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## Impact of food and nutrition on health status of tribal community of north 24 Paraganas in West Bengal

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### Abstract

The paper represents the nutrition which integral to health promotion and disease prevention. Information from many disciplines, including anthropology, biology, biochemistry, economics, epidemiology, food science and technology, genetics, physiology, psychology, and sociology, are applied in nutritional studies. The paper also consider what people eat and drink, and take as dietary supplements, during different life stages and over time. Lama, Pravhat (2017)., They focus on interconnections to build evidence for public policy, health system, and environmental improvement strategies mostly the tribal and other back ward class people of north 24 paraganas in west Bengal According to research, it is needed for tribal people to sustain the Micronutrients which are vitamins and minerals that are required for our body in minute amounts to fight diseases, to support metabolic activities and protect against infections. These are essential for maintenance of health and longevity. The backward classes and tribal people works include sub caste people from primitive tribal groups, workers of closed industry, gardens, pavement dwellers of north affected people, drought affected of Purulia, residents of Darjeeling hill area and inhabitants of Jangalmahal. Singh, Abhishek (2020)., The paper also represents the facilities of Sufal Bangla, a competitive retail daily use prime vegetable outlet - is significantly important for ensuring food and nutritional security for the hundreds of millions of tribal people that still live below the poverty line in our state besides it also help for raising rural incomes and generating millions of on-farm and non-farm employment opportunities, eradication poverty and usher in a prosperity movement throughout beautiful rural Bengal.

**Keywords:** Tribal community, health status, food and nutrition

### Introduction

The Ministry of Tribal Affairs is responsible for the overall development of the scheduled tribes in India. This Ministry was set up in 1999 after the bifurcation of the Ministry of Social Justice and Empowerment with the objective of providing a more focused approach on the integrated socio-economic development of the Scheduled Tribes (STs), the most underprivileged of the Indian Society, in a coordinated and planned manner. The district lies within the Ganga–Brahmaputra delta. The major distributary of river Ganga that is river Hooghly flows along the western border of the district. There are many other distributary branches, sub-branches of Ganga River and other local rivers, which include the Ichhamati, Jamuna, and Bidyadhari. Lama, Pravhat (2017) <sup>[14]</sup>. As a scientific field, nutrition is integral to health promotion and disease prevention. Information from many disciplines, including anthropology, biology, biochemistry, economics, epidemiology, food science and technology, genetics, physiology, psychology, and sociology, are applied in nutritional studies. Scientists consider what people eat and drink, and take as dietary supplements, during different life stages and over time. Bowden, Mitchell (2009) <sup>[10]</sup>. They focus on interconnections to build evidence for public policy, health system, and environmental improvement strategies. Human beings need adequate energy to carry out their daily routine physical work, maintain body temperature, metabolic activity and to support growth. The survey conducted by National Nutrition Monitoring Bureau (NNMB) revealed that in India nearly 50% of men and women suffer from chronic energy deficiency.

### Objective

1. To know the impact of food and nutrition on health status of santhal tribal community of north 24 Paraganas in West Bengal.

- To know the impact of food and nutrition on health status of munda tribal community of north 24 paraganas in West Bengal.



Fig 1: Economic activity of Bagdah block



Fig 2: Health status of ST community, Bagdah block

### Hypothesis

- H0<sub>1</sub>:** There exists no relation between the impact of food and nutrition and health status of santhal tribal community of north 24 paraganas in West Bengal.
- H0<sub>2</sub>:** There exists no relation between the impact of food and nutrition on health status of munda tribal community of north 24 paraganas in West Bengal.

### Research question

- What is the impact of food and nutrition on health status of santhal tribal community of north 24 paraganas in west Bengal?
- What is the impact of food and nutrition on health status of munda tribal community of north 24 paraganas in west Bengal?

### Methodology/procedure to be followed

#### Data collection and analysis

- Primary data was collected from mundari people of karanga, jhupo, amdobe villege of bagdah block of north 24 paraganas.
- Secondary data was collected from draft report – 2021 n.24.pgs, health center, block office, co-operative office, primary and high school of koniarya G.P of badgha block.

### Sampling method

The research was conducted by survey based method and also use simple random sampling and stratified random sampling for analysis of primary and secondary data.

### Population and sample

One block (bagdha-I) was observed and Two g.p region (koniarya -i and koniarya – ii) was observed. Survey was conducted on 200 families. Sample size should be 1200 (public survey).

### Delimitation of study

The area of research was delimited in only one block as bagdha block and two grame panchayate as a kaniyara – I and kaniyara – II GP.

The research was delimited only mundari ans santhal sub caste of korongo, jupo and amdobe villeges under koniarya – I and II gram panchayat of bagdha block.

The research was also delimited only 600 male and 600 female tribal resident of korongo, jupo, and amdobe villege.

### Socio-economic status

The National Commission for Scheduled Tribes (NCST) was established by amending Article 338 and inserting a new Article 338A in the Constitution through the Constitution (89th Amendment) Act, 2003. By this amendment, the erstwhile National Commission for Scheduled Castes and Scheduled Tribes was replaced by two separate Commissions namely- (i) the National Commission for Scheduled Castes (NCSC), and (ii) the National Commission for Scheduled Tribes (NCST) w.e.f. 19 February 2004. In general, those who are poor are at risk for under-nutrition, in India while those who have high socio-economic status are relatively more likely to be over-nourished. Anemia is negatively correlated with wealth.

Lal, Rattan (2017) [19] When it comes to child malnutrition, children in low-income families are more malnourished than those in high-income families. PDS system in India which account for the distribution of wheat and rice only, by which the proteins are insufficient by these cereals which leads to malnutrition also. One cultural belief that may lead to malnutrition is religion. Among these is the influence of religions, especially in India are restricted from consuming meat. Also, other Indians are strictly vegan, which means, they do not consume any sort of animal product, including dairy and eggs. This is a serious problem when inadequate protein is consumed because 56% of poor Indian households consume cereal to consume protein. It is observed that the type of protein that cereal contains does not parallel to the proteins that animal products contain. This phenomenon is most prevalent in the rural areas of India where more malnutrition exists on an absolute level. Whether children are of the appropriate weight and height is highly dependent on the socio-economic status of the population. Children of families with lower socioeconomic standing are faced with sub-optimal growth. While children in similar communities have shown to share similar levels of nutrition, child nutrition is also differential from family to family depending on the mother's characteristics, household ethnicity, and place of residence. It is expected that with improvements in socio-economic welfare, child nutrition will also improve.





Fig 3: Tribal economy, study area, 24 (n) paraganas.



Fig 5: Local study area, north 24 paraganas.

**Significance of nutrition**

Bowden, Mitchell (2009) [10] for the body to function properly, grow appropriately, and keep healthy, one must consume enough macronutrients (proteins, carbs, fats, and water) and micronutrients (vitamins and minerals). As we have noticed, processed, sweet, fatty, and salted foods drain the body and cannot function properly. On the other hand, consuming fresh, whole-natural meals fuels the body by producing the necessary energy, metabolic activity, micronutrient shortages, chronic disease prevention, general health promotion and well-being. Proteins, carbs, fats, vitamins, minerals, fibre, and water are the seven main types of nutrients that the healthy human body requires to survive. We need a lot of macronutrients, although we can get by with fewer micronutrients (vitamins and minerals).

**Proteins:** Our body’s immune system and muscles are both strengthened by protein. Protein consists of amino acids. And these amino acids are essential for our body to function correctly. Protein helps our bodies repair damaged cells and create new tissues. It supports the synthesis of enzymes and

hormones.

- **Vegetarian:** Lentils, low-fat dairy, tofu, almonds, seeds, and other legumes
- **Non-vegetarian:** Chicken, beef, fish, turkey, and other types of meat



Fig 4: Nutrition foods in research area, bagdah, 24(n) paraganas

Morales, Alfonso (2011) [7] **Carbohydrates:** Carbohydrates are considered to as energy providing foods. They give the body the energy it requires to function. Carbs account for up to 65% of our energy. Due to the ease of conversion into energy, they serve as the body’s primary fuel source. Typically, this energy takes the form of glucose, which all of our body’s tissues and cells can use immediately. Simple carbohydrates and complex carbohydrates are two different types of carbohydrates. Carbohydrates are the main reason for the production of ketones. Good examples of carbohydrates are bread, potatoes, pasta, soda, chips, cookies/biscuits, puddings, cakes, sugar, bananas, etc.

Singh, Abhishek (2020) [16], **Fats:** Including fats in your diet is crucial because they can give your body energy. While some forms of dietary fats (Monounsaturated fatty acids and Poly unsaturated fatty acids) may be better for you than others (Saturated fatty acids and Trans-fat), they are still a vital element of your diet and help your body produce hormones, grow cells, store energy, and absorb vitamins.

Fat is essential for healthy skin and blood pressure regulation. Saturated fats and Unsaturated fats are the two different varieties of fats. Saturated fats are present in products like cream, butter, cheese, and some chocolates. Some of the unsaturated fats are sunflower, soybean, cardamon, and corn oils.



Fig 6: Croprs production in study area (Bagdah block)

**Vitamins:** Vitamins are essential compounds that play an important role in making our body function properly. Some of them are vitamin A, vitamin B, vitamin C, vitamin D, vitamin E, vitamin K, vitamin B-6, and vitamin B-12. We receive most of these vitamins daily. Our body naturally tends to produce vitamins like D and K.

**Minerals:** Compared to trace minerals, macrominerals are needed in greater quantities. The significant macrominerals and their roles comprise:

- **Calcium:** Essential for the healthy structure and operation of bones
- **Phosphorus:** A component of cell membranes
- **Magnesium:** Enzyme reactions
- **Sodium:** Blood pressure maintenance and fluid balance
- Chloride Promotes the production of digestive juices and maintains fluid balance
- **Potassium:** Muscle contraction and the transmission of nerve impulses
- Sulfur is a substance found in all living tissues

Morales, Alfonso (2011) [7] on the other hand, trace minerals are needed in tiny amounts but have several vital roles in our bodies. Some of the crucial trace minerals required by the body are selenium, iodine, iodine salts, copper, zinc, manganese, copper, and iron.

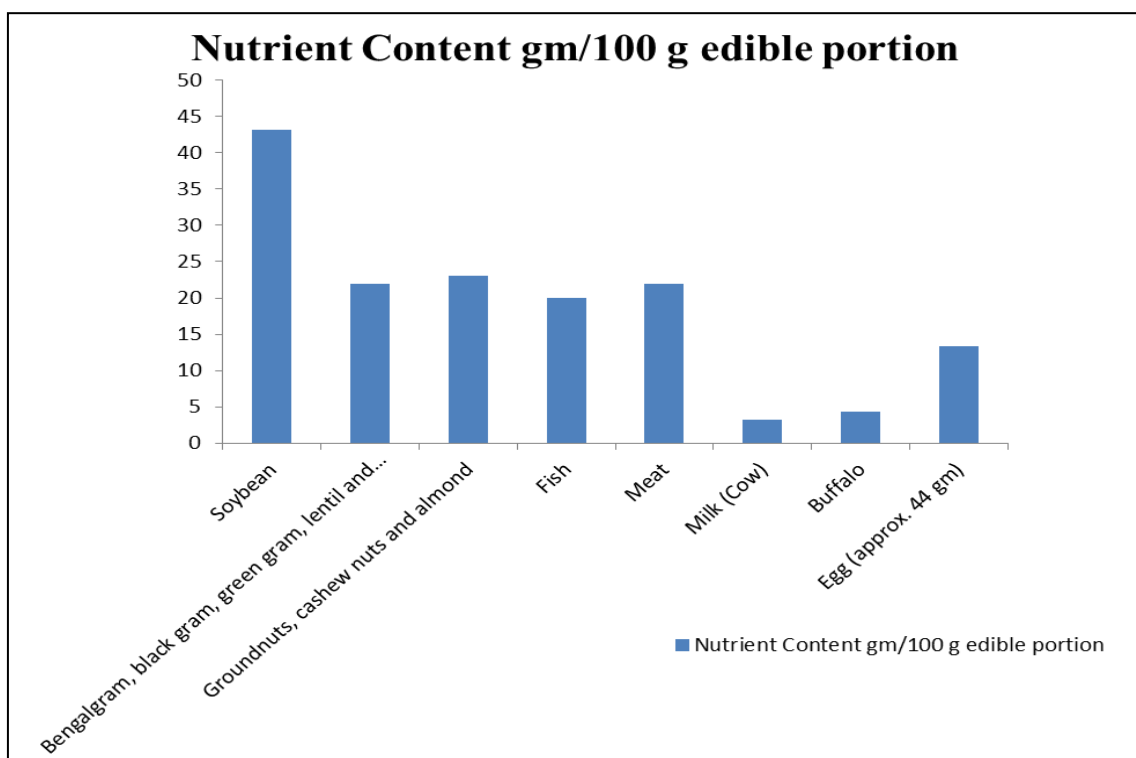
**Analysis and interpretation**

Indian tribes are one of the oldest inhabitants of the sub-continent. The word tribes were introduced in the colonial era. For administrative convenience, the British colonists in India used a single term ‘tribe’ for a diverse set of communities. This article will throw light on the Indian tribes. One of the major causes for malnutrition in India is economic inequality. Due to the low economic status of some parts of the population, their diet often lacks in both quality and quantity. Dangol, Narendra (2018) [2].

women who are malnourished are less likely to have healthy babies. Nutrition deficiencies inflict long-term damage to both individuals and society. Compared with their better-fed peers, nutrition-deficient individuals are more likely to have infectious diseases such as pneumonia and tuberculosis, which lead to a higher mortality rate.

**Table 1:** Food based nutrient content table (gm/100g)

Foods	Nutrient Content
	gm/100g edible portion
Soybean	43.2
Bengalgram, black gram, green gram, lentil and red gram	22
Groundnuts, cashew nuts and almond	23
Fish	20
Meat	22
Milk (Cow)	3.2
Buffalo	4.3
Egg (approx. 44 gm)	13.3



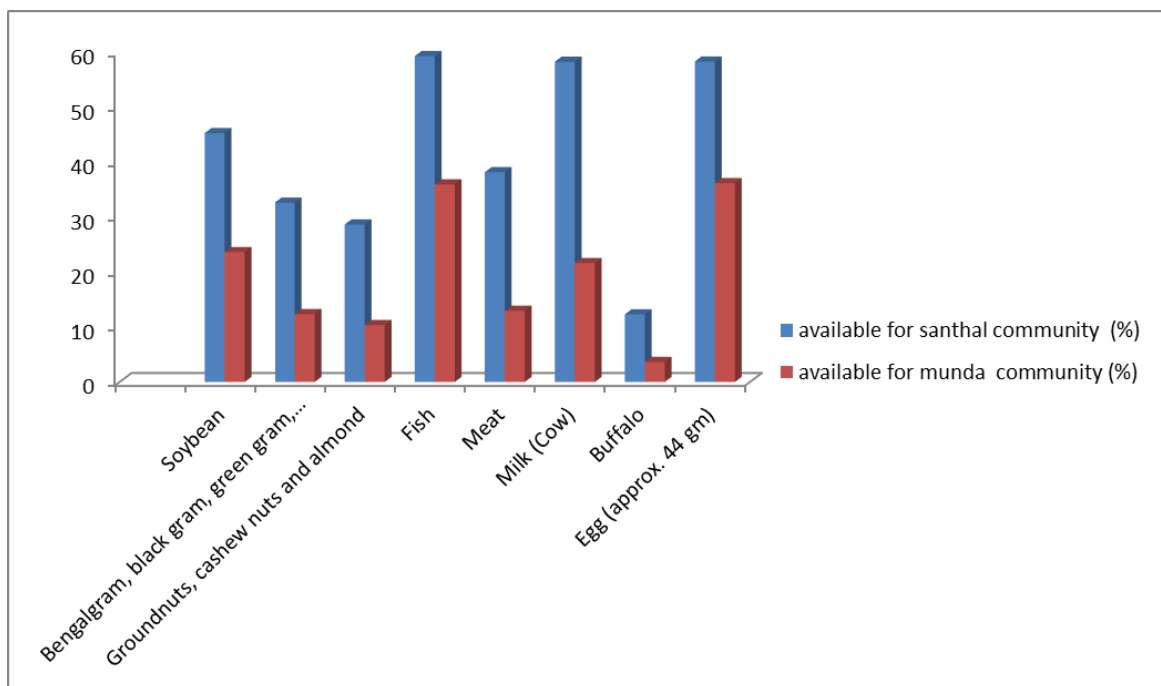
**Fig 7:** Graphical presentation of nutrient content gm / 100 g edible portion

Besides, nutrition-deficient individuals are less productive at work. Low productivity not only gives them low pay that traps them in a vicious circle of under-nutrition,<sup>[2]</sup> but also brings inefficiency to the society, especially in India where labor is a major input factor for economic production. On the other hand, over-nutrition also has severe consequences.

In India national obesity rates in 2010 were 14% for women and 18% for men with some urban areas having rates as high as 40%. Obesity causes several non-communicable diseases such as cardiovascular diseases, diabetes, cancers and chronic respiratory diseases.

**Table 2:** Comparative presentation data table of foods available among santhal and Mundari community

Foods	Available For Santhal Community (%)	Available For Munda Community (%)
Soybean	45.32	23.65
Bengal gram, black gram, green gram, lentil and red gram	32.65	12.36
Groundnuts, cashew nuts and almond	28.69	10.36
Fish	59.35	35.98
Meat	38.21	12.98
Milk (Cow)	58.32	21.65
Buffalo	12.32	3.65
Egg (approx. 44 gm)	58.36	36.21



**Fig 8:** Comparative presentation of foods available among santhal and Mundari community

**Table 3:** Data management table of confidence level test

Available for santhal community (%)		Available for munda community (%)	
Mean	41.6525	Mean	19.605
Standard Error	5.983483	Standard Error	4.227511
Median	41.765	Median	17.315
Mode	#N/A	Mode	#N/A
Standard Deviation	16.92385	Standard Deviation	11.95721
Sample Variance	286.4166	Sample Variance	142.9748
Kurtosis	-0.60107	Kurtosis	-1.12625
Skewness	-0.52262	Skewness	0.392321
Range	47.03	Range	32.56
Minimum	12.32	Minimum	3.65
Maximum	59.35	Maximum	36.21
Sum	333.22	Sum	156.84
Count	8	Count	8
Confidence Level (95.0%)	14.14869	Confidence Level (95.0%)	9.996474



**Table 4:** T- test analysis of tribal community (Munda & Santhal)

t-Test: Paired Two Sample for Means		
	Available for munda community (%)	Available for santhal community (%)
Mean	19.605	41.6525
Variance	142.9748	286.4166
Observations	8	8
Pearson Correlation	0.912095	
Hypothesized Mean Difference	0	
df	7	
t Stat	-8.03423	
P(T<=t) one-tail	4.43E-05	
t Critical one-tail	1.894579	
P(T<=t) two-tail	8.87E-05	
t Critical two-tail	2.364624	

**Sufal bangla**

Sufal Bangla, a competitive retail daily use prime vegetable outlet - is significantly important for ensuring food and nutritional security for the hundreds of millions of people that still live below the poverty line in our state besides it also help for raising rural incomes and generating millions of on-farm and non-farm employment opportunities, eradication poverty and usher in a prosperity movement throughout beautiful rural Bengal. Sufal Bangla project commenced through selling vegetables (Potato and Onion) in mobile van at 14 outlets on and from 29th September 2014, since then the operation carried on uninterrupted, though there were a number of Major Festivals like Durgapuja, Kalipuja, Eid etc. were celebrated during that period. Initially the vegetables were procured only from Koley Market, however, now some farmers of santhal and Mundari communitis surrounding Singur in north 24 paraganas and Hooghly District have been supplying fresh

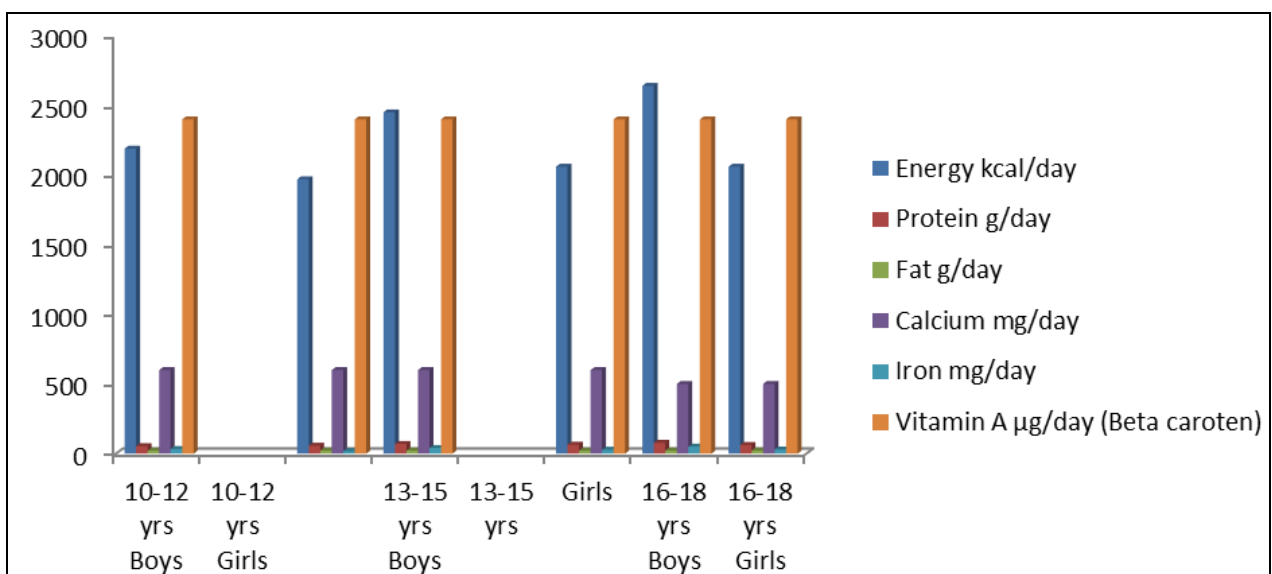
vegetables at Tapasi Mallick SingurKrishak Bazaar.



**Fig 9:** Sufal Bangla and tribal development

**Table 5:** Frequency distribution table for age wise nutrient data (boy and girls)

Age group	Energy kcal/day	Protein g/day	Fat g/day	Calcium mg/day	Iron mg/day	Vitamin A µg/day (Beta caroten)
10-12 yrs Boys	2190	54	22	600	34	2400
10-12 yrs Girls	1970	57	22	600	19	2400
13-15 yrs Boys	2450	70	22	600	41	2400
13-15 yrs Girls	2060	65	22	600	28	2400
16-18 yrs Boys	2640	78	22	500	50	2400
16-18 yrs Girls	2060	63	22	500	30	2400



**Fig 10:** Comparative study of nutrient aspect of boyes and girls (study area)

Sufal Bangla is also making fruit producer's retail market competitive. Different Hubs at various Agro Climatic Zones of West Bengal will be set in motion for procurement of fruits at different seasons in future days. However, so far Dumps is concerned, it is an inevitable part of the Fresh Fruits and Vegetables trade. Managing Dump efficiently is a part and parcel of the trade which is done in this project very proficiently.

**National nutrition mission**

This project has launched in 2018 (although the programme was being implemented in 2017) by the Government of India with the aim of tackling the malnutrition problem prevalent in India.

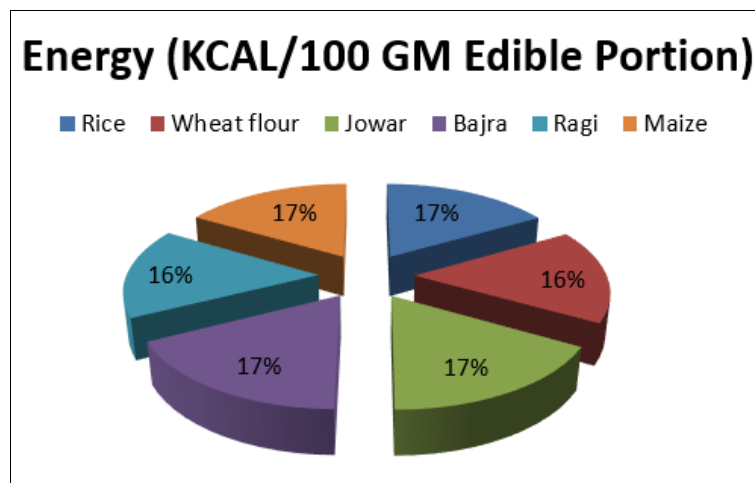
- The chief objective of the mission is to reduce the level of under-nutrition and also enhance the nutritional status of children in the country.
- The mission is a multi-ministerial initiative and aims at removing malnutrition from the country by 2022.

**Table 6:** Data for Energy (kcal/100 gm edible portion)

Food items	Energy (kcal/100 gm edible portion)
Rice	345
Wheat flour	341
Jowar	349
Bajra	361
Ragi	328
Maize	342



**Fig 11:** National nutrition mission

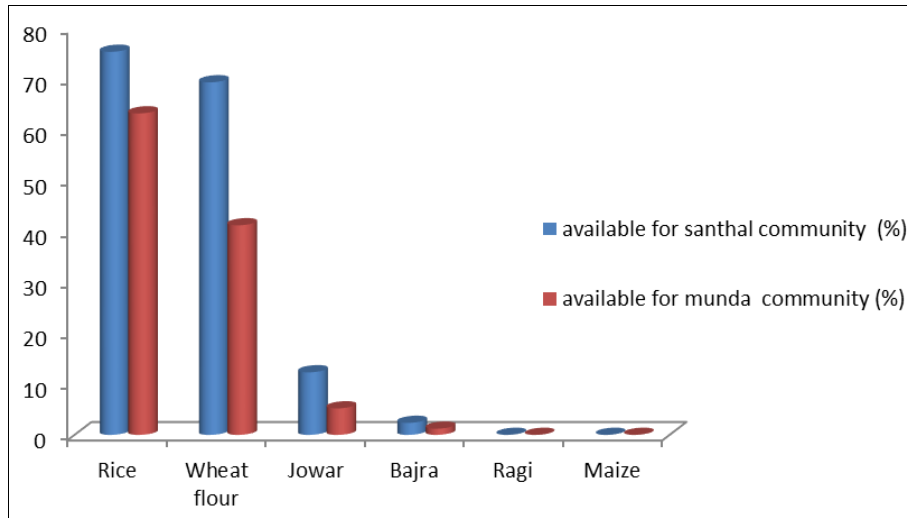


**Fig 12:** Distribution of energy food based

- Poshan Abhiyaan is India’s flagship scheme to improve the nutritional outcomes of adolescents, children, pregnant women and lactating mothers.
- The mission leverages technology and convergence between various modules and departments.
- The term ‘Poshan’ in the name of the programme stands for ‘Prime Minister’s Overarching Scheme for Holistic Nutrition.
- The programme has specific targets for reducing stunting, anaemia, under-nutrition and low birth weight.
- According to ‘Mission 25 by 2020’, the National Nutrition Mission aims to achieve a reduction in stunting from 38.4% to 25% by 2022.

**Table 7:** Data for Available for santhal and Mundari community (%) by foods items

Food items	Available for santhal community (%)	Available for munda community (%)
Rice	75.32	63.21
Wheat flour	69.32	41.21
Jowar	12.3	5.21
Bajra	2.36	1.21
Ragi	0	0
Maize	0	0



**Fig 13:** Comparative study of santhal and Munda community (%) by foods items

- Lal, Rattan (2017) <sup>[19]</sup> The mission also encompasses mapping of various other schemes related to malnutrition and enabling synergies through ICT-based real-time monitoring system, robust convergence between the schemes, incentivising states and UTs for meeting the set targets, and optimising Anganwadi centres’ functioning, apart from conducting social audits.
- These other schemes include the Pradhan Mantri Matru Vandana Yojana (PMMVY), Janani Suraksha Yojana, Scheme for Adolescent Girls (SAG), Swachh Bharat Abhiyaan, PDS, National Health Mission, etc.
- For Anganwadi centres, the mission envisages the following:
  - Giving incentives to Anganwadi Workers (AWWs) for using IT-based tools.
  - Elimination of registers used by AWWs.
  - Measuring the height of children at Anganwadi centres.

Another component of the mission is the gradual scaling up of the interventions under the World Bank assisted Integrated Child Development Services (ICDS) Systems. The implementing agency is the Ministry of Women and Child Development, GOI.

The NITI Aayog also plays a pivotal role in the mission. The National Council on India’s Nutritional Challenges, which has been set up under the Poshan Abhiyaan, has the Vice Chairperson of NITI Aayog as its Chairperson.

- The council is also called the National Council on Nutrition or NCN.
- The NCN offers policy directions to address nutritional challenges and review programmes for the same.
- It is a national-level coordination and convergence body on nutrition.

**RKSY ration card scheme**

Raja Khadya Suraksha Yojana includes two types of ration cards that are issued to those people who belong to the financially underserved category and tribal groups are residents of West Bengal. West Bengal Ration Card 2023. Residents of West Bengal who belong to the Below Poverty Line (BPL) group or are just above the Above Poverty Line (APL) can apply for a ration card so that they can purchase food item at subsidised rates. Apart from that, the ration card can also act as a legitimate government document. Under the scheme, the Government of India will provide free foodgrains to all NFSA beneficiaries i.e. Antyodaya Ann Yojana (AAY) households & Priority Household (PHH) persons for the next one year through the widespread network of 5.33 lakhs Fair Price Shops across the country.



**Fig 14:** Health center, asaru, bagdah block

**Table 8:** Data for food products in tribal community (research area)

Food	Available for santhal community (%)	Available for munda community (%)
Ghee	31.6	10.5
Coconut	32.2	12.36
Vanaspati	13.4	3.21
Palmolein	12.65	3.3
Rape/mustard	13.89	9.32
Groundnut	28.12	9.3
Rice bran	33.32	11.6
Sesame	40.32	21.5



Sunflower oil	12.2	1.65
Soybean	36.85	15.21
Safflower	12.32	1.5

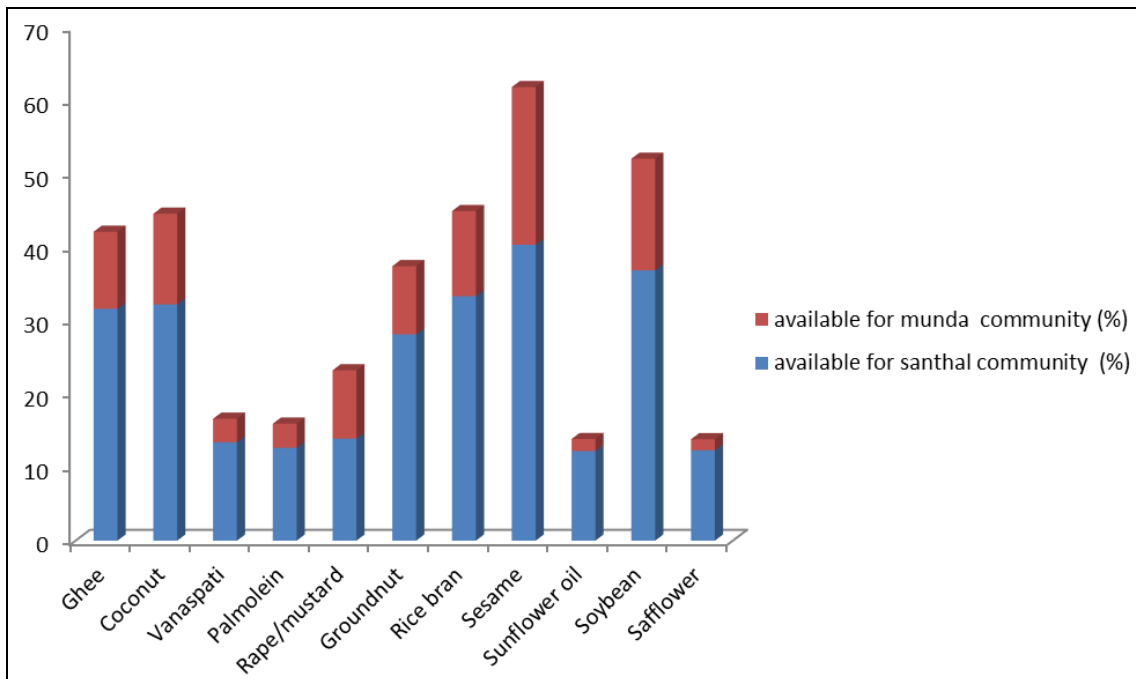


Fig 15: Graph showing the food products available in tribal community (research area)

Table 9: \$scheme wise commodity allotment (tribal data base)

Scheme	Commodity	Monthly Allotment (KG per head)	FPS Price (per KG)
RKSY-I	Wheat	3	2
RKSY-I	Rice	2	2
RKSY-II	Wheat	1	9
RKSY-II	Rice	1	13

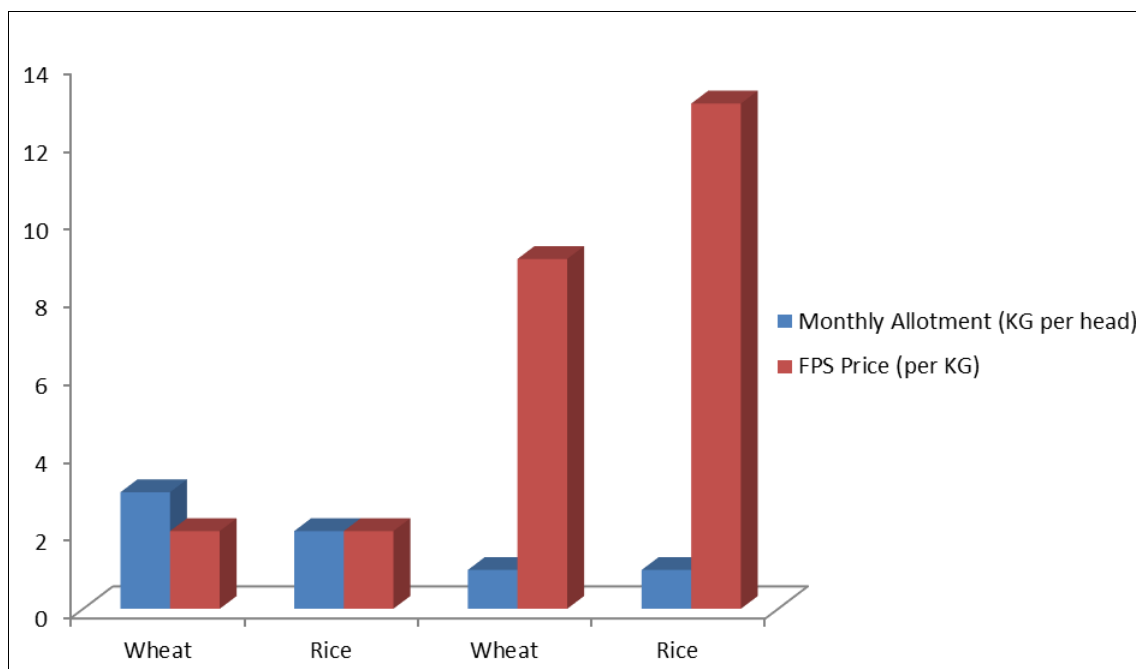


Fig 16: Comparative graph showing, scheme wise commodity allotment (tribal data base)

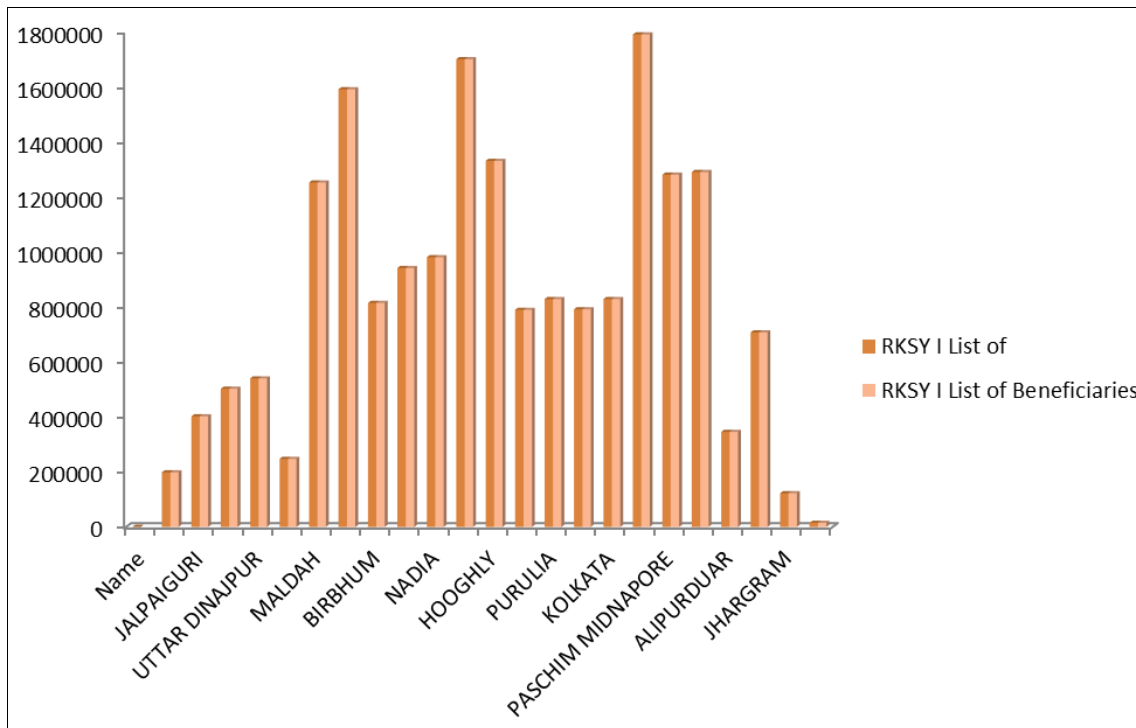


Fig 17: RKSYS I List of and RKSYS I List of Beneficiaries graph

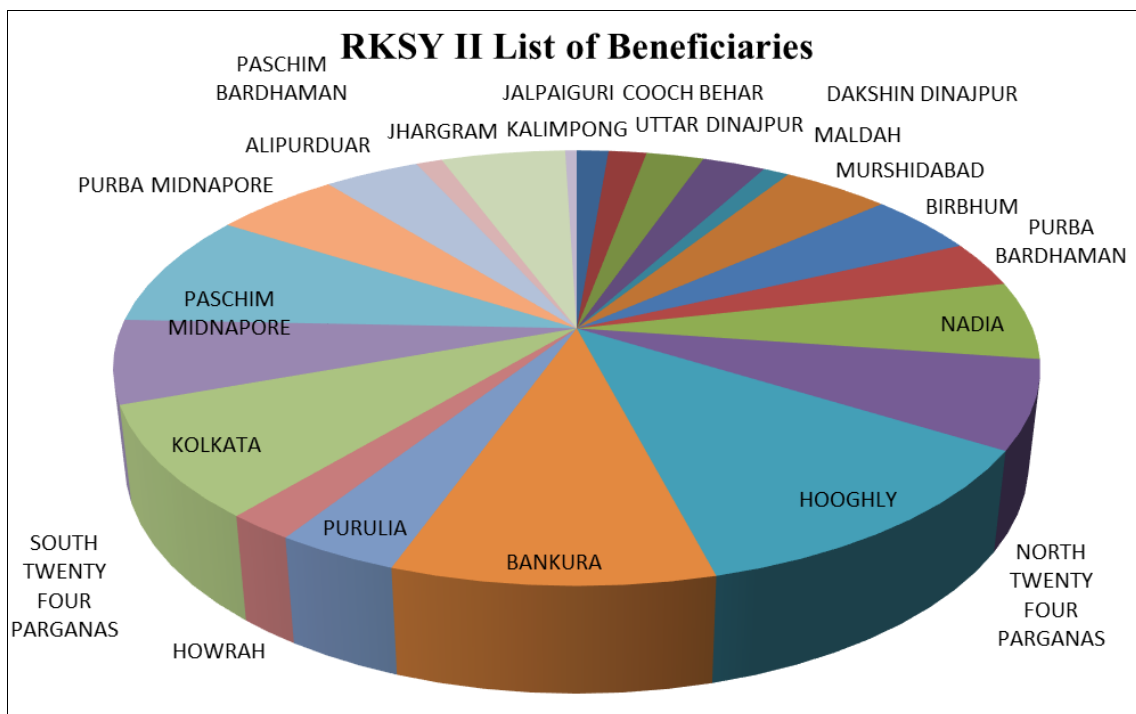


Fig 18: Distribution of RKSYS II List of Beneficiaries chart

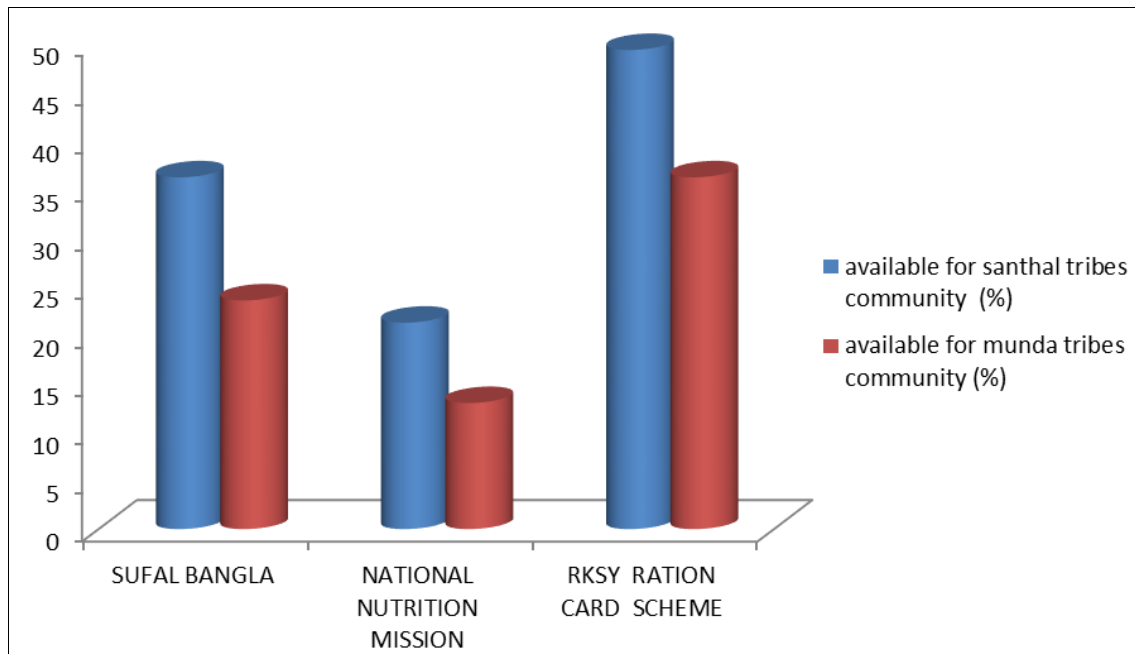
**Factors influencing nutritional needs for tribal society**

**Age:** Your nutritional requirements are significantly influenced by age. For instance, a child’s need for vitamin C increases over time. The requirements for calcium and phosphorus similarly rise during childhood but decline with

age. In older adults, the gastrointestinal tract frequently absorbs less magnesium and vitamin B12. Additionally, older adults have decreased skin vitamin D production. Lutein, a carotenoid present in spinach, may significantly prevent age-related macular degeneration in older persons.

Table 10: Scheme wise data for tribal community

Scheme	Available for santhal tribes community (%)	Available for munda tribes community (%)
Sufal Bangla	36.21	23.54
National nutrition mission	21.25	12.98
RKSYS ration card scheme	49.32	36.21



**Fig 19:** Comparative study of scheme based tribal development (study area)

**Gender:** Dangol, Narendra (2018) [2] The amount of nutrients needed is significantly influenced by gender as well. Compared to men, women require more calcium and iron. Additionally, women are frequently advised to take calcium and vitamin D together since vitamin D facilitates calcium absorption. During pregnancy, folate and other B vitamins, calcium, vitamin D, and iron are crucial nutrients for embryonic growth. Additionally, the need for several nutrients, such as calcium, iron, and zinc, rises during pregnancy.

**Lifestyle:** The kind of lifestyle of tribal groups has influenced your nutritional needs. The most significant lifestyle aspect that affects health is diet. In urban societies, a poor diet and its effects, such as obesity, are prevalent health issues. BMI can be used to determine an unhealthy lifestyle. Urban living causes nutritional issues such as eating fast foods and unhealthy foods, which increases lifestyle diseases like diabetes, cholesterol etc.

**Physical activity:** The level of physical activity that you engage in affects your nutritional needs. Electrolytes are a class of essential nutrients for preserving the body's fluid balance. While too much salt is bad for us, salt is necessary for health along with the electrolyte's magnesium, calcium, potassium, and chloride. Ensure that your food contains enough salt to recover your lost salt levels. While many energy drinks have electrolytes, they are not if you are trying to lose weight because they also have significant sugar content.

**Cultural context:** Cultural factors affect how people eat regularly, how food is prepared, and in some situations, whether or not they can impose restrictions like banning meat and dairy from the diet. However, cultural influences are changeable; when relocating to a new country, people frequently take on some local dietary customs.

**Locally available foods:** Lal, Rattan (2017) [19] Supermarkets in big cities offer a wide variety of products to choose from. However, if you live in a smaller city or town or tribal area, food choices may be highly influenced by what is available locally. Additionally, local foods like rice and chapati may be better carbohydrate sources for Indians when compared to oats or bread. This is because these foods are local staples and are better suited to Indian physiologies.

**Dietary and food customs:** People frequently use food to uphold their sense of cultural identity. People make different dishes from varied ethnic backgrounds. For instance, the fact that idli evokes images of South India and pasta reminds you of Italy is for this reason.

#### **National plan of action for children**

India is a signatory to the 27 survival and development goals laid down by the World Summit on children 1990. To implement these goals, the Department of Women & Child Development has formulated a National Plan of Action on tribal Children. Each concerned Central Ministries/Departments, State Governments/U.Ts. and Voluntary Organisations dealing with women and children have been asked to take up appropriate measures to implement the Action Plan. These goals have been integrated into National Development Plans. A Monitoring Committee under the Chairpersonship of Secretary (Women & Child Development) reviews the achievement of goals set in the National Plan of Action. All concerned Central Ministries/Departments are represented on the committee. 15 State Governments have prepared State Plan of Action on the lines of National Plan of Action specifying targets for 1995 as well as for 2000 and spelling out strategies for holistic backward and tribal child development.





Fig 20: Health centre for tribal community (Bagdah block)

Summary Output								
Regression Statistics								
Multiple R	0.995914							
R Square	0.991845							
Adjusted R Square	0.983691							
Standard Error	1.485362							
Observations	3							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	268.3522	268.3522	121.63	0.057567			
Residual	1	2.2063	2.2063					
Total	2	270.5585						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-5.1115	2.796442	-1.82786	0.318695	-40.6437	30.42066	-40.6437	30.42066
Available for santhal tribes community (%)	0.824728	0.074781	11.0286	0.057567	-0.12545	1.77491	-0.12545	1.77491
Residual output		Probability Output						
Observation	Predicted available for munda tribes community (%)	Residuals	Standard Residuals		Percentile	available for munda tribes community (%)		
1	24.75192	-1.21192	-1.15387		16.66667	12.98		
2	12.41398	0.566021	0.538909		50	23.54		
3	35.56411	0.645895	0.614956		83.33333	36.21		

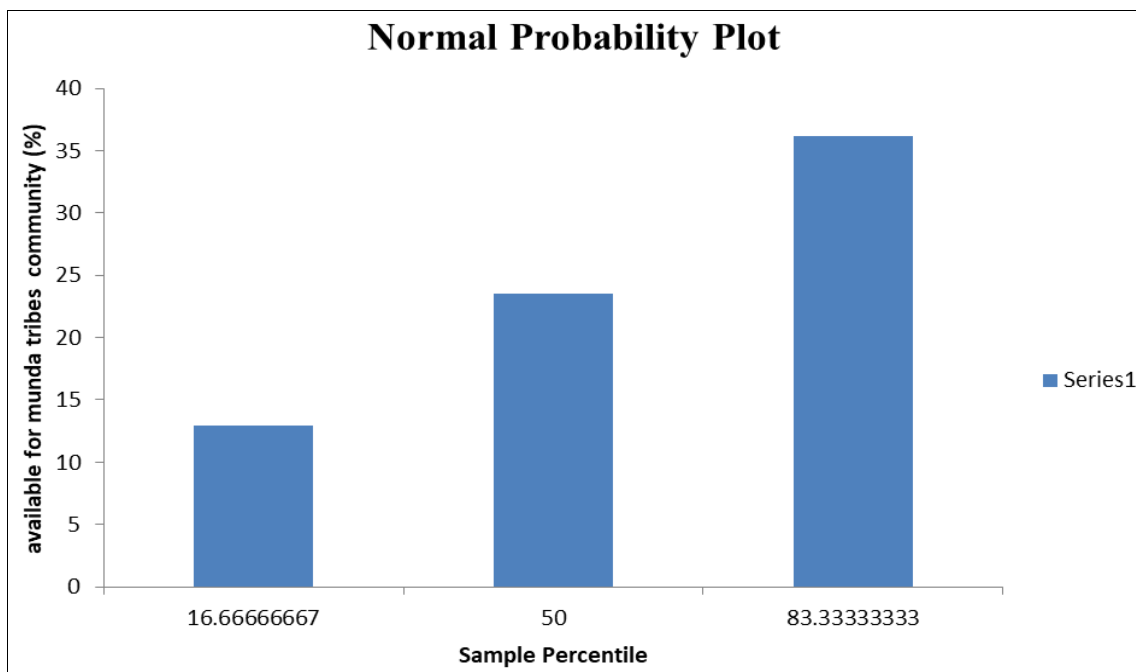


Fig 21: Probability assessment graph

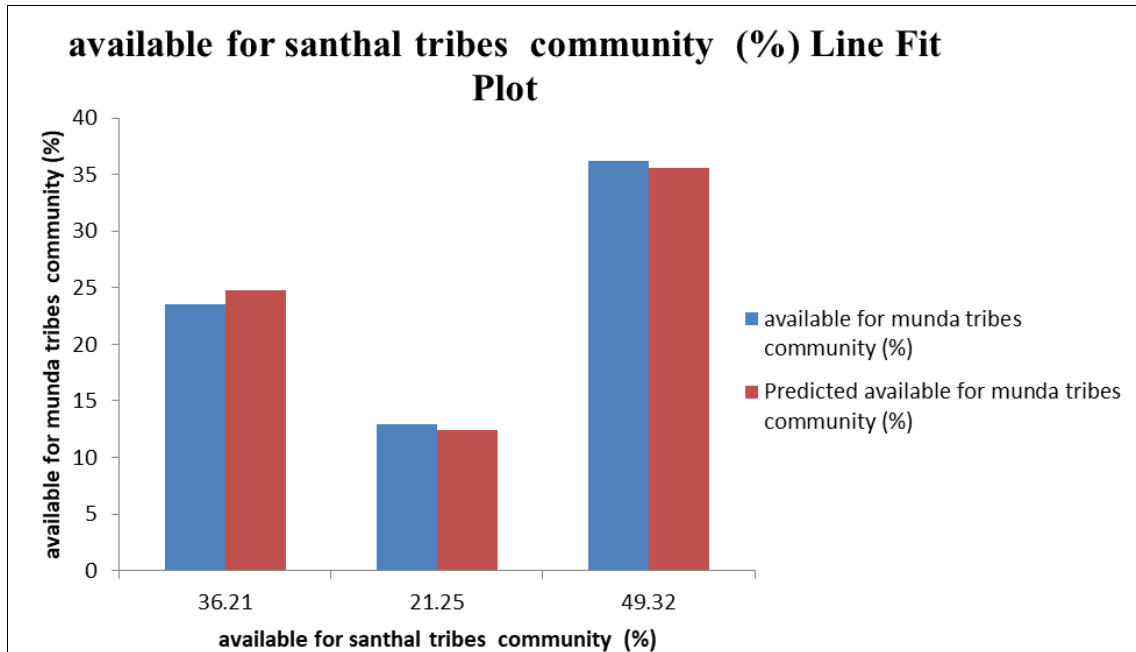


Fig 22: Comparative line fit graph for tribal assessment

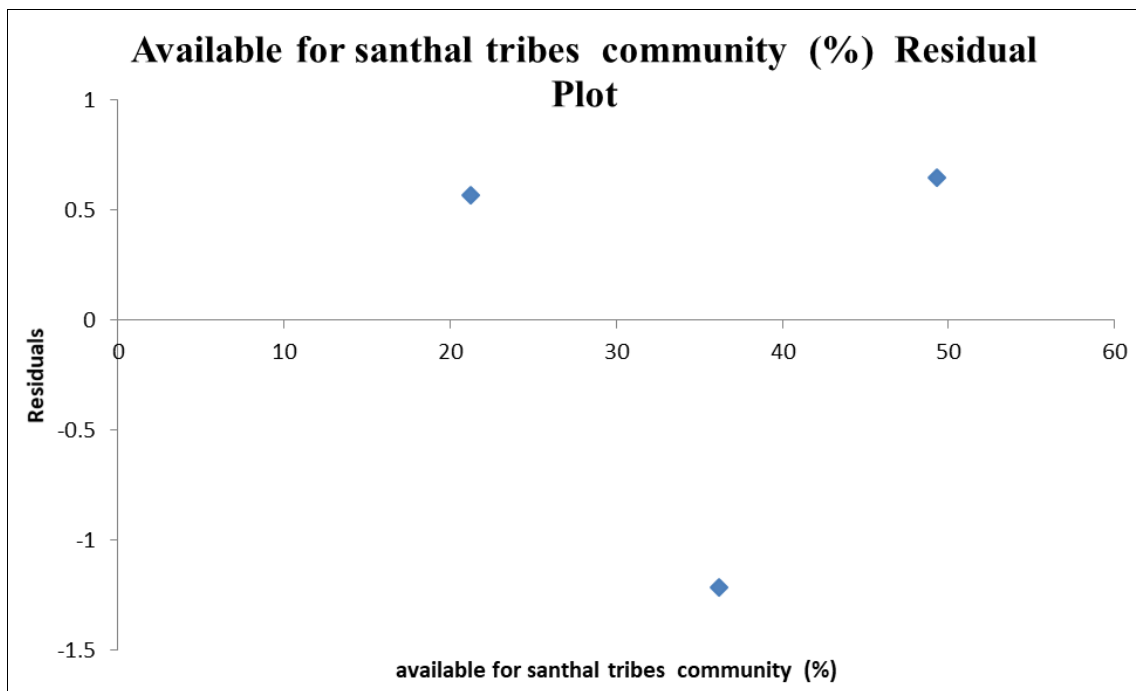


Fig 23: Residual plot for, community development (tribal research)

Table 11: Table for analytical measurement (stat)

Available For Santhal Tribes Community (%)		Available For Munda Tribes Community (%)	
Mean	35.59333	Mean	24.24333
Standard Error	8.108975	Standard Error	6.715138
Median	36.21	Median	23.54
Mode	#N/A	Mode	#N/A
Standard Deviation	14.04516	Standard Deviation	11.63096
Sample Variance	197.2664	Sample Variance	135.2792
Kurtosis	#DIV/0!	Kurtosis	#DIV/0!
Skewness	-0.1972	Skewness	0.271123
Range	28.07	Range	23.23
Minimum	21.25	Minimum	12.98
Maximum	49.32	Maximum	36.21
Sum	106.78	Sum	72.73
Count	3	Count	3
Largest(1)	49.32	Largest (1)	36.21

Smallest(1)	21.25	Smallest (1)	12.98
Confidence Level (95.0%)	34.8901	Confidence Level (95.0%)	28.89291

**Table 12:** Tribal food significant Level

Scheme	N	Mean	Sd	T – Value	P – Value	Multiple- R	Standard Error	Confidence Level (95.0%)	Significance Level
Available For Santhal Community (%)	100	35.59333	8.108975	11.0286	0.318695	0.858812	1.485362	28.89291	Significance At 0.05 & 0.01 Level
Available For Munda Community (%)	100	24.24333	6.715138						



**Fig 24:** Health Center Amdobe Study Area

**Conclusion**

According to Dangol, Narendra (2018) [2] Food Environments – A systematic review published in 2020, partially funded by NIEHS, suggests that the health of some children may be affected by food environments near schools.

Researchers examined the presence of fast-food outlets, convenience stores, supermarkets, and grocery stores near schools along with measures of overweight/obesity by race/ethnicity, gender, grade, and income level of rural tribal community of 24 north paraganas in west Bengal. This review and result found that when fast food outlets were located near schools, obesity rates were generally higher among children in all grade levels. Additional research is needed to better understand this finding, especially for children at higher risk of obesity, such as those from socio-economically disadvantaged populations Food Packaging – PFAS are a group of more than 9,000 perfluoroalkyl and polyfluoroalkyl substances, a class of chemicals associated with harmful health effects, including liver damage, cancer, and impaired immunity. Due to widespread usage, PFAS are in the blood of nearly every American, according to the Centers for Disease Control and Prevention.

Food Safety and tribal health – Food safety studies funded

by NIEHS include contaminants in common foods. In particular, arsenic, a metal-like element that can harm many human organs, presents a global food contamination problem. The problem of contaminants in food led researchers funded by the Superfund Research objective to develop approaches for addressing soils used to grow crops. Some are working on phytoremediation approaches that are cost-effective and ecologically friendly. Phytoremediation is a process that uses fast-growing plants in engineered systems to degrade, extract, contain, or immobilize contaminants from soil or groundwater among the santhal and Mundari community in west Bengal.

Food Gardening – The need for affordable, healthy foods has increased public interest in home, school, and community gardens. While rural and urban gardens provide numerous benefits, soil contamination may be an issue. Producing videos about safely gardening in areas where soil may have contaminants.

- Testing soil for lead and other contaminants and raising awareness of children’s health risks associated with exposure.
- Reducing exposures of urban gardeners to soil contaminants by empowering communities to implement effective, community-based exposure mitigation strategies.



- Evaluating arsenic in vegetables commonly home grown and the potential risk from consumption.
- Transforming former brownfield sites into community gardens with safe soil.

According to Lama, Pravhat (2017) <sup>[14]</sup> Food Security – Diet is widely recognized as a key contributor to human gut microbiome composition and function.

A healthy gut microbiome can help the immune system develop, protect against pathogens, and enable proper food digestion. It is found the gut microbiome of adults tribes with food insecurity, a lack of access to healthy food, differed from those who were food secure. This study is significant because it focused on a social factor rather than dietary components the make the active impact on tribal health of study area.

In conclusion, factor meals offer numerous benefits for health-conscious individuals. They provide time-saving convenience, portion control made easy, balanced nutrition, and customization options. By incorporating factor meals into your routine, maintain a healthy lifestyle without the stress of meal planning and preparation. Remember to choose reputable factor meal providers that prioritize quality ingredients and have positive customer reviews. With the right approach, factor meals can be a valuable tool in achieving your health and wellness goals as well as female tribal groups should have to ensure the level of sustainable health and nutrition.

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