

## Habitat and Nutritional Status of a Kandh Village of Eastern Ghats, Orissa

Kalpana Rani Sabat, Nirmal Chandra Das and Bijayalaxmi Das<sup>1</sup>

*P.G. Department of Anthropology, Khallikote Autonomous College, Berhampur 760 001, Orissa, India*  
*1. P.G. Department of Botany, Khallikote Autonomous College, Berhampur 760 001, Orissa, India*

**KEY WORDS** Kandh. Habitat. Nutrition. Age. Height and Weight.

**ABSTRACT** Kandhs, being the largest tribal group in Orissa, are mostly distributed in the mountain regions of Phulbani, Koraput, Ganjam, Kutia, Dangria and Desia are the three subsections of Kandhs. All the Kandhs of Ganjam belong to the Desia. The study highlights the habitat and nutritional status of the Kandhs of Ganjam. Although these Kandhs stay in the close proximity of a city, the study shows that most of their activities are still connected with the forest ecosystem. They almost retain their traditional way of life and are still in the stage of subsistence economy. The different types of foods consumed by the Kandhs are much less than the ICMR standards. The average intake of calories of an adult Kandh is 2084 which is also lesser than the ICMR standards. The average adult consumption unit is 4.7 per family. Both weight-for-height and weight-for-age measurements show that Kandhs are under weight and are in the state of malnutrition particularly under nutrition.

The relation between environment and culture has been studied in terms of environmentalism and possibilism (Bumham and Ellen, 1979; Ellen, 1981). In the former it was held that energy culture is a product of the given environment and its constraints. The trouble with the perspective was of reductionism as every element of culture was believed to have a cause in the environment. Contrasted this, possibilism considered environment as one of the factors that shapes the social relations as well as the culture of a people, and such a shaping is more pronounced in the case of small scale societies who are entirely dependent on the kind on its products (Forde, 1934).

The nutritional status of any population is the product of its cultural and ecological factors. Man has always been dependent, to a varying extent, on fluctuating ecological balance between people and basic resources and its sur-

rounding ecological systems. The utility of resources has constantly increased but in many cases natural resources do not increase at the same pace (Chandrasakehar, 1954), which results in change of techno-economic pursuits. Carrying capacity is thus basically conditioned by a stratified relation between its food resources and its cultural realities as manifested in the form of mechanism of utilization of available resources (Kessing, 1957).

It is recognised that as a result of extreme poverty, the intake of various essential constituents of food may be inadequate among the tribals in India. The nature and extent of deficiency varies from tribe and from place to place among the same tribe. There is a general view that primitive people are not nourished, but empirical data from India (Sengupta, 1969 and Rao et al., 1983) and other parts of the globe (Wrisling, 1985), show that the nutritional status of relatively less acultured primitive tribals is most satisfactory. However, certain ecological stress increases the intensity of communicable diseases among the tribals (Sahu, 1980; Sinha, 1986), which in turn deteriorates the nutritional status because of the well known interaction between health, nutrition and infection (Scrimshaw et al., 1986).

In the present study, an attempt has been made to highlight some specific features of habitat and the nutritional status of a Kandh village of the Eastern Ghats of Ganjam, Orissa.

### MATERIALS AND METHODS

The present study has been carried out on a Kandh inhabited village, Tamana in Kukudakhandi block of Ganjam district, Orissa.

At first the basic information regarding the habitat has been collected on the village because habitat dictates the livelihood pattern of the entire village.

Information with regard to productivity and number of livestock have been calculated by personal investigation through interview technique. The non-participant observation technique is also followed. As many as 66 households out of the total 83 were covered for collecting the household information of the village. The family diet survey was conducted from a sample of 30% household following the principle of systematic random sampling. Thus 25 households were interviewed for the collection of data on dietary practices. The amount of raw food stuffs consumed by the family members either weekly or monthly were recorded and from that daily consumption was calculated. The per unit consumption was estimated by the use of consumption coefficients (Swaminathan, 1988). The average intake of each food stuff in gram per consumption unit per day was calculated for each family. The calorie values of various food stuffs have been calculated from the food comparison table (Gopalan et al., 1971). The results were compared with ICMR recommended allowances.

Data on nutritional anthropometry (particularly height and weight) were collected from the adult individuals between 15 to 49 years of age from the entire village by means of a well verified anthropometer and weighing machine.

### THE KANDHS

The Kandhs, famous in anthropological world for their *meriah* (human sacrifice) cults, are a Scheduled Tribe inhabiting south-west Orissa in the district of Phulbani, Koraput and Ganjam. They also live in Srikakulam and Visakhapatnam districts of Andhra Pradesh. Numbering close to one million, they are the seventh largest tribe in India and the largest of the sixty two tribes in Orissa. The Kandhs consider themselves as the original inhabitants of the soil; according to them "this is our soil, the earth is

our mother and we always appease her by regularly worshipping because she provides us food" (Boal, 1982).

The Kandhs are divided into three main sections because of inhabiting different habitats and echniches. Dangria Kandhs living in the Niamgiri Hills of Koraput, Kutia Kandhs living in the Belghar and G. Udayagiri regions of Phulbani and Desia Kandhs living in Phulbani and Ganjam Districts. Although each section is endogamous, inter marriages between them is not rare. Response to change also varies and in interior villages, which are still inaccessible, the pristine customs and practices survive (Choudhury, 1989).

Desia Kandhs of Ganjam District are one of the endogamous groups of the large Kandhs tribe of Orissa. They are largely concentrated in the Easter Ghats region of Kukudakhandi and Chikiti Blocks in Ganjam District.

### HABITAT

Ganjam District is divided into two distinct physical divisions; the plain region in North and the Coastal region in the South. However Eastern Ghats lies in the south-western direction. The fertile plains of this region lie between the high mountain ranges of Kerandimal and Ghadaghada river, a tributary of river Bahuda. The Kerandimal forms a plateau around 600 meters above sea level. The whole area otherwise exhibits a number of villages and vast forests.

The entire area is a hilly tract intersected in all directions by streams and torrents which run dry after the rains. It is characterised by comparatively less cultivated land. The uplands and slopes leading down from the foot of hills are periodically cleared for raising dry crops and the low paddy lands have been permanently cleared and cultivated every year. The rest of the area is covered with thick forest.

The vegetation of the area comes under two major divisions: (A) Tropical semi-ever green forest. The species found under this division are *Mangifera indica* (Mango), *Azadirachta indica*

(Neem), *Diospyros ambryopteris* (Makarken-du), *Michelia champaca* (Champa), *Dillenia pentagyna* (Rai), *Mesua ferrae* (Nagkesar), *Saraca indica* (Asoka) and Calamus (Canes). Teak plantation has been raised with success and it is being commercially exploited. (B) Tropical moist deciduous forest — the important species found here are *Shorea robusta* (Sal), which is the most common and valuable tree, *Balbergia latifolia* (Sisua) and *Terminalia tomentosa* (Beda).

Among other plants of economic importance in the area are different species of bamboos, *Bambusa arundinacea* (Kanta Bans), *Dendrocalamus strictus* (Big Bans) and *Bambusa nutens*, *Diospyros melanoxylon* (Kenduleaf), *Rauwolfia serpentina* (Patalagaruda), *Tamarindus indica* (Tamarind), *Caryota urens* (Sagopalm, locally known as Solopo) and *Bassia latifolia* (Mahua). In addition, the jungle yields grass for thatching, rushes (stem of marshy plants) for strong sleeping mat, large leaves for plates and bowls, barkrope and many edible roots, berries and leafy vegetables (Boal, 1982).

The forests around the village have many wild animals. They include tiger, leopard, wild pig, wild fowl, wolf, wild dogs, fox, jackel and different types of sambar and elephant. The leopards are harmful to the people as they kill the domestic animals. Some of them are also man-eaters. The bear and elephant frequently enter the village and destroy the crops.

The maximum temperature in Summer, particularly in the month of May is around 39°C, while the mean minimum temperature in the cold season, particularly in December is 8.7°C.

Humidity is generally high in the area especially in the south-west monsoon and post-monsoon months. April is the driest month. During the south-west monsoon, the sky is generally clouded to over east. Winds are generally light to moderate with some increase in force.

### NUTRITIONAL STATUS

It is well known that nutrition has a profound effect at every stage of our life from prenatal stage to extreme old age. It plays a vital role in determining our longevity. It deals with the entire process of growth, maintenance and repair of the living organs as related to the intake of food. Health influences all activities of man and shapes his destiny. It is the solid foundation on which man's happiness rests (Sahu, 1982). The parameters used for finding the nutritional status of the Kandhs are diet survey and nutritional anthropometry.

#### Dietary Pattern

Kandhs have a very irregular food habits, they eat whenever food is available. Staple food articles taken by them vary with different seasons and the diet is mainly based on the availability of food stuffs. Calculation of average Adult Consumption Unit (A.C.U) of the 25 sample families is given below.

$$\frac{\text{Adult consumption unit per family (ACU) = Total family consumption unit}}{\text{Total no. of households}} = 118 / 25 = 4.7$$

The above figures shows that the total population of the sample households is 126 (Table 1). Out of the total population there are 51

Table 1: Distribution of populations and consumption unit among the Kandhs

Age group	Children					Adolescents (Teens) 12-19	Adults 20-59		Aged 60 +	Total population/ adult consumption
	1-3	3-5	5-7	7-9	9-12		M	F		
Adult Consumption unit coefficient	0.4	0.5	0.6	0.7	0.8	1.0	1.2	1.2	0.8	
Population in various ages	6	8	10	12	8	24	26	25	7	126
Total adult consumption unit	2.4	4.0	6.0	8.4	6.4	24.0	31.2	30.0	5.6	118

**Table 2: Distribution of average family consumption, average adult consumption of different foods per day and their respective calorie values**

Different food items	Average family consumption in gms	Average intake of an adult Kandh		Required allowance of an adult Kandh	
		in gms	in Kcal	in gms	in Kcal
1	2	3	4	5	6
Cereals	2460.86	523.59	1820	476	1650
Pulses	110.78	23.58	70	80	230
Leafy vegetables	175.17	37.28	20	125	70
Other vegetables	181.08	38.52	15	75	30
Roots and tubers	178.82	38.04	45	100	120
Milk	21.73	4.62	03	100	60
Meat and fish	38.65	8.22	10	30	40
Fruits	58.82	12.51	16	30	40
Oil and Fats	13.65	2.90	30	40	390
Sugar and Jaggery	31.26	6.65	30	40	170
Liquor	183.91	39.12	25	-	-
Total	3454.73	735.03	2084	1095	2800

*Note :*

Column - 1 This contains different food items

Column - 2 This represents the average consumption of foods per day (in gms) of a Kandh family.

Column - 3 This represents the average intake of food per day (in gms an adult Kandh. It is obtained by dividing the adult consumption unit per family with the total average family consumption (represented in column-2).

Column - 4 This represents the calorie values of the foods of column-3.

Column - 5 This represents the required allowances (in gms) of an adult Kandh. An adult Kandh male or female consumes 1.2 adult units as per ICMR standar (see description under dietary pattern).

Column - 6 This represents the calorie values of column-5.

adults. Male and female have been categorised as moderate and heavy workers respectively. As per ICMR standard both moderate male workers and heavy female workers should consume 1.2 Adult units. Various consumption coefficients are presented and the average Adult Consumption Unit has been calculated as 4.7 per family.

The average daily family consumption of different food items and the average adult consumption have been presented in table 2. The average Adult Consumption has been calculated with the help of the Adult Consumption Unit of the family.

Compared to other food stuffs, cereals consumed by the Kandhs is higher than the ICMR standard. The consumption of pulses is common for Kandhs. Vegetable consumption as regards the nutritional requirements is no way satisfactory. The rich families having kitchen

gardens grow varieties of vegetables which are consumed by them. These include such as tomato, cucumber, pumkin, brinjal, amaranthus etc. Leafy vegetables are important items among the Kandhs which is eaten as vegetables with rice. Roots and tubers are mostly collected from forests. They are olokond, pitchkondh, colocassia, yam etc. The intake of milk and milk products is almost nil. It is a rare food item and the cows are not milched. Children are breast fed for one year after which they are given ragi porridge or rice. Meat and fish are consumed occasionally or on festive days. If an animal or bird is hunted it is shared by the villagers. Kandhs are very fond of dried fish. Eggs are not eaten but left for hatching. Different types of fruits are consumed by the Kandhs. The Kandhs consume sugar and jaggery very rarely. The consumption of oil is not a regular feature among the Kandhs. Liquor plays a vital role

in the Kandh life. The Kandhs feel that liquor is an energetic stimulant which breaks monotony and a drink which satisfies the starving belly. 'Mahua' and 'Solopo' are the common liquors used by the Kandhs.

The average Kandh diet consists primarily cereals and pulses which is mostly reflected in their calorie intake. In order to assess whether persons suffer from under or malnourishment, it is important to find out the calorific requirement and intake.

The average calories intake of an adult Kandh is approximately 2084 and this has been calculated from the staple diet of the Kandhs (Table 2). The total calorie requirement, for an adult moderate working male and hard working female, recommended by ICMR is 2800 (ICMR, 1994). This indicates that Kandhs are undernourished with respect to the calorie value of the food intakes.

#### Nutritional Anthropometry

The pattern of growth and the physical state of the body, though genetically determined, are

profoundly influenced by diet and nutrition. For nutritional assessment among the adults, nutritional anthropometry is also applied in the present study.

Anthropometric data were collected on adults as part of the diet and nutrition survey in the study village. The sample comprises of 170 adult Kandhs (84 males and 86 females) in the age group of 15 to 49 years. Two measurements namely, height and weight are collected to evaluate the nutritional status.

The nutritional grades are calculated according to weight for height and weight for age, using ICMR standards.

The nutritional grade by weight for height [Table 3(A) and 3(B)] is observed for both adult male and female Kandh. The distribution of weight for height classification shows that, a higher percentage of male, about 37%, is found between 0-10% above the ICMR standard while only 23% female lie in the same category. However, a higher percentage of females, more than 37%, is distributed between 10-20% below the ICMR standard while a smaller portion

Table 3 (A): Distribution of adult male Kandhs by weight for height

Height in cms	Beyond 20% below the std	Between 10-20% below the std	0-10% below the std	Weight as per ICMR in kg	0-10% above the std	Beyond 10% above the std	Total number
	-3	-2	-1		0	+1	
Below 150	1 (1.19)	3 (3.57)	2 (2.38)	47.5	-	-	6 (7.14)
150-154	3 (3.57)	3 (3.57)	1 (1.19)	49.0	5 (5.95)	2 (2.38)	14 (16.67)
155-159	-	1 (1.19)	9 (10.71)	51.5	8 (9.52)	5 (5.95)	23 (27.38)
160-164	-	1 (1.19)	3 (3.57)	54.0	14 (16.67)	11 (13.09)	29 (34.52)
165-169	-	-	-	59.0	4 (4.76)	7 (8.33)	11 (11.10)
170 +	-	-	-	62.0	-	1 (1.19)	1 (1.19)
Total :	4 (4.76)	8 (9.52)	15 (17.85)		31 (36.90)	26 (30.95)	84 (100)

Table 3 (B): Distribution of adult female Kandhs by weight for height

Below 140	-	1 (1.16)	-	40.5	-	-	1
140-144	3 (3.49)	8 (9.30)	6 (6.98)	43.0	-	-	17
145-149	4 (4.65)	9 (10.47)	9 (10.47)	46.5	5 (5.81)	2 (2.33)	29
150-154	1 (1.16)	12 (13.96)	4 (4.65)	48.5	11 (12.79)	1 (1.16)	29
155-159	-	2 (2.33)	3 (3.49)	50.5	4 (4.65)	1 (1.16)	10
160 +	-	-	-	52.5	-	-	-
Total :	8 (9.30)	32 (37.21)	22 (25.58)		20 (23.26)	4 (4.65)	86 (100)

Figures in brackets indicate percentage

**Table 4 (A): Distribution of adult Kandhs by weight for age**

Age group	Beyond 20% below the std	Between 10-20% below the std	0-10% below the std	Weight as ICMR std	0-10% above the std	Beyond 10% above the std	Total number
	-3	-2	-1		0	+1	
15-19	2 (2.38)	3 (3.57)	5 (5.55)	57 kg	3 (3.57)	2 (2.38)	15 (17.86)
20-24	-	1 (1.19)	4 (4.76)	60 kg	5 (5.95)	6 (7.14)	16 (19.05)
25-29	-	-	3 (3.57)	do	4 (4.76)	5 (5.95)	12 (14.28)
30-34	-	1 (1.19)	3 (3.57)	do	6 (7.14)	9 (10.71)	19 (22.62)
35-39	-	-	1 (1.19)	do	3 (3.57)	4 (4.74)	8 (9.53)
40-44	-	-	1 (1.19)	do	3 (3.57)	3 (3.57)	7 (8.33)
45-49	-	-	2 (2.38)	do	2 (2.38)	3 (3.57)	7 (8.33)
Total	2 (2.38)	5 (5.95)	19 (22.62)		26 (30.95)	32 (38.10)	84 (100)

**Table 4 (B): Distribution of adult female Kandhs by weight for age**

15-19	5 (5.81)	11 (12.78)	1 (1.16)	49 kg	-	-	17 (19.77)
20-24	1 (1.16)	7 (5.13)	4 (4.65)	50 kg	1 (1.16)	1 (1.16)	14 (16.28)
25-29	-	5 (5.81)	5 (5.81)	do	8 (9.30)	2 (2.32)	20 (23.26)
30-34	-	3 (3.48)	2 (2.32)	do	6 (6.97)	-	15 (12.80)
35-39	-	1 (1.16)	1 (1.16)	do	3 (3.48)	1 (1.16)	6 (6.97)
40-44	1 (1.16)	3 (3.48)	3 (3.48)	do	2 (2.32)	-	9 (10.47)
45-49	2 (2.32)	3 (3.48)	3 (3.48)	do	1 (1.16)	-	9 (10.47)
Total	9 (10.47)	33 (38.37)	19 (22.09)		21 (24.42)	4 (4.56)	86 (100)

Figures in brackets indicate percentage

(nearly 10%) of males are found in the same group, and 9% of females are found 20% below the ICMR standard. Further, nearly 18% males and 26% females are found 10% below the ICMR standard. The weight for height in the present study shows that a higher percentage of females are placed below the ICMR standard in comparison to their male counterparts. In other words, almost 55% males and 49% females are found to be in the normal range (considering "+1" and "-1" grades as normal range). Nearly 14% males and 47% females are underweight while about 31% males and 5% females are over weight as per the normal standards. Thus the female are the more effected.

The nutritional grade by weight for age [Table 4(A) and 4(B)] shows that males, almost in all age groups, possess normal or above normal weight. However, the females show a reverse picture. Considering '+1' and '-1' categories as normal range, it is found that nearly 53% males and 47% females fall in normal category. The

rest 8% males and 49% females are below normal whereas 38% males and 5% females are above normal. It shows that most females are underweight compared to the males.

## CONCLUSION

The present study has been undertaken to describe the nutritional status of a Kandh village in the Eastern Ghats of Orissa. It has been observed that although Kandhs of the study area stay in the close proximity of a city, the study shows that most of their activities are still connected to the forest eco-system. They almost retain their traditional way of life and are still in the stage of subsistence economy.

The different types of foods consumed by the Kandhs are quantitatively less than the ICMR standards. However, the consumption of cereals is found to be more than the recommended allowance. The average intake of calories of an adult Kandh is 2084 which is also less than the

ICMR standards. The Average Adult Consumption Unit (A.C.U) is 4.7 per family.

Both weight-for-height and weight-for-age measurements show that a majority of the adult Kandhs are underweight, particularly the females. The study broadly highlights that the Kandhs are in the state of malnutrition, particularly undernutrition. This may be due to the lack of proper knowledge regarding nutrition and health.

The poor socio-economic status along with the careless attitude to education add further to the gravity of the situation. Concerted efforts both by the government and by the non-government organisations are required for the around development of such a downtrodden community.

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