process of food product development is expected to benefit the women folk by boosting their economy, reducing their poverty and improving their social status.
- Interdisciplinary approach for food and nutritional security
- Development of community led nutri gardens for tribal peoples
- Regular and frequent growth monitoring and diet counselling

List of research publications and papers based on work done on the project during the fellowship

The work done in the project will be published in the reputed journal.

Research Papers (To be communicated)