Chapter - V

Summary And Conclusion
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5.1 Summary

It is well known fact that the tribals have been leading an independent isolated life which is much different from the large population living around them. Ethnographic and anthropological studies have mentioned that the tribals have their own ways of managing their day to day life activities of which food is an important aspect. Among primitive tribes “Abujhmarias” are the most primitive community living in the remotest and the most backward region in Bastar (Chhattisgarh). Entirely hilly, the region provides an isolated environment for the Abujhmarias with slow pace of cultural advancement. The people are practically isolated from outside world.

The place of field investigation was Orchha block of Bastar district. The area popularly known as Abujhmar is a prohibited place for visitors. It is situated between latitudes 19°0.0’ and 20°0.0’ N and longitudes 80°39’ and 81°39’ E. Area of this unknown tract is between 1500 to 1600 square miles (Tiwari, 1984). Abujhmaria tribe do not form a part of the main stream of civilization and lead a fairly simple life in their natural environment. Their life styles are simple and they depend on local forest eco-system for fulfilling their need, be it food health or anything.

A comprehensive nutritional survey of Abujhmaria tribe was undertaken, that reflects the status of society, food intake, and health of the tribe. The components of the survey were: the family size of the tribe, housing condition, food and water facility, food preparation practices, food and drinking habits, dietary intake, and socio-economic characters.

The various studies conducted from time to time by different persons and institutions show that the tribal living in different parts of India, under different socio-economic conditions, have varying degree of nutrition and health status. This sector of population lives in the forest ecosystem with poor economic status, rich in social culture, self reliance, ecological adjustment and
good understanding about health care. In course of time, large amount of information has been gathered about flora and fauna, food, and food habits, health care, shelter, health care practices and local trade. Most of these informations are of qualitative nature. They do provide insight into the tribe’s way of life but do not quantify the status to enable in comparison with National standards.

The **INTRODUCTORY** chapter describes the Abujhmarias place in tribal world in respect of demography, social, food and nutrition scenario while planning the objectives of the study. Present study was conducted on nutritional aspects of the Abujhmarias diet with the objectives of status of their knowledge on food, nutrition and health, food consumption pattern, status of food and nutrition, health care practices, nutrient analysis of rare food items, socio economic scenario and exploring on appropriate research approach for developing forest produce based food and nutrition programme.

**REVIEW OF LITERATURE** is cited in the second chapter. A wide range of work has been done at different levels to study the food habits and socio-economic status of the tribals. Various development programmes are also being implemented for the different tribes through Government agencies. Available information has been documented in this chapter. The critic of the review tells upon that “need for tribal development is unquestionable area as this sector of population has lived so far isolated life while meeting their day today needs from the forest ecosystem. The studies conducted in this area reveal that the informations generated are of qualitative nature. They do provide insight into the tribe’s way of life but do not quantify the status to enable any worth while comparison with National standards. Actual analysis of food ingredients for nutrients are required to understand the value of traditional food and beverage packages evolved and used by the tribes in remote forest ecosystems and to reveal the potential of unique food packages for improvement and use in development programmes”.

The third chapter of **MATERIALS AND METHODS** deals with the procedural aspects of the study. Location of the study, general scenario of the study area sampling procedure, tools and techniques of data collection on
socio-economic status, diet survey, health care practices, food analysis, and collection of rare food samples, nutrients analysis methods, and statistical measures are described in this chapter. A simple random sampling method was applied for collection of data concerning Abujhmaria population. Socioeconomic details were collected by using “Schedule for assessment of socioeconomic status of families as prescribed by NIN, Hyderabad. Food consumption pattern was assessed by oral questionnaire (24 hour recall method for three consecutive days) during different seasons of the year. Food intake was measured by NIN standard cups. The consumption unit was calculated by the NIN prescribed formula. The food composition of the dietaries was computed on the basis of standard tables (ICMR 1994) for comparison. The analysis of food was done by various chemical analysis methods.

The fourth chapter RESULTS AND DISCUSSIONS deals with the results on life profile of Abujhmaria tribe, socio-economic status of the community, food consumption pattern (i.e. typical meal pattern, food and nutrient intake, frequency of food intake), knowledge about nutrition, health care practices, and nutritional quality of rare foods. In addition elaborate discussion of the results has been done based on the tabulated data and compared those with similar studies.

Main occupation of Abujhmarias is penda (shifting) cultivation and collecting forest produce. The collection of forest produce is done for own consumption as well as for sale. Formal education has very little impact on Abujhmarias. The housing and sanitary conditions are primitive. Houses are without windows and ventilators. 76 % families live in kaccha houses. Only 19 percent of them have bicycles. 11 percent of the families have electricity facility with one bulb connection.

Food intake was dependent mainly on availability of food. The morning meal is liquid saline pudding chiefly of rice cooked together with small proportion of various millets. Data on food intake frequency revealed that among cereals, minor millets viz., kosra and madia were the main staple food in the diet consumed daily. Green leafy vegetables were grown in their own compound or collected by nearby streams. Variety of root and tubers collected
from forest area are consumed. This tribe doesn’t consume milk at all. There are wide seasonal variations in food consumption pattern.

This tribe used their own method for treatment of illness. Medicinal plants like dioscorea, wild turmeric and many others with therapeutic values are used for curing several health disorders. In rare cases they consult doctors. Their knowledge regarding vaccination and immunization is extremely poor. As far as nutrition knowledge is concerned all the subjects surveyed discard excess water while cooking and this water was generally given to their pets. 80 percent of them don’t wash fruits and vegetables before eating. Personal hygiene is almost non-existent and they don’t bother for their basic hygienic need.

Forest areas are natural habitat of tribes in which they live and sustain their life on different kinds of food obtained from local flora and fauna. For these people, natural streams and spring are source of water—the prime need for living. The process of evolution and development has come to a stage where population pressure is adversely affecting the sustenance of forest ecosystem, which no more can meet the growing demand of the people living in these areas. Efforts therefore are being made to know the socioeconomic and livelihood status of tribal community and endeavour to bring them closer to the developed world. In this process enormous studies have been made after independence and are continuing particularly on their food, nutritional and health aspects. The review of literature do provide insight into the tribes way of life but most of the work do not quantify the status that are based on the factual nutritive status of food items collected from the forest area that they consume. In present study, efforts were made to collect and analyse the food items and study the Abujhmaria tribe—A most primitive one living in prohibitive area ‘Abujhmar’ in Orchha block of District Bastar in Chhattisgarh.

Abujhmarias are simple, shy, light hearted and scantily clothed people. They are contented, live in the present and do not care to hope for future. They are omnivorous, live in thatched, temporary houses. They have collective and communal life and the land belongs to the village. Cultivation, threshing, harvest, hunting and fishing are all collective operation. The social organization
of the Abujhmarias has important place by the traditional standards of the tribe that encourages its members by according social approval. It keeps an eye that laws, customs and traditions are not breached by the members.

In general, health of the people is good, but conspicuously the youth of Abujhmaria is very short lived and ages very fast. Profile of the Abujhmaria tribe, indicates that they are a happy community in their own environment. The social discipline at individual and community level is unique as they posses every thing that a spiritually developed, democratic society should have. They deliberately keep their requirements and demands limited, but they are not poor. However, with Abujhmaria the problem of fast aging of youth is a cause for concern and here, the food, hygiene and balanced diet seems to be the area that needs to be explored in depth. The Abujhmaria tribe is conducive to cooperative development programmes that need careful planning in introducing development ventures in this area.

Abujhmaria, with poor education and economic status live in joint families (78 %) with 5 to 8 members. Majority of the families live in kaccha houses. Literacy was only 12.02 % that too up to primary and middle level. Female literacy was higher than the males. Formal education has very little impact on Abujhmarias. This may be due to their ignorance and lack of proper facilities for education.

Abujhmaria tribe in general consumes 3 meals a day. Morning meal consists of Pej or left over rice of previous night. In afternoon, they take Pej, rice, amat / dal / flesh food / red ant chutney. The evening meal is of boiled rice or millet taken with pulse of kulthi (horse gram), Urad (Black gram), Mung (green gram) or vegetables. Milk is not consumed at all. Kosra is predominantly consumed by all. Use of spices, salt, chilies, garlic, turmeric are made to limited extent. Salphi, Pej, Landa and red ant chutney are popular food and beverages consumed by them.

Food habits of Abujhmaria tribe similar to other tribes are unique in which alcohol plays a significant role in their social and religious life. Rajyalakshmi (1991) also reported that drinks occupy an important place in the
life of the tribes of Andhra Pradesh. The use of *mahua* spirit is universal in Bastar. Other important drinks are “*Salphi*” and *chhind rus* which are fresh or fermented juice of sago palm (*Caryota urens*) and wild date palm, respectively. *Landa* (rice beer) is another beverage consumed which is made by boiling equal proportions of rice or *kosra* (*Kutki*) and *madia* (*Ragi*) flour and then fermenting it. Seasonality and availability of food ingredients determine the constituents for the preparation of alcoholic beverages which are nutritious providing proteins, minerals and vitamins. With *Abujhmarias*, *Madia Pej*, is very popular. *Abujhmaria* tribe use fresh rhizomes of *tikhur* to prepare starchy flour, which has a medicinal value and is considered good for peptic ulcer patient, as it provides cooling effect. This starchy flour is mixed with water and consumed in the form of *sherbat*. It is used as an energy drink and medicinal beverage for cooling effect during hot summers. Frequency of consumption of different kinds of food constituents (Appendix–IV) presents a very complex picture of food scenario, warranting a detailed study for suggesting appropriate standardization of dietary practice that includes local and outside supplement food ingredients.

Results of the study conducted on food intake both on quantity and quality for different age group is discussed in succeeding text. *Abujhmarias* start feeding cereals to infants at the age of 2 – 12 months in the form of *Pej*, *Landa*, *tikhur sherbat* etc. Average consumption of cereals by this group of infants was found to be 96.3 g per day. There is no RDA standard prescribed by ICMR for this group.

Cereal intake in the age group of 1-3 years of *Abujhmaria* population was higher than RDA. Calorie intake is the final indicator of food value that one takes. Energy intake through the meals by male and female was assessed to be 70.3 and 75.5 % of RDA respectively (Table 4.8). Intake of protein under this group was higher than the RDA, but the consumption of fat and carbohydrate (in males) was only 15.2 and 77.9 % of RDA. This has been attributed as a reason for inadequacy in food value when judged from energy intake standard. It has been argued that, frequent eatings of minor fruits, small birds, animals etc that the children of this age group fetch during playing in the
surroundings of their hutmports (a common and natural practice in Indian rural scenario) also substitute nutrition. Studies as the present one have limitation of gathering data on this important aspect. Considering these aspects and the special care of this group by the parents, it is difficult to say that this group of Abujhmaria population is not adequately fed.

Intake of cereal and pulses in the age group 4 - 6 years of Abujhmaria population is very close to the RDA. Nutrient intake in reference to RDA was found to be higher in terms of protein (236.3 %), calcium (117.1), and thiamine (336.0%) and almost adequate for riboflavin (93.3%) and niacin (95.6%) in males. The status of nutrients amongst female was higher for protein (251.3%), thiamine (122.6%), riboflavin (1216.0%) and ascorbic acid (100.5 %). Carotene intake by female group was found more than the male group due to higher intake of fruits in the diet. However, the diet taken by this group provides only 71.7% and 56.6% of RDA for energy (Kcal) to the male and female groups, respectively. The reason for higher intake of energy by male group is due to consumption of more fat and carbohydrate in comparison to females. Similar to the age group of 1 to 3, food and energy intake by this group may be quite close to the RDA, if one accounts the intakes that the children manage on their own from the surroundings during their pass time activities.

Intake of cereals in the age group of 7 – 9 years, in terms of adequacy was found to be lower than RDA in both males (58.7%) and females (86.4%). However, the intake of pulses and roots / tuber (173.8 % & 136. 2 % in males and 163.2% & 121.8% in females) was higher. The reason for such a scenario was attributed to the availability of dioscorea, colocasia, tikhur and other minor tuber crops in abundance which grows wildly. The nutrient intake picture both for males and female groups show inadequacy of energy intake as the meals meet only 63.9 and 71.8 % of RDA requirements, respectively. Population of this age group, at very active growth stage normally gets occupied with enormous mental diversions in learning process at the cost of food and health. That may also be a factor for the deficiency in total energy intake, despite of the adequate availability of food items.
Food intake by the male group 10 -12 years age shows that they consume cereal (102.5 %), pulse (246.2 %) and roots / tubers (130.7 %) in higher amount than the RDA. Similar was the case with females too, as the cereal, pulse and roots / tuber consumption was 111.5%, 312.8% and 150.4% of RDA, respectively. Amongst nutrition, consumption level of protein (181.3%), calcium (147.5 %), thiamine (126.4 %) and niacin (114.0 %) over RDA was more in males. Similar was the case with female population in consuming protein (125.4 %), carbohydrate (102.4 %), iron (131.3 %), thiamine (114.0 %), riboflavin (160.0 %) and niacin (112.2 %) over RDA. Over all energy value of the meals was found to be 95.3 and 98.9 % of RDA in case of males and females respectively. Non vegetarian edibles, variety of rare foods, betel leaves, fruits, mahua flowers etc. contribute nutrition to the food intake. Food and energy intake by this group was found almost at par with RDA.

Female group of 13 -15 years age was found to be taking adequate food as the consumption of cereals (120.6 %), pulse (355.7 %) and roots / tubers (105.5 %) were higher than RDA. In males, the food intake of only pulses (109.4 %) was higher than RDA. Males and females of this age group start working in fields and the male group becomes addicted to drinks as per the family tradition. Similarly the female group work and learn the traits of their mothers. The female groups are more serious and hard working as they had to manage house hold works too. The nature of work of the females might be the reason for high intake of food than their male counter parts. The female group shows higher level of nutrient intake of protein (133.7 %), carbohydrate (115.7%), iron (105.6 %), thiamine (223.0 %), riboflavin (125.8 %) and niacin (144.7%) over RDA. The intake of nutrient by males was higher only for riboflavin (107.3%) than RDA. Total energy value of the food intake was assessed as 69.2 and 109.5 % of RDA in males and females, respectively.

The male group 16- 18 years of age was found to be consuming pulses in higher quantity (404.2%) over RDA and the intake of other items ranged between 3.4 to 87.1 % of RDA. Food intake by the females was higher in case of cereals (109.9 %) and pulses (448.6 %) over RDA. The intake of other items ranged between 4.4 to 72.1 % over RDA. The food value in terms of energy for...
males and females of this group was found to be equivalent to 62.8 and 88.8 % of RDA. The food consumption trend follows same trend as of the age group 13-15 years. The tribe do not have fixed meal pattern and what ever eatables they get in their day to day collections, they consume. Seeds and leaves of \textit{sal (Shorea robusta)}, pith and seeds of bamboo, seeds of \textit{sehari (Bahunia vahlii)}, pith of \textit{salphi} tree, variety of tubers and reptiles are consumed. However, the data does show that in this group too the food intake was more by the female group.

Male of 19-35 age group of Abujhmaria population was found to be consuming higher amount of pulse (279.6 %) over RDA. The other ingredients consumed ranged between 1.7 to 99.5 % of RDA. In the case of female group, cereals (103.5 %), pulses (165.8%) and fruits (104.9%) were found to be consumed in higher quantity over RDA. The other ingredients consumed by females ranged between 3.4 to 69.3 % of RDA. In the 19-35 years age group, the males were found to consume more nutrients namely protein (116.8%), thiamine (145.7%), riboflavin (255.6%) and niacin (116.2%) than RDA. The consumption of other nutrients ranged between 17.7 to 94.0 % of RDA. In the diets of females, the consumption of protein (115.2%), iron (123.5%) and riboflavin (109.2%) was more than the RDA. The consumption of other nutrients ranged between 22.3 to 95.4 % over RDA. Value of food intake in terms of energy for male and female group was found to be 78.8 and 83.4 % respectively. Higher intake of protein in males was due to the intake of pulses. Higher intake of calorie in females was due to the intake of carbohydrates.

In the age group of 36-55 years males were found to be consuming pulses (208.5%), fruits (147.6%) and fish / meat / egg (161.9%) in higher quantity over RDA and the intake of other items ranged between 6.2 to 84.4 % of RDA. Food intake by the females was higher in case of pulses (235.4 %) and fish / meat / egg (256.2 %) over RDA. The intake of other items ranged between 12.5 to 94.0 % over RDA. In comparison to other age group, males and females of this group were found to be consuming more non-vegetarian diets. Nutrient consumption by the male group indicate intake of more nutrients namely protein (101.6%), calcium (122.4 %), iron (117.6%) than RDA. The
consumption of other nutrients ranged between 29.6 to 88.5 % of RDA. In the diets of females, the consumption of calcium (209.6%), iron (214.8%) and niacin (109.9%) was more than the RDA. The consumption of other nutrients ranged between 30.2 to 96.1 % over RDA. Value of food intake in terms of energy for male and female group was found to be 72.4 and 91.8 % respectively. In terms of energy intake, females were found in better state than the male group.

Male group of > 55 years age was found to be consuming higher amount of cereals (111.1%) and pulses (733.8 %) over RDA. The other ingredients consumed ranged between 3.5 to 70.4 % of RDA. In the case of female group, cereal (107.6%) and pulses (174.8%) were found to be consumed in higher quantity over RDA. The other ingredients consumed ranged between 11.3 to 66.8 % of RDA. Nutrient consumption by the male group was protein (160.6%), iron (102.1%), thiamine (195.0%), riboflavin (159.3%) and niacin (115.8%) above RDA. The consumption of other nutrients ranged between 27.4 to 99.2% of RDA. In the diets of females, the consumption of thiamine (129.0%) and riboflavin (220.7) was more than the RDA. The consumption of other nutrients ranged between 31.8 to 97.5 % of RDA. Value of food intake in terms of energy for male and female group was found to be 101.7 and 91.5 % respectively.

Food intake pattern of pregnant and lactating mothers of Abujhmaria population indicate that this section of population does not consume diet equivalent to the RDA. Milk is totally absent from their diet. Fruits, meat, fish, roots and tubers were found to be consumed in lower amounts as compared to other age groups of the females. It may be due to certain food, fads related restrictions of this group during pregnancy and lactation. Adequacy of food stuff intake vary from 3.4 to 96.3 %; 11.5 to 68.0 % and 5.1 to 81.2 % of RDA in the groups of pregnant and lactating mothers with up to 6 months old child and lactating mothers with over 6 months old child, respectively. The nutrient intake by lactating mothers up to 6 months old child was thiamine (422.1 %), riboflavin (350.0 %) and niacin (112.2%) more than the RDA. The pregnant women were found to consume nutrients much below the RDA. The mothers having above 6 month old child consumed iron (114.5%) and riboflavin (173.3%) in higher
quantities than the RDA. Adequacy of nutrients intake in reference to RDA varied in the range of 20.9 to 97.3%; 7.1 to 95.7% and 6.1 to 80.8% in the groups of pregnant & lactating mothers with up to 6 month old child and lactating mother with over 6 months old child, respectively. Energy needs of these groups from the food intake is met to the extent of 75.6 %, 45.5 % and 64.0 % respectively. Mean ‘Protein Energy’ ratio percent of these group was found to be 10.1,14.0 and 8.8 % which shows that lactating mothers with 0-6 months old child only meet the standards (12-14 %) as prescribed by ICNND.

Knowledge of Abujhmarias on nutrition was assessed. Majority of the respondents (79.7%) consider food as essential for the development of the body but on the question of variety of food ingredients should be constituent of food, 72% respondents did not agree. Majority of the respondent consider non vegetarian diet superior to vegetarian diet (65.7%), were unaware about superiority of hand pounded rice over milled one (66.3%) and also were unaware about the changes in nutrient quality of cooked food (81.0%). Responses indicate that, these people are reasonably aware about basics of nutrition but it is not yet an issue of major concern to them.

Abujhmarias have mixed perception about the conservation of nutrients of the food. Perception on use of rice starch (62.0%) and heating of food many times is not good (84.7%) indicate that in general people are aware about the conservation of nutrients. But, perception on washing of raw vegetables and pulses before cooking from hygienic point of view is missing.

Knowledge of Abujhmaria on food and cooking practices was not very satisfactory understanding on cleaning the raw fruits and vegetables before use (75.3%), taking raw vegetables as salad (57.7%), awareness about the bad effects of *Lathyrus* pulse (92%) and in consuming iodised salt in their diets (55%) does not seem to be satisfactory. However, the majority of the respondents do have adequate knowledge about the importance of covered cooking (72%), using green leafy vegetables (70.3%) and jaggery (82.3%).

Knowledge of Abujhmarias on nutrition for vulnerable group indicate that they do not feel necessary for regular medical check up during pregnancy (59.7%), extra food for pregnant and lactating mother (66.7%), green leafy
vegetable for pregnant ladies (60.7%), avoiding some foods during pregnancy (78.7), breast feeding of infants after birth (50.7%) and giving milk to the infants after breast feeding is stopped (75.3%). Belief on medical care to the infants was found to be on same pattern as they do not rush to hospital when the child is ill (76.3%), do not give ORS to the child during diarrhoea (72.3%), giving food to the child during illness (56.3%) and importance of fresh food to the children (66.7%). However, they have awareness about the superiority of mother’s milk over the animal milk (59.3%) and on the need of some supplementary food to the infants after about 6 months along with the breast feeding.

Abujhmarias have poor perception on the need and importance of immunization of children and pregnant women. 54.3 to 96.7% of the respondents replied in negative on vaccines, need for vaccines, its doses etc.

Abujhmarias have very poor perception on the traits of health and hygiene. Majority of them (40.7 to 82.9%) do not think necessary in maintaining cleanliness and this character of the tribe corroborates with Baiga, Kamar and ‘Langia-Saoras’ as reported from several other studies. This proves that tribe’s in general have no concern for hygiene.

Abujhmarias were found to have very poor perception and understanding on environmental sanitation. Despite of having knowledge on the need of sanitation of environment, 68 to 79% of the respondents have no knowledge about the reasons for maintaining cleanliness.

Participation of Abujhmarias in Government sponsored welfare schemes is poor. 58.0 to 80.7% of the respondents were found not to be participating in welfare programmes.

Study on the knowledge related to different traits of food, nutrition and hygiene indicate that Abujhmarias are extremely poor in perception. Studies by other workers on the knowledge of tribes also corroborate with above mentioned status. The finer aspects namely nutrition and hygiene in food sector amongst tribal is yet to receive attention and seems that the immunity or resistance that these tribes have developed in natural environment protects them.
Abujhmarias have more faith in traditional health care system that fits well with their culture and way of living. The non-professional ancient medical care system is widely practiced in the area. Wrath of God, mischief of evil spirits and magic of human being are regarded as the main causes of health disorders. Treatment is based upon the removal of causative factors through appeasing Gods, exorcism (deliverance form evil spirits) counter magic, use of charms and tabeeji, Jhar Funk with some herbal preparation. It is the faith and belief in God that plays vital role in medical system that exists in the area. It is believed that most of the diseases and deaths are caused by supernatural agencies due to sin committed by the men. A belief, that in enmity one can harm any one with help of sorcerer, who can bring disease and destruction. Often deaths in case of enmity are attributed to this belief. Belief also prevails amongst the people of this tribe that diseases are also transferred from one person to another through magic. Such magician does not charge money but do accept some gifts. Money charging takes away the supernatural power of the magic man is the belief.

Treatment is done by the local medicine man known as Gunia, Baiga, Guru or Ojha. The medicine man is supposed to have super human knowledge and he diagnoses the disease, plays intermediary role and reveals the demand of the invisible power from the sick man. Such medicine man also plays extensive role as judge, magician, fortune teller, and priest in the tribal community. Majority of the sick persons get cured and in the cases, where the treatment fails, the medicine man is not discredited. In such cases it is taken that the evil spirit that attacked the patient was too powerful or the God was too angry.

Eighteen plant species were recorded that are used by Abujhmaria tribe for medicinal purpose and in curing various types of ailments. Starchy flour of Tikhur rhizome is used for curing peptic ulcer and provides cooling effect to stomach. Rhizome pulp applied externally is used for pain relief in case of headache and joint pains. Abujhmarias believe that red ant bite cures fever. Snake bites are cured with paste of Dang Kanda (Dioscorea bulbifera). Plants namely Baichandi, Kewkand, Patal Kumhra, Chotatulsi, Rasan Jadi and Sal are
used in ailments. Some health hazards are also believed to occur due to the fault in physical system and are treated with herbal medicines. Most of the herbal medicines are prepared through traditional methods. Quantitative and qualitative losses do occur in the process reducing their medicinal value. The traditional approaches that they know appeared to be the first option. However, the present stage of development being transition where there is no hospital, the concept that they are resistant to modern medical care appears, unfounded.

In general this sector in the tribe is based on faith and belief in traditional approaches towards life and living. During the survey interactions, the confidence that was seen amongst the respondents, the author has no option except to believe that there is some thing in their system which can not be ignored and needs separate study. Such study has to have spiritual bent of mind where faith and beliefs play major role. Nevertheless, the traditional system can not be ignored without any logic, as it has survived and developed through centuries.

Major rare food ingredients that the Abujhmaria collect from the forest include Tendu (a fruit of yellowish brown colour), Bhelti (nut of a tree), Basta (tender shoot with fibrous texture), Futto (wild mushroom), Boda (a type of mushroom), Tikhur (light brown colour rhizomes), Madia (brown colour grains), Kosra (inferior minor millet), Gond (milled kosra), Arku (inferior minor millet), Khatti Bhaji (under shrub), Chez Bhaji (leaves and shoots are eaten), Koliyari Bhaji (a tree-leaves, flowers, buds are eaten), Karmatta Bhaji (an trailing herb-leaves and shoots are eaten), Peepal leaf (tender leaves are eaten) and Kulthi Dal (trailing herb, seeds are eaten).

Amongst the 17 food items analysed for nutrients, protein content per 100 g dry matter of the first five food items was found in the order of Futto (48.43 g), Basta (32.59 g), Koliyari bhaji (31.72 g), Sehari (31.06 g) and Chez bhaji (23.18g). The lowest protein content was found in Tikhur (1.97 g). Fat was in the order of Sehari (18.20 g), Peepal leaf (8.20 g), Khatti bhaji (6.20 g), Tendu (6.0 g) and Boda (5.70 g). The lowest fat content was found in Arku (0.70g) . Carbohydrate contents were in the order of Bhelti (38.63 g), Tendu
(23.21 g), *Madia* (22.32 g), *Kulthi dal* (13.09 g) and *Gond* (11.85 g). The lowest carbohydrate was found in *Boda* (1.74 g). The items with regard to fibre content were found in the order of *Boda* (75.10 g), *Kosra* (70.60 g), *Kulthi dal* (62.50 g), *Gond* (60.0 g) and *Arku* (59.20 g). The lowest content of fibre was recorded in *Tikhur* (3.0 g). Ascorbic acid content (per 100 g of dry sample) was found in the order of *Koliyari bhaji* (94.59 mg), *Kosra* (67.56 mg), *Khatti bhaji* (28.93 mg), *Futto* (8.78) and *Tendu* (8.11 mg). The lowest value of ascorbic acid was recorded in water *spinach* (1.35 mg). In terms of energy (kcal per 100 g of dry sample), the food item *Sehari* (320) was on top followed by *Futto* (239.74), *Bhelti* (213.30), *Khatti bhaji* (187.48) and *peepal* leaf (177.60). The lowest energy content was in *Tikhur* (47.16).

Analysis of mineral contents of rare food items present interesting scenario. The first 5 food items in order of higher values (mg per 100 g of dry food sample) of various minerals are summarized. The food items rich in calcium were in the order of *Futto* (4.87), *Chez bhaji* & *Water spinach* (4.12), *Khatti bhaji* (2.0), *Tikhur madia* & *Arku* (1.75) and *Kosra* (1.62). The lowest value of calcium was found in *Kulthi dal* (0.87). Iron rich food items were in the order of *Boda* (584.0), *Futto* (556.0), *Water spinach* (320.0), *Khatti bhaji* (112.0) and *Madia* (103.0). The lowest value of iron was in *Tendu* (2.9). Zinc content in food items was: *Futto* (7.9), *Peepal* leaf (7.0), *Boda* (6.9), *Water spinach* (6.40) and *Chez bhaji* (6.10). *Tikhur* recorded Trace level of iron. The food items in terms of copper were found as *Water spinach* (13.0), *Futto* (2.9), *Boda* (1.4), *Chez bhaji* (0.2) and other items showed the iron contents as trace only. Food items rich in manganese content were in the order of *Kulthi dal* (15.0), *Water spinach* (13.2), *Khatti bhaji* (10.30), *Tikhur* (9.50) and *Boda* (7.80). *Tendu* indicated Trace. The food items in respect to Phosphorous were in the order of *Futto* (1.56), *Sehari* (0.91), *Peepal* leaf (0.84), *Basta* & *Boda* (0.64) and *Chez bhaji* (0.63). Water spinach was the item that showed the lowest value (0.05). In terms of potassium, the food items were in the order of *Basta* (0.76), water spinach (0.75), *Chez bhaji* (0.54), *Peepal* leaf (0.42) and *Futto* (0.49). *Tikhur* and *koliyari bhaji* was found to have minimum potassium content (0.03). The food items in respect of ash content were in the order of
Madia (5.90), Water spinach (4.90), Basta (4.20), Boda (3.70) and Sehari (3.10). Peepal leaf had the lowest ash content.

5.2 Conclusion

1. Life profile of the Abujhmaria tribe reflects that they are self contended people, live in present and follow high level of social discipline at individual and community level. This is the unique character of spiritual tenet that the Abujhmaria possess and a desirable social discipline for all round development of individuals and society in general.

2. Abujhmaria tribe is primitive in housing (thatched), education (12.02% literacy) and income (Rs.151 to 200 per month per family). Low income of the tribe is attributable to exploitation by middleman in the process of marketing of valuable minor forest produce and handicraft - the main economic pursuit of the tribe. The female section of the population was found to be more receptive to formal education at primary and middle level.

3. Abujhmarias takes 3 meals a day. Most of the food preparation is either through roasting or boiling. Drinks namely pej and landa (a kind of soup) are common food preparation. Salt and chilies are the only spices used in the meals. Kosra and madia (both minor millets) are the staple food items. Milk has no place in the diets of Abujhmaria. They believe that consumption of milk is a sin and do not milk cows.

4. Comparison of food and nutrition intake by Abujhmaria tribe with Kamars indicate that Abujhmaria group is found to be a better lot. The reason attributed was that the status of forest ecosystem with higher levels of food ingredients productivity in comparison to the areas where Kamars live. The Abujhmar area due to prohibition is protected from outside biotic exploitation.

5. Overall food and nutrient intake analysis considering cereals, pulses and energy by males and females of all the age groups studied, the Abujhmaria tribe have reasonably adequate intake of the staple items of the diet (cereals and pulses) in reference to RDA. Thus the food availability and consumption scenario of the Abujhmaria tribe, though living in isolation,
does not appear to be of any serious concern. The total energy intake scenario in reference to RDA is not that good though the levels are not very low and that possibly can be managed with improving the intake of fat which was found to be low. On the contrary to above, the scenario of cereals, pulses and energy intake by pregnant and lactating mothers is rather more deplorable. This section of population needs more care and attention. The problem with this section of population is attributed to be of management rather than availability of food.

6. Protein energy ratio is an important aspect of RDA. It defines percentage of energy provided by proteins in relation to total energy (Kcal). Standard protein energy ratio of self selected diet by ICNND is between 12 to 14 percent. Over all food quality of the Abujhmaria population, was judged through this ratio. It was also compared with the food status of Hill Korwa tribe. It was found that the food consumed by Abujhmaria tribe both male and female groups is not only quite satisfactory but superior to the food consumed by Hill Korwa tribe.

7. Study on the knowledge related to different traits of food, nutrition and hygiene indicates that Abujhmarias are extremely poor in perception. This status corroborates with the studies by other workers on different tribes. The finer aspects namely nutrition and hygiene in food sector amongst tribal is yet to receive attention and seems that the immunity or resistance that these tribes have developed in natural environment protects them from infections.

8. Abujhmarias have more faith in traditional health care system that fits well with their culture and way of living. The non- professional ancient medical care system is widely practiced in the area. Wrath of God, mischief of evil spirits and magic of human being are regarded as the main causes of health disorders. Treatment is based upon the removal of causative factors through appeasing Gods, exorcism (deliverance form evil spirits) counter magic, use of charms and tabeeji, Jhar Funk with some herbal preparation. It is the faith and belief in God that plays vital role in medical system that exists in the area.
9. Major rare food ingredients that the Abujhmoria collect from the forest include Tendu, Bhelti, Basta, Futto, Boda, Tikhur, Madia, Kosra, Gond, Arku, Khatti Bhaji, Chez Bhaji, Koliyari Bhaji, Karmatta Bhaji, Peepal leaf and Kulthi.

10. Analysis of nutrient contents of rare food items present interesting scenario. It was found that they were nutritionally rich.

5.3 Recommendation

The study reveals that, Abujhmoria tribe living in isolation are fairly well placed so far food and nutrition intake is concerned. The forest eco-system in which they live has only faced the onslaught of the local growth of population. Due to area being prohibited, the outside biotic influence has been negligible. The community still follows Penda (Shifting) cultivation. Tribal development programme elsewhere in the country, initiated after independence has not succeeded to the desired level. The one major reason identified as lacuna in tribal development has been that most of the programmes have been planned on sectoral basis with replacement approach. The problem with the tribals is of complex nature where only improvement approach may work. Food and nutrient intake though important but is a small fraction of the total need of development. Earlier workers in food and nutrition sector have advocated, educating parents about hygiene, change of attitude, nutritive value of the food ingredients, developing kitchen gardens, providing drinking water facility, social mobilization, encouraging voluntary agencies etc. Though these suggestions are important, but the basic question is, what they need. The reviews, highlight upon the facts that tribals are self contended people with strong social bondage, high level of individual/community discipline and a unique culture. However, they are illiterate in the matter of modern education. Blending of modern knowledge with their indigenous knowledge for their benefit is the challenge on the front of suggestions on methodology of development for this isolated tribal community where the present study was conducted.

With enormous limitations, the present study could only lay hand on floral food ingredients that has been studied, that to the major ones, due to time
and administrative constraints. Faunal varieties of food ingredients could not be studied except in terms of meat, fish and eggs. Information emerging out of the study on food and nutrition intake by the male and female Abujhmaria population does reflect on the potential of the area on natural food availability, which is a unique scenario. Holistic and multi-disciplinary approach of research and development may help in evolving appropriate method not only in the matter of food and nutrition but over all development of the Abujhmaria society.

Coming to the food and nutrition aspect further study is required that also accounts local faunal food ingredients and brings out clearly the contribution from floral and faunal sectors with status and availability. Many foods particularly those of plant origin, contain a wide range of anti-nutritional factors, which interfere with the assimilation of nutrients contained in them. Identification of such anti-nutritional factors and value addition in rare foods consumed by Abujhmaria tribes is another aspect, which needs study.