ECOLOGIC AND SOCIO-ECONOMIC STUDIES ON SANTALS, MUNDAS AND ORAONS IN THE HILI BLOCK, DAKSHIN DINAJPUR, WEST BENGAL, INDIA

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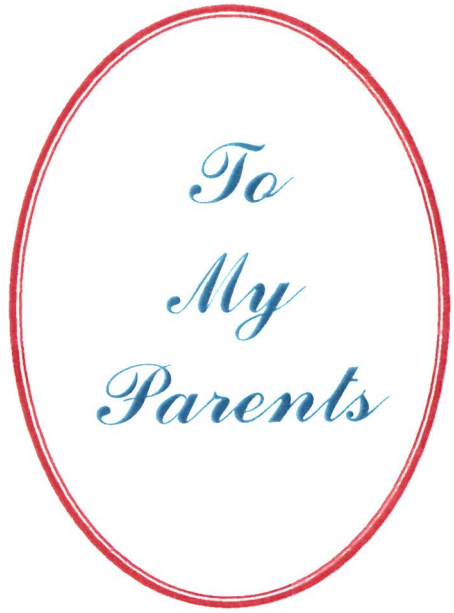
To
My
Parents

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(Ranendra Nath Seal)

CONTENTS

1. INTRODUCTION :

The appearance of man though recent in the complex, ever continuing process of organic evolution, is very significant. Probably no single species ever played so wide and extensive role as the *Homo sapiens*, in the whole C.D. of evolution up to present date. Most people believe that man evolved a little more than 2 million years ago. Human population in general followed sigmoid or logistic pattern of growth for most part of their existance. However, following industrial revolution it is gradually shifting over to J-shaped form. In the last part of the 20th century we have seen the most dramatic increase in the history of human population. In merely 35 years global human population doubled from 2.5 billion to over 5.9 billion. Presently we are growing at the rate of about 9000 per hour, 214000 per day or about 78 million per year. In July 1999, the world populations passed 6 billion, making us the most numerous vertebrate species on this planet (Botkin and Keller, 2000; Cunningham and Saigo, 2001).Malthusian apprehensions have never been so real as at present. However, it is not only scarcity / non-availability of food and resource leading to drastic decline of populations as envisaged by Malthus (1978) but also increasing pollution load and loss of biodiversity, - all of which act synergistically to devastate ecological balance leading to "ecological crisis".

Moreover, the culture and traditional ways of life of those small ethnic populations who managed to survive till today are experiencing gradual extinction as a result of impact with advanced cultures.

The realization that humankind although superior to all other beings is yet only a part of the natural ecosystem and is also governed by the same laws as applicable to other organisms, gradually grew stronger. This concept led to the development of human ecology, now an important and busy discipline of ecology. Unlike other animals, culture as a determinant of behaviour played an important role in the adaptive mechanism among human populations (Laughlin,1963).

Different authors studied various aspects of human ecology. Some of the broad based studies are on : ecological stresses through appropriate physiological and biological means (Dill, 1964; Baker, 1971 and 1979); interrelationships among man, his culture and the ecosystem (Childe, 1952; Price,1971; Franzle, 1966; Palmer, 1966); social and ecological impact of water resources (Bird, 1966; Zimmerman and Russel, 1967; Sterling, 1971; Biswas, 1974); environmental factors and settlement pattern (De Planhol, 1966; McCaskil, 1954, 1966); functional nature of social structure as an adaptive response to environmental pressure (Cohen, 1968; Vayda, 1969).

Similarly ecology, culture and changing behaviour pattern of the food gathering and hunting peoples (Das-Jagnnath [a], 1998); Demographic implications of socio-economic transition among the tribal populations of Manipur, India (Heman-Natabar-Shyam; Reddy-B-Mohan, 1998); biodiversity value, status and strategies for conservation sacred groves of Meghalaya, India (Tiwari B.K. [a]; Barik, S. K. [a]; Tripathi R. S. 1998); effect of urbanization in the epidemology of diseases (Cockburn, 1967); effects of inbreeding of reproductive losses in Kota tribe (Sivakumaran, T. A. [a]; Karthikeyan, S. 1997); tribal health (Rajpromukh, K. E. [a],1998) nutritional deficiency disorders and high mortality among children (Rao, V. G. [a]; Sugunan, A. P.; Sehgal, S. C., 1998); social stress and cromic diseases such as cardiovascular and diabetes (Dodge and Martin, 1970; Galle et al., 1972); age sex and seasonal variations of sickle cell disorder (Das, B. P.; Das, R. K., 1998); allelic frequency of Hb and ABO genotypes in African and American negro populations (Allison, 1955; Livingstone, 1967); ABO gene distribution among the Totos (Pal & Sinha, 1983); protein genetic studies among the Tupi-Monde Indians of the Brazilian Amazonia (Salzano, F.M. [a]; Weimer, T. A.; Franco, M. H. L. P.; Callegari-Jacques, S. M.;

Mestrimer, M. A.; Hutz, M. H.; Santos, R. V.; Coimbra, C. E. A. Jr.; 1998); towards a sustainable natural resource management of tribal communities (Panda-Smita-Mishra [a], 1999).

Mega studies, however, require extensive arrangement and facilities which are often hard to meet. Again in such studies it is not usually possible to give proper attention to details of certain aspects. On the other hand, workers can venture to go at considerable depths when studying small human communities in their natural setting even with moderate facilites and arrangements. Eyre and Jones (1966) aptly called small human communities as analogous to the single ecotype. Small populations that is the populations of comunities in which most people have lived prior to extensive urbanization, donot behave in the same way as large statistical aggregates. Such societies have had relatively stable or slowly changing material culture for exployting their natural environment, and rather unstratified simple social system for governing relations between individuals or between groups.

Such social units be it hunter gatherer, agricultural-gatherer, all are governed by the balance between the carrying capacity of their habitat and biotic potential. It has been estimated that the primitive societies, i.e., the hunter-gatherers at best utilized about 30-40% of the available resources of their habitat (Birdsell, 1957; Lee and Devore,1968; Casteel, 1972; Polger, 1972). Micro-studies have contributed much in the understanding of various novel facets of human ecology particularly for those small ethnic communities which reside in remote areas in different parts of the world. Some of the notable contributions of this type are : on Amerindian groups including Quechua Indians at high altitude (Salzano, 1972); indegenous population of the great basin region of North America (Steward, 1938); Native people of central Brazil (Gross et. al.,1979; Warner et. al.1979); in the American continents. In Africa on pygmy hunters (Turnbull, 1972); Kung Bushman (Lee, 1969); Karimojong (Dyson-Hudson, 1966); Djibwa (Bishop, 1974). In Australia on Asmat Hunter-Gatherers (Van Arsdale, 1978). In Asia, Bataks of Philippine (Eder, 1978); Thai cultivators in the tropics (Kunstadter, 1972). In India, on non-pastoral and pastoral nomads of Maharashtra (Malhotra et al., 1983). Human and cattle population of West Bengal (Odend'hal, 1972,1980); Schedule caste population at Mirpur (Mukhopadhyay, 1981; Basu et. al., 1980); High altitude Sherpas and Lepchas of Eastern Himalayas (Basu et. al., 1979; Gupta, 1980); Santal and Birhor (Verma, 1977).These studies in general showed complex multidimensional interactions among climate, soil, agricultural practices, resource utilization, settlement pattern, population distribution, demographic characteristics and components of Biological and Social structure.

The tribals (Santals, Mundas & Oraons) provide us with such a small demographically transitional group of about 2582 Santals, 2803 Mundas and 1526 Oraons (2000) confined a particular spot i.e., the Hili Block region , situated at the Indo-Bangladesh border of Dakshin Dinajpur District whose Social taboo is apparently strong enough to maintain identity of the race. The arguments infavour of selectioning the small ethnic communities such as the tribals (Santals, Mundas & Oraons) were :

i) Their homeland at Hili Block region was relatively free from outside disturbance.

ii) Effective application of simple procedure were possible.

iii) Total count of pupulation and direct observations were possible in most cases.

iv) Digital analysis of various Socio-ecological aspects was possible due to their rather simple mode of life.

(v) Response of any disturbance 'be it, social, environmental or any other became readily apparent.

1.2 Aims and Objectives of the study :

This dissertation involves socio-ecological, economical and ethno-zoological studies on the tribal populations, i.e, Santals, Mundas and Oraons at the Hili Block, Dakshin Dinajpur. No data on these tribals was available prior to this work.

The main objectives of this study are to collect and analyse qualitative and quantitative data on some of the specific aspects listed below which are essential to evaluate the present level of development of the communities. Data were collected to determine the following aspects :

1. Abiotic and biotic factors prevailing in the area.
2. Crop productivity of this area.
3. Bio-resource utilization by the communities.
4. Demographic scenario of the tribals.
5. Tribal Blood group analysis.
6. Child labour and the communities.
7. Traditional folk medicine of the tribals.

2. Tribal Country :

The present study site is in the Hili block, on the eastern corner of Dakshin Dinajpur. The whole block is virtually encircled by Bangladesh except on its western boundary. The geographical area of the block is 88.10 km^2 with a total population of 61, 806 (Census records- 1991). The total number of scheduled tribe population in this block is 12095 which mostly comprises of the three communities i.e., Santal, Munda and Oraon. The Block lies between 25°0'10.55" and 26°35'15" North latitudes 87°48'57" and 89°0'30" East longitudes. It is situated only about 15 meters above the sea levels. The shape of the block is more or less trapezoid (Fig. 3.1). The major rivers of the district generally flow from North to South, and are : Punarbhaba, Tangon, Atrai, Jamuna, Ghagra and Chiri. However, only three rivers i.e., Jamuna, Ghagra and Chiri flow through the block under study. The general drainage condition of the area is poor as a result floods and inundation of vast areas is almost a regular feature in the monsoon and post monsoon seasons.

Transport facility of the block is utterly inadequate. Besides there is no railway track in the district and in that consideration it acquired the dubious distinction to be one of the few districts in India where the headquarters is not connected by railway route with other parts of the country. Again there is no major or even minor industry to mention in the district and most of the people specially the tribals directly depend upon agriculture, agricultural-labour, fishing and hunting-gathering from the nearby forests.

2.1 About the Tribals

2.1.1 SANTAL :

The Santals are described as the largest, most integrated and possibly the most resilient tribe in eastern India (Singh, 1984). They are variously considered as a Dravidian (Reslay, 1891) and pre-Dravidian (Mukherjee, 1962) settled agriculturist tribe. From linguistic point of view they are kolarian as also the Mundas (Reslay, 1891). Their language known as Santali belongs to the Munda family of the languages. Recently many words from Bengali, Hindi and Oriya have been incorporated in Santali.

It is difficult to trace their original abode but basing on folklore, language etc. Most authorities believe that they resided at various places in their sojourn to Chotonagpur plateau.

In the 18^{th} century they were settled in Chotonagpur plateau and adjoining districts of Midnapur and Singbhoom (Mukherjee, 1962). At present their highest concentration is found in Santal Parganas located in the eastern extremity of Chotonagpur plateau, in the newly created state of Jharkhand. However, due to various reason such as extraction and atrocities of money lenders and jamindars, loss of land, increase in population, need for hard cash, persuasion of labour contractors and many others social factors; a large number of populations of the tribe, like other tribes have dispersed widely to different districts of Bihar, Orissa, Bengal and Assam.

On analysing the ecology of their present day settlements (except those working in towns and cities in various offices as labour) in the Santal parganas and other areas in eastern India, it appears that they have a definite preference for hilly mountainous wooded jungle country with temperate to tropical climate, forested by sal, mahua etc. close to wild life habitats.

It is assumed that the present Hili population of the tribe settled in this area about a country or more ago from their original homeland at Chotonagpur plateau and surroundings.

2.1.2 Physical characteristics :

Physically the Santals are characterized by dark to very dark-brown in complexion; coarse, black, straight and occasionally curly hair; scantly beard and sparse body hair; dolichocephalic and hypsicephalic head form with a high vault; narrow forehead; eyes of medium size and black colour; eye-slit usually straight and rarely oblique; straight prominent and platyrrhine nose with conspicuous depression at the root; large mouth provided with thick and sometimes projecting lips; euryprosopic to mesoprosopic face; and short to medium stature.

Certain physical features of the Santals such as curly, frizzly hair, dark complexion, projecting thick lips, flat nose etc. were taken to be Negroid elements in them by some authorities. However, this has been refuted by most other authorities. Various authorities have described them to different groups such as Austro-Asiatic, Proto-Australoid (Guha, Vedded, Sarkar; in Bhowmik, 1971).

2.1.3 Clan Structure :

The Santals are an endogamous tribe in the sense that they have a common home, traditional housing pattern, distinctive social structures, ritual patterns and traditional power structure. They are divided into twelve patrilineal exogamous clan: Hansda, Murmu, Kisku, Hembrom, Mandi, Soren, Tudu, Baske, Besra, Pauria, Chore and Bedea.

The clan names are derived from the name of their totems, for example Hansda and Goose, Murmu and Nilgai etc. The clan membership is patrilineal and the woman adopts the clan of her husband but comes back to her father's clan on being widowed or divorced. Each clan is divided into a number of sub-clans. A married is accepted within a clan but the sub-clan must be different. In order to avoid inbreeding each sub-clan has its own passwords which is connected with their original home.

2.1.4 Family Structure :

Although the Santals traditionally lived in extended type of family, the recent trend is towards unit family. The authority in the traditional extended family lies with the senior most male member. As regards division of labour in the family, the adult males are engaged in outdoor works while the females are involved in household works. However, the females render considerable assistance to their husbands in their outdoor jobs. Grown up children also assist their father.

2.1.5 Rights and Rituals :

The life of the Santals is marked by four rites in connection to birth, adulthood, marriage and death. Each of which is observed by elaborate ceremonies. Naming of the newborn child follows a definite pattern where in the names of grand fathers and mothers family are used in definite pattern. Adult males are inducted into the society by a ceremony which is important for him in order to enjoy the rights and privileges and endows him with responsibilities towards the wellbeing of the society.

2.1.6 Marriage :

Santals are monogamous but polygamy is allowed in case the first and or second wife is barren. The brides family are entitled to get a bride price from the groom's family. There are several types of marriages including arranged and love marriages. Marriage of widow or divorced women is also known. Marriages are marked by elaborate ceremonies. Marriages are restricted within the community. However, if bride is from a different community the groom's family has to pay a fine and incur the cost of a feast for the whole

community. Besides the groom's father has to beg forgiveness in village community meeting.

The dead body is cremated in rituals.

2.1.7 Property rights :

Traditionally descent is patrilineal. Right of land goes to community as whole who cleared the forests together. Individual ownership of land is not traditional but is a recent practice among them. All movable and immovable properties are divided equally among the sons on the death of their father. In case the deceased person have no sons, the property will go to his brothers or to some other male relative but never to the daughters. Thus women have no right of inheritance. The widow, however, inherits the property of her husband which in time is divided equally among her sons.

2.1.8 Socio-Political Organisations:

The Santal village council (Panchayat) consisting of several members takes care of the problems of the community. On occasions all other male members are invited to participate in a meeting which takes place at the Manjhisthan, believed to be the abode of the spirit of the original founder of the village. Most decisions are taken by concensus. The village council is headed by a Manjhi or headman who is assisted by Paranik Naeke, the village priest and others. The headman receives rent-free land for his service. All the village officials are customarily related at the tome of foundation of a village. Later succession to these positions became hereditary, usually the eldest son succeeds the father to his office.

2.1.9 Occupation :

Most of the Santals are very poor and make living in some of the marginal ecosystems. Main occupation of these people are : daily wage labour, fishing and hunting. Some people depend on agriculture, pigery and poultry. Very few of them are engaged in the private and government services. Besides, few families totally depend on alcohol production and selling. Some families with old non-earning male take up prostitution as a means of life. Besides few are engaged in the brick fields, tea gardens and coal mines away from the study area.

2.1.10 Religion :

The supreme God of the Santals is the Thakur who has created everything and provides all the necessities of life including rains, crops etc. He is regarded as the sun God. Besides, there are many other Gods who reside in the hill forests, river and other places. The Gods are called Bongas. It is believed that the Bongas are very powerful and must be kept satisfied with sacrifices of animals and vegetables from time to time. Every family has a family God, who lives in the family house.

They also believe in evil spirits who are capable causing lot of damage if they are angry. They try to please these spirits by the help of village black magicians through various kinds of sacrifices. Their faith in their Gods and spirits is very strong and is continued to these days unabated.

On analysing the social customs of the Santals including birth, marriage, death etc. it may be said that the Santal religion even if it is different from Hinduism is most close to it than any other religion. Recently they are known to worship Goddess Kali, Durga and Shiva

just like the Hindus. The Christian missionaries are at bays to describe Santal religion different from Hinduism just as any other religion.

2.1.11 MUNDA :

The Mundas are considered as one of the largest tribal communities of India, they present an interesting situation for anthropological analysis in space and time (Singh, 1998). They are a large Dravidian tribe of Chotonagpur who are classed on linguistic ground as kolarian, and closely a kin to the Hos and Santls and probably also to the Kandhs (Reslay, 1891). Sachchidananda (1979) on the other hand considered them as to belong to proto-Australoid racial stock from linguistic point of view. The name Munda is of Sanskrit origin. The general name Kol, which is applied to both Mundas and Oraons, is interpreted by Herr Jellinghaus to mean pig killer, but the better opinion seems to be that it is a variant of 'horo' meaning man in Mundari language. However, due to various reasons such as population pressure, atrocities of higher socio-economic classes, loss of land, persuasion of labour contractors and other social factors, many of them could not flourish any longer in their original homeland. They dispersed in small groups to various directions and some of them could successfully established themselves in different parts of the country particularly the east and north-east India, including their present abode at the Hili block, a secluded area relatively free from external influences.

2.1.12 Physical Characteristics :

The Mundas are dark brownish to black in complexion; with black and occasionally curly hair; large mouth-thick lips, narrow forehead, broad flat nose; sparce body hair and of medium stature. Their eyes are bright with black iris and prominent eye-brows, the zygomatic arches are prominent while the skull is of dolichocephalic type.

2.1.13 Clan Structure :

The tribe is divided into a number of clans which are exogamous. The numbers of a clan originate from a common ancestor. The clans are mostly known after some animal or plant species some important event, certain locality and even after soil. Authorities differed on the number of clans, for example : thirteen described Reslay 1891; twenty-one by S. C. Roy, 1970; twenty-two in land settlement records; fifty, S. C. Roy, 1912; one hundred and six, Hoffmann, 1950 and one hundred fifty Sachchinanda, 1979. It is apparent from the consistent increase in clan size with time that whatever have been the original number of clans, the clan members multiplied in number and in time divided and subdivided themselves to present day distinct clans.

2.1.14 Occupation :

Most Mundas do not have their own agricultural land. Thus there are a few cultivators while the bulk are agricultural labourer. Few are engaged wholly or partially in traditional occupations such as fishing, hunting and rearing livestock including piggery and poultry, which most often turns out to be less and less rewarding because of unscientific methods of rearing. Besides, some are engaged in jobs in the government offices, brickfields, coal mines, tea gardens, factories, transport, alcohol preparation in far and near localities. Some families in absence of earning males have even taken up prostitution as means of life.

2.1.15 Religion :

Sing-Bonga is the supreme God/ deity of the Mundas. He is worship before every religious functions. It is believed that he created human beings to enjoy the fruits of his creation. He also created the other Bongas or deites and also the spirits. The village God i.e.,

hatu bongako help the Mundas in agricultural operations, hunting excursions and day to day activities. The house gods, Orabongako are worshiped by the head of the family and it is believed that if these Gods are annoyed they can create lot of troubles for the family. So these Gods must be kept happy with sacrifice of red hen. There are several house Gods all of whom is to be kept happy for family happiness. Besides, there are many nature Gods such as Burubonga, Ikirbonga, Nagabonga, Chandibonga, Birbonga etc. These Gods exert beneficial as well as harmful effects on the people.

In sum the religious belief of the Mundas appears to be a admixture of their original faith and Hinduism. It is a common observation that minor cultures somehow imbibe and incorporate elements of adjacent dominant culture.

2.1.16 Festivals :

The life of the Mundas are invigorated with a host of festivals throughout the year. The festivals usually corresponds to agricultural or social activities and always include episodes of drinking and dancing of the male and the female members. Thus during January, February and March we get Mage, Phagur Purnima (Holi), Sarhul (ba) the corresponding dance and music is called Jadur. In April, May, June we get Honba jatra and Batauli which corresponds to agricultural operations such as manuaring, ploughing, sowing the Kharip paddy and sowing of summer paddy. The corresponding dance and music is called Japir, and wed in the summer paddy. In July, August, September there is Karam bhado (bhado acadoshi), jomnnwa, ende (bhado purnima), dasai (Hindu Dussehra), these are associated within the Kharip paddy, harvesting the Fora and Gondhi. The corresponding dance and music is called Karam. In October, November, December we get Soharai (Hindu Diwali), Colour Singbonga (Khaiihan Puja), Sukunburu jatra (Hasda area), Hiburu or Poos mela (Punch Pargonas). The corresponding agricultural harvesting and threshing along with dance and music activity is called Japi. Besides there are other social events such as marriages, births, naming etc. which are also accompanied by drinking, dancing and singing.

2.1.17 Marriage :

The Mundas do not have any system of preferred marriages. A person can marry into any clan other than his own. All clans are considered equal in status. There is no fancy for contracting marriage alliances between particular clans. Marriage is considered obligatory for the Munda. Even spirits and deitices are supposed to have consorts. Even though pre-marital sex is permitted the Mundas accept the restrictions in the married state as it gives both men and women a higher status than otherwise. Marriage is not regarded as an affair between two persons but between two groups of kin. The relationship is emphasized at different rituals and occasions by exchange of gifts of foods and clothes.

2.1.18 ORAON :

The Oraons are considered as a Dravidian agricultural tribe as the Santals and Mundas but differ from them linguistically. They belong to be the Dravidian language family rather than Austro-Asiatic language as the Santals and the Mundas (Reslay, 1891; Sachchinanda 1979). Authorities differ as to their original home but long back the majority of the tribe settled in the Chotonagpur plateau driving the Mundas away from the area. The Oraons of the Hili block claim to have settled here over a century back from their original home at the Chotonagpur plateau. In this block, they reside along with the Santals and Mundas.

2.1.19 Physical Characteristics :

They are dark brown to black in complexion with coarse jet black hairs, projecting jaws, thick lips, narrow forehead and broad flat nose. The eyes are bright with no obliquity in the opening of the eye-lids and without any sign of mongoloid features.

2.1.20 Clan Structure :

The tribe is divided into several clans which are exogamous in nature. However, a son is allowed to marry a girl of his mothers clan. There is some in built arrangement to prohibit in breeding. For example, any Oraon would admit that he cannot marry his maternal aunt or his first cousins on the mother's side, though he is not sure how far these prohibitions go in descending line. Marrying younger brothers widow or elder sister of his deceased wife is prohibited. On the other hand, marriage with elder brothers widow or deceased wife's younger sister is permissible. Marriages among the first cousins belonging to the same clan (gotra) of the Oraons are prohibited. In present day Oraon community marriages are prohibited among blood relatives upto three generations (Das, 2000). On the whole the prohibition structure is rather complicated but it shows definite inclination towards exogamy as in the Santals and Mundas.

2.1.21 Occupation :

Daily wage labour and fishing are the two main sources of livelihood for the Oraons. Agriculture is practiced by only a few Oraons who own land and is far from being even a secondary occupation. Hunting at present is mostly ritualistic and is observed during some festivals. Only a few of them are employed in the private and government services. A least number of people are involved in rearing cattle, goats, ducks, hens, pigeons etc. Some families earn some money by selling dried cow-dung as fuel. Some people collect forest materials for their own consumption and sell the rest of the material in the market. Few of them are involved in the brickfields, coalmines and construction works out side of the study area.

2.1.22 Religion :

The concept of religion of the Oraons appears to be a synthetic one which include ingredients from the neighbouring tribes, particularly the Mundas as also from the Hindu community. They believe in a supreme deity/ God i.e., Dharmi or Dharmesh which is perfectly pure, perpetually beneficent and the creator of the world. His beneficent will mercy is essential for their well-being and survival. But if a person or a family or a village plunges under misfortune due to the spell of a evil spirit (as believed by them, the supreme God does not interfere and keeps himself aloof in the matter. Thus they are actually compelled to please the evil spirits rather than the supreme God, through the village Ojha/ magic man. Under the circumstances they tend to develop strong faith in spirits and magic-cult. Thus they believe that all animate and inanimate objects can fall under the influence of spirits who must be kept happy for peace and prosperity.

2.1.23 Festivals :

As in the case of other tribes, the calendar year of the Oraons is dotted with a various Pujas/ Festivals. The utility of the festivals in the life of the tribal people is enormous. The festivals provide them with opportunities to start life anew, to rejuvenate their spirits and to set new targets for brighter future. All their festivals involve lot of drinking, dancing, singing and merry-making. Of all the festivals, "Dal" puja i.e., worship of a branch is the most important. This festivals spans over three to four days and falls in the month of Vadra (September). On the third day morning the members of the community go the forest singing and dancing on their way and return in the evening with a freshly cut branch of a Karma

A Santal damsel looking over to their cultivable land.
An irrigation pond is seen in the background.

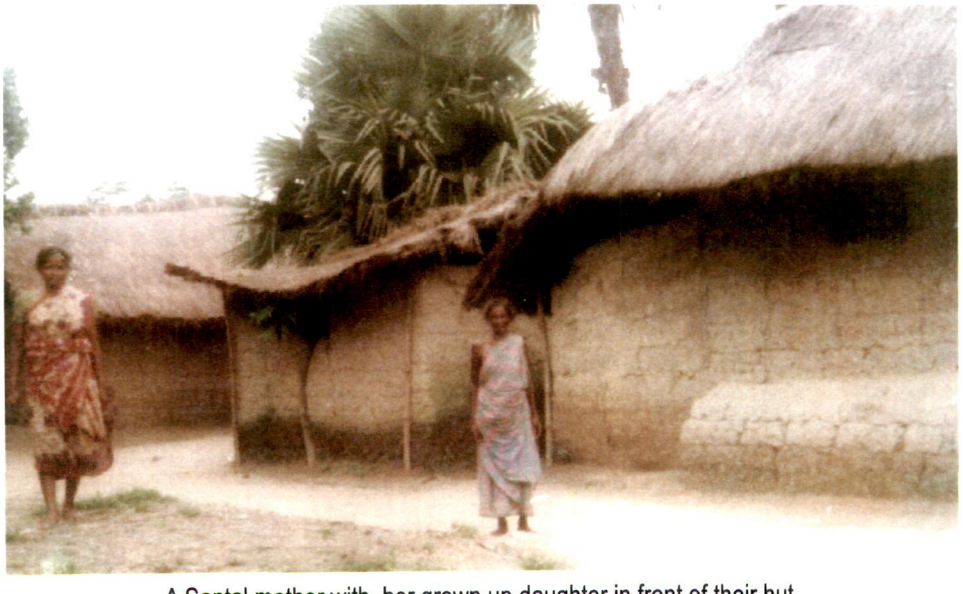
A young Santal labour posing for the snap.

A Munda mother with her child near a bamboo grove.

An Oraon mother with her infant.

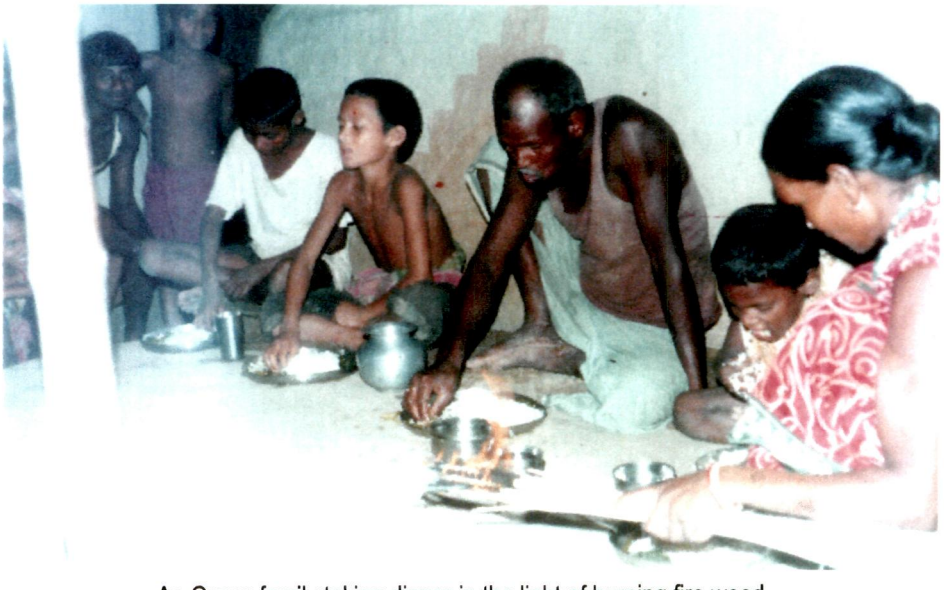
An oraon kid posing proudly in front of the gate of their hut. A few goats resting in the foreground.

Several thatched house of a Munda family.



A Santal mother with her grown up daughter in front of their hut.

Some Tribal children.



An Oraon family taking dinner in the light of burning fire wood.

A Santal house wife is cooking on an indigenous earthen oven (Chulli).

A Santal girl reparing an indigenous oven.

An Oraon lady is cooking on an earthen oven (Chulli).

A Munda woman is cooking on an earthen oven (Chulli).

Plucking of cowdung cakes after drying by an Oraon child.

A munda housewife preparing a papaw for cooking.

An Oraon elderly lady preparing food for her domestic pig.

An Oraon young man preparing a fishing net.

An Oraon mother with her children.

A tribal couple making a bamboo basket.

A Munda lady cleaning the dishes near a pond.

An Oraon old man sitting on the ledge of his hut along with goats.

A munda old women feeding a pig.

tree. They then implant it into the soil and worship the Dal (branch) throughout the festival they drink, dance and sing. In the following morning they take out the branch and visit all the house holds of the community with the branch which they finally immerse in the pond. They continue with their dancing and singing throughout the night.

In October November, each family worship their cowsheds i.e., "Gooal" puja on the day following "Kali puja" of the Hindus. They then offer food and drinks to their neighbours which ultimately ends night-long drinking, dancing and singing.

"Pusna" festivals comes in the month of December-January. In this festival each family prepare lot of sweets in their houses and offer them to their neighbours. This again terminates with drinking, dancing and singing.

"Chaiti", a communal festivals comes in the later part of the month of Chaitra (February-March). The members of the community meet with the head man and decide the exact date and amount of subscription for the festival. Usually it falls on Tuesday or Saturday. During the festival, Goddess "Sitala" and "Lord Shiva" are worship with sacrifice of a goat to the former and a pair of pigeons to the later. The meat is then cooked and whole community shares the food along with drinks and nightlong dancing and singing.

"Bij-bapan" festival i.e., sowing of seeds mainly paddy occurs in the month of June, the whole community enjoys drinks, dancing and singing following sowing.

"Dhan-gara" festival occurs in the month of July and involves transplantation of paddy seedlings in the field. This festival is accompanied by sacrifice of a red and a white hen in the field. This festival also ends up in drinking, dancing and singing.

It may be mentioned that the last two festivals are performed by landowners only and may not be a communal festival.

2.1.24 Marriage :

A person of Oraon community can marry into any clan except his own. All the clans are equal in status. Infant marriage is rather unknown among the tribe. However, few wealthier men, at present and the influence of adjacent cultures (Hindu) practice child marriage for children, even before they attain puberty. Most people, however, marry after they attain puberty. In contrast to Reslay 1891, the Oraons of the Hili block appears to maintain high sexual morality. Sexual intercourse is prohibited among unmarried people. However, if it is detected the female member is tacitly punished by her family. In case of pregnancy of an unmarried girl, the headman of the community is contacted and marriage is arranged between the couple along with a feast which must include pork and drinks. The cost of the feast is borne by the father of the girl as punishment. Marriage of widows is not prohibited but it is uncommon among the Hili block Oraons.

3. Abiotic Factors

Ecology is the science of interactions among individuals, populations, communities and also of ecosystems, - a spatial organizational unit of biosphere which includes living organisms (biotic community) and non-living (abiotic environment) interacting to produce an exchange of materials between the living and non-living parts (Tansley-1935). The functioning of an ecological system is intimately related to the prevailing abiotic and biotic factors. Abiotic factors such as water, 0_2, NaCl, N_2, $C0_2$ etc.and other physical and chemicals influence the regulation of temperature, light, humidity, rainfall, pH etc. As such study of temperature, humidity, rainfall soil(physical and chemical nature) etc. are of much help in understanding the overall functional pattern of an ecosystem.

3.1 Geographical Background and Topography:

The district of West Dinajpur came into existence in 1947 by carving out of portion of Dinajpur of prepartition Bengal. The study block is situated on the eastern part of the district. As such the whole block is encircled by Bangladesh except on the western side lies the Balurghat block of the district. (Fig. No- 3.1). The West Dinajpur district was subsequently divided into two districts viz.- Dakshin Dinajpur and Uttar Dinajpur since 1st April 1992. Dakshin Dinajpur district is bounded by Uttar Dinajpur in the north and Bangladesh in the south and east while the Malda district forms the western boundary(fig.3.2). The geographical area of the district of Dakshin Dinajpur is 2,21,4.80 sq. k.m. with a total population of 1178594. The density of population is 532 per sq. k.m. and the area of the Hili block is 88.10 sq. k.m. with the total population 61806. The total number of S.T. population of this block is 12095, of which 6071 are males and 6024 are females (according to 1991 census). The district lies between $25^0 0'$ 10.55" and 26^0 35' 15", North Latitudes 87^0 48' 57" and $89^0 0'$ 30"East Longitudes. It is situated 15 meter above the sea level.

The district is rather peculiar in shape, very much like the blade of a seythe. The flow of rivers show that the lands are flat, sloping gently towards south. Old as well as new alluvium deposits are found on the south and west of the district.

The district is mostly flat with alluvial plains, scrub jungles and stunted trees. The rivers vary from shallow stretches of low and to deeper depressions like old river beds.

The bed rock is metamorphic which is found at a very deep strata in the southern and middle parts of the district but such rocks appear at lesser depths in the northern part. The underground water level is suitable for installation of shallow and deep tube well through out the district.

The rivers of the district generally flow from north to south, as a result of gentle slope of land in that direction. Punarbhaba, Tangon, Atrai, Jamuna, Ghagra, and Chiri are the major rivers of the district, out of which only Jamuna, Ghagra and Chiri flow through the study block.(fig. 3.3). The present tribal settlement of this Block is also shown in fig. 3.1.

3.2 Meteorological Condition:-

Meteorological conditions of the study area is mostly similar to the district in general. During winter season, rainfall is associated with the passage of western disturbances traveling eastward and consequent incursion of moisture from the Bay of Bengal. On an average 10 to 30 m.m. rainfall occurs during the whole winter season which lasts only for three months. Nor-wester generally passes over the district in the month of March and April. Rainfall increases slowly and gradually along with the progress of the season. During late March to April occurrence of squalls of cyclonic storms and thunder storms are regular features with rains.

Normally premonsoon shower starts from the late April. As in other parts of the country the southeast monsoon brings the main rainy season in the district, and contributes 70 to 80 percent of the total annual rainfall. Usually, monsoon withdraws by mid-October.

3.3 Temperature, Humidity and Rainfall:

A maximum- minimum thermometer was used to record temperature, while humidity was recorded by a dry-wet bulb thermometer. The thermometer was reset at 4.00 to 5.00 p.m. each day. Dry-wet bulb readings were taken four times a day. i.e., at 5.00 to 6.00 a.m. (morning), 11 a.m. to 12 noon, 4.00 to 5.00 p.m. (afternoon) and 11.00 to 12.00

p.m. (night). Average monthly relative humidity was calculated from daily readings. Maxi. mini. temperature is presented in ^{0}c and humidity

in % by 7 LMT and 14LMT. Rainfall was recorded twice a day i.e., 6.00 to 7.00 a.m. in the morning and 5.00 to 6.00 p.m. in the afternoon with a conventional rain gauge. Rainfall data are shown in mm../month.

The yearly average maxi. mini. temperature prevailing in the study block was 24.66^{0}c and 15.46^{0} for 1996, while the annual average day-night temperature varied from 14 ^{0}c to 29.5 ^{0}c and 17.5 ^{0}c to 33.4 ^{0}c for the years 1997 and 1998 (table 3.1). January is the coldest month with an average maxi.-mini. temperature around 14.5 ^{0}c and 7.02 ^{0}c for 1996; 23.0 and 08.0 for 1997 and 20.50 as maxi. temperature for 1998. The daily maxi-mini. and highest maxi.-mini. temperature are shown in table 3.1 for 1996, 97,98 and 99 respectively. Overall, during the hot summer months, maximum temperature rises up to 39^{o}c and during the peak winter season, i.e, from late December to middle of January minimum temperature falls to even as low as 3.5^{0}c.

The annual average relative humidity is 85% and 58% measured in 7 LMT and 14 LMT respectively for the year 1997, and this value is 82% and 61% for the year1998 (table3.2)

The average monthly rainfall ranged from 1.00 m.m. to 512.3 m.m. The distribution pattern of rainfall is however irregular (Table 3.3) for the years 1996, 97, 98 and 99. Nearly 75% of rainfall occurs during April-October. The months from November-February are rather dry. Although rainfall during March - May is little, it is of considerable importance for the cultivation of paddy, jute and other crops in this area.

Considering the prevailing weather conditions in this region, a year may be divided conveniently into four main seasons: December to February: dry-cold; March to May: warm-moist with premonsoon showers; June to September: Wet-humid summer or hot monsoon; October to November: temperate moist autumn, with little rainfall till mid-October.

* Meteorological data were collected from Hili Govt. agricultural farm and Principal Agricultural Office, Balurghat, Dakshin Dinajpur.

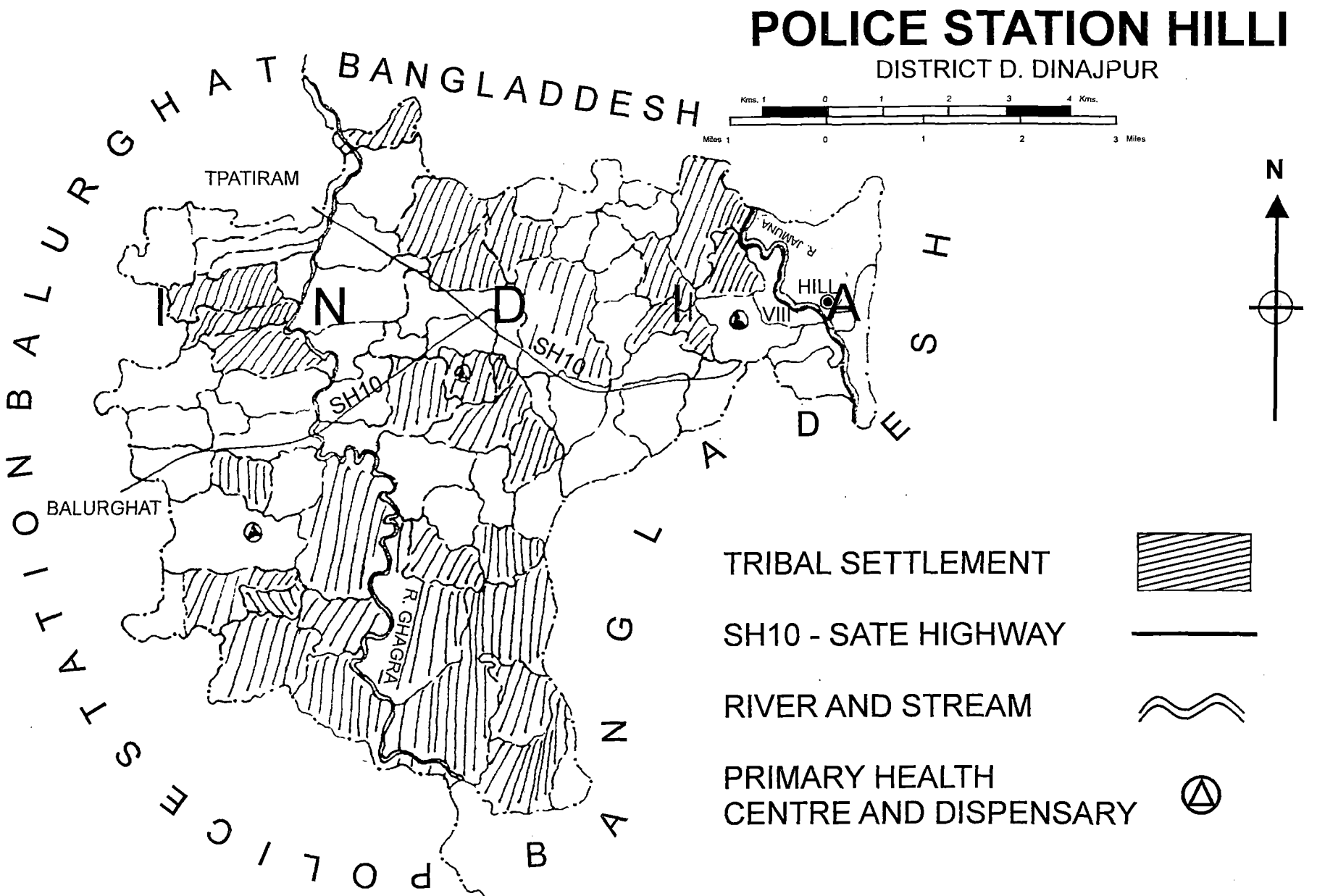


Fig - 3.1 Sketch Map of Hili Block Showing Tribal Settlement.

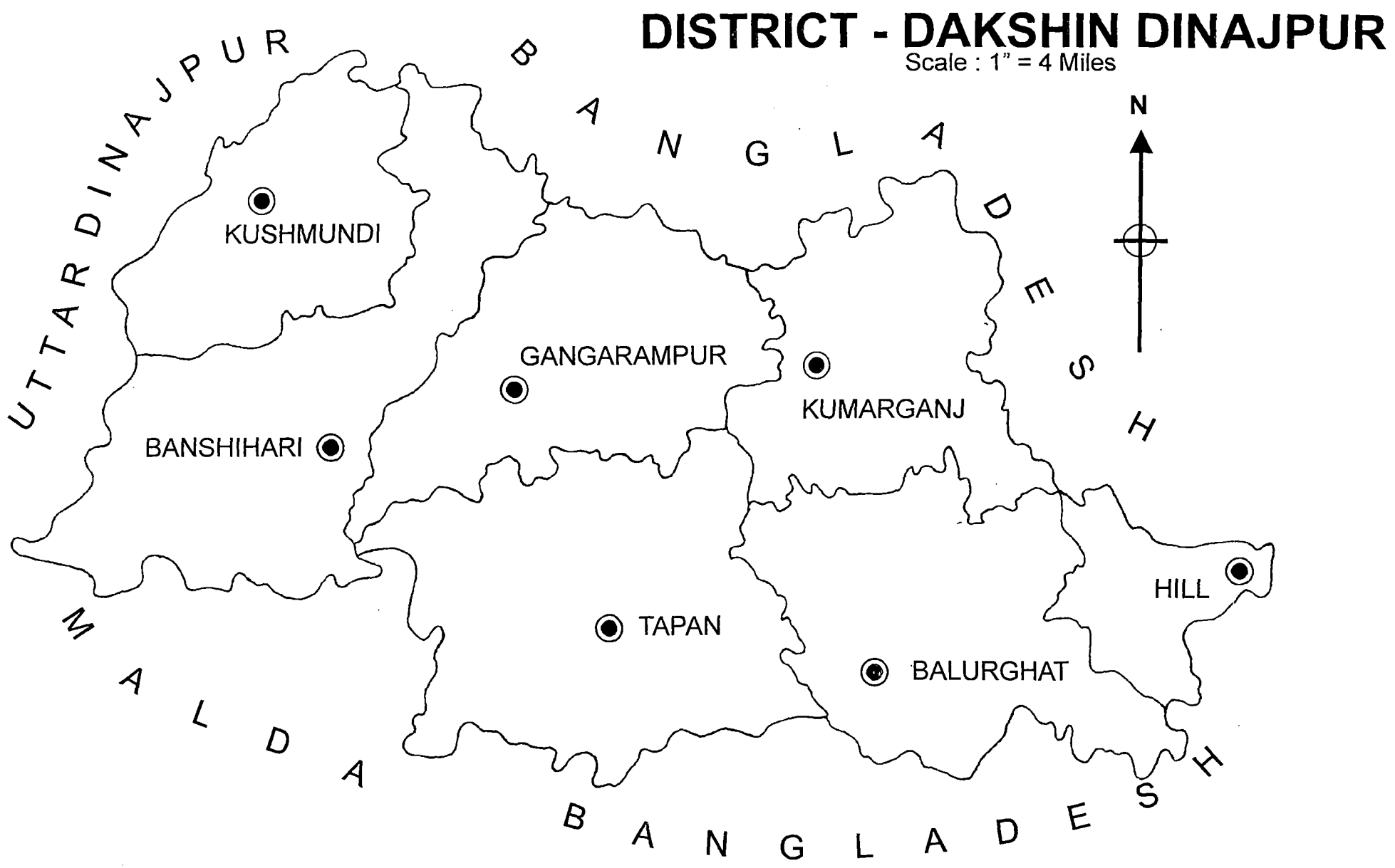


Fig - 3.2 Map of Dakshin Dinajpur District Showing The Position of Hili Block.

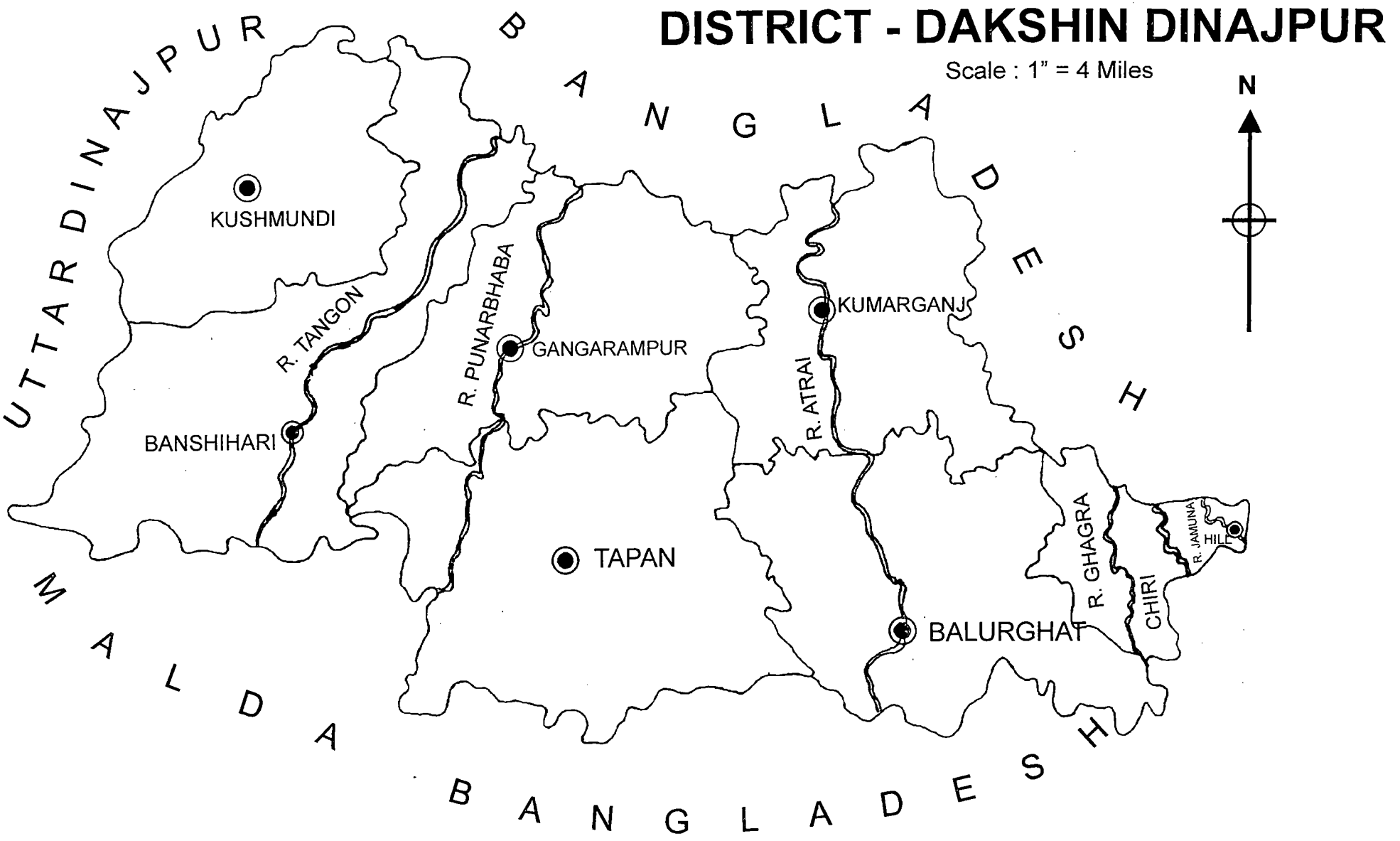


Fig - 3.3 Map of Dakshin Dinajpur District Showing Rivers of This District.

Table-(3.1) : Maximum- Minimum temperature in ^{0}c for 1996 and 1997 in Hili Block

Month	1996		1997 Means		1997	
	Max.	Min.	Daily Max.	Daily Min.	Highest Max.	Lowest Min.
January	14.50	7.02	23.00	8.00	25.20	4.60
February	16.50	8.66	24.70	9.70	27.80	5.80
March	21.94	14.88	31.00	15.80	34.40	11.00
April	25.76	17.64	30.10	17.80	34.40	13.80
May	34.02	20.06	34.20	20.80	38.20	17.00
June	27.15	18.40	33.50	22.80	38.40	19.40
July	28.10	22.60	31.80	24.10	33.60	22.40
August	28.02	22.54	31.70	24.10	35.40	22.40
September	28.89	22.10	30.70	-	33.00	-
October	26.85	14.48	30.40	-	32.60	-
November	25.05	9.43	28.60	-	31.50	-
December	19.08	7.65	22.90	-	27.80	-
Yearly Average	24.66	15.46	29.40	17.90	32.70	14.60

* - means not available.

Cont. Table(3.1) : Maximum - Minimum temperature in ^{0} c for 1998 and 1999 in Hili Block.

	1998	Means	1998	Extreme	1999	
Month	Daily Max.	Daily Min.	Height Max.	Lowest Min.	Max.	Min.
January	20.50	-	25.40	-	15.61	-
February	26.40	-	29.60	-	20.32	-
March	28.70	15.90	31.80	12.00	27.84	-
April	31.30	20.80	37.20	16.00	30.00	-
May	33.30	24.30	38.40	20.40	26.72	-
June	34.10	26.40	40.40	22.00	29.50	-
July	31.50	25.90	34.00	24.20	28.25	-
August	31.10	25.90	34.00	23.80		-
September	31.30	25.30	34.50	22.50		
October	31.20	23.30	34.20	19.20		
November	29.30	17.50	30.80	12.80		
December	26.20	11.90	28.60	8.60		
Yearly Average	29.50	21.70	33.20	18.15		

* - means not available.

Table (3.2) : Relative humidity in % for 1997 and 1998 in Hili Block

Month	Means of 1997		Means of 1998	
	7-LMT	14-LMT	7-LMT	14-LMT
January	91	43	90	56
February	87	40	77	41
March	72	43	73	40
April	82	54	76	51
May	80	52	79	64
June	86	65	84	67
July	87	75	88	77
August	83	77	88	80
September	88	79	86	77
October	84	63	85	71
November	85	52	78	55
December	91	58	80	49
Yearly Average	85	58	82	61

* - means not available

Table – (3.3) : Average rainfall (in m.m.) for 1996 and 1997

Month	1996	1997			
	Mean Monthly	Actual	Normal	% Departure	No. of Rainy Day
January	4.00	13.00	06.00	+116%	1
February	3.00	19.00	07.00	+171%	2
March	0.00	02.00	17.00	-88%	NIL
April	22.80	82.00	68.00	+21%	5
May	92.60	66.00	184.00	-64%	5
June	304.40	262.00	261.00	NIL	8
July	305.00	462.00	408.00	+13%	16
August	341.00	421.00	314.00	+34%	13
September	512.30	247.00	290.00	-15%	13
October	100.00	06.00	121.00	-95%	1
November	0.00	50.00	07.00	-29%	NIL
December	0.00	290.00	07.00	+314%	2
Total	1685.10	1726.00	1690.00	+2%	66

Cont.Table-(3.3) : Average Rainfall (in m.m) for1998 & 1999

Month	1998				1999
	Actual	Normal	%Departure	No. of RainyDays	Mean monthly
January	01.00	06.00	-83%	1	0.00
February	23.00	07.00	+200%	2	0.00
March	31.00	17.00	+82%	2	12.50
April	126.00	68.00	+85%	5	127.80
May	120.00	184.00	-34%	5	241.40
June	120.00	261.00	-54%	8	229.00
July	426.00	408.00	+4%	20	399.80
August	473.00	314.00	+50%	16	
September	506.00	290.00	+174%	12	
October	327.00	121.00	+270%	9	
November	01.00	07.00	+85%	1	
December	00.00	07.00	-100%	NIL	
Total	2154.00	1690.00	27.5%	81	

3.4 METHODS OF SOIL ANALYSIS :

3.4.1 Soil Samples:

Soil samples were collected randomly to a depth of 8-10cm.from different land types such as agricultural, fallow and grassland etc. Each sample consisted of soil drawn from eight to ten holes dug within an area of approximately 0.12 ha. About 800-1000gm.soil was taken from this pool and air dried under shed. Samples collected were grouped into land categories; labelled and packed accordingly into cloth bags. Parts of each samples were send for quantitative determination of available potassium, phosphorus and calcium, of the soil testing laboratory at Raiganj (Udaypur), Uttar Dinajpur. While quantitative estimation of soil temperature, moisture content, pH, total soluble salts (TSS) and percent organic carbon were done by the author following standard methods with the remaining part.

3.4.2 Determination of Sand, Silt and Clay percentage in soil :

Percent sand, silt and clay in soil was determined by the method proposed by Bouyoucos (1926). This method involves use of a hydrometer in the sample suspension to indicate the stages of settlement. In most cases, the results obtained by this method were in agreement with those obtained by the pipette method. In case of soils with high soluble organic salts breaking of some of the organic matter before dispersion was done. An initial digestion with hydrogen peroxide (H_2O_2) is generally adequate to break up any coagulating agents and this improves the dispersion of the finer particles. 10ml of 5% sodium hexametaphosphate was taken in a litre measuring cylinder and made up to 1(one) litre with distilled water. The suspension was thoroughly shaken and brought to room temperature, then a hydrometer was dropped in the suspension and the reading was determined as RL (callibration correction).

Three soil samples of about 35-40 gms. each were taken. All the samples were taken in separate beakers and 20 ml of distilled water and 5 ml of 30 % H_2O_2 were added. Then the beakers were covered with a watch glass and placed on a hot plate until most of the H_2O_2 decomposed. It was then allowed to cool. The process was repeated till the colour of the suspension become lighter and frothing stopped (More H_2O_2 will be required if the soil contained high organic matter). Following last addition of H_2O_2 the beakers were kept on a hot plate for at least two hours and then allowed to cool again. The solutions were then transferred in dispersing cups. 200 ml of distilled water and 10 ml of 5% sodium hexametaphosphate soln.was then added and the soil samples were allowed to soak for at least 15 minutes. The solutions were stirred with the help of a electric stirrer for 10 minutes.The whole suspension was then poured in a litre measuring cylinder and the volume was made up to 1(one) litre with distilled water. The mouth of the cylinder was closed with a rubber stopper and shaked for one minute. The cylinder was then placed on a table and time was recorded. First hydrometer reading was taken at the 4th (fourth) minute when particles larger than 0.02 m.m.will settle down. Following the first reading the suspension was allowed to remain undisturbed and again hydrometer reading was taken at the end of 5 hours from the starting time when particles larger than 0.002 m.m. will settle down. The hydrometer was callibrated at 67^0F(28.6^0c). Therefore, if work is performed at any other temperature, the temperature corrections are required. The temperature correction is equal to (X^0F-67^0F) x 0.2 or (X^0C-28.6^0C) x 2; where x is the room temperature.

The percentage of dispersed materials, remaining in suspension at any time is calculated by:

$$P = \frac{(R-RL.r)\times 100}{W}$$

Where, R = Hydrometer reading.

r = Temperature correction.

W = Dry (air-dry) Weight of soil sample

RL = Callibration correction.

3.4.3 Determination of moisture content :

About 75-100 gms. of Soil sample was collected from the site. The soil was then taken into a sample can and the lid was closed quickly. The cans were weighed to obtain fresh weight of soil. The oven dried samples at 80^0 c to constant weight indicate the final dry weight. Percent moisture

content is given by the following relation:

$$\frac{\text{Loss of weight on drying}}{\text{Dry weight of soil}} \times 100$$

3.4.4 Determination of soil pH :

In the present study a digital pH meter (ECL p^H 5651) and a soil suspension by neutral pH water were used.5 gms.of fresh soil was taken and 10 ml. of neutral pH water was added. The mixture was stirred gently with a stirrer machine for a few minutes and allowed to stand for 15 minutes. The glass electrode was then immerged in the soil sample and pH was recorded to one decimal place.

3.4.5 Determination of total soluble salt (TSS) OR Conductivity of soil :

The conductance of the soil solution gives an idea of the total soluble salts of soil. Total soluble salts of soil were determined by the electric conductivity meter. The principle of determination of soluble salts by the measurement of electrical conductivity is based upon the fact that ions are the carriers of electricity and higher the amount of soluble salts greater would be the electrical conductivity of the system.

15 - 20 gms. of soil was taken in a 250 ml. conical flask and 50 - 65 ml. of distilled water was added to it. The mixture was then allowed to settle for a maximum of 30 minutes. The supernatant liquid was then decanted in a beaker and the electrode bulb was immersed into the solution. The conductivity of soil sample was recorded. The average of three sets of readings were considered as result.

3.4.6 Determination of soil organic matter :

Organic matter was determined from the organic carbon multiplied by a factor of 1.724 and is based on the assumption that the soil organic matter contains 58% carbon (Russel and Engel 1928). Organic carbon of soil was determined by the method developed by Walkley and Black (1934), in which chromic acid was used for oxidation. In this process, soil carbon was at first digest and then oxidised to CO_2 by nascent oxygen produced by the reaction of $K_2cr_2O_7$ and H_2SO_4 . CO_2 thus produced is liberated in the atmosphere as gas.

1 gm. $K_2cr_2O_7$ is equal to 0.003 gm. carbon. The requirement of $K_2cr_2O_7$ is determined indirectly by titration with ammonium sulphate (Mohrs. solution).

1 gm. soil sample was taken in 500 ml flask and then 10 ml of 1(N) $K_2cr_2O_7$ solution and 20 ml. conc. H_2SO_4 (containing Ag_2SO_4)was added and mixed thoroughly. The solution was then allowed to stand reaction from 30minutes.The mixture was diluted by adding 200 ml water and 10 ml of phosphoric acid. Then 10 ml of NAF solution and 2 ml of diphenyl amine (indicator) was added. The solution was then titrated with standard ferrous ammonium sulphate solution to brilliant green colour, diphenyl amine showed green colour in iron solution and purple in $K_2cr_2O_7$ solution. A blank (chemical without soil) titration was also performed. The average of three sets of readings was considered as result.

Percentage of carbon was determined by the following formula :

$$C\ (\%) = 10(1- T/s) \times 0.003 \times 100/\text{wt. of soil sample}$$

Where, T = ml. of ammonium of ferrous sulphate solution taken for titration.

S = ml. of ammonium of ferrous sulphate solution required to titrate the blank.

3.5 Results :

3.5.1 Soil texture : Soil particles ranging from 2.00-0.20 and 0.20-0.02 m.m. diameter are described as coarse and fine respectively. Where as 0.02-0.002 and below 0.002 m.m. diameter are silt and clay respectively. Amount of silt and clay particles determine the water holding capacity and nutrient availability of the soil. Table 3.4 shows the physical characteristics of the soil and its percentage. Table 3.5 shows the nature of the soil of cultivated land i.e., sandy (380ha.), sandy loam (4285ha.), loam (1060 ha.), clay loam (1075 ha.) and clay (700 ha.). Table 3.6 shows the percent sandy loam (57.13%) is more in the cultivated loam which is probably due to continuous crop practice. Less percentage of sandy loam (11.53%), loam (3.11%), clay loam (5.16%) and clay (6.89%) is found in the riverine soil, probably due to seasonal wash out of clay and silt particles to the river. According to the nature of the soil texture, the soil of Hili Block may be described as loamy in general.

3.5.2 Seasonal variation of soil moisture :

Table 3.7 shows the monthly variation of soil moisture percentage among different types of land at the study area. The water content of soil depends primarily upon the soil texture and topography. Percent moisture is more during the wet months and less in the dry ones in the cultivated and fallow lands mainly due to their soil texture and topography.

3.5.3 Chemical nature of soil :

Fertility status (Chemical nature) of soils of different land types of Hili Block is shown in the table 3.8 . Soil in the cultivated land is on the average acidic in nature while in the fallow and riverine lands are neutral. Conductivity of soil ranged from 0.01 to 1.7 m.m. hos./cm. which is conducive to plant growth. High conductivity at riverine land of down area (0.03 - 3.0) is critical for germination. This is probably due to lack of humus and more sandy nature of soil texture. Present organic carbon in different types of land at the study area ranged from 0.5 - 0.06 to 0.05 - 0.97. Soil rich in organic matter are generally rich in nitrates. Nitrate production is very rapid when soils submerged for long get exposed as a dried up pool. Very high percentage of organic carbon was recorded in the jute field and fallow land is probably due to dung manuaring, blockage of water and decaying of organic matter i.e., straw, leaves etc. Available phosphorus and potassium ranged from 0.05-100 to 4-125 kg/ha. and 30 -50 to 60 - 450 kg/ ha. respectivily. Low content of phosphorus and potassium are found only in the sandy riverine area.

Table – 3.4 : Physical characteristics of soils and groups :

Name of the Block	Area available for cultivation	Soil Groups			
		Predominant Group	% of total area	Other groups	0 % of total area
Hilli	7500	Alluvium	60	Alluvium	40

Table – 3.5 : Soil types (Texture) in cultivable area in ha :

Name of the Block	Sandy	Sandy Loam	Loam	Clay loam	Clay
Hili	380	4285	1060	1075	700

Table – 3.6 : Physical characteristics of soils in different land types at Hili Block in % :

Types of land	Soil Texture				
	Sandy (%)	Sandy loam (%)	Loam (%)	Clay loam (%)	Clay (%)
Cultivated land	5.07	57.13	14.13	14.33	9.33
Fallow land	10.18	50.25	14.15	15.05	10.37
Riverine grass land	73.31	11.53	3.11	5.16	6.89

Table – 3.7 : Percent moisture content in soil samples from different land types at Hili Block :

Month	Types	of	land
	Riverine grass land	Fallow land	Cultivated
January	11.01	10.12	9.99
February	12.53	10.98	11.10
March	14.03	12.00	11.25
April	14.80	12.70	11.68
May	18.73	19.55	18.98
June	20.00	20.14	20.73
July	21.89	21.97	23.81
August	22.71	22.89	24.35
September	21.05	22.10	21.04
October	20.16	19.15	17.06
November	18.03	16.10	15.45
December	13.15	12.11	12.43

Table- 3.8 : Fertility status of soil samples from different land types :

Types	0. C %	Range of Nutrient Status		and P^H	m.m hos. E.C. basis
		Av. P_2O_5 kg./ha.	Av. K_2O kg./ha.	P^H	
Cultivated land	0.05-0.08	2-125	40-500	5.50 -7.00	0.01 – 1.40
Land under paddy cultivation	0.05-0.07	2-200	50-500	5.60 -7.50	0.02 – 1.60
Land under jute cultivation	0.05-0.92	4-125	60-450	5.70 - 8.00	0.02 – 1.70
Fallow land	0.05-0.97	1-250	59-450	6.90 – 8.60	0.03 – 1.90
Riverine sandy grass land	0.05-0.06	0.05-100	30-50	6.00 – 7.01	6.00 – 3.00

Table – 3.9 : Effect of traditional manuring of fertility status of soil in cultivated lands with reference to time after manuaring :

History	Chemical Nature					
	pH	TSS	C %	A.V.P.	A.V.K.	Cal %
Before manuring	5.80	0.07	0.80	36.12	105.00	0.450
After 15 days of manuring	5.40	0.22	1.71	26.50	80.90	0.141
After 30 days of manuring	5.70	0.21	1.60	32.10	158.10	0.117

Table 3.9 shows the chamical nature of soil in reference to their traditional manuaring practices.Usually the tribals (Santals, Mundas and oraons) are not prone to use chemical fertilizer in their agricultural fields. Usually the tribals dig a pit of varying size close to their hut and dump all kinds of organic waste materials such as: cow dung, kitchen garbage, domestic wastes, out - rooted woods etc.through out the year. Before cultivation they pick up the decomposed organic wastes from the pits and apply in the cultivation fields as a manuare approximately 10 - 15 days prior to ploughing.

Soil samples were collected for this study in three stages i.e., before manuring and on the 15th and 30th day after manuring. Percent organic carbon increased considerably in comparison to other nutrients such as Phosphorus, Potash and calcium. pH of the soil also remained almost unchanged. Influence of rainfall and other environmental factors on manuring were not considered.

Considering the characteristic of the soil it may be said that it is suitable for cropping but due to lack of irrigation facility or water supply particularly in the dry-wet and dry-summer months, the production of the seasonal crops are not up to the expectation.

4. Crop Productivity

4.1 Introduction :

Productivity of a region or a country is one of the most important indices of the well being of the people inhabiting it. Productivity is defined as production per unit area and is influenced by various environmental factors such as rainfall, temperature, soil characteristic as well as agricultural practices followed by the people. About 80% of the female population in India, lives in the rural areas and more than 86% of them work in agricultural or allied activities (Borah, 1998). Rural men folk often work at distant urban areas and towns on various jobs. Thus the contribution of the women in agricultural activities is much higher than their male counterparts. This coupled with the fact that our economy still is mostly agro-based unmistakably point out to the significant contribution of our ladies to rational economy. Agricultural practice is basically a culture that varies among communities according to their tradition, level of development and the environment. As crop land productivity is a fundamental issue in the life of any community, it has attracted attention of various authorities both in India and outside and still remains a topic of considerable interest (Bhople and Palki, 1998; Danda, 2001; Cashdan, 2001). Despite perceptible interest on productivity studies, not much is known about the main agricultural produces of the ethic communities in the Hili Block, Dakshin Dinajpur.

This part of the study gives an account of the crop cycle of major produces in the Block. The total cultivable area of this Block is about 7500 ha. The main crops cultivated by the tribal communities in the Block are:

a) Cereals – Paddy (IR-8, IR-28, IR-30, Pusha 2-21, Ratna and Jaya), wheat (Sonora – 64, Janak, Giriza, Larama Rojo, Sophed Larma).

b) Pulses – Arhar, Kalai and Khesari.

c) Oil seeds – Mustard groundnut, coconut, linseed and sesame.

d) Vegetables – Potato, tomato, brinjal, cabbage, cauliflower, chilli, ladies finger, papaw, sweet potato.

e) Cash crops – Jute, bamboo and sugarcane.

f) Minor crops – Ginger, radish, beat, onion, bitter guard, arum and spinach.

4.2 Methods:

Field observations and household survey was conducted through out the year. Land area used on different crops by the tribals at the Hili Block was recorded in acres. Productivity of randomly selected plots of 1 × 1m of different crop fields were measured following "Harvest method. The mean of 3-5 experimental plots was considered. Cultivated crops were recorded in terms of gm /m^2.

4.3 Results and discussion:

Table 4.1 shows land distribution pattern on different types of crops at the Hili Block among the three ethics communities. It indicates that the major portion of land is cultivated for cereals by all the communities(Fig.-4.1). It is observed that the Oraons use 80% land for cereals which is considerably higher than the overall percent area (i.e. – 57.37%) employed by the three communities. Similarly, the Mundas put less area (45%) than the overall

average. Likewise the present area used for pulses is higher in the Mundas and lower among the Oraons. The Oraons also put less area for oil seeds.

Table – 4.1 : Distribution of land in acres for different types of crops (cereals, pulses, oil seeds and cash crops among the three ethic communities (Santal, Munda and Oraon).

Types of Crops	Santal		Munda		Oraon	
	Area (in acres)	%	Area (in acres)	%	Area (in acres)	%
Cereals	229.24	54%	126.27	45%	175.20	80%
Pulses	89.31	21%	89.82	32%	10.95	5%
Oil seeds	59.54	14%	25.26	9%	6.57	3%
Cash crops (Jute, Bamboo & Sugar cane)	47.21	11%	39.33	14%	26.28	12%
Total	425.30	100%	280.68	100%	219.00	100%

Table 4.2 shows the land distribution on different cereals among tribals during 1998 – 99, compared with those for Dakshin Dinajpur District. It is observed that paddy is by far the most dominant cereal. Area employed on wheat by the tribal communities, however, is significantly higher in comparison to that of the district as a whole.

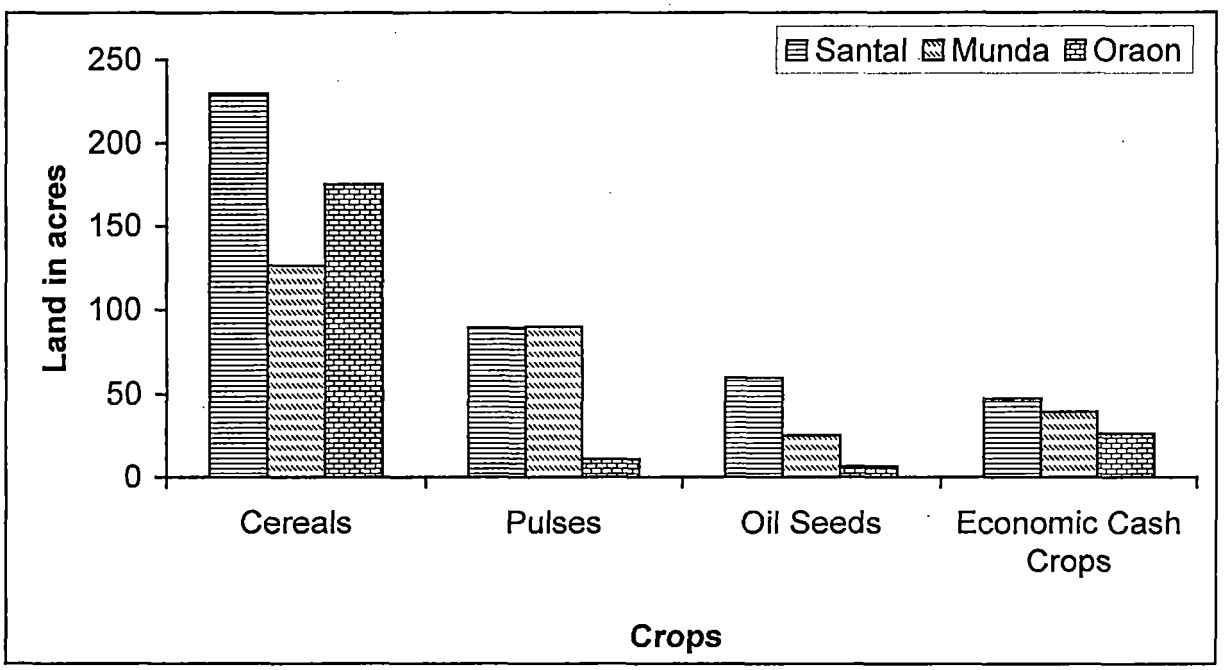


Fig. 4.1 : Different crops cultivated (in acres) by the Santals, Mundas and Oraons.

Table – 4.2 : Land in acres under major cereals in the tribal lands compared with those for Dakshin Dinajpur in 1998 – 1999.

Food grains	Santal	Munda	Oraon	Dakshin Dinajpur
Paddy	191.81 (83.67%)	102.52 (81.19%)	152.77 (87.20%)	414787.5 (98.38%)
Wheat	37.43 (16.33%)	23.75 (18.81%)	22.42 (12.80%)	6787.5 (1.62%)

Source : Annual plan on agriculture, Uttar & Dakshin Dinajpur 1999 -2000, office of the Principal Agricultural Officer, Uttar & Dakshin Dinajpur, Balurghat & Present study.

Table 4.3 shows crop yield measured in gm /m^2 among the tribal communities compared with Hili Block and Dakshin Dinajpur in 1998 – 99. It is observed that in general yield of paddy and wheat is more or less similar among the tribals. Yield is, however, higher in case of paddy in comparison to that for the Hili Block and the District but lower in case of wheat.

Table – 4.3 : Crop yield (gm/m^2) in the tribal lands compared with those for Hili Block and Dakshin Dinajpur in 1998 – 1999.

Food grains	Santal	Munda	Oraon	Hili Block	Dakshin Dinajpur
Paddy	238.55	218.11	248.66	218.11	186.26
Wheat	249.52	258.35	215.95	381.55	413.51

Land areas under different kinds of pulses among the three ethnic communities and those for the District in 1998 – 99 are shown in table 4.4. The land area used for Kalai production is considerably higher than any other pulses. This indicates that Kalai is the most preferred pulse not only among the tribal communities but also in the District or that the soil and environmental factors in the area are more suitable for Kalai production. The land area put under Mung by the tribals is higher than that for the District. The area under khasari lathyrine containing pulse is higher among the Mundas and also in district as a whole. This is a critical situation because the tribals are not aware of the harmful effects of lathyrine on vision.

Table – 4.4 : Land in acres under major pulses in the tribal lands compared with those Dakshin Dinajpur in 1998 – 1999.

Pulses	Santal	Munda	Oraon	Dakshin Dinajpur
Arhar	2.95 (3.30%)	4.63 (5.16%)	0.24 (2.20%)	600.00 (5.36%)
Kalai	67.33 (75.40%)	63.79 (71.02%)	8.78 (80.20%)	8277.50 (73.92%)
Mung	14.47 (16.20%)	13.02 (14.5%)	1.44 (13.10%)	925.00 (8.26%)
Khasari	4.56 (5.10%)	8.38 (9.32%)	0.49 (4.50%)	1395.00 (12.46%)

Table 4.5 presents the crop yield measured in terms of gm /m^2 in the tribal land and Dakshin Dinajpur District in 1998 – 99. It shows that yield (gm /m^2) of Kalai is about double to that of any other pulses. The production rate is more or less same for other pulses i.e., Arhar, Mung and Khasari among the three ethic communities.

Table – 4.5 : Crop yield (gm/m^2) in the tribal lands compared with those for Hili Block and Dakshin Dinajpur in 1998 – 1999.

Pulses	Santal	Munda	Oraon	Hili Block	Dakshin Dinajpur
Arhar	63.48	52.72	55.95	89.63	370.14
Kalai	97.16	108.89	92.54	-	-
Mung	44.87	55.95	54.12	-	90.92
Khasari	43.36	52.72	44.12	-	-

Means not available.

Mustard is by far the most important oil seeds in all communities and in the District (table - 4.6). This ought to be so because mustard finds multivarious use for example the seed is used as spice, the oil is used as the most common cooking medium as also as body oil while sesame and linseed is of occasional use as medicament and food. It is, however, observed that land area used for the two minor oil seeds is considerably higher among the communities than the District as a whole.

Table – 4.6 : Land in acres under major oil seeds in the tribal land compared with those for Dakshin Dinajpur in 1998 – 1999.

Oil Seeds	Santal	Munda	Oraon	Dakshin Dinajpur
Mustard	52.57 (88.29%)	21.48 (85.03%)	5.72 (87.06%)	50,000.00 (98.38%)
Linseed	2.09 (3.51%)	1.24 (4.91%)	0.28 (4.26%)	75.00 (0.15%)
Sesame	4.88 (8.20%)	2.54 (10.06%)	0.57 (8.68%)	750.00 (1.47%)

Table 4.7 presents oil seed yield in the tribal land, Hili Block and Dakshin Dinajpur District in 1998 – 99. Yield of mustard is much higher than that of the other oil seeds among the tribal communities. Mustard yield in the communities is also considerably higher compared to that of the District. Sesame yield on the other hand is high in the District than among the tribal communities.

Table – 4.7 : Crop yield (gm/m^2) in the tribal lands compared with those for Hili Block and Dakshin Dinajpur in 1998 – 1999.

Oil Seeds	Santal	Munda	Oraon	Hili Block	Dakshin Dinajpur
Mustard	90.49	104.37	107.82	95.66	58.75
Linseed	37.34	34.43	31.63	62.73	61.76
Sesame	74.67	76.40	72.63	119.54	115.56

The tribals put more land for cash crop production that oil seeds. Of the cash crop they mainly produce jute which take up 82% to 93% land. Bamboos and sugarcanes are cultivated in 6.8% to 10.0% and 7.2% to 9.90% land respectively. Interestingly the Oraons at the Hili Block do not go for sugarcane (Table – 4.8).

Table – 4.8 : Land in acres under major cash crops in the tribal land compared with those for Dakshin Dinajpur in 1998 – 1999.

Cash crops	Santal	Munda	Oraon	Dakshin Dinajpur
Jute	38.72 (82.02%)	32.55 (82.76%)	24.48 (93.15%)	21212.50
Bamboo	3.82 (8.09%)	3.94 (10.02%)	1.80 (6.85%)	-
Sugar Cane	4.67 (9.89%)	2.84 (7.22%)	*	1080.00

* means do not cultivate

\- means not available.

It may be mentioned that cultivation of Jute is on the decline because of the fall in its price in recent times. This actually is a serious problem all over West Bengal as plastic is substituting jute in a major way. The yield of the cash crops among the tribal communities is similar but is considerably lower than the District as a whole. Data on bamboo for the District is not available (Table – 4.9).

Despite high illiteracy (more than 80%) among the tribals their sense of seasonality with regard to cultivation of different crops are surprisingly sharp. Different crops are to be cultivated in different seasons and in different kinds of soil / land i.e., alluvial, clay, sandy, loam, upland and low land etc. The traditional judgements of the tribal in respect of all these factors are almost always without any flow.

Presently, even the Hili Block tribals go for three paddy crops i.e., Aman, Kharali Boro and Barshali Boro in a year. They prepare the cultivate land by ploughing and manuring before sowing. The main paddy crop is Aman which is sowed during May – July. Of the lesser paddy the kharali Boro is sowed during December – January and the Barshali Boro in March – April. As paddy requires a lot of water and irrigation facility is sufficient the tribals cultivate paddy mostly in low land. During the winter months i.e., December. – January the tribals cultivate a variety of crops such as wheat, four types of pulses, oil seeds, potato and a host of vegetables. They harvest most of the crops at the onset of the warm season i.e., March – April. Most of the winter crops are cultivated in the available upland areas in the Block. In the monsoon the tribals cultivate mainly jute and Barshali Boro paddy (already mentioned), and a number summer vegetables such as lady's finger, bitter gourd, luffa, gourd, pumpkin, chilli, parbel and some other spices.

Besides a variety of fruits are also produced by the tribals. Some of which such as: mango, jackfruit, litchi, banana, berry, palm, watermelon, fruity etc.(Summer); plum, cucumber (winter) are seasonally cultivated and some others are produced through out the year such as : papaw, guava and coconut etc.

Table – 4.9 : Cash Crop yield (gm/m^2) in the tribal lands compared with those for Dakshin Dinajpur in 1998 – 1999.

Cash crops	Santal	Munda	Oraon	Dakshin Dinajpur
Jute (Fibre)	298.81	272.66	288.91	325.49
Bamboo (Whole)	53800.00	55952.00	53681.64	-
Sugar Cane (Whole)	3766.00	3497.00	*	4737.41

* means do not cultivate

\- means not available.

Paddy plantation by tribal people.

Paddy plantation by two Santal adults.

Paddy plantation by a Santal mother with her daughters.

Paddy plantation by tribal women with their children.

A Santal child labour preparing the paddy field of his master.

An Oraon child labour ploughing his master's land with the help of bullocks.

A Santal old man ploughing paddy field with the help of bullocks.

A Munda man ploughing his land for paddy plantation with the help of bullocks.

Tending potato plants by a tribal young.

Tribals stripping jute fibre.

A young tribal lady harvesting jute with her child

To market with cabbage

Collection of seedlings by a Santal male along with his mother.

Collection of seedlings by a Santal family.

5. Bio-resource utilization:

5.1 Introduction :

Study of the ethnic communities in the present state of socio-political environ of our country is not only very important but a necessity. Tribal people of the present study at Hili Block as also others elsewhere often suffer from the notion that they are being left out from the mainstream society of the country. This feeling generates discontent, dissent and distress in them and emboldens them to dissociate from the general developmental activities of the country. Study of the patterns of resource utilization by different ethnic communities is important not only in identifying existence of possible unutilized niches in their ecosystem and suggesting proper strategy for their exploitation on one hand and also in determining resources they are over-exploiting to the detrement of the resource in question and themselves. Significant studies in different aspects have been conducted by various authorities both in India and abroad (Dube, 1951; Vidyarthi, 1963; Malhotra, 1974; Malhotra *et al.*, 1978; Gadgil and Guha, 1992; Vithal, 1992; Das, Jagannath, 1998; Lee and Devore, 1968; Dwyer, 1974; Eder, 1978; Odend'hal, 1980; Brightman, 1996; John Christy and Thirunavukkarasu, 2002.

The objectives of the present study is to determine resource utilization pattern of the three tribal communities at Hili Block with particular emphasis on hunting-capture-collection (HCC), daily wage labour, forest collections and livestock rearing..

5.2 Materials and methods :

Data were collected from house to house survey and field observations. Detailed survey was conducted for enumeration of human as well as livestock population of the village. The age-sex of the cattle were recorded for each household. The age of the cattle reported by their owners were found to be fairly accurate because it coincided well with 30 – 35% cases where it was checked by a veterinarian. Verification of data is possible by repeating the procedure once or twice, where each successive survey acts as a check on the previous count (Odend'hal, 1980). The weight of fresh dung of the experimental cattle in the field were taken separately and oven dried at 75°C – 80°C to constant weight. Energetic value of dried dung was taken to be 4.26 K. Cal/ gm (National Council of Applied Economic Research, 1965). The work performed by each bullock was converted in terms of K. Cal/ hr which was approximately 433 K. Cal/ hr (Kurup, 1967; Ubbelohde, 1963; Brody, 1945; Odend'hal, 1972). The energetic value of milk of the study cattle was taken to be 829 K. Cal/ kg for milk containing 4.7% fat (Panse *et al.*, 1967; Brody, 1945). All the reported data were strictly verified and cross-checked with those obtained from other sources before finally accepted for consideration. The data were analysed qualitatively and quantitatively and those obtained from direct observations agreed well with reported ones.

Often the hunting, fishing, and collection spots were visited in company with the tribal groups to determine the manner of their activity and the amount of materials obtained. Plant and animal materials collected were first sorted out. The materials were grouped into animal and plant categories and weighed. Animal specimens were preserved in 70% alcohol. Herbarium sheets were prepared with the plant specimens. Professor A. P. Das, Department of Botany, N.BU. graciously identified the plant specimens. Animal specimens were identified by experts at Z. S. I., Calcutta.

5.3 Results :

At the very outset it may be pointed out that resource utilization pattern in the three tribal communities at the Hili Block is similar in general. This could probably be a function of living in close proximity with one another for over a century and due to the fact that they are mostly cut-off from their own main-stream populations elsewhere. Subsistence activities

of the tribal communities of the Hili Block include a host of activities such as hunting-fishing-collection of animals, cultivation in own land, daily-wage labour, preparation - sale of alcohol, small trade, forest collection, (mainly green vegetables and fire wood) for own consumption and sale and rearing of domestic animals. The common terrestrial and aquatic fauna utilized by the tribals in the Jungles and water bodies of the Block are shown in the Table 5.1, and 5.2, respectively.

It is to be mentioned that tribal communities maintain some taboo in consumption of certain animals found in the block. For example, the Santals do not consume crows and kingfishers, similarly the Mundas do not take bats, jungle cats; and the Oraons the porcupines, frogs, bats, wood cutters, crows, jungle cats and kingfishers.

In general it may be said that at present hunting among the tribal communities has ceased to be a major subsistence activity mainly because of paucity of preferred game species due to massive deforestation on one hand and enactment of laws prohibiting hunting on the other. Hunting nowadays is mostly ritualised to some religious activity on some particular days of the year such as: Holi, Pousparbon, X-mass (for the Christian tribals), Kalipuja, Soharai, Dalpuja, 1st January and "Gai" (worship of bow and arrow). However, despite all constraints few Santal and Munda families still hunt considerably.

Table 5.3 shows comparative accounts of number and percent families participating in hunting-capture-collection of animals, total and average amount obtained per family per year. It is observed that a high percent of families practice fishing and snail collection in all the three communities. Percent participation of Santal and Munda families in different capture-collection activities is mostly similar and differ substantially from that of the Oraons. For example, about 75%, 60% and 8% Oraon families participate in fishing, snail and prawn collection in comparison to 51%, 48%, 3.7% and 44%, 51% 3.9% percent in the Santals and Mundas respectively. The Oraons also hunt less than the others. Again unlike the Santals and Mundas the Oraons do not consume frogs at al. It is also observed that although the Santals and Mundas are more or less similar in their food habits, the Santals prefer frogs more than the Mundas whereas the latter prefer turtle more than the former. It may be pointed out that average animal food materials hunted-captured-collected by a Oraon family per year is 143.80 kg in comparison to 168.80 kg and 164.42 kg in the Santals and Mundas respectively.

Table 5.1 : Utilization of Terrestrial Fauna by the Santals, Mundas and Oraons at Hili Block (1996-97)

Common Name	Santal Name	Munda Name	Oraon Name	Scientific Name
Jungle cat	Runda	Gara	Bando	*Felis sp.*
Indian hare	Tulai	Lambha	Lambha	*Lepus ruficandatus*
Guinea pig	Asulgudu	Beniposh	Beniposh/ baramusa	*Cavia porcellus*
Indian porcupine	Jhink	Chhedar	Chhedar	*Hystrix indica*
Rat	Godo	Indur	Musa	*i. Bandicota bengalensis* *ii. Ratus rattus*
Wild boar	Birsukri	Jangli sukor	Jangli kisshi	*Sus cristatus*
Bat	Bakdur	Bakdul	Bakdul/ Badri	*Pteropus giganticus*
Dove	Otum	Ghughu	Ghughu	*Streptopelia sp.*
Wood cutter	Kath thokra	Kath thokra	Kath thokra	*Picus spp.*
Pea fowl	Marah	Mayur	Mayur	*Pavo cristatus*
Sparrow	Hatiuri	NA	Chocha charai	*Passer domesticus*
Wild fowl	Birsim	Ban murgi	Jangli kher	*Gallus sp.*
Wild duck	Sherali	Genrey	Genrey/ Bali hansh	
Pigeon	Paora	Kaptor	Kaptor	*Columba livia*
Crow	Kanhu	Kauoa	Kauoa	*Corvus Splendens*
Kingfisher	Kikir	Kil kila	Kil kila	*Alcedo sp.*

NA = Not available

Table 5.2 : Utilization aquatic fauna by the Santals, Mundas and Oraons at Hili Block (1996-97)

Common Name	Santal Name	Munda Name	Oraon Name	Scientific Name
Turtle	Hara	Kachhua	Kachhua	*Chelone sp.*
Frog	Bardha rotey	Holabang	Bang	*Rana tigrina*
Punti fish	Punti hako	Punti masri	Punti masri	*Barbus puntio*
Singi fish	Sishing hako	Kanos masri	Kanos masri/ Shingi masri	*Heteropneutes foosilis*
Magur fish	Mangri hako	Magur masri	Magur masri	*Clarius batracus*
Tangra fish	Ranreh hako	Tengra masri	Tengra masri	*Mystus sp.*
Blind serpent	Bambi	Cuchia	Cuchia	*Amphipnous cuchia*
Climbing perch	Rodgo hako	Kai masri	Kai masri	*Anabus testudenius*
Snake heads	Ganrai hako	Santhi masri	Santi masri	*Channa punctatus*
Crab	Katcom	Khokra	Kankro	*i. Potamon atkinsonianum* *ii. Cancer sp.*
Prawn	Iccha hako	Jal masri	Ichla masri	*i. Palaemon sp.* *ii. Macrobranchium rogenburgii*
Apple snail	Gungha	Ghungi	Ghungi	*i. Pila globossa* *ii. Brotia costula*
Mussel	Jhinuk	Jhinuk	Jhinai	*i. Lamellidens marginalis* *ii. Anodonta sp.*

Table 5.3 : Contribution of hunting-capture-collection of different animal items in the diet of the Santals, Mundas and Oraons at Hili Block (1996-97)

Hunt- capture - collection of Animals	Number and percent families practicing			Amount / year (kg)			Average amount hunted-captured-collected/ family/ year (kg).		
	Santal	Munda	Oraon	Santal	Munda	Oraon	Santal	Munda	Oraon
Mammals and birds	135 (23.89)	137 (23.46)	67 (21.33)	3651.75 (10.39)	3733.25 (10.12)	1440.50 (6.15)	27.05±0.9	27.25±0.50	21.50±0.32
Turtle	13 (2.30)	11 (1.88)	07 (2.23)	68.25 (0.19)	82.50 (0.22)	45.00 (0.19)	5.25±0.46	7.50±0.44	6.43±1.28
Frog	29 (5.13)	25 (4.28)	-	275.5 (0.78)	156.25 (0.42)	-	9.50±0.57	6.25±0.31	-
Fish	287 (50.80)	281 (48.12)	235 (74.84)	13058.50 (37.15)	11450.75 (31.05)	9928.75 (42.38)	45.50±0.67	40.75±0.62	42.25±0.22
Crab	189 (33.45)	195 (33.39)	113 (35.99)	1086.75 (3.09)	1033.50 (2.80)	595.00 (2.54)	5.75±0.14	5.30±0.12	5.27±0.14
Prawn	21 (3.72)	23 (3.94)	25 (7.96)	63.00 (0.18)	75.00 (0.20)	65.00 (0.28)	3.00±0.23	3.26±0.31	2.60±0.21
Snail	251 (44.42)	297 (50.86)	187 (59.55)	16440.50 (46.77)	20005.50 (54.24)	11220.00 (47.89)	65.50±0.79	67.36±0.81	60.00±0.38
Mussel	56 (9.91)	51 (8.73)	23 (7.32)	406.00 (1.15)	344.25 (0.93)	132.25 (0.56)	7.25±0.24	6.75±0.30	5.75±0.24
						Total	168.8	164.42	143.8

* Figures in the parentheses indicate %; – Means absent; ± Indicate S. E.

Various forest produces contribute substantially in the diet of most tribal societies including Santals, Mundas and Oraons in the present study. While animal food items are solely used for self-consumption, some of the plant produces collected are sold in the market for cash.

Time invested in a particular activity by an individual is a reliable index of the relative importance of that activity in the life of the individual in question. This is sometimes called time-budget. Table 5.4 shows time spent by Santals, Mundas and Oraons at the Hili Block on different subsistence activities. Six major subsistence activities of the tribals have been considered. For convenience, some of the smaller activities have been lumped with certain major activities. It is found that all three communities invest more time in three categories of subsistence activities, i.e., agricultural work, day labour and forest collection. The time-budget strategy of the three communities are in general similar, however, investment of time by the Santals and Mundas are more similar than the Oraons. For example, Oraon males and females do little hunting, agricultural work and preparation selling of liquor but more day labour. Division of labour among the sexes is also not very conspicuous. Both sexes invest some time in almost all the activities except that the Santal and Oraon males do not perform any domestic rearing while Oraon females are not involved in liquor preparation and selling. Besides the females in all the communities put more time in forest collection and domestic rearing while the males give more time in the rest of the subsistence activities.

Table 5.4 : Average time spent / adult on different subsistence activities among the three ethnic communities at Hili Block (1996-97).

Activity	Time spent (hours/ year/ adult)					
	Male			Female		
	Santal	Munda	Oraon	Santal	Munda	Oraon
Hunting-fishing-collection of animals	150.30 (8.03)	159.30 (8.23)	100.75 (6.37)	90.45 (4.86)	100.00 (5.97)	85.50 (5.08)
Agricultural work in own land	550.15 (29.40)	530.45 (27.41)	400.15 (25.30)	350.00 (18.80)	370.15 (22.08)	220.45 (13.11)
Day labour	600.00 (32.07)	655.00 (33.84)	630.50 (39.86)	450.00 (24.18)	400.50 (23.90)	475.15 (28.25)
Preparation and selling of alcohol and other small trade	225.15 (12.03)	205.50 (10.62)	150.25 (9.50)	90.00 (4.84)	80.00 (4.77)	-
Forest collection	345.45 (18.46)	330.30 (17.07)	300.00 (18.97)	555.30 (29.83)	500.00 (29.83)	550.50 (32.74)
a. Sell of forest produces	27.52 (1.47)	26.32 (1.36)	23.90 (1.51)	44.24 (2.38)	39.84 (2.38)	43.86 (2.61)
b. Consumption of forest produces by self	3.16 (0.17)	3.02 (0.16)	2.75 (0.17)	5.09 (0.27)	4.58 (0.27)	5.04 (0.30)
c. Firewood	314.76 (16.82)	300.96 (15.55)	273.35 (17.28)	505.97 (27.18)	455.58 (27.18)	501.60 (29.83)
Domestic rearing	-	54.75 (2.83)	-	325.50 (17.49)	225.40 (13.45)	350.00 (20.81)

* Figure in the parentheses indicate %.

Table 5.5 : Number of households, human and domestic animals reared by the Santals, Mundas and Oraons at the Hili Block (1999).

Ethnic community	Households	Human	Cattle	Goats	Sheep	Chicken	Ducks	Pigs
Santal	565	2547	1820	965	150	2403	225	663
			(1.40)	(2.64)	(16.98)	(1.06)	(11.32)	(3.84)
Munda	584	2787	1672	1872	50	1553	305	342
			(1.67)	(1.49)	(55.74)	(1.79)	(9.14)	(8.15)
Oraon	314	1506	1305	885	28	1105	355	451
			(1.15)	(1.70)	(53.79)	(1.36)	(4.24)	(3.34)
Total	1463	6840	4797	3722	228	5061	885	1456

- Figure in parentheses indicate animal/ human.

Table 5.5 shows no of households, human and domestic animals reared by the three ethnic communities while all the tribes at Hili Block maintain all the common domestic animals it is observed that the Santals keep sheep and chickens more; the Mundas keep more goats and the Oraons keep more cattle, ducks and pig in terms of animal man ratio. The Oraons obtained substantially lesser amount of animal food materials from hunting-capture-collection (HCC) activities (Table 5.3). The deficit probably is met through more animals rearing activity. Table 5.6 shows daily average wet weight, dry weight and dry wt./ wet wt. ratio of dung produced by three age sex categories of tribal cattle.

Table 5.6 : Daily per capita dung production and dry matter among the tribal cattle in kg.

Age class	No. of cattle	Mean per capita dung production and dry matter		
		Wet weight	Dry weight	Dry weight/ wet weight
Adult male	1439	11.25	2.37	0.210
Adult female	1295	8.5	1.74	0.205
Below 3 years (Sub-adult)	2063	2.25	0.57	0.253

Table 5.7 : Caloric output through dung of tribal cattle.

Age class	Mean daily caloric output per cattle through dung (dry wt.)	Daily total production (K. Cal)
Adult male	2.37 × 2.13 = 5048.1 K. Cal / male	7264215.9 K. Cal.
Adult female	1.74 × 2.13 = 3706.2 K. Cal / female	4799529 K. Cal.
Below 3 years (Sub-adult)	0.57 × 2.13 = 1214.1 K. Cal / Sub-adult	2504688.3 K. Cal.

Table 5.7 presents caloric output through dung production for the tribal cattle. Daily total dung production is converted in terms of K. Cal., taking 2.13 K. Cal/ gm of dry cattle dung (National Council of Applied Economic Research, 1965 : 114). Total daily energy production through dung by the cattle population = 14568432 K. Cal / day (Table 5.7). Hence total yearly energy production through dung = 5317477680 K. Cal/ year. In India use of cow dung as fuel varied from 40% (National Council of Applied Economic Research, 1965) to 75% (Lodh, 1968). However, cow dung is used not only as fuel but also as fertilizer in the crop fields.

Table 5.8 : Total No. Lactating cows and yearly caloric value.

No. of lactating cows	Daily milk production / cow (kg)	Daily total milk production (kg)	Yearly total milk production (kg)	Yearly caloric value (K. Cal)
466	2.25	1048.5	382702.5	3172603725

* Energy conversion of milk is done by 829 K. Cal/ kg (Panse *et. al.*, 1967; Brody, 1945).

The number of lactating cows and their average milk production is estimated in Table 5.8. This estimation is done during the three survey periods in 1999. Table 5.8 shows total number of lactating cows and their yearly calorific value. Daily milk production per cow is only 2.25 kg, which is considerably lower than high milk producing varieties.

Bullocks are employed by the tribals for ploughing from the age of about 5½ years. Workable male tribal cattle population during 1999 is 1207 (Table 5.9). A bullock works on average for 4.25 hours a day and is used on average for 205 days a year. A team of two bullocks usually operate at 1.35 horsepower, i.e., an expenditure of 0.675 H. P. / bullock. 1 H. P. is the work done at the rate of 642 K. Cal./ hour (Kurup, 1967 Ubbelohde, 1963; Brody, 1945) and thus the work-rate of a bullock is approximately 433.35 K. Cal./ hour. Thus, work accomplished by all the workable bullocks in a year amounts to : 433.35 K. Cal/ hr. × 4.25 hr. / day × 205 days / year × 1207 = 455710305.5 K. Cal/ year.

Table 5.9: Total number of workable bullocks and yearly total energetic value.

No. of workable bullock	Working hours/ day/ bullock	Working days/ year/ bullock	Working power/ day/ bullock (H. P.)	Yearly total energetic value (K. Cal)
1207	4.25	205	2.87	455710305.5

Table 5.10 : Total energetic output (K. Cal/ year) of cattle reared by the Santals, Mundas and Oraons at the Hili Block1999.

Age class	Average number of cattle	Calorie obtained/ year (K. Cal/ yr.)		
		Dung	Milk	Work
Adult male	1439	2651438475	-	455710305.5
Adult femal	1295	1751828085	3172603725	-
Below 3 years (Sub-adult)	2063	914211120	-	-
Total	4797	5317477680	3172603725	455710305.5

Table 5.10 represents total energetic output from dung, milk, and work of tribal cattle in the Hili Block is 5317477680 K. Cal/ year, 3172603725 K. Cal/ year and 455710305.5 K. Cal/ year respectively.

5.4 Discussion :

Despite low human population, favourable climatic regime and a number of rivers and rivulets, that promote growth of forests and games; there is severe decline of forest area and games solely because of indiscriminate deforestation in the Block. This is evident from Table 5.1 and 5.2. Meagre success from HCC activities compelled tribal populations to concentrate more on other subsistence activities. The Oraons differ considerably from the Santals and Mundas in their animal food habits and procure less of it on average/ year.

As omnivores human beings feed from several tropic levels and they depended on hunting and gathering for their subsistence for over 99% of their evolutionary history (Lee and Devore, 1968). At present, however, in most enlightened ethnic communities; agriculture, daily-wage labour and small trade complement substantially to their subsistence in addition to hunting and forest collection because the latter two means are inadequate to meet the total requirement due to colossal disappearance of forests in most parts of the world.

Unlike certain tribes such as Aka (Andrew and Hewlett, 2001), Ju-hoan (Bisele and Barkley, 2001), the women folk of the tribal communities at Hili Block do not accompany their husbands or male members during hunting-fishing-forest collection etc. because there is no apprehension of rape and violence from males of other groups. The female members, however, accompany other adult members, both male and female in most of their hunting capture-collection endeavours. In other words, tribal women of Hili Block apprehend little or no assault and violence in their outdoor activities. Hardy (1997) opined that co-operation in hunting reduce the risk of violence on women. Lower investment of time by the tribal women in outdoor subsistence activities also provide them with opportunities to invest more in infant-child care (Kelly, 1995; Mukhopadhyaya and Higgins, 1998), domestic core and domestic rearing.

Tribal communities at Hili rear a variety of domestic animals out of which cattle and chicken are most common. Almost all-tribal families irrespective of community rear one or two cattle, which serves them in various ways to meet their subsistence.

Tribals at Hili Block are in a state of transition from hunter-gatherer community to settled agriculturist-gatherer-labourer society. This probably is due to their contact with mainstream society as also due to nonavailability of game animals in the forest of the region. In this connection it may be mentioned that wildlife conservation strategy of our country should have some provision for utilization of game animals as food by tribals who traditionally depend on this resource.

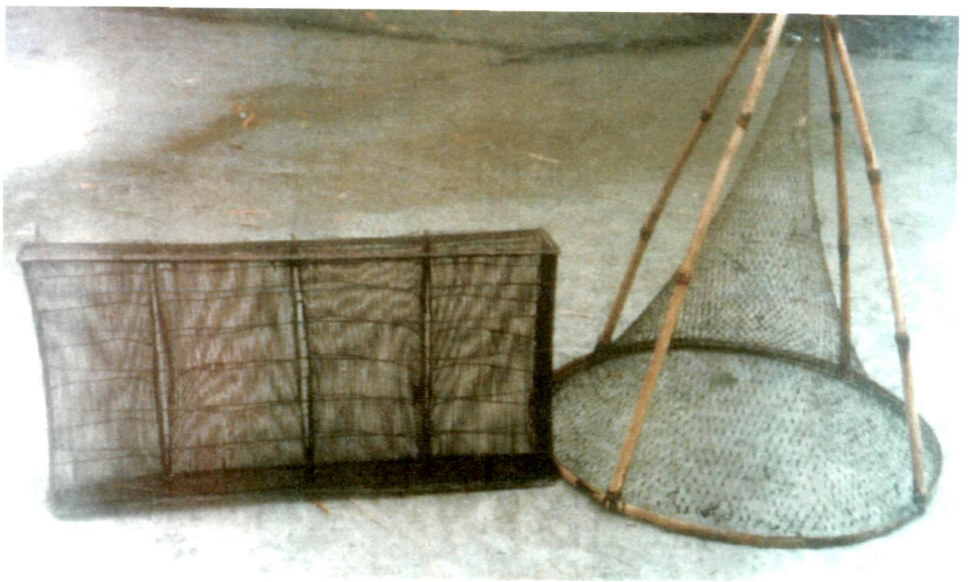
Projects to popularise cultivation of some common fruits, mushroom cultivation and animal husbandry particularly involving cattle, goats, pigs, and chicken have enormous potential in enhancing socio-economic transition of this tribal people.

Some Munda returning from hunting.

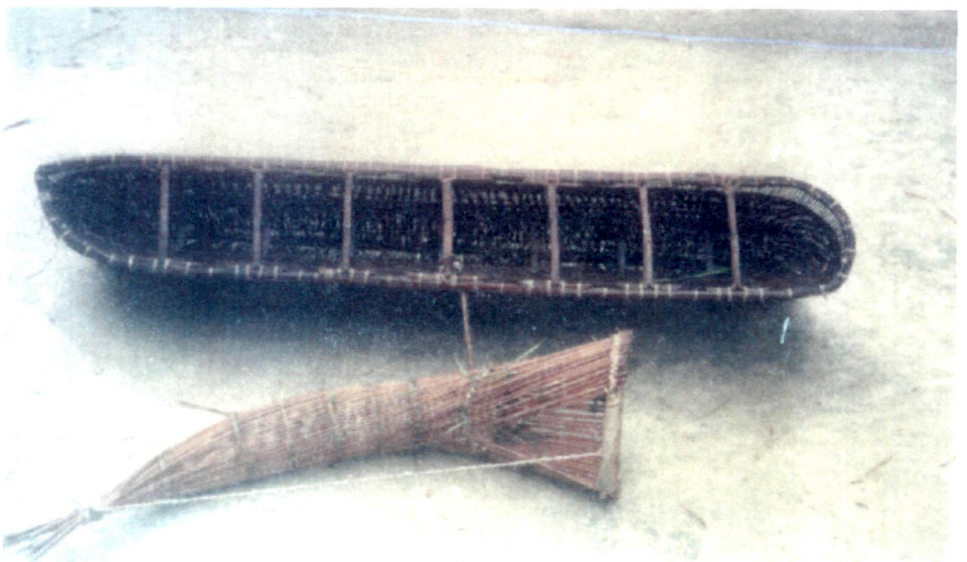
Santals on a hunting spree in a forest at Hili Block.

Oraons engaged in shooting birds with indigenous bows and arrows.

A Santal hunting team in a different posture.



Two indigenous fishing implements made of bamboo and thread .



Two indigenous fishing implements made of bamboo and thread of the Santals.

Two indigenous fishing implements made of bamboo and thread of the Santals.

A group of Santals enjoying fishing around the last phase of winter with indegenous fishing gear.

Tribal people catching fishes with their fishing implements.

Tribal people Catching fishes from a rivulet.

A tribal team with fishing implements on their way to fishing.

A basket of dry leaves near an indigenous oven.

An Oraon girl carrying fuel sticks made of cowdung and jute steam.

A Santal girl with a basket of cowdung cake.

Indigenous fuel of tribal community.

Tribal children returning from forest with loads of fire wood while santal male stands aside.

A stack of paddy straw to be used for fuel and fodder.

The Tribals collecting snales and crabs from a rivulet.

Tribal people with their children catching fishes from a low lying field.

6. Demographic Studies on Santals, Mundas and Oraons at Hili Block:

6.1 Introduction : Analysis of data on fertility, mortality, migration, growth etc. and studies on human population is usually termed as demography. John Graunt (1662) was the first worker on demography, who published an article entitled, "Natural and political observations made upon the bills of mortality on the population of London." Though many workers as Petty (1665, 1680, 1691); King (1696); Halley (1693) ; Sussmilch (1775) etc. worked on population around that time, the subject received little attention, until Malthus (1798). The work of Malthus aroused a lot of excitement in general but were criticized by many scientist, politicians and clergymen. With the acceleration of scientific progress in the 19th century, population studies attracted many scientists.

Accurate quantitative data on population is essential to determine the problems with regards to health, education and social habits of a society. and to formulate appropriate remedial measures. Socio-cultural aspects play a crucial role in analyzing natality, mortality, fertility, growth rate migration etc. of a population. On the other hand population parameters are heavily influenced by the ecological realities of particular geographic regions. Despite demographic vulnerability of small populations with regards to epidemics and incidence of random demograhic variations Mac-Farlane (1976) believed that, 'Microdemograhy can come up with meaningful estimate of general demographic trends and can make very useful contribution to population studies'. According to Kunstadter (1972) we may come up with three types of demograhic variables while studying a small community.

(1) variation of population structure within a given community overtime; (2) Variation between communities with the same basic social system when observed at the same time and (3) variation between families within any community at any time. Works on different aspects of small population such as on fertility differences inrelation to altitude (Gupta, 1980); on the economic value of child labour (Nag et. al., 1978; Rehman, 1992); on land ownership and labour requirements (Mamdani, 1972); on educational opportunity (Stanhope and Hornabrook, 1974); and on fertility statusque of a population, (Roberts, 1971), contributed greatly to our understanding of the dynamics of small population.

6.2 Aims and Objectives :

The main objectives of this chapter are :
(i) To estimate the impact of externally induced changes of socio-ecological and cultural nature on the demography of the santals, Mundas and Oraons, and
(ii) to analize their demographic structure at the Hili Block.

6.3 Method : With the emergence of nation states as political entities in the dawn of modern period in Europe it became a necessity to have an estimate of human population for proper execution of various Governmental activities. The first estimation of whole population by house to house survey was done in 1665 for the colony of New France. The credit of accomplishing first National Census goes to Sweden in 1749. Similar census records were done in 1801 for France and England and in 1790 for U.S.A. The first census record for India (India and Pakistan) was completed in 1872 and officially the population was declared as 233 million (U.N., 1973).

Demographic data of the tribals (Santals, Mundas and Oraons) at the Hili Block for the year 1971, 1981 and 1991 were collected from the census records and the present study. No work on the

tribals of the Block is known. Following van Arsdale (1978) birth order among siblings, marital and parenthood history, event calenders and appearance was used in the present study. Enumeration in the present study was mainly based on household survey, all the heads of the families or their wives were interviewed. The age sex structure, marital status and reproductive performance of married females were recorded. Data were cross checked from several sources. For example, age of a person was determined with the help of the following information :

(i) relative age of the members in the settlements.
(ii) date of known external events such as flood, famine and outbreak of diseases.
(iii) age at marriage
(iv) present age
(v) age at first pregnancy
(vi) interval between the subsequent pregnancies etc.

Only in three to four (3-4) percent cases, the calculated age varried by a factor of one to two years from the reported age of the subjects. In order to minimize the chance of variation associated with the small population as well as errors in ascertaining the age, the population was divided into different age groups. To describe the structure and to measure the trends of population, grouped data on different age-sex class indices, rates and proportions were presented in suitable graphs and tables.

Important demographic information obtained through calculation such as life table, gross reproductive rates etc. of small populations are usually subjected to various criticism. However, reasonably accurate and acceptable estimates of population can be obtained with reference to model life tables developed by the U.N. (1967) and Demeny (1971) mainly based on heavily weighted age-sex mortality rates. With the help of these life tables it is possible to cover a wide range of mortality levels experienced by human populations of different countries. The refined demographic structures including the level of mortality for the preparation of life tables as described in the study were based on U.N. (1967) and Demeny (1971) and stable population concept.

For the calculation of trends of population growth, available data recorded in the statistical abstract , India; Bereau of applied economics and statistics, W.B.; District statistical hand book for Uttar and Dakshin Dinajpur and partial census records were considered.

6.4 Results and Discussion :

6.4.1 Density: Density of population in a particular area depends mainly on socio-economic structure. Population density i.e, the number of individuals per unit area often reflect the inherent socio-cultural dimensions and ecological involvement of a community. On the basis of Anthropological studies it has been assessed that the maximum density of hunter and food gatherer community could hardly exceed one or two persons per square mile, even in the most favoured areas. Hassan (1975) also claimed that the population density of hunter gatherer communities were very low and were estimated as 0.01 to 2 persons per square miles.

Table - 6.1 Presents the population density of the Hili Block tribals inrelation to India, West Bengal, Howrah, Purulia, Uttar Dinajpur, Dakshin Dinajpur, Kumarganj Block and Balurghat Block. The density of Hili Block can be compared with the neighbouring Balurhgat. The population density at the Hili Block including both tribals and nontribals was 701 per squre kilometer (1991 census records). This density as a whole was higher than Kumarganj Block, Dakshin Dinajpur District, other Districts of West Bengal and India. The density of tribals in the Block was 137 per

squre kilometer, total cultivable land in the Block was 7500 hactor. Therefore, the physiological density i.e. net cultivable area/person was 0.303 acres. Considering only the tribals it was 0.710 acres / person. Physiological density of Dakshin Dinajpur District calculated in 1991 was 0.356 acres / person (Annual plan on Agriculture, Uttar and Dakshin Dinajpur. 1999-2000).

Ecologically, to calculate the actual population pressure on an area the total land / man ratio is to be considered. However, a favourable land / man ratio, does not necessarily imply higher productivity or uitlization. For example, the tribals enjoy a favourable ratio incomparison to the nontribals at the Hili block but due to primitive agricultural technique and other reasons, their productivity / unit area was lower than that fo the non tribals.

Table - 6.1 : Population density per squre kilometer at Hili Block, adjaust areas, West Bengal and India.

Name of the Places	Year			Sources
	1971	1981	1991	
India	182	216	267++	Statistical abstract (India)
West Bengal	504	621	767	Do
Howrah (Dt.)	1640	2022	2543	Bereau of applied economics and statistics, W.B.
Purulia (Dt.)	256	296	355	Do
Uttar Dinajpur (Dt.)	328 (D.D.+U.D)	450 (D.D.+U.,D)	607	District Satistical hand book, Uttar and Dakshin Dinajpur
Dakshin Dinajpur (Dt.)	Do	Do	552	Do
Kumarganj Block	301	365	452	Do
Balurghat Block	508	692	819	Do
Hili Block	425	573	701	Do

Note :

D.D - Dakshin Dinajpur

U.D- Uttar Dinajpur

++ - density has been worked out on comparable data.

6.4.2 Composition : Biological variable such as age and sex affect a community in various ways. Individuals of different age-sex groups assume various domestic, economic and cultural activities of the community. This process is influenced to a great extent by socio-cultural and ecological conditions in the region.

6.4.3 Demographical economic analysis of the tribals :

People undertake variety of jobs of subsistence. The qualitative and quantitative nature of work and subsistence activities depend on the capability, tradition and demand of the society. People differ in their capabilities in performing certain jobs. Most societies endeavour to engage a portion of the people to appropriate jobs through the phenomenon of division of labour. But in most populations a substantial proportion of people are dependent on others for subsistence i.e, the young, the unemployed physically disabled and aged persons.

The number of dependents vary among different communities. Because of high fertility, decrease in infant mortality and increase in life span, the proportions of dependents is increasing in most developing countries.

Dependency ratio (DR) can be formulated as :

$$DR = \frac{\text{Dependent children + Dependent aged}}{\text{Active population}} \times 100$$

Communities differ in demarkating the start and end points of economically active life. In most tribals it starts rather early but also terminates early. The dependency ratio among the Santals, Mundas and Oraons were - 74.81, 77.74 and 83.19 respectivley. Because of unemployment dependency ratio does not provide a clear picture about the economic load factor in most communities. The economic load factor can be expressed from the following relation :

$$\text{Economic Load factor (ELF)} = \frac{\text{Economically inactive population}}{\text{Economically active population}} \times 100$$

Economic load factor of santals, Mundas and Oraons were almost the same as DR. Absence of employment of a large proportion of the population seemed to be the sole reason for a very high DR and ELF among the tribals.

6.4.4 Age-sex structure of tribal population at Hili Block :

Population structure in demography constitutes a central point of analysis; because it defines the limits of reproductive potential of a society on one hand and express past trends in fertility, natality, mortality and migration on the other.

Age-sex structure of a population is usually presentled in bar graphs. The sex wise population structure of the santals, Mundas and Oraons at Hili Block are presented in fig. 6.1, 6.2 & 6.3

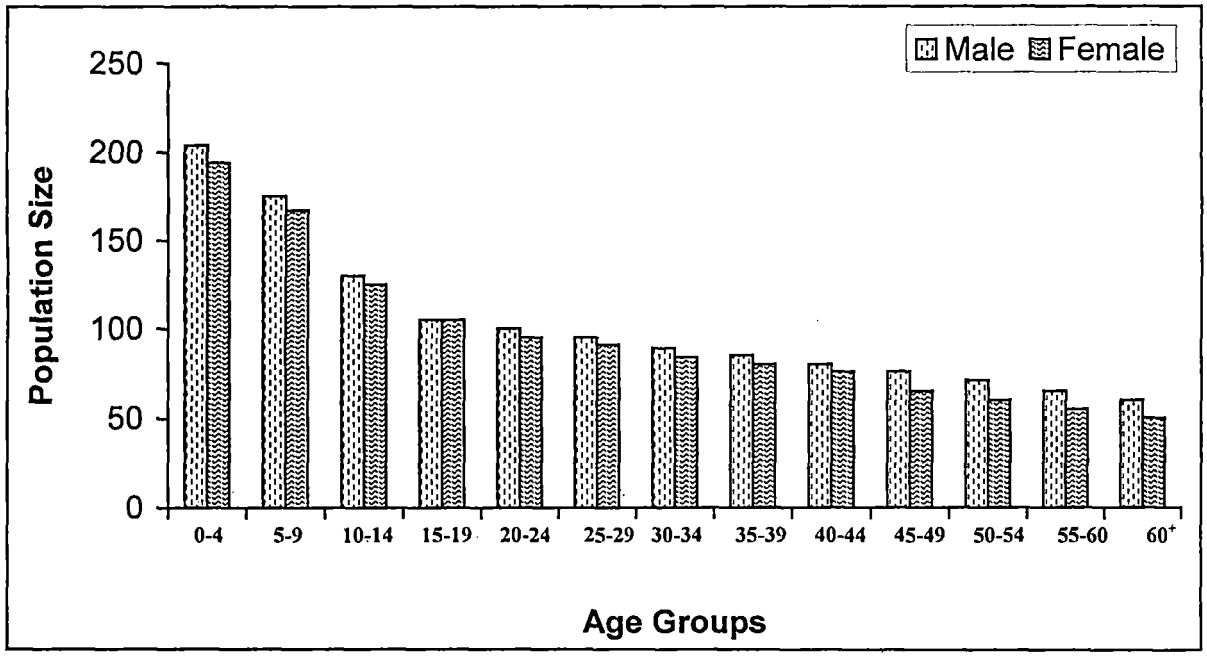


Fig. 6.1 : Population structure of the Santals (Males & Females) in 2000.

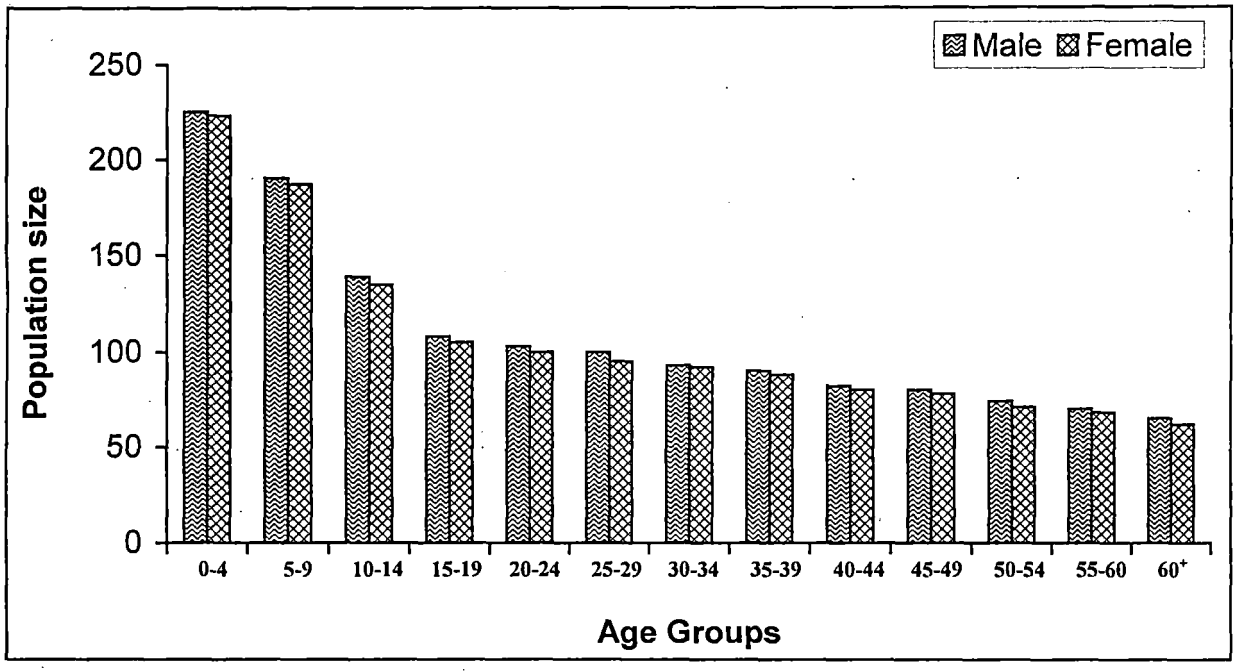


Fig. 6.2 : Population structure of the Mundas (Males & Females) in 2000.

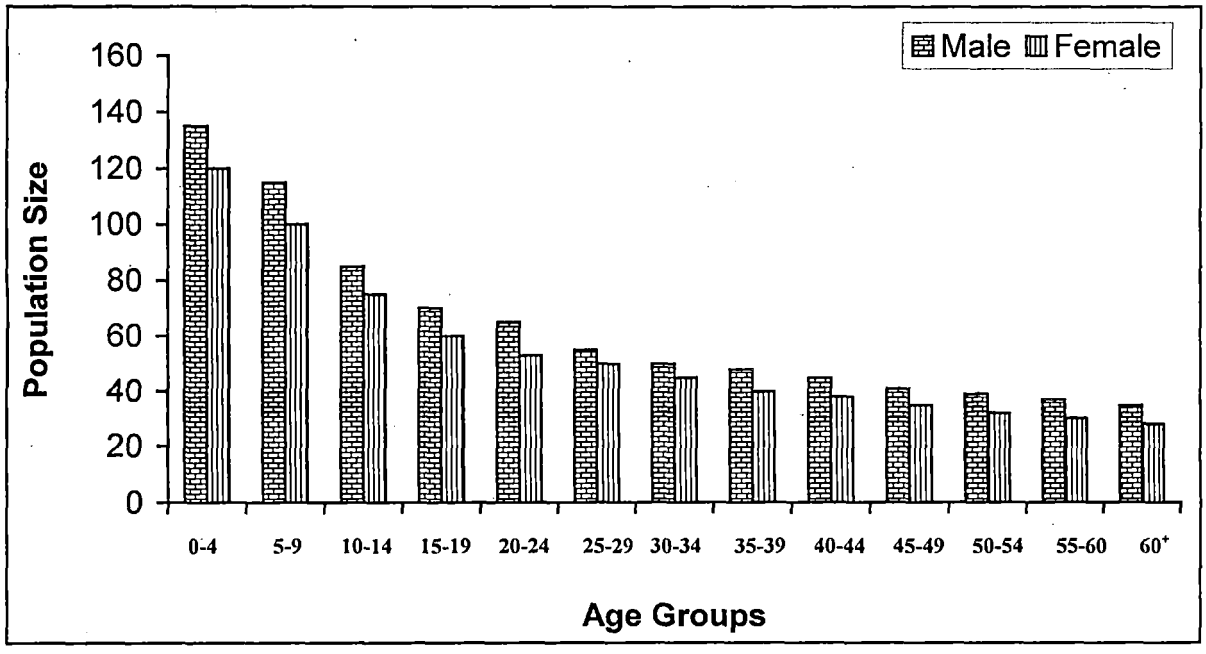


Fig. 6.3 : Population structure of the Oraons (Males & Females) in 2000.

respectively for the year 2000. These represented a stable population in general with proportionately higher distribution in the lower age groups for all the three ethnic communities.

Table - 6.2, 6.3 & 6.4 shows percent distribution of the population in different age-sex classes in the three ethnic communities . Lower percent population in the lower age groups was considerably higher in all the communities. High percentage of population in the lower age groups indicated high fertility among them. In the old age groups (60^+) percent distribution of population was low. Lower percentage of population in the old age groups indicates high mortality rate among them. Moderate percentage of population in the middle age groups coupled with high percentage in the younger age groups is indicative of a growing population.

Table - 6.2 : Percent distribution of Santal population in different Age-sex group in 2000.

Age groups	Male		Female		Total	
	Number	%	Number	%	Number	%
0-4	204	15.28	194	15.56	398	15.41
5-9	175	13.11	167	13.39	342	13.25
10-14	130	9.74	125	10.02	255	9.88
15-19	105	7.87	105	8.42	210	8.13
20-24	100	7.49	95	7.62	195	7.55
25-29	95	7.12	91	7.30	186	7.20
30-34	89	6.67	84	6.74	173	6.70
35-39	85	6.37	80	6.42	165	6.39
40-44	80	5.99	76	6.09	156	6.04
45-49	76	5.69	65	5.21	141	5.46
50-54	71	5.32	60	4.81	131	5.07
55-60	65	4.87	55	4.41	120	4.65
60^+	60	4.49	50	4.01	110	4.26
Total	1335	100	1247	100	2582	100

Table - 6.3 : Percent distribution of Munda Population in different age-sex group in 2000.

Age groups	Male		Female		Total	
	Number	%	Number	%	Number	%
0-4	225	15.86	223	16.11	448	15.98
5-9	190	13.39	187	13.51	377	13.45
10-14	139	9.80	135	9.75	274	9.76
15-19	108	7.61	105	7.59	213	7.60
20-24	103	7.26	100	7.23	203	7.24
25-29	100	7.05	95	6.86	195	6.96
30-34	93	6.55	92	6.65	185	6.60
35-39	90	6.34	88	6.36	178	6.35
40-44	82	5.78	80	5.78	162	5.78
45-49	80	5.64	78	5.64	158	5.64
50-54	74	5.21	71	5.13	145	5.17
55-60	70	4.93	68	4.91	138	4.92
60+	65	4.58	62	4.48	127	4.53
Total	1419	100	1384	100	2803	100

Table 6.4 : percent distribution of Oraon population in different age-sex group in 2000.

Age groups	Male		Female		Total	
	Number	%	Number	%	Number	%
0-4	135	16.46	120	16.99	255	16.71
5-9	115	14.02	100	14.16	215	14.09
10-14	85	10.37	75	10.62	160	10.48
15-19	70	8.54	60	8.50	130	8.52
20-24	65	7.93	53	7.51	118	7.73
25-29	55	6.71	50	7.08	105	6.88
30-34	50	6.10	45	6.37	95	6.23
35-39	48	5.85	40	5.67	88	5.77
40-44	45	5.49	38	5.38	83	5.44
45-49	41	5.00	35	4.96	76	4.98
50-54	39	4.76	32	4.53	71	4.65
55-60	37	4.51	30	4.25	67	4.39
60+	35	4.27	28	3.97	63	4.13
Total	820	100	706	100	1526	100

6.4.5 Sex ratio of Santal, Munda and Oraon:

The sex distribution pattern extends beyond its demographic domain into wider realms of ecological and economical perspectives of a community. Sex ratio measures the balance between males and females in human population. Large imbalances in this aspect affect the ecologic, economic and social statusque of life in many ways. In a population closed to migration, the sex ratio is an indicator of the sex differential in mortality. A higher or lower sex ratio reflect the status of the socio-cultural maternal and child health care programmes existing in the population. Thus it is required to study the sex distribution in different age groups to determine the planning strategies for the well being of a community.

The sex composition of the population in India is found to be favourable to males. Female disadvantage in mortality attributed as the cause for the low sex ratio [females/thousand males over the last 30 year i.e 941 (1961), 930 (1971), 935 (1981), 927 (1991)].

The sex ratios of males /100 females in santal, Munda and Oraon populations belonging to different age groups for the year 2000 at Hili Block are presented in table - 6.5, 6.6 & fig. 6.4. The

sex ratio in all age groups among the santals, Mundas and Oraons were in favour of males. Sex ratios for the broader age groups of santal, Munda and Oraon at the Hili Block; Toto and non Toto at Totopara, Jalpaiguri; Malanesia (a developing region) and Europe (a highly developed region) are shown in table -6.6. In general, among the Santals, Mundas and Oraons, the sex ratio was infavour of males which were close to the Totos and non Totos (Pal & Sinha, 1988).

Table - 6.5 : Sex ratio in different age groups among the santals, Mundas and Oraons:

Status	Age groups in years	Sex Ratio (Male / 100 female)		
		Santal	Munda	Oraon
Infant	0-4	105.15	100.89	112.50
Sub adult	5-19	103.27	102.34	114.89
Adult	20-60	109.08	102.98	117.64
Old	60^{+}	120.00	104.84	125.00
Total	$0\text{-}60^{+}$	107.06	102.53	116.15.

Table - 6.6 : Sex ratio of broad age groups among the Santals, Mundas and Oraous (2000), Malanesia and Europe.

Place	Community	Age groups in years				Source
		0-14	15-60	60^{+}	Total	
Hili Block	Santal	104.73	107.74	120.00	107.06	Present study
	Munda	101.65	102.96	104.84	102.53	Do
	Oraon	113.56	117.49	125.00	116.15	Do
Totopara	Toto	102.40	98.50	122.50	101.10	Pal & Sinha
	Nontoto	105.60	112.80	110.90	107.40	
Malanesia	1965	107.10	*112.30	105.70	109.90	U.N., 1973
Europe (excluding the U.S.S.R),	1965	104.80	*95.30	**66.60	94.10	U.N., 1973

* Sex ratio of 15-64 years age group

** Sex ratio of 65^{+} years age group.

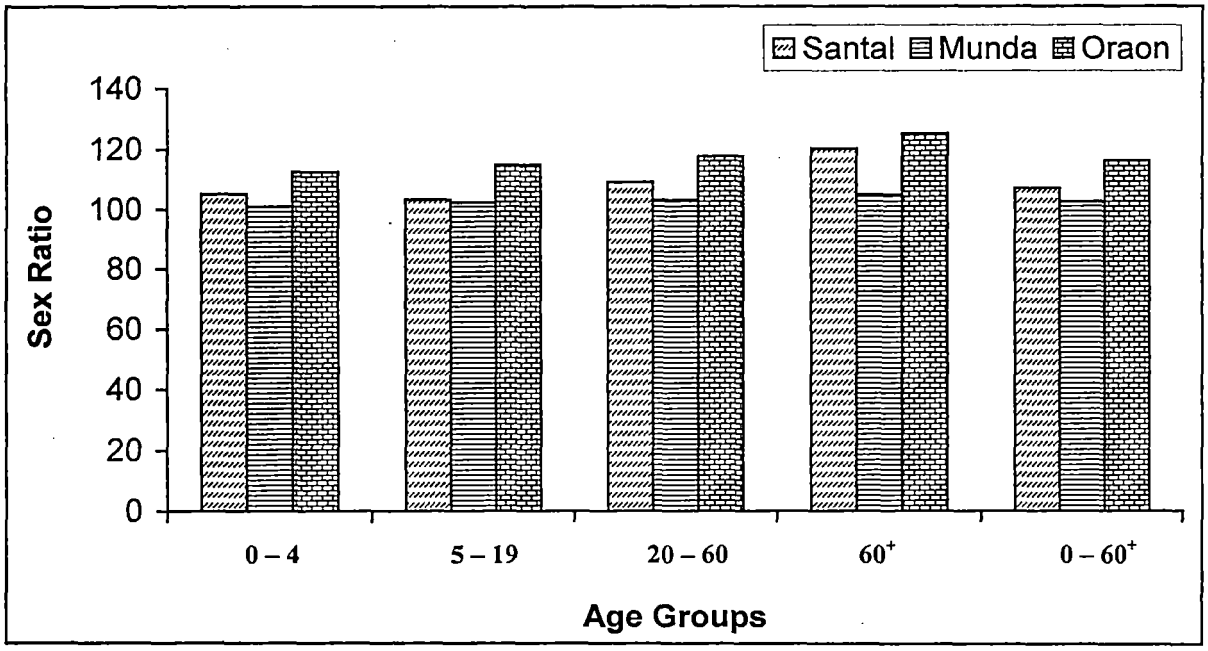


Fig. 6.4 : Sex ratio among the Santals, Mundas and Oraons in 2000.

This trend was similar to those found in case of over all India and Malanesia, a small developing region in Oceania, This was however, did not agree with the trends found in Europe, a highly developed region. In developed regions the sex ratio at birth was usually infavour of males but due ot higher mortality of males in all age groups, the ratio swinged infavour of females with advance in age.

6.4.6 Family structure of Santals, Mundas and Oraons :

The structure and variations in the size of the families and household and the factors affecting them form comparatively a new field of demography. In demography, family is considered to be one of the most important concepts, for it is the family or household and not the individuals which is the unit of statistical enumeration of the study of income maintenance, economic dependency, saving, fertility, migration, social welfare and various other things (U.N., 1973). The development of the ideas pertaining to 'families life cycle' and 'unclearisation' of the families may be described as direct outcomes of studies on the families.

Family is defined by various authors in various ways. Consideration of essential components of a family in the present study may be stated as follows:

(i) a group of social individuals living togather in a common residence.

(ii) having relationship among themselves through socially regulated reproduction and blood.

(iii) Shairing common source of socio economic facilities.

(iv) The association is usually stable (U.N., 1973; Murdock, 1949)

During the course of present study the number of santal, Munda and Oraon families were recorded to be 587, 592 and 324 respectively at the Hili block of the ITDP Mauzas.

Table 6.7 shows the percent distribution of family sizes among the Santals, Munda and Oraon at Hili Block for the year 1995 and 2000. Five categories of family sizes were considered for convenience i.e, 1 member; 2-3 members; 4-5 members, 6-7 members and 8^{+} members units. It is observed that single member families are decreased among the santals, Mundas and Oraons in 2000 in comparison to 1995. Single member families among the tribals were mainly represented by the persons belonging to DWS (divorced widowed and separated) category and a small number were formed primarily by male immigrants from other areas. Recent increase in 2-3 membered families among Mundas and Oraons and 4-5 members families among santals and Oraons in the main reflects the effect of increased growth rate coupled with a traditional custom where by the married children live separately from their parents along with a share of parental property. Of these three communities Oraons are most choiced to shift from large sized family to small sized family due to better handling and management Nowadays . they are trying to follow the family structure of nontribal general ethnic communities. In general, data showed a shift in percent distribution in large sized families i.e, 6-7 membered among all the societies in 2000 from 1995. This situation was probably dictated by socio-economic demand for a large labour force required in agricultural and agricultural gatherer communities. However, in adequate economic resources and land holding, seem to have played an important role in limiting the number of a large membered families more among the tribals. At present the average family size of 4.34; 4.71 and 4.65 among the santals, Mundas and Oraons respectively which were better than the Totos i.e. 6.00 (Pal and Sinha, 1988)

The analysis of family structure of the santals, Mundas and Oraons at Hili block showed that there were -

(i) non-familial or single member unit.
(2) conjugal unit (husband and wife).
(3) elementary family unit (Parent with unmarried children).
(4) extended or patrilocal joint familial unit (parent with married children).
(5) any unit with patri and matrikin's.

Table - 6.7 Percent distribution of different family sizes among the santals, Mundas and Oraons (1995 and 2000).

Ethnic community	Number of members in a family	Year	
S		1995	2000
A	1	4.31	3.41
N	2-3	33.54	28.79
T	4-5	40.57	45.83
A	6-7	18.17	16.18
L	8^{+}	3.41	5.79
Total No. of Family -		552	587
M	1	2.10	2.03
U	2-3	15.35	18.24
N	4-5	45.19	42.40
D	6-7	32.17	30.07
A	8+	5.19	7.26
Total number of family		573	592
O	1	3.21	1.85
R	2-3	24.24	25.30
A	4-5	42.11	49.38
O	6-7	24.23	18.42
N	8+	6.21	5.05
Total no. of family		303	324

Table - 6.8 shows percent distribution of different familial units for the year 1995 to 2000 among the tribal communities at Hili Block. Elementary family type constituted more than half of the total familial units among all of the Santals, Mundas and Oraons. It is cleared that elementary familial units increased remarkably in 2000 at the cost of patrilocal joint familial units.

In 1995 the Santals and Mundas presented exactly opposite picture with regard to percent young conjugal unit. At present the ratio of young and old conjugal units were approximately 1.3:1; 1: 2 and 3:1 among the santals, Mundas and Oraons respectively.

Table - 6.8 Percent distribution of family types among the Santals, Mundas and Oraons. (1995 to 2000)

Community	Year	Non-familial unit		Conjugal unit		Elementary familial	Extended or patrilocal familial	Any units with patri or	Total
		Man	Woman	Young	Old	Unit	Unit	matrikins	
SANTALS	1995	1.52	2.79	7.31	12.74	51.35	20.90	3.39	552
	2000	1.06	2.35	17.06	13.12	47.03	15.07	4.31	587
MUNDAS	1995	0.75	1.35	0.00	13.42	54.13	24.75	5.60	573
	2000	0.95	1.08	6.05	12.01	49.74	23.47	6.70	592
ORAONS	1995	1.20	2.01	11.05	9.80	44.51	22.49	8.94	303
	2000	0.71	1.14	17.15	5.81	52.24	15.76	7.19	324

6.4.6.1 Marital Condition

The Santals, Mundas and Oraons are male dominated endogamous tribal community. In 2000, 587, 592 and 324 families were studied for the santals, Mundas and Oraons respectively. During the course of the present study, it is confirmed that intraclan marraige is not permissible among the three communities. It was observed that the communities encouraged monogamy but polygamy was not prohibited. Though Nika of widows was forbidden, polyandry is forbidden in all the three communities encouraged monogamy but polygamy was not prohibited. Though Nika of widows was forbidden, polyandry if forbidden in all the three communities. It may be mentioned that one could marry after one year from the death of the partner. Marriage between brothers and sisters and cousing were forbidden. Consanguineous marriages are common in the Kota tribes of Nilgiri District. Tamil Nadu, India (Siva kumaran, Karthikeyan, 1997). Exogamy is not practiced by the Santals, Mundas and Oraons though it is practiced among all the subsistence categories of the Gangte, a little known tribe from North east India, Manipur (Heman - Natabar - Shyam - Reddy -B-Mohan, 1998).

6.4.6.1.1 Among the santals :

No santal may marry within his own sept, nor within any of the Sub septs into which the sept is divided. He may marry into any other sept, including the sept to which his mother belonged.

A santal proverb says : no one heeds a cow track or regards his mother's sept. A man may not marry into the sub sept to which his mother belonged, though it is doubtful wheather the santals observe this rule for as many generations in the descending line as is customery.

Pre marietal sex is tacitly recognised, it being understood that if the girl becomes pregnant the young man is bound to marry her. If he refuges to marry her he would be severely beaten by the "Moroles" and in addition his father would be required to pay a heavy fine. Polygamy is not favoured by the custom of the tribe. A man may take a second wife if his first wife is barren, or if his elder brother dies, he may marry the widow. It appears that fraternal polyandry might times have existed among the santals. A man's younger brother may share his wife with impunity; only they must not go about it very openly. Similarly, a wife will allow her younger sister to develope intimate relations with her husband, and if pregnancy occurs scandal is avoided by his marrying the girl as a second wife.

The following forms of marraiges are recognised by the Santals and distinguished by separate names :

(i) Regular marriage (bapla or kiring behu, literally bride-purchase); (ii) Ghardijawae; (iii) Itut; (iv) Nir-bolok; (v) Sanga and (vi) Kiringjawae.

6.4.6.1.2 Among the Mundas :

A Munda may not marry a woman of his own sept. The sept-name goes by the father's side and inter-marriage with persons nearly related through the mother is guarded against. As among the Santals premarietal sex is tacitly recognised, but in all respectable families matches are made by the parents, and the parties themselves have very little say in the matter. The bride-price is still rupees twelve and a low if possible. Sindur-Dan, or the smearing of vermilion on the bride's forehead by the bridegroom and on the bridegroom's forehead by the bride, is the essential and binding portion. Marrying the bride to a Mahua tree and the bridegroom to a mango seems now to have been abandoned. A form of marriage, resembling the Santali nir-bolok still survive among the Mundas. It is called dhuko era, meaning a bride who has entered the household of her own accord.

However the children out of such marriage seem to have an inferior status in respect of their rights to inherit the landed property of their father.

Widows may marry again by the ritual known as sagai, in which Sindur-Dan is performed with the left land. Divorced women are permitted to marry again. In cases of adultery the seducer is required to pay the husband the full amount of the bride-price.

6.4.6.1.3 Among the Oraons :

Infant marriage is entirely unknown among the Oraons. A few fo the wealthier - men, who affect to imitate Hindu customs, have now taken to this practice, and marry their daughters before

they attain puberty. In general however, girls marry only when they are grown up, often following courtship during festivals and social gatherings of various kinds. Sexual intercourse before marriage is tacitly recognised, and is generally practiced.

A girl is usually taken to be a virgin at time of her marriage. sexual morality however, seems to be of little importance among the oraon community. An unmarried woman may bestow her favours according to her sweet will. If, however, she becomes pregnant, arrangements are made to get her married without delay, and she is then expected to lead a virtuous life.

When a young man makes up his mind to marry, his parents or guardians go through a process of bride selection. However the girl they ultimately select is always the one that the groom has already selected. The parents arrange all preliminaries, including the price of the damsel, which is traditionally rupees 125/- and six cloths. A number of visits are exchanged by the negotiators, when all is settled, the bridegroom proceeds with a large party of his friends & relatives to the bride's house. Most of males have war like weapons, real or sham and as they approach the village of the brides family the young men from the bride's family emerge, also armed, as if to repel the invasion and a sham fight ensues, which finally transforms to a pleasant dance. Soon the bride and bridegroom join, each riding on the back of one their friends. A bower is constructed infront of the residence of the bride's father, into which the bride and bridegroom are carried by women. A host of rituals follows. Finally the groom danbs vermelion on the forehead of the bride. The Oraons have no prescribed wedding garments. Nor any special days or seasons for marriages. The ceremony may take place in any month of the year. but the hot, dry months are generally preferred.

Polygamy is permitted among the Oraons and in there is no limit to the number of wives a man may have. This luxury, however, is but little sought after. The majority however content themselves with one. Widows may marry again, and are subject to no restrictions in selecting their second husband.

Divorce is readily effected at the will of either husband or wife. The consent of panchayet is not required. If a woman have children, her husband may be compelled to contribute to their maintenance if he divorces the mother on any ground other than adultery. Similarly, when a wife deserts her husband, her parents may be called upon to repay the bride-price which they received at her marriage. Divorced wife may marry again.

Social norms and customs associated with marriage ceremonies have important bearings on the demographic behaviour of a society.

Percent distribution of marital status of Santals, Mundas and Oraons are shown in table 6.9, 6.10 & 6.11 respectively. Of the 2582 Santals, 2803 Mundas and 1526 Oraons at Hili Block, 38.26%, 37.35%, 40.72% were in unmarried categories, whereas 59.15%, 59.25% and 57.01% belonged to married categories respectively. Percentage of DWS (Divorced - widowed - separated) categories 2.57%, 3.39% and 2.27% respectively. No marriage was reported below 10 years among the Santals, below 12 years among the Mundas, and below 11 years among the oraons. Majority number of males and females (30^+) age groups (18.49% and 16.37%) were married among the Santals.

Table - 6.9 : Percent distribution of marital statusque of 'Santal' males and females in different age groups in 2000.

Age groups	Unmarried			Married			DWS			Total		
	♂	♀	Total	♂	♀	Total	♂	♀	Total	♂	♀	Total
↓15	18.31	12.45	30.76	1.40	6.37	7.77	-	-	-	19.71	18.82	38.53
15-20	2.74	1.99	4.73	2.00	2.60	4.60	0.10	0.21	0.31	4.84	4.80	9.64
20⁺ - 25	0.67	0.41	1.08	2.95	2.96	5.91	0.21	0.27	0.48	3.83	3.64	7.47
25⁺ - 30	0.45	0.24	0.69	2.97	3.04	6.01	0.22	0.32	0.54	3.64	3.60	7.24
30⁺ ↑	0.67	0.33	1.00	18.59	16.37	34.96	0.91	0.73	1.24	19.67	17.43	37.10
Total	22.84	15.42	38.26	27.81	31.34	59.15	1.04	1.53	2.57	51.69	48.29	100.00

Table - 6.10 : Percent distribution of marital statusque of 'Munda' males and females in different age groups in 2000.

Age groups	Unmarried			Married			DWS			Total		
	♂	♀	Total	♂	♀	Total	♂	♀	Total	♂	♀	Total
↓15	18.20	12.05	30.25	1.45	7.12	8.57	0.11	0.27	0.38	19.76	19.44	39.20
15-20	2.35	1.98	4.33	1.93	2.12	4.05	0.29	0.36	0.65	4.57	4.46	9.03
20⁺ - 25	0.69	0.42	1.11	3.27	3.40	6.67	0.32	0.39	0.71	4.28	4.21	8.49
25⁺ - 30	0.41	0.26	0.67	3.45	3.35	6.80	0.35	0.42	0.77	4.21	4.03	8.24
30⁺ ↑	0.68	0.31	0.99	16.75	16.41	33.16	037	0.51	0.88	17.80	17.23	35.03
Total	22.33	15.02	37.35	26.85	32.40	59.25	1.44	1.95	3.39	50.62	49.37	100.00

Table - 6.11 : Percent distribution of marital statusque of 'Oraon' males and females in different age groups in 2000.

Age groups	Unmarried			Married			DWS			Total		
	♂	♀	Total	♂	♀	Total	♂	♀	Total	♂	♀	Total
↓15	20.74	12.37	33.11	1.21	6.96	8.17	-	-	-	21.95	19.33	41.28
15-20	3.18	2.00	5.18	2.16	2.39	4.55	0.10	0.20	0.30	5.44	4.59	10.03
20⁺ - 25	0.63	0.35	0.98	3.37	2.77	6.14	0.13	0.29	0.42	4.13	3.41	7.54
25⁺ - 30	0.31	0.21	0.52	3.00	2.63	5.63	0.23	0.37	0.60	3.54	3.21	6.75
30⁺ ↑	0.62	0.31	0.93	17.60	14.92	62.52	0.45	0.50	0.95	18.67	15.73	34.40
Total	25.45	15.24	40.72	27.34	29.67	57.01	0.91	1.36	2.27	53.73	46.27	100.00

DWS - Divorced - Widowed and separated; - means not available.

Similarly majority males and females of (30^{+}) age groups (16.75% and 16.41%) of Mundas and Majority males and females (17.60% and 14.92%) of oraons of the same age groups were married. Unmarried tribal people are rather common in the middle age group (15-20). Physically and mentally disabled individuals were accounted for must of the aged unmarried tribals.

Percent distribution of males and females in the married category was infavour of the males among the santal's Munda's and Oraon's . Among the Santals, Mundas and Oraons DWS persons were found in the younger age groups, even in the (15-20) years age group also. Early marriage among the tribals accounted for occurence of DWS persons in the younger age groups. Remarriage on the other hand reduced the number of the DWS category.

6.4.6.2 Family life cycle and headship:

The most widely accepted family life cycle is described by Glick and Parke (1965), and is as follows :

(i) Family formation : First marriage.
(ii) Opening of Child bearing : Birth of first child.
(iii) End of child bearing : Birth of last child.
(iv) Empty nest : marriage of last child.
(v) Family dissolution : death of one spouse.

Headship status and dynamics of family life cycle among the three tribal communities were strongly governed by the socio-economic considerations, natality fertility, mortality and life expectancy of the community.

It may be mentioned that the three communities at Hili Block are mostly similar in the basic socio-economic aspects such as : mode of subsistance, age at marriage, immigration, castism, inheritance of parental property and attitude to tradition and modernisation. :

No significant differences were found in family structure of the communities. It is reported that the community had significant differences only, about one or one and half decades ago.

6.4.7 Fertility :

Fertility is one of the most important and complex physiological process ensuring perpituation of species. It is influenced by a multitude of Socio-economic, cultural, genetical, disease and health factors (UN, 1973; Nag 1962; Benedict, 1972). Generally, fertility among the tribals is high and varies from one tribe to another. For example, fertility was twice as high in the developing as in the more developed regions of the world. Though fertility is a biological phenomenon there are a number of factors that influence the levels and differentials of fertility among tribals. Demographers usually measure the fertility differentials by looking at such dimensions as land, income, occupation, education, family type etc., of women. It is understood that some of these variables are not relevant for the tribal population. Because, tribals usually own very meager assets and most of them work in traditional occupations and the majority of them are below the poverty line. When such is the situation, measuring fertility differentials using these variables for tribals may not provide good insights. Cultural practices also important factors in demography of ethnic groups.

According to Mazumdar (1947) economic conditions are largely responsible for these variations. During field studies, he collected information on children ever born and children surviving among six tribes. He estimates high fertility among tribals (for example, Ho 6.2; Oraon 6.0; Kuki 6.5 Khond 7.2; Tara 6.6 and Saora 5.7). Evidences of Verma (1977) obtained high fertility for Santals (6.96) and Birhor (6.33) in Bihar in (45-49) years age groups.

In the present study the fertility rate were 5.3, 6.0 and 5.0 for the Santals. Mundas and Oraons in the 30-45 years are groups. Sekar - A - Chandra; Xaviour -D; Sirajuddin - S.M (1998) Stated that the percentage of fertility component is more than 3 times to that of mortality component among the koraga tribe of Karnataka. The study of the factors associated with fertility assumed great importance in view of achieving optimal growth and development of a society. Various aspects of fertility among the Santals, Mundas and Oraons at Hili Block region are discussed.

Data obtained from interviewing all the heads of the family or their wives at Hili Block. Collection of data were cross checked from several sources. The factors associated with fertility discussed in the portion as follows :

(i) age at puberty.
(ii) age at marriage.
(iii) ratio of married males and females .
(iv) birth rate.
(v) child-women ratio.
(vi) child survival rate.
(vii) total and gross fertility rate
(viii) order of birth, according to the age of mother including foetal wastage.
(ix) seasonality of birth, attitude measures and customs related to fertility.

6.4.7.1 Puberty :

The transitional stage of life characterized by gradual appearance of physical features secondary sexual characters subsequently leading ot adulthood is described as puberty. This period starts by the appearance of the first oestrus or mensturation cycle in the females.Age at menarchae varries according to geographical location, ecological set up, economic and social environment of the community.

Table - 6.12 describes the mean menarcheal age for the three ethnic communities into five different age groups. The menarcheal age is lower in the higher age groups than in the lower for the Santals and Mundas. But in the Oraons opposite picture is obtained. They attain later puberty from the past to present possibly due to malnutrition, different socio-economic and environmental factors lack of conciousness and sexual unawareness etc. A total of 471 Santals, 460 Mundas and 280 Oraon women were considered for this study. No Santal girl had her first period not below the age of eleven and last period within $14^1/_2$ years of age. In Mundas this period started first at the age of $11^1/_2$ year and last period was within $14^1/_2$. But for the Oraons, they had their first period not below the age of twelve years and above up to fifteen years. Fig- 6.5 showed the mean age at menarche among the santals, Mundas and Oraons, Mazumder (1947) started that 78.4% tribal (mainly of North India) girls and 92% among girls of all races in India menarcheal period started between (10-14) years of age which holds good for the Santals, Mundas & Oraons at Hili Block.

Table - 6.12 Showing mean age at puberty in the three ethnic communities (Santal, Munda and Oraon) at Hili Block.

Ethnic	Age groups (in years)				
communities	11-20	20^{+} -30	30^{+}-40	40^{+} - 50	50^{+}
Santal	12.34	12.60	12.78	13.00	13.24
	(112)	(84)	(90)	(85)	(100)
Munda	12.42	12.61	12.79	12.95	13.19
	(100)	(80)	(85)	(95)	(100)
Oraon	13.12	12.96	12.75	12.68	12.53
	(55)	(65)	(60)	(50)	(50)

*Figures in the paranthesis indicate sample size.

Table - 6.13 shows the frequency occurence of Santal, Munda and Oraon girls according to age at menarche. For this specific study a total of 198 santals, 223 Mundas and 75 Oraons women were considered. The mean menarcheal age among the Santals, Mundas and Oraons were 12.65 years (SD = 1.41; co-efficient of varianee i.e. cv = 11.15%) ; 12.72 years (SD= 1.26, CV = 9.91%) and 13.65 years (SD = 0.94; CV = 6.89%) respectively. The Santal, Munda and Oraon societies are significantly differed among themselves on the age of women experiencing their first meanstural period.

Table - 6.13 Distribution of age at puberty among the Santals, Munda and Oraon females (1996-97)

Age of menarche	Frequency of Occurence		
	Santal	Munda	Oraon
10-11	41	37	Nil
12-13	101	125	32
14-15	56	61	43
	$\overline{X}$ = 12.65 SD = 1.41 CV = 11.15	$\overline{X}$= 12.72 SD= 1.26 CV = 9.91	$\overline{X}$= 13.65 SD = 0.94 CV = 6.89

6.4.7.2 Age at marriage : The age at marriage of girl depends on social values. Among the tribals, virginity is not very much valued. Many of the tribal societies were lax towards premarital sex relations which were negotiated or otherwise. Marriage ceremony of these communities consisted of two parts. The first part started as a training in the art of love and sex life and when the couple was allowed to stay together, often ended in marriage (Vidyarthi and Rai, 1977). Girls were given marriage generally when they attain puberty in majority of the tribal societies. Age at marriage of the females strongly influences the levels of fertility. Data from different regions of the world showed that the number of children born were significantly higher in women married at early

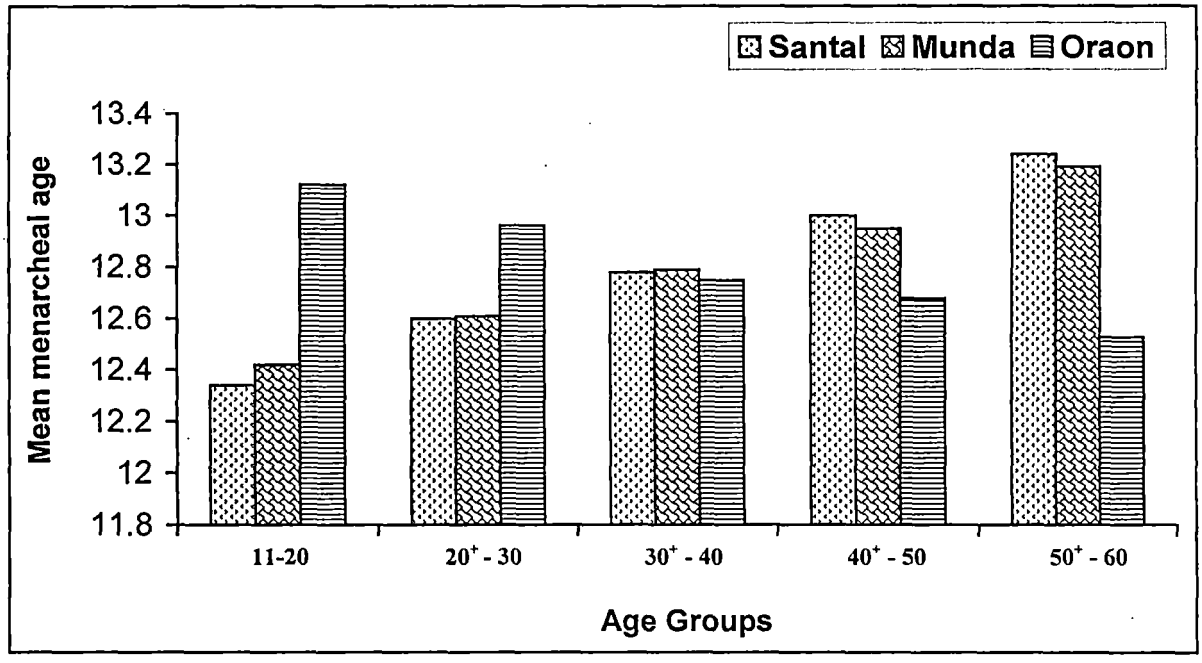


Fig. 6.5 : Illustrates mean menarcheal age among the Santals, Mundas and Oraons at Hili Block.

than late in life (Glass and Grebenik, 1954; UN, 1961).

Age at marriage, here has been used to mean age of socially accepted sexual union between men and women. In 1976, Government of India, increased the age of marriage of girls and boys to 18 and 21 years respectively, as one of the population control policies. However, this limit was not enforced on small ethnic communities.

According to 1971 census at the national level, the age at marriage for tribal women was higher (16.39) than that of the rural women in general (15.39). The mean age at marriage of the tribal females in Assam, Gujarat, Himachal Pradesh, Kerala, Manipur, Meghalaya, Nagaland, Andaman and Nicobar Islands and Arunachal Pradesh was more than 18 years, the highest being in Nagaland (21.33). On the other hand, it was less than 15 years in Rajasthan and Uttar Pradesh, lowest being in Uttar Pradesh (14.50).

There were a few micro-level studies which dealt with the age at marriage of individual tribes i.e. female age at marriage - Ao Naga (16-20 years), Bbil (16 yrs), Chenchu after puberty, Khasi (13-18 yrs), Koli (12-16 yrs.), Bodh (19yrs), Gond (18 yrs), Munda (18 yrs), Oraon (16 yrs) (Sinha, 1986) Mean age at marriage of jaunsads was 12.2 yrs., Dudh Kharias, 21.41 yrs., and santals - 17.87 yrs (Basu, 1993).

In the present study age at first marriage of 202 Santals, 201 Mundas and 150 Oraons women were 18.19, 18.45 and 18.60 yrs respectively which compares well with Basu (1993) and for Totos 16.78 yrs.(Pal & Sinha, 1988).

Highest percentage of marrage occured in the 15 - 20 years age groups for all the three communities. Most mariages occurred in the 15 - 20 yr. group where at least or negligible in the 30^{+} year group. in all communities (Table 6.14).

Table - 6.14 Showing mean age at first marriage in the three ethnic communities at the Hili Block.

Ethnic Commnunities	Age groups in years					
	↓15	15 - 20	20^{+} - 25	25^{+} - 30	30^{+}↑	Total
Santal	13.09 (49) (24.25)	17.91 (109) (53.96)	23.56 (34) (16.83)	27.67 (09) (4.46)	31.00 (01) (0.50)	202
Munda	13.20 (42) (20.90)	17.90 (111) (55.22)	23.29 (38) (18.91)	28.27 (10) (4.98)	Nil	201
Oraon	13.25 (28) (18.67)	17.98 (88) (58.67)	23.38 (27) (18.00)	28.36 (6) (4.00)	35.00 (01) (0.67)	150

*Figures in the parantheses indicate sample size and percentage.

Nowadys, the Oraons are avoid to celebrate the marriage ceremonies of their daughter be-

low 15 years due to late puberty, population control, to aviod foetal wastage and mothers death at the time of child birth.

6.4.7.3 Child woman ratio :

Child woman ratio is described as the number of child present per hundred women of child bearing age. The child-woman ratio is often employed by the demographers as an index of fertility particularly in situations where birth statisties are in adequate. The index can be computed from age-sex distributions of census data by the following formula :

$$\text{Child woman ratio (CWR)} = \frac{Px}{F} \quad x\ 100$$

Here, Px = Number of children in the (0-4) years age groups.
F = Women of child bearing age (14 - 45) years.

There is some hereditory limitations in CWR as it does not make provision for

(i) misstatement of age of both children and women under enumeration.
(ii) mortality either children or women.
(iii) a precise specification of the population that bore the children content in the enumerator.

However, CWR is not one of the most widely used measures to determined the women of child bearing age of small communities confined to small areas where birth statistics were inadequate.

The CWR of Oraon (82.79%) and Munda (74.42%). The CWR of the Santals, Mundas and Oraons can be compared with the Totos at Totopara (82.00% Pal and Sinha 1983) and 70.8% among the Kaoras of West Bengal (Pakrashi and Dasgupta, 1982). One of the main causes for high CWR among the ethnic communities is due to the fact that almost all women in the (15 - 49) years age groups are married.. Table 6.9, 6.10, 6.11 shows 2.97%, 2.97% and 2.87%. unmarried women in the 15-30^{+} years age groups among the Santals, Mundas & Oraons.

6.4.7.4 Crude birth rate (CBR) :

The fertility performances of a woman varies according to age and duration of married life. If the duration of marriage increases 20 years in non-contraceptive communities women may give birth to more children. Generally, fertility is higher among women of the younger age group than in the older ones.

The most common indicator for measuring the fertility in a community is the crude birth rate (CBR), usually represented by the number of live births per 1000 mid year population.

$$\text{i.e, CBR} = \frac{B}{P} \times 1000$$

Here, B = The total number of live births that occus during a ealender year.
P = Total population of a mid calender year.

Table - 6.15 describes the distribution of crude birth rate (CBR) among the Santals, Mundas and Oraons for a period of six years from 1995 to 2000. Data were collected from field

survey during the period 1995 - 2000. Tribal CBR compares well with those of Bihar in 36.1 and 32.0 in West Bengal (Agarwala, 1972) but do not match with those of the developing regions of the world (1965-70) such as 49.0 of Western Africa (U.N.. 1973), the eastern states i.e. 45.5 for Assam, (Agarwala 1972) CBR from 52 to 71 for a culturally transitional hunter gatherer tribe as Bisman Asmat of Papua New Guinea (Van Arsdale, 1978). CBR of rural India declined from 40.4 in 1965-67 to 32.8 in 1969.

Table - 6.15 Crude birth rate among the Santls, Mundas and Oraons at Hili Block from 1995 to 2000.

Year	Crude birth rate (CBR) Per 1000		
	Santal	Munda	Oraon
1995	35.44	36.18	32.28
1996	37.51	36.12	32.35
1997	35.77	36.95	32.98
1998	36.83	36.53	34.22
1999	36.63	36.59	34.78
2000	27.95	37.46	35.39

6.4.7.5 General Fertility Rate (GFR) (2000 - 2001)

Number of births per year per 1000 women of child-bearing ages is reffered to as general fertility rate (GFR) and may be expressed as follows :

$$GFR = \frac{B}{F} \times 1000$$

Here, B = The total number of births that occur during a calender year.

F = The total number of women of child bearing reproductive age.

GFR is one of the most important practices for measuring fertility though it is less precise and have some obvious limitations. The chief virtue of GFR is that it removes from the denominator most of the population that is not directly exposed to child-bearing, female children and women who have passed menopause. On account of this, it is a more important acceptable measure of fertility levels. The practice of using the female population is widely accepted as standard procedure (Bauge, 1971).

The general fertility rate (GFR) of Santals, Mundas and Oraons at Hili block were 180.15, 182.61 and 184.30 per 1000 females of reproductive age respectively (Table 6.16, 6.17 and 6.18) The GFR of West Bengal was 201 and 139 per 1000 of reproductive females for 1967 - 1968 and 1971 respectively and 171.1 for India in 1970 (Mehta, 1978). The GFR among the Santals and Mundas were lower than that of the Oraons. The GFR or Oraons cand be comparable with West

Bengal in 1967. The GFR of Oraons is higher than the non-Totos (121.10) but is lower than the Totos (233.7 : Pal and Sinha, 1988)

6.4.7.6 Age specific fertility rate (ASFR) :

The frequency of child bearing of women within a population remarkably varied from one age group to another. The schedule of age specific fertility rate at a given period provides more precise important information about the child bearing activity of a population. Usually it is calculated for the whole reproductive age of females i.e, 15 to 49 years divided into five (5) years age intervals. Bauge (1971) concluded that the shape of the age specific fertility curve is determined by collective interaction of a definite set factors such as :

(i) The distribution of age at marriage.
(ii) The proportion of women of each age who were co-habiting either with or outside marriage.
(iii) The distribution of sterility and subnormal fecundity by age.
(iv) The distribution of age and birth order with regard to use of birth control.

The difference in these factors must be understood interms of fertility with in a population . Age specific fertility rate is calculated as follows :

$$nfx = \frac{nBx}{nFx} \times K \; [K = 1.0422222]$$

Where, nfx is age specific fertility rate of females aged x to x + n years.
nFx is the number of females aged x to x + n year.

nBx is the number of births to females aged x to x + n years during a calender year.
K is a constant.

Table - 6.16 Age specific fertility among the Santals (2000- 2001)

Age of women in years	Total number of mother in this group	Total no. of births in this group	Average No. of birth per women in 12 months proceeding the survey	adjusted age specific fertility rate
15-20	124	28	0.226	0.236
20^{+} - 25	94	20	0.213	0.222
25^{+} -30	89	15	0.169	0.176
30^{+} - 35	84	14	0.167	0.174
35^{+} - 40	79	12	0.152	0.158
40^{+} - 45	74	09	0.122	0.127
45^{+} - 50	-	-	-	-

The general fertility rate (GFR) is calculated per 1000 to be 180.15 for the Santals. From age specific fertility rate; total fertility rate is obtained as 5.47 and gross reproductive rate (GRR) as 2.68.

Table - 6.17 Age specific fertility among the Mundas (2000-2001)

Age of women in years	Total number of mothers in this group	Total no. of births in this group	Average No. of birth per women in 12 months proceeding the survey	Adjusted age specific fertility rate
15-20	125	30	0.240	0.250
20^{+} -25	99	24	0.242	0.252
25^{+} - 30	94	18	0.191	0.199
30^{+} - 35	91	15	0.165	0.172
35^{+} - 40	87	11	0.126	0.131
40^{+} - 45	79	7	0.089	0.093
45^{+} - 49	-	-	-	-

The general fertility rate (GFR) is calculated per 1000 as 182.61 for the Mundas. From age specific fertility total fertility rate is obtained as 5.49 and gross reproductive rate (GRR) as 2.67.

Table - 6.18 age specific fertility among the Oraons (2000-2001)

Age of women in years	Total number of mothers in this group	Total no. of births in this group	Average No. of birth per women in 12 months proceeding the survey	Adjusted age specific fertility rate
15 - 20	70	17	0.243	0.253
20^{+}-25	53	12	0.226	0.236
25^{+} - 30	49	11	0.224	0.233
30^{+} - 35	44	06	0.136	0.142
35^{+} - 40	39	05	0.128	0.133
40^{+} - 45	38	03	0.079	0.082
45^{+} - 49	-	-	-	-

The General fertility rate (GFR) is calculated per 1000 as 184.30 for the Oraons. From age specific fertility total fertility rate is obtained as 5.40 and gross reproductive rate (GRR) as 2.80.

The tables 6.16, 6.17 & 6.18 shows the current and adjusted age specific fertility rate per santal, Munda and Oraon women of reproductive age at the Hili Block for the year 2000-2001. Adjustment of age specific fertility rate was done by using the factor P3/F3 through current age specific fertility following demeny (1971). The table 6.16 shows that the most potentially fertile group among the Santals is (15-20) years age group and then fertility started to decline. Table 6.17 described for the Mundas at Hili block that the maximum fertility potential group was 20^{+} - 25 and the fertility started to decline after that age group. The table 6.18 showed that the most potentially fertile group for the Oraons were (15-20) and then fertility started to decrease the fig. 6.6 showed the trends of age specific fertility among the Santals, Mundas and Oraons at the Hili Block region. Higher fertility in the (15-25) age groups onwards was similar to that of south European migrants in Australea, which Cladwell et.al. (1973) and Yusuf and Eckstein (1980) described to the use of less efficient contraceptive methods.

6.4.7.7 Total fertility rate (TFR) :

Total fertility rate (TFR) presents the overall measure of fertility obtained by summing the age specific fertility rates for each year of the child bearing period of women. It provides the number of children per women would bear during their life spans if they were to bear children through out their lives at the rates specified by the schedule of age specific fertility rates for a particular year. A similar measure i.e. the gross reproductive rate (GRR) is identical to TFR except that it refers to female births only which is described by some Demographers. Emperically TFR may be represented as follows:

$$TFR = n \sum_{W_1}^{W_2} Fix$$

Where, $n \sum_{W_1}^{W_2}$ = The sum of age specific fertility rate.

fix = the lower and upper age limits of the female reproductive period W_1 and W_2 i.e., 15 - 49, and

n = the age interval i.e., 5.

The Gross reproductive rate (GRR) may be emperically expressed as follows :

$$GRR = \frac{f_x}{B_x} \times nf_x$$

Where, f_x = the total number of female births that occur during a calender year.
B_x = the total number of births during the same year.
nf_x = the total fertility rate of women aged x to x + n years.

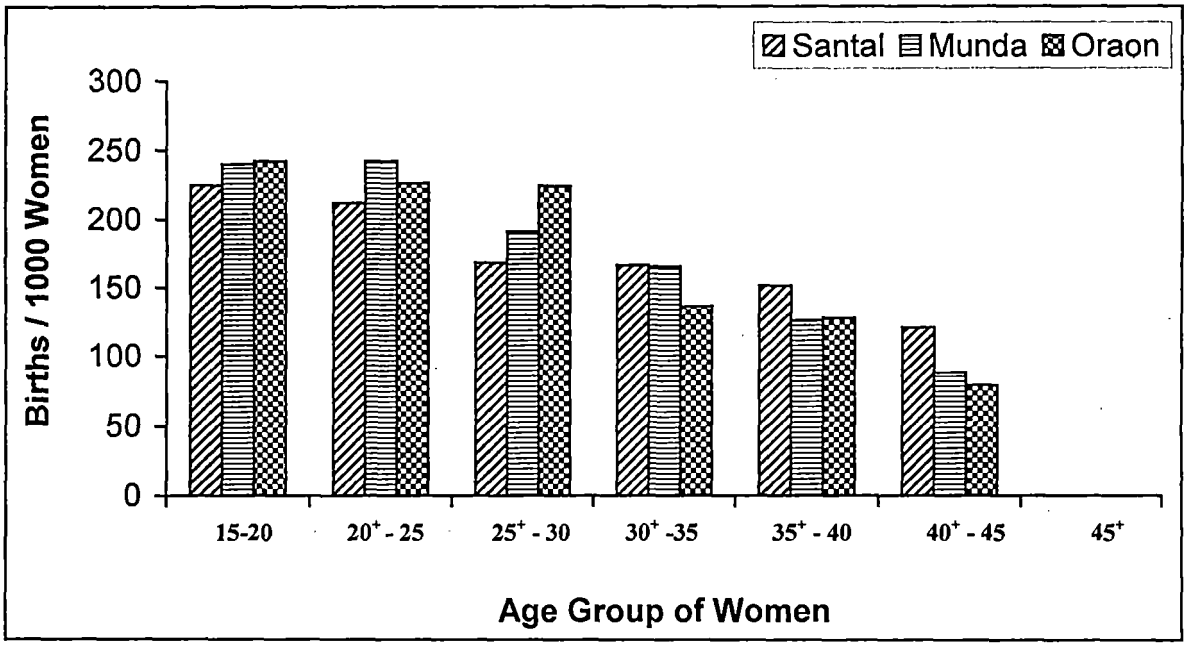


Fig. 6.6 : Age specific fertility among the Santals, Mundas and Oraons at Hili Block (2000-2001)

The total fertility rate (TFR) and gross reproductive rate (GRR) of the Santals were calculated from the adjusted age specific fertility (Table - 5.18, 5.19 and 5.20) and the calculated TFR and GRR were 5.47 and 2.68 respectively for 2000-2001. TFR of the Mundas and Oraons were 5.49 and 5.40 where as the GRR were 2.67 and 2.80 respectively for the same period. The value of TFR of the tribals were more or less parallel and can be compared to 4.42 of West Bengal, 5.53 of India in 1970 (Mehta, 1978) but lower than the Totos (8.45) in 1981-1982 (Pal and Sinha - 1988). The TFR values of the Santals, Mundas and Oraons were lower than 6.28 for the Namasudras, (Basu et.al.,1980; Mukhopadhyay, 1981). Similarly GRR of the tribals were also similar but lower than the Totos [(4.38) Pal and Sinha - 1988]. The number of children born alive per women in agricultural communities in India varied from 4.9 (Driver -1963) 5.0 -5.6 (United Nation, 1961) to 7.1 and 7.38 (Saxena, 1959 and Agarwala, 1972) Coale (1974) reported that no definite sizable population was observed with total fertility greater than 8 births pre women.

6.4.7.8 Children Even-born and Survive:

Marriage was common and almost ubiquitous among was the Santal, Munda and Oraon communities. The divorced - widowed - separted i.e the DWS persons get married at the earliest opportunity. All female spouses were considered here as ever married women. The number of children everborn to ever married women were rerecorded irrespective of the number of marriages.

The table 6.19 shows the average number fo children everborn per ever married Santal, Munda and Oraon women at the Hili Block. Substantially, the average number of live births in the 25 yrs, and below age groups among Santal, Munda and Oraon females more or less similar but in the 45^+ years age group the said number was higher among the Mundas. This indicated that the average size of family of completed fertility were similar for all of the three communities.

Table : 6.19 Average number of Children ever born per even married woman 2000-2001.

Age of women in years	Total number of women surveyed	Average number of children women	Average number surviving Children per women
Santal:			
25	51	0.88	0.82
25^+ - 35	48	3.58	3.50
35^+ - 45	40	5.20	4.98
45^+	31	6.06	5.70
All ages	170	3.61	3.44
Munda :			
25	55	0.96	0.87
25^+ - 35	49	3.63	3.55
35^+ - 45	42	5.24	4.98
45^+	29	7.00	6.48
All ages	175	3.74	3.54
Oraon :			
25	48	0.77	0.71
25^+ - 35	40	3.13	3.03
35^+- 45	35	5.43	5.14
45^+	27	5.67	5.44
All ages	150	3.37	3.21

6.4.8 Pregnancy, births, conception and family planning

Pregnancy order indicates the level of fertility. A higher proportion of low order and high order births in a population with uncontrolled fertility indicate lower and higher fertility respectively. It is observed that there are some differences in first three order of births between rural and urban areas, and on average about 20% of all births in India are of sixth and higher order (Agarwala, 1972; Mosher, 1979; Kramer, 1987; and Park, 1997). Nowadays, family planning methods ae accepted slowly in the tribal communities in India and it is also in practice among the santals, Mundas and Oraons of the Study area. Lack of knowledge of contraceptive methods can be a major obstacle to their use. We obtained information on awareness and use of contraceptive methods by asking each respondent.

Table 6.20 shows that percent females completing their 1st order of pregnancy up to 20 years age group were lower among the Oraons (13.44%) than the Santals (14.98%) and Mundas (17.21%). Fig - 1 showed the distribution of pregnancy by pregnancy order among the three ethnic communities.

Table - 6.20 Distribution of Santal, Munda and Oraon Mothers completed pregnancy up to 2001, by pregnancy order and age.

Community	Ageof mothers (in yrs.)	No of female in order of pregnancy				Total
		1	2-3	4-5	6+	
SANTALS	20 & below	29 (5.87)	05 (1.01)	-	-	34 (6.88)
	20+-30	45 (9.11)	65 (13.16)	49 (9.92)	11 (2.23)	170 (34.42)
	30+ - 40	-	04 (0.81)	32 (6.48)	115 (23.28)	151 (30.57)
	40+ & above	-	-	41 (8.30)	98 (19.84)	139 (28.14)
	All ages	74 (14.98)	74 (14.98)	122 (24.70)	224 (45.35)	494 (100.01)
MUNDAS	20 & below	41 (7.93)	02 (0.39)	-	-	43 (8.32)
	20+ - 30	48 (9.28)	65 (12.57)	61 (11.80)	15 (2.90)	189 (36.56)
	30+-40	-	-	30 (5.80)	95 (18.38)	125 (24.18)
	40+ & above	-	-	45 (8.70)	115 (22.24)	160 (30.95)
	All ages	89 (17.21)	67 (12.96)	136 (26.31)	225 (43.52)	517 (100.00)

Contd. Table - 6.20

Community	Ageof mother (in yrs.)	No of female in order of pregnancy				Total
		1	2-3	4-5	6^+	
O	20 and	16	-	-	-	16
R	below	(4.78)				(4.78)
A	20^+ - 30	27	37	20	10	94
O		(8.06)	(11.04)	(5.97)	(2.99)	(28.06)
N	30^+ - 40	-	10	30	57	97
			(2.99)	(8.96)	(17.01)	(28.96)
	40^+ and	02	10	37	79	128
	above	(0.60)	(2.99)	(11.04)	(23.58)	(38.21)
	All	45	57	87	146	335
	ages	(13.44)	(17.02)	(25.97)	(43.58)	(100.00)

Figures in the parantheses indicate %

6.4.9 Seasonality of birth :

Seasonality of birth among humans has received less than expected attention from demographers. Guha (1997) documented demographic significance of these seasonal patterns. Interest about seasonal pattern of human births in more than a century and half old (Heape, 1909; Westermarc, 1922). Recent studies indicate that seasonality fo birth is substantially influenced by a broad based ecological background comprising of a complex mosaic of environmental, physiological and cutural variables (Gunn, 1992; Gerocia- Mora, C. 2000). This include temperature in the month of conception (Takahashi, 1964; stoeckel and Choudhury, 1972), heatstress, protein deficiency and poor nutrition during the warm months (Pasamanik et. al., 1959; Mc Donald, 1966; Malina and Himes, 1977; Wrigley et. al., 1997), cultural factors such as religions festivals (Takahashi, 1964; Johnson et. al. , 1975) and seasonal availability of food supply (Susheela et. al. 1991, Kishor et. al., 1999) Under nourished women tend to deliver low birth weight babies (Kramer, 1987) Women among less privileged communities in India era malnourished (Samuel and Rao, 1992) and their dietary energy intake is not adequate to compensate their heavy physical work load (Chatterjee and Lambert, 1990) Mosher (1979) from his studies on a fishing community in Taiwan claimed that the annual cycle of production was linked to conception through the intervening variable of diet particularly in populations where diet significantly varried in different seasons.

Table - 6.21 shows the number of births among santals, Mundas and Oraons according to different seasons. as well as months of the year for a seven years period starting from 1995 to 2001. Data is cross-checked with reference to the names of the children, their date of births and major events of the community from their parents and relatives and other sources where ever possible.

There were altogether 417, 436 and 266 live births among the Santals, Mundas and Oraons respectively. Percent births was highest in the winter months i.e November to February for Santal

47.00%, Munda - 47.24% & Oraon 51.12%. Highest live births of the Santals was 14.15% (in December), of the Mundas was 13.76% (in January) and of the Oraons was 17.29% in December. Birth rate gradually increased from summer to winter among the three communities. Incidence of births in different months of the year from 1995 to 2001 among the Santals, Mundas and Oraons in shown in fig - A.

Table - 6.21 Births according to different seasons / months of the year from 1995 to 2001 among the Santals, Mundas and Oraons.

Ave. Temp. ^{0}C	Ave. Rain fall m.m.	Season	Months	No. of Births					
				Santal		Munda		Oraon	
				No.	%	No.	%	No	%
25.09^{0}C	114.97	Summer	March	22	5.28	20	4.59	14	5.26
			April	23	5.52	24	5.51	15	5.64
			May	21	5.04	25	5.73	15	5.64
			June	27	6.47	24	5.51	14	5.26
			Total	93	22.31	93	21.34	58	21.80
26.41^{0}C	343.97	Rainy	July	25	6.00	24	5.51	15	5.64
			August	31	7.43	35	8.03	15	5.64
			September	35	8.39	39	8.94	19	7.14
			October	37	8.87	39	8.94	23	8.66
			Total	128	30.69	137	31.42	72	27.08
16.24^{0}C	32.36	Winter	November	52	12.47	55	12.61	36	13.53
			December	59	14.15	51	11.70	46	17.29
			January	49	11.75	60	13.76	31	11.65
			February	36	8.63	40	9.17	23	8.65
			Total	196	47.00	206	47.24	136	51.12

6.4.10 Seasonality of conception :

Conceptions appeared to be influenced not by and single factor but by a combination of several factors. Pandey (1994) considered sociological and biological explanations and concluded that "the seasonal component in human reproduction is based on biological factors." Of the high conception months, January and February was related to good nutritional period and frequency of social ceremonies; March and April was related to moderate environment and high frequency of social ceremonies; May was related to good nutritional period; July to December were related to slack period alone.

As described earlier as a agriculturer gatherer community the Santals, Mundas and Oraons mainly depend on the cultivation of paddy, wheat, and other cereals besides some other food items. They partly depend on fishing and hunting. Actually, the social and economic activities of the tribals were mainly settlement based, planting, harvesting and forest gathering constituted their sustenance

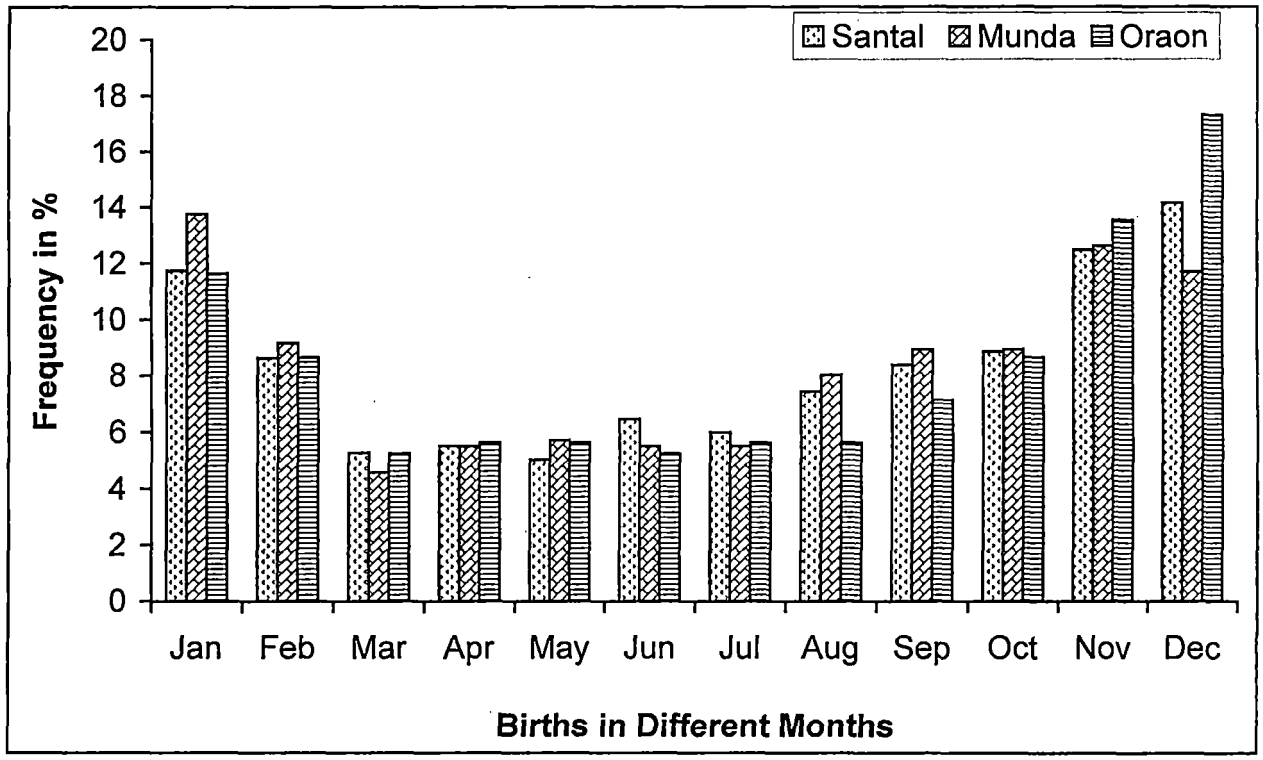


Fig.A : Births in different months of the year from 1995 to 2001 among the Santals, Mundas and Oraons.

activities and subsequent availability of the items determined their nutritional status. Scheduling of social and religious cermonies also corelated considerably with harvesting periods particularly with the autumn crops. The whole panorama, however, is effectly influenced by basic environmental factors such as temperatiure rainfall and humidity. Rank order co-rrelation co-efficients between monthly conceptions and monthly humidity (Kendall'stan = -0.380), average rainfall (Kendall'stan = -0.563) and average temperature (Kendall'stan = -0.584) suggested significant relation with the climatic conditions. Business transactions and communication with outside were conducted mostly during moderate environmental regimes because of convenience.

Mosher (1979) reported that seasonality of conception depended mainly on :
(i) geographical location i.e. more in areas where extremes of environmental variations prevail.
(ii) availability of nutrition is higher where food resource varied widely in different seasons.
(iii) Cultural stimuli is more effective where seasonal pattern of coital frequency occured due to cultural stimuli (Such as religions, seasonal migration and seasons of marriage).

(iv) Rosenberg (1966) was of opinion that socio-economic factors in a way acted to filter out the soical, behavioural and Physiological consequences of seasonal changes of births and conceptions. This appeared to be the case among the Santals, Mundas and Oraons.

Now, it was difficult to pin point to any single factor to be responsible for higher conception among the three ethnic communities but the environmental factors seems to have an edge over other factors. The action, however, may not be direct but rather through other factors associated with the environment.

Table - 6.22, 6.23 & 6.24 summerized the results of interviews regarding the attitude of Santal, Munda and Oraon married males and females separately belonging to younger (below 25 years), middle younger (25-40 yrs.) and older age groups (above 40 yrs.) regarding their family size and sex life. Here, most Santals and Mundas were infavour of unlimited families, whereas most Oraons favoured the limited families. A portion of both sexes of Santals, Mundas and Oraons believed that excessive sex was harmful for health. Only a few indulged having sex within a weeks before and after parturition.

6.4.11 Contraceptive use and family planning :

The increasing prevalence of contraceptive use among uneducated women in South Asia has recently attracted attention (Cleland et. al., 1994; kishor, 1994; Cladwell et. al., 1999). The concealment of induced abortions can lead to an erroneous conclusion about the role of contraceptive use or other proximate determinants of the changes in fertility. Recently some tribals (Santals, Mundas and Oraons) particularly those belonging to the younger age groups (below 25 yrs.) were becoming incusitive regarding conventional contraceptive practices. Here 578 couples of Santals, 536 of Mundas, 294 Oraons and 421 of nontribals of the Hili Block were interviewed regarding the use of contraceptives (Table - 6.25)

Table 6.25 shows that a large proportion of couples about 60-70% did not use any contra-

Table - 6.22 Attitude towords family size and sex life of Santals.

Favouring					Sexual activity				
Age group	Sex	Number favouring unlimited family	Number favouring limited family	Responded %	Excessive sex harmfum	Sex within 2-3 days before delivery	Sex within a week after delivery	Responded %	Sample size
↓25	♂	15	12	72.97	08	02.	02	32.43	37
	♀	11	04	60.00	02	-	-	8.00	25
25-40	♂	40	05	71.43	22	13	07	66.67	63
	♀	37	04	54.67	19	07	-	34.67	75
40+	♂	77	-	77.00	15	10	11	36.00	100
	♀	28	-	28.00	16	03	-	19.00	100

Table - 6.23 Attitude towords family size and sex life of Mundas.

Favouring					Sexual activity				
Age group	Sex	Number favouring unlimited family	Number favouring limited family	Responded %	Excessive sex harmfum	Sex within 2-3 days before delivery	Sex within a week after delivery	Responded %	Sample size
↓25	♂	25	09	97.14	05	03	02	28.57	35
	♀	19	04	74.19	02	02	-	12.90	31
25-40	♂	36	26	95.38	15	18	10	66.15	65
	♀	36	10	66.67	09	07	03	27.54	69
40+	♂	67	-	67.00	29	15	14	58.00	100
	♀	27	-	27.00	20	05	-	25.00	100

Table - 6.24 Attitude towords family size and sex life of Oraons.

Favouring					Sexual activity				
Age group	Sex	Number favouring unlimited family	Number favouring limited family	Responded %	Excessive sex harmfum	Sex within 2-3 days before delivery	Sex within a week after delivery	Responded %	Sample size
↓25	♂	04	13	94.44	04	02	01	38.89	18
	♀	02	11	76.47	03	01	-	23.53	17
25-40	♂	05	23	87.50	16	06	05	84.38	32
	♀	04	17	63.64	12	02	-	42.42	33
40+	♂	40	19	59.00	27	06	07	40.00	100
	♀	11	15	26.00	15	-	-	15.00	100

ceptive devices. Women in all three communities used more contraceptive devices than their male counterparts. It is interesting to note that more ethnic people depend on Government Hospital facilities in regard to birth control than traditional herbal medicine.

Further it may be stated that more and more tribal women are accepting pills as birth prevention measures particularly the below 40 year group. Of the three communities the Santals till use herbal medicine as temporary birth prevention methods.

Table - 6.25 Family plannings of Santals, Mundas, Oraons and nontribals of Hili Block.

Community	Age group	Sex	Use of contraceptive					No. of couples without any protection	No. of Couples studied
			Permanent sterilization		Temporary methods				
			Herbal	Inhospital	Pills	Condoms	Herbal		
SANTALS	Below 40 yrs	male	-	01 (1.11)	-	05 (5.56)	04 (4.44)	190 (67.86)	280
		Female	04 (4.44)	28 (31.11)	27 (30.00)	-	21 (23.33)		
	above 40 yrs	male	-	01 (0.82)	-	-	06 (4.92)	176 (59.06)	298
		Female	20 (16.39)	65 (53.28)	03 (2.46)	-	27 (22.13)		
MUNDAS	Below 40 yrs	male	-	04 (5.41)	-	-	03 (4.05)	166 (69.17)	240
		Female	03 (4.05)	30 (40.54)	19 (25.68)	-	15 (20.27)		
	above 40 yrs	male	-	04 (3.81)	-	-	-	191 (64.53)	296
		Female	11 (10.48)	76 (72.38)	08 (7.62)	-	06 (5.71)		
ORAONS	below 40 yrs	male	-	-	-	05 (11.63)	-	85 (66.41)	128
		Female	01 (2.33)	19 (44.19)	12 (27.91)	-	06 (13.95)		
	above 40 yrs	male	-	02 (3.85)	-	-	-	114 (68.67)	166
		Female	04 (7.69)	44 (84.62)	-	-	02 (3.85)		
NONTRIBALS	below 40 yrs	male	-	02 (1.31)	-	23 (15.03)	-	47 (23.50)	200
		Female	02 (1.31)	17 (11.11)	109 (71.34)	-	-		
	abvoe 40 yrs	male	-	05 (5.62)	-	04 (4.49)	-	132 (59.73)	221
		Female	07 (7.87)	60 (67.42)	13 (14.61)	-	-		

6.4.12 Mortality trends among the Santal, Munda and Oraon Communities:-

Demographic theory has developed in response to dramatic changes in mortality and fertility in the recent past which is called demographic transitions (Wilson and Airey, 1999). Mortality is one of the most important demographic trait that affects population structure, fertility, growth and various socio-economic variables. It is studied in relation to marital status (Spiegelman, 1960; Benjamin, 1964; Fox and Goldblatt, 1978), in relation to sex (Madigan, 1957; Myrdal, 1968; Bauge, 1969), in relation to food habits (Beaver, 1973), in relation to health, disease and sanitary conditions (Gillbert, 1958; Mc.Keown, 1962 ; Benjamin , 1964; Woods, 1978; Wilson, 1991; Rangneker and Darbari, 1993; Tanuja et.al., 1995; Mondal, 1997).

Recent population explosion in most developing countries is attributed to decline in mortality accompanied by unabated fertility. Ethnic differences are common in mortality. Mortality variation among the ethnic communities mainly reflects differences in socio-economic status and available health facilities (U.N., 1973). Kark and Chesler (1956) claimed biological and cultural factors to be responsible for significantly lower neonatal mortality among the Hindu and Zulu communities. Embryonic mortality is ratter small for the tribals in India. It was 0.002 in Bhatra to 0.11 among the Totos, the Oraons also showed a lower range. (Das, 1997).

Anaemia during pregnancy increases the risk of high maternal and foetal mortality, morbidity, low birth weight and many other health problems (Jackson and Latham, 1982; Edmundson and Edmundson, 1992; Steer et.al., 1995; Mondal, 1997; Park, 1997). In India, 20-40% of maternal deaths are due to anaemia (Rushwan, 1994) of the 52% anaemia pregnant mothers globally. 90% reside in developing countries and at present at least 50% pregnant women in India are anaemic (Editorial note of Indian J. Pub. Hlth, 1999). Over the last few years there has been an enormous increase in research dealing with infant and child mortality, morbidity, reproductive wastage etc. in both the tribal and non tribal populations of North East India (Barua, 1982; Khongsdier, 1995; Pathak and Mondal, 1999; Mondal, 2000). Iron and folic acid deficiency singly or in combination is a common cause of anaemia inducing large scale mortality of pregnant mother (Rushwan, 1994; Sing et.al.,1998; Agarwala et.al., 1999).

6.4.12.1 Crude death rate (CDR):

Table 6.26 describes the crude death rate (CDR) per thousand of Santals, Mundas and Oraons from 1995 to 2001. CDR is comparatively low among the Mundas and fluctuates considerably among the Mundas and Oraons in comparison to the Santals where the range of fluctuation is much smaller than the other two communities. The moving average of 3 years CDR did not show a trend of decline in mortality from upwords to downwords for the communities. Comparatively, low death reate was found in 1997. and 1998 in all communities. High death rate in the year 2001 occured due to an outbreak of gastroenteritis epidemic at the Hili Block.

Table : 6.26 Crude Death Rate (CDR) of the Santals, Mundas and Oraons from 1995-2001

Community	Year	Crude death rate per 1000	Moving average of 3 years
S	1995	9.19	-
A	1996	10.26	-
N	1997	11.28	10.24
T	1998	9.11	10.22
A	1999	9.41	9.93
L	2000	10.46	9.66
	2001	11.53	10.47
M	1995	10.43	-
U	1996	11.51	-
N	1997	6.00	9.31
D	1998	4.43	7.31
A	1999	8.25	6.23
	2000	12.49	8.39
	2001	11.30	10.68
O	1995	14.71	-
R	1996	11.74	-
A	1997	8.80	11.75
O	1998	9.38	9.97
N	1999	11.95	10.04
	2000	15.07	12.13
	2001	16.23	14.42

High CDR experienced by the Oraons in 2001 (16.23) is comparable to 16.7 for Senegal in 1960-61, and 17.6 for the Totos at Totopara, in the year 1980-81 (Pal and Sinha, 1983) and 18.0 for Vietnam, in 1960 (UN, 1967, Van Arsdale, 1978).

6.4.12.2 Age Specific Death Rate :

Actual number of deaths experienced by different age groups of from 1995 to 2001 is shown in table - 6.27. A total of 179, 175, and 131 among Santals, Mundas and Oraons respectively during the last seven years were considered. Maximum and minimum mortality was recorded for the age groups 0-4 and 15-21 in all three communities. Mortality pattern were similar in the communities at Hili Block.

Table - 6.27 Deaths in different age groups among the Santals, Mundas and Oraons from 1995 to 2001.

Ethnic groups	Year	Age groups in years						Total
		0-4	4⁺-15	15⁺-↓21	21-40	40⁺-55	55⁺↑	
S	1995	09	02	-	01	03	07	22
A	1996	12	-	01	01	02	09	25
N	1997	15	03	01	02	-	07	28
T	1998	10	03	01	-	03	06	23
A	1999	09	02	02	01	02	08	24
L	2000	14	-	01	04	01	07	27
	2001	11	03	-	02	04	10	30
	Total	80 (44.69)	13 (7.26)	06 (3.35)	11 (6.15)	15 (8.38)	54 (30.17)	179
M	1995	11	02	01	03	03	07	27
U	1996	14	03	-	-	04	09	30
N	1997	07	-	01	02	01	05	16
D	1998	05	01	-	-	03	03	12
A	1999	10	02	-	01	04	06	23
	2000	15	01	01	01	04	13	35
	2001	12	02	02	01	03	12	32
	Total	74 (42.29)	11 (6.29)	05 (2.86)	08 (4.57)	22 (12.57)	55 (31.43)	175
O	1995	08	02	-	02	02	07	21
R	1996	08	02	01	01	01	04	17
A	1997	05	01	02	-	01	04	13
O	1998	06	-	01	02	02	03	14
N	1999	07	02	-	02	02	05	18
	2000	12	-	01	02	03	05	23
	2001	10	02	01	02	03	07	25
	Total	56 (42.75)	09 (6.87)	06 (4.58)	11 (8.40)	14 (10.69)	35 (26.72)	131

6.4.12.3 Seasonality of death:

Table - 6.28 describes the present distribution of deaths experienced by the Santals, Mundas and Oraons different months of the year during the study period. Higher mortality was observed in the months from March to June; a small increase, however, occured during september -October. Mortality trend was represented graphically in fig 6.7, 6.8 & 6.9 for the Santals, Mundas and Oraons respectively. Peak mortality may be said to corelate with transitional environmental factors such as temperature (maximum-minimum), rainfall and humidity characteristics of seasonal change. Socio-cultural events of the societies also influenced mortality. For example : Most social ceremonies

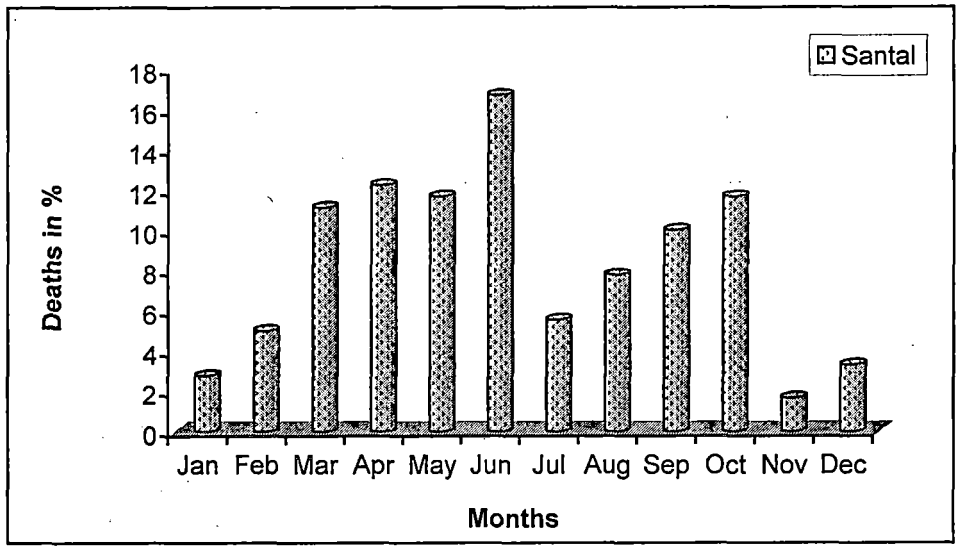


Fig. 6.7 : Percent distribution of Deaths among the Santals in different months of the year over 7 years from 1995 to 2001.

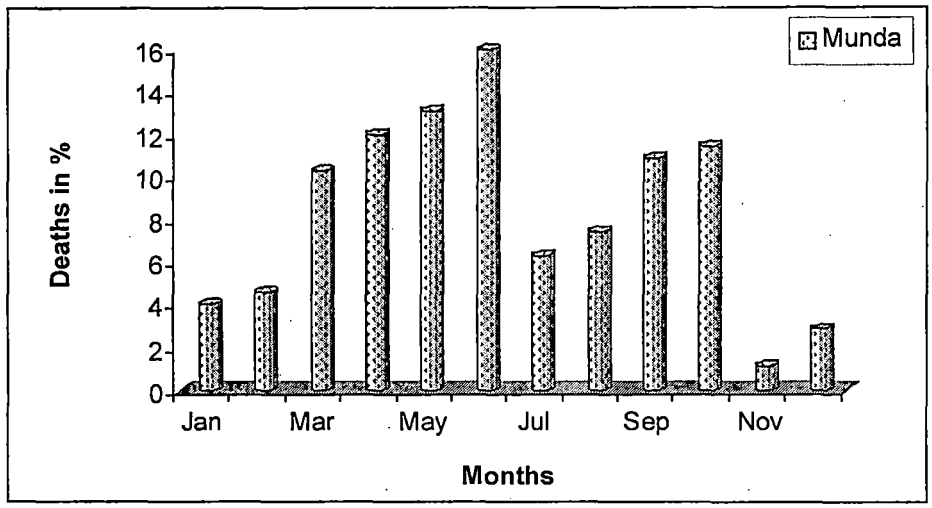


Fig. 6.8 : Percent distribution of Deaths among the Mundas in different months of the year over 7 years from 1995 to 2001.

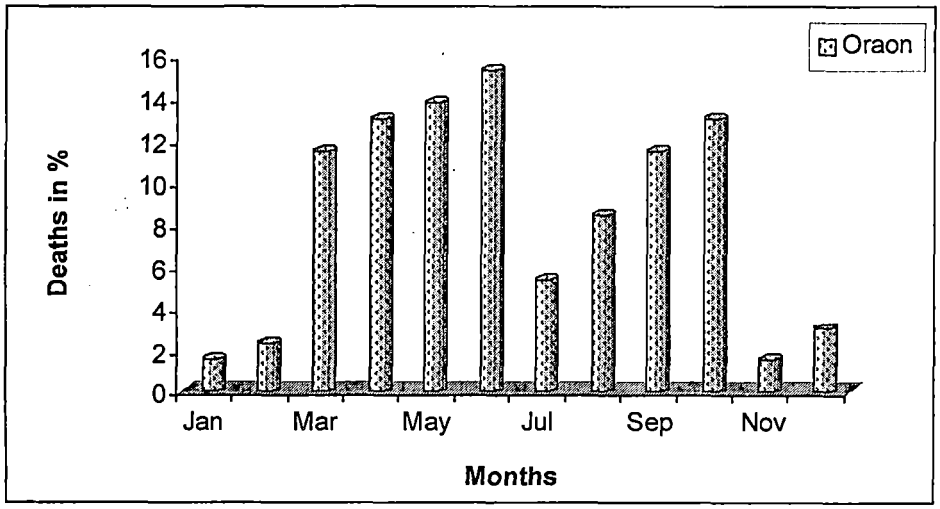


Fig. 6.9 : Percent distribution of Deaths among the Oraons in different months of the year over 7 years from 1995 to 2001.

(religions, marriages etc.) occured during the months from February to April and deaths peak during May - July. Festivals traditionally are associated with elaborate feasts including lots of Pork and drinks. It is suspected that the food materials consumed during the social events may be unhygienic due to improper preservation and cooking. In general mortality appears to coincide well with temperature being low in the winter months and high in the warmer months.

Table : 6.28 Deaths according to different months of the year from 1995 to 2001 among the Santals, Mundas and Oraons.

Months	No of deaths					
	Santal	%	Munda	%	Oraon	%
January	05	2.79	07	4.00	02	1.53
February	09	5.03	08	4.57	03	2.29
March	20	11.17	18	10.29	15	11.45
April	22	12.29	21	12.00	17	12.98
May	21	11.73	23	13.14	18	13.74
June	30	16.76	28	16.00	20	15.26
July	10	5.59	11	6.29	07	5.34
August	14	7.82	13	7.43	11	8.40
September	18	10.06	19	10.86	15	11.45
October	21	11.73	20	11.43	17	12.98
November	03	1.68	02	1.14	02	1.53
December	06	3.35	05	2.85	04	3.05
Total	179	100	175	100	131	100

6.4.12.4 Causes of Mortality :

Causes of mortality are diverse: due to diseases, poor health, malnutrition and accidents. They suffer from Malaria, Amoebic dysentry, Respiratory infections, Paralyses, Jaundice, and Tuberculosis. Deaths are also known due to alcoholism, gastroenteritis and helminth infections. Most of the tribals are careless about the use of slipper. So they have the chances of getting helminth infections particularly hook-warms and a major part of time they suffered from it. Tanuja et.al., (1995) pointed out that the tribal women of Bihar did not wearing slippers when they go out. This may increase the chances of getting hook warm infection there by causing anaemia and sometimes causing of death. Rao sugunan and Schgal (1998) reported that continuous decline is largely due to malnutrition and high infant mortality.

The santals, Mundas and Oraons go to the Health Centre during the course of any kind of disease established at the Hili Block ethnic community people visit the Health Centre Only, when folk medicines failed. Even then the tribals value the advise of the quack doctors residing in the locality.

The distribution of diseases in kind and magnitude varies from society to society and this variance could be explained with the help of different biological, ecological and socio-cultural factors (Rajpramukh, 1998). Disease specific mortality records among the Santals, Mundas and

Oraons are inadequate. Due to modernisation and control programmes most of the traditionally prevalent diseases are at present under control. However, available disease specific mortality records from the Health Centre; verbal reports of the Welfare Organiser, Hili Block; compunder of Missionary dispensary and folk medicine man of the tribals are shown in table 6.29, 6.30 & 6.31 for the Santals, Mundas and Oraons respectively. Epidermics (Gastroenteritis diarrhoea); respiratory infections, cough, cold, high fever and old age account for more than 55% deaths. Among many tribals, some of the respiratory diseases are caused by excessive alcoholism and smoking (Rajpramukh, 1998). Delivary and maternal care is still performed in the primitive traditional manner. Death of 3,5 and 2 mothers within 5 days of delivery among the Santals, Mundas and Oraons respectively and 12 babies of Santals, 8 of Mundas and 7 of Oraons on the days of birth indicate poor sanitary and inadequate facilities for delivery, maternal and child care.

Table : 6.29 Available disease specific mortality records among the Santals, 1995 to 2001.

Diseases	Adult		Children (0-14 yrs)		% occurence
	male	female	male	female	
Epidemics (Gastroenteritis diarrhoea)	06	05	16	13	22.35
Respiratory infections, caugh, cold and high fever	04	01	12	10	15.08
Paralyses	06	03	-	-	5.03
Jaundice	-	02	04	02	4.47
Tuberculosis	04	03	-	-	3.91
Malaria	01	02	01	-	2.23
Oldage	15	16	-	-	17.88
Measles	-	-	03	09	6.70
Death on the date of birth	-	-	06	06	6.70
Death of mother within 5 days of delivery	-	03	-	-	1.68
Heart attack	07	04	-	-	6.15
Sickle cell disease	01	-	-	-	-
Accident	01	-	-	-	0.56
Snake bite	-	-	01	-	0.56
Dog bite	-	-	-	01	0.56
Miscellaneous (weakness, sudden death, etc.)	02	02	03	04	6.15
Total	47	41	46	45	179

N.B. Diseases were not diagonised by medical practitioner .
- means absent.

Table : 6.30 Available disease specific mortality records among the Mundas, 1995 to 2001.

Diseases	Adult		Children (0-14 yrs)		% occurence
	male	female	male	female	
Epidemics (Gastroenteritis diarrhoea)	09	08	12	11	22.86
Respiratory infections, caugh, cold and high fever	05	03	13	08	16.57
Paralyses	05	03	-	-	4.57
Jaundice	01	-	03	02	3.43
Tuberculosis	03	04	-	-	4.00
Malaria	02	01	03	-	3.43
Oldage	14	11	-	-	14.29
Measles	-	-	09	06	8.57
Death on the date of birth	-	-	03	05	4.57
Death of mother within	-	05	-	-	2.86
5 days of delivery					
Heart attack	07	04	-	-	6.29
Sickle cell disease	-	01	-	-	0.57
Snake bite	-	-	01	-	0.57
Dog bite	-	-	-	02	1.14
Miscellaneous (weakness, sudden death, etc.)	03	03	03	02	6.29
Total	49	43	47	36	175

N.B. Diseases were not diagonised by medical practitioner .
- means absent.

Table : 6.31 Available disease specific mortality records among the Oraons, 1995 to 2001.

Diseases	Adult		Children (0-14 yrs)		% occurence
	male	female	male	female	
Epidemics (Gastroenteritis diarrhoea)	07	05	06	08	19.85
Respiratory infections, caugh, cold and high fever	02	05	07	08	16.79
Paralyses	04	02	-	-	4.58
Jaundice	-	-	03	02	3.82
Tuberculosis	02	03	-	-	3.82
Malaria	-	-	03	04	5.34
Oldage	10	14	-	-	18.32
Measles	-	-	05	03	6.11
Death on the date of birth	-	-	04	03	5.34
Death of mother within 5 days of delivery	-	02	-	-	1.53
Heart attack	04	03	-	-	5.34
Sickle cell disease	01	-	01	-	1.53
Snake bite	-	-	01	-	0.76
Dog bite	-	-	-	-	-
Miscellaneous (weakness, sudden death, etc.)	02	01	03	03	6.87
Total	32	35	33	31	131

N.B. Diseases were not diagonised by medical practitioner .
- means absent.

6.4.13 Population Growth

Change in population size irrespective of increase or decrease is regarded as growth. It is the balance between birth, death, immigration and emigration.

Emperically it may be expressed as:

$P_t = Po + (B-D) + (I-E)$. ..... (i)

Where, Pt = total population at a point of time.
Po = total population at last census.
B = total number of births, during the given period.
D = total number of deaths during the given period.
I = total number of immigrants during the period.
E = total number of emigrants during the period.

Rate of natural increase is the difference between birth and death rates. The birth and death rate are dependent upon the age distribution of the population. Populations subjected to stable mortality and fertility schedules attain stable age structure.

The realisation that wide range of present day human populations irrespective of geographical or ethnic similarity are close to the stable state (Lotka 1925; Un, 1973) due to stable fertility and mortality schedule experienced by them in the indefinite past; provide a powerful tool in determining demographic parameters of populations with deficient or erroneous demographic statistics but having a real stable state.

Stable population analysis has been applied by demographers to populations:

i) Where fertility has been subject to no more than low amplitude and short duration variations during the previous five or six decades, and mortality has changed only slightly and gradually during past generations. The stability of fertility is a common feature of agricultural populations with low literacy and income. The absence of major trend in mortality has also been a common characteristic of less developed areas until the past few decades when very rapid decline in death rates was observed.
ii) Whose mortality has been declining, although the resultant estimates may be biased.

The weakness of the method of stable population are

i) The actual situation may be poorly approximated by a stable model.
ii) If the true situation is close to a stable state, the available data may be too fragmentary or biased to permit the derivation of the approximate stable populations. However, inspite of these drawbacks, it has proven effective under many circumstances and a significant

portion of our current knowledge on world demographic trends and characteristics come directly from the application of stable population analysis.

The estimation of stable population parameter consists of two basic steps:

(i) On the basis of available evidence relating to a given population.

(ii) The various parameters of the stable population are assigned to the actual population in order to estimate the corresponding parameters in that population.

The age distribution of stable population is described by the well-known formula developed by Lotka (1925).

$$C_{(a)} = be^{-ra} P(a) \quad \ldots\ldots\ldots\ldots\ldots\ldots \text{(ii)}$$

Where $C_{(a)}$ is proportion of the population at age a,

b, is the birth rate of the stable population which is determined by the fact that the sum of the proportions of all ages must be equal to one,

r, is the annual rate of increase.

P(a), is the proportion surviving from birth to age 'a' according to the prevalent mortality risks or is an alternative expression for the survivor function l_a/l_0 in the life table.

The expectation of life e: for the santals. Mundas and oraons at the Hili Block region was calculated from the data on live births and child survival.

The rate of increase for the santals, Mundas and oraons were 0.015, 0.017 and 0.014 respectively per person per annum as calculated from the population data of 1995 to 2001. The following equation was used to determine the rate.

$$Pt = Po\ (1+r)^t \quad \ldots\ldots\ldots\ldots\ldots\ldots \text{(iii)}$$

Where, Po, is the population in initial year of census.

Pt, is population in next census y)ear.

t. is the time between two censuses.

r, is the intrinsic rate of increase per person per annum.

The santal, Munda and oraon male and female stab)le age distribution (Table– 6.32) are presented graphically in figures 6.10, 6.11, 6.12, 6.13, 6.14 & 6.15. Figures show that the santal, Munda and oraon male and female stable age pattern are more or less similar to each other.

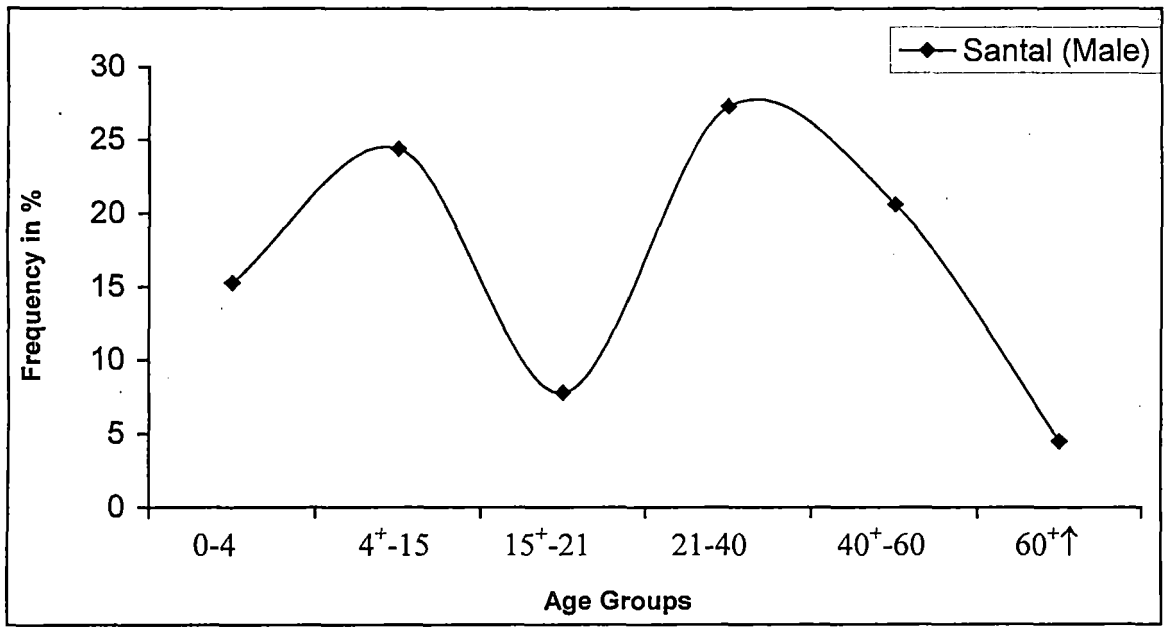


Fig. 6.10 : Observed age distribution of Santal Male.

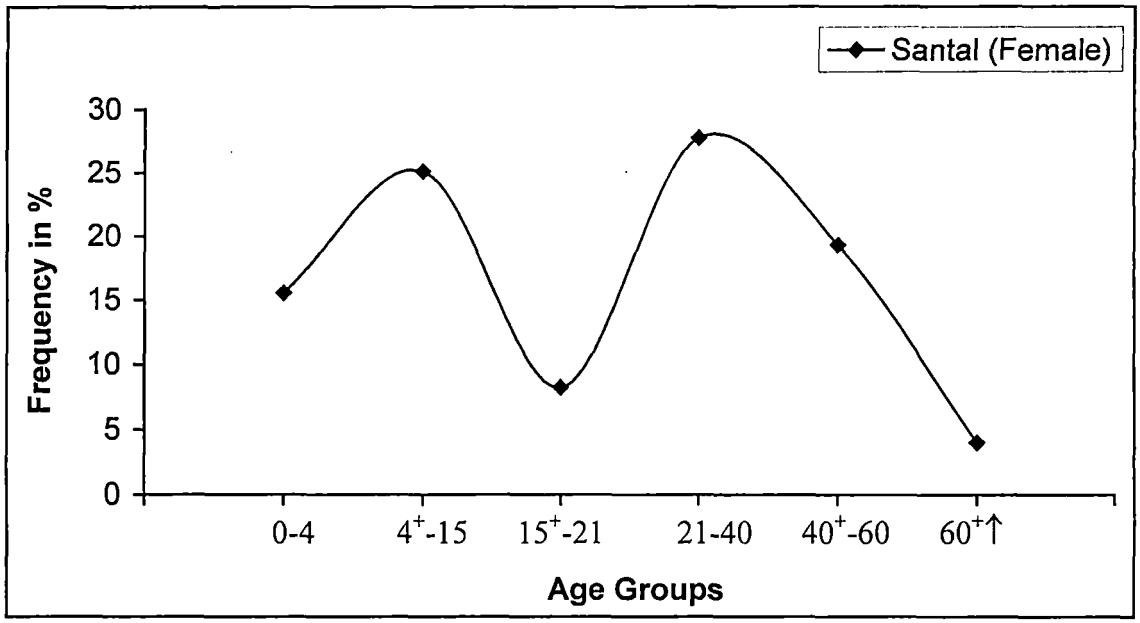


Fig. 6.11 : Observed age distribution of Santal Female.

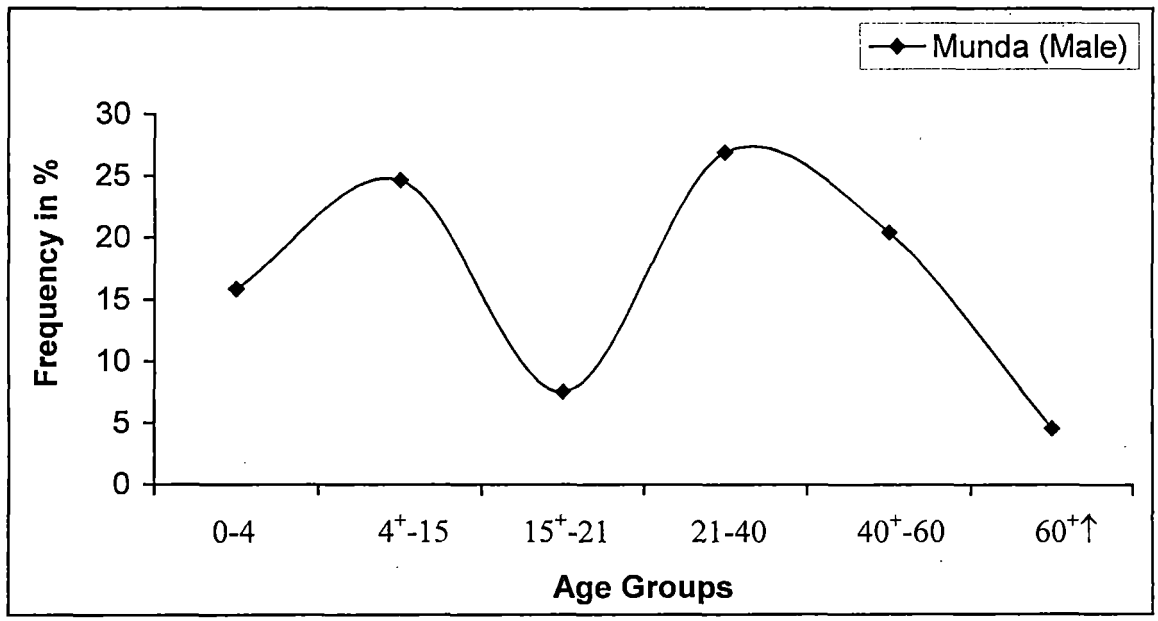


Fig. 6.12 : Observed age distribution of Munda Male.

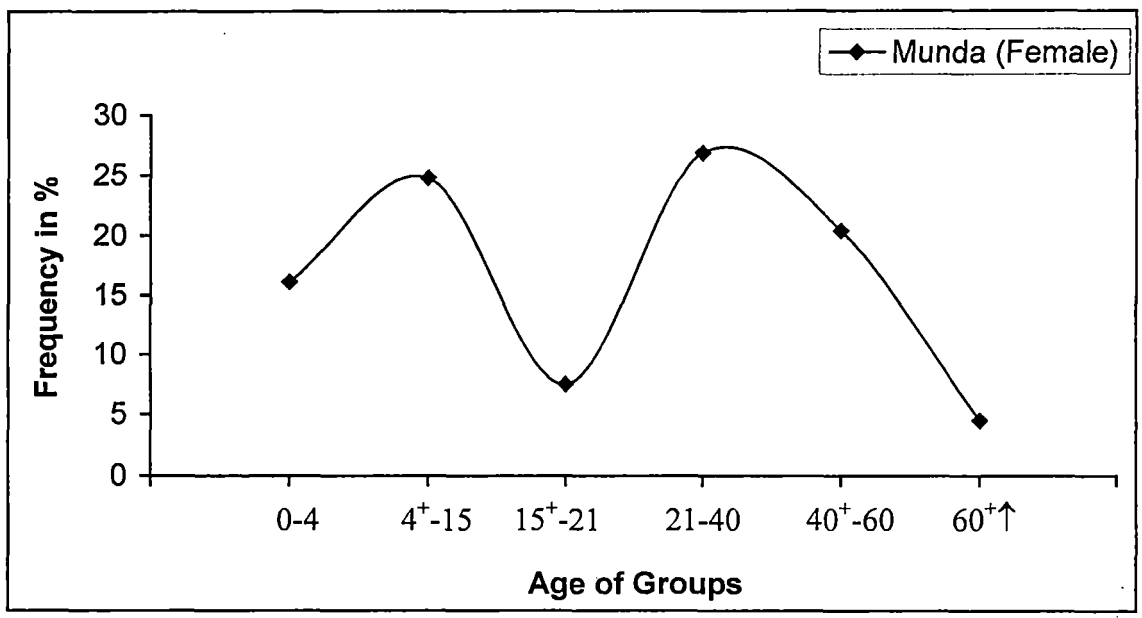


Fig. 6.13 : Observed age distribution of Munda Female.

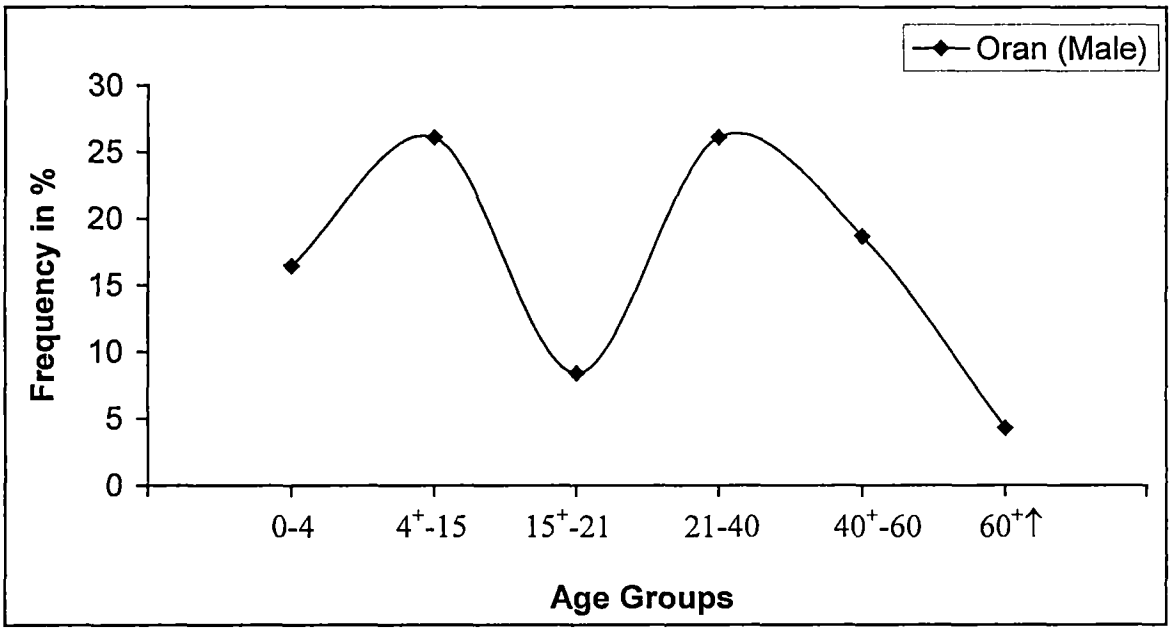


Fig. 6.14 : Observed age distribution of Oraon Male.

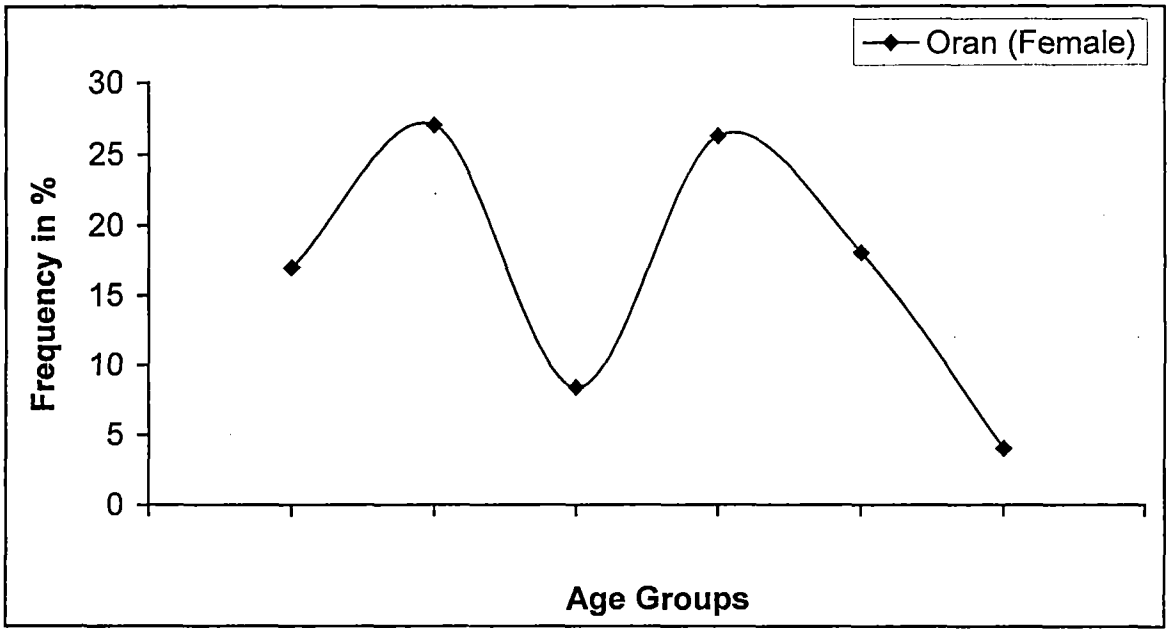


Fig. 6.15 : Observed age distribution of Oraon Female.

Table 6.32 structure of stable population for santals, Mundas and Oraons.

Age groups	Santal		Munda		Oraon	
	♂	♀	♂	♀	♂	♀
0-4	15.28	15.56	15.86	16.11	16.46	16.99
4⁺ - 15	24.42	25.10	24.67	24.78	26.09	26.49
15⁺ -↓21	7.79	8.26	7.54	7.51	8.41	8.36
21 - 40	27.34	27.75	26.92	26.81	26.10	26.20
40⁺ - 60	20.67	19.33	20.44	20.30	18.66	17.99
60⁺ ↑	4.49	4.01	4.58	4.48	4.27	3.97

Table - 6.33 Census population for the Santals, Mundas and Oraons at Hili Block.

Year	Census Population		
	Santal	Munda	Oraon
1995	2393	2588	1428
1996	2437	2606	1448
1997	2482	2667	1477
1998	2524	2709	1492
1999	2550	2787	1506
2000	2582	2803	1526

Table - 6.33 and fig. 6.16, 6.17 & 6.18 shows the trend of population growth of the Santals, Mundas and Oraons at Hili Block from 1995-2000 significantly gradual increase are seen for the Communities. Immigration among the Santals, Mundas and Oraons are nil. On the other hand, the traditional socio – political systems of the above mentioned communities do not accept marriage with the non-tribals. They (Santal, Munda, Oraon) do not accept marriage with each other and any participant in such an union would be ostracized. This taboo is old as the Santals, Mundas and Oraons and had a significant role in preventing cultural and genetic changes of the communities.

It is obvious from the study of different demographic characteristics that since 1995 the tribal (Santal, Munda, Oraon) population growth was influenced by various social and environmental components.

6.4.14 Functional Involvement of Tribals as per age - sex classes :

For convenience, the functional involvement of the tribals (Santals, Mundas, and oraons) of different age groups were broadly divided into four categories :

(i) Domestic / household activities - included all domestic and household works.

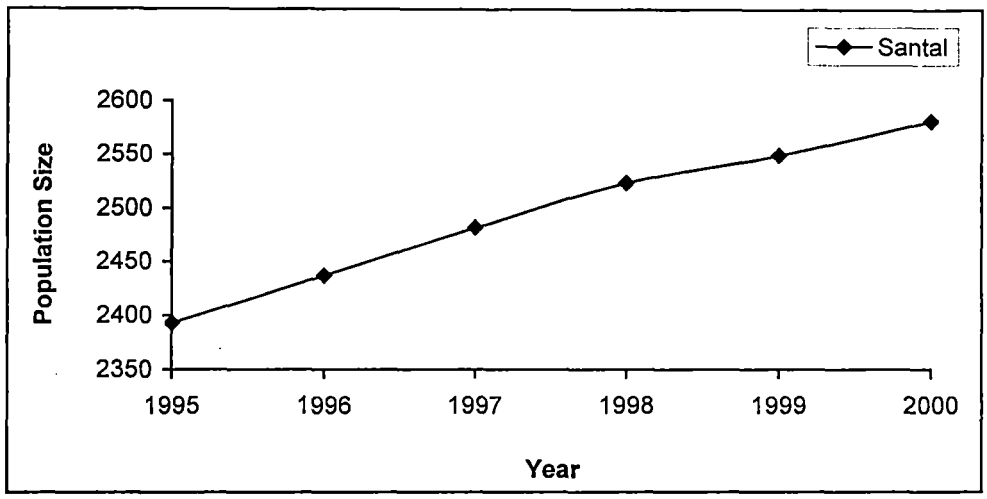


Fig. 6.16 : Population growth trend of the Santals at Hili lock.

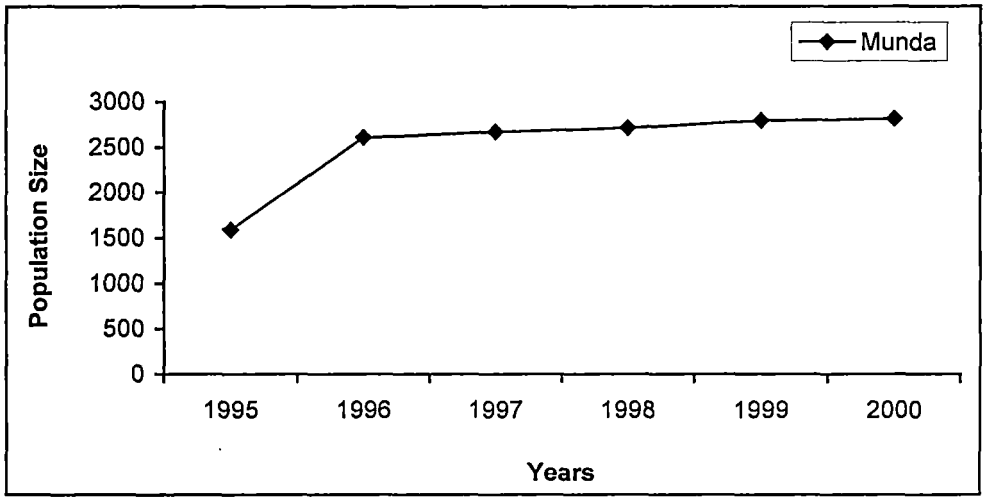


Fig. 6.17 : Population growth trend of the Mundas at Hili lock.

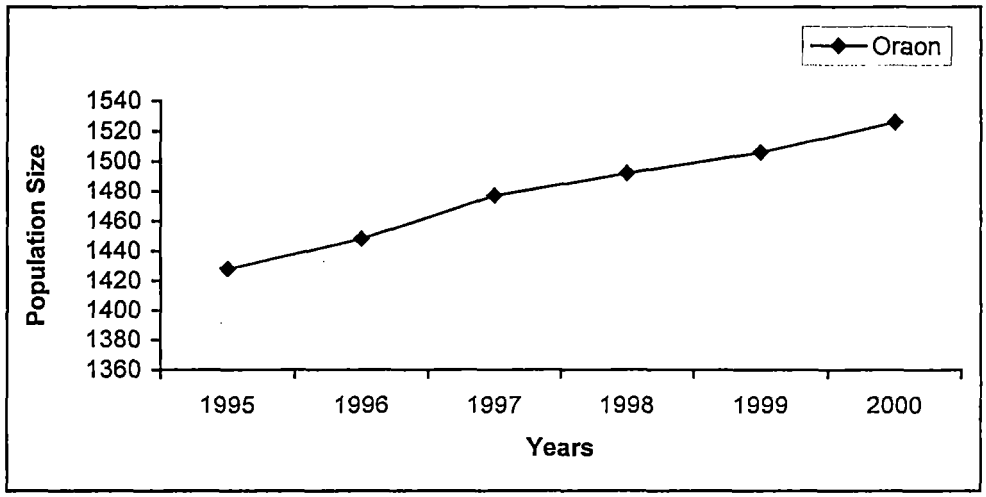


Fig. 6.18 : Population growth trend of the Oraons at Hili lock.

(ii) Economic activities included agriculture, labour, hunting, fishing, gathering etc.

(iii) Socio-political mainly involved activities pertaining to traditional political system, gram panchayet etc.

(iv) Socio-cultural included religious and other community functions and ceremonies such as - marriage, naming of the newly born, sowing of seeds, harvesting etc.

Table 6.34, 6.35 & 6.36 presents the functional involvement of the santals, Mundas and Oraons separately for both males and females. The tribal children of 5^{+} - 12 years age groups performed some domestic / household and economic works through helping their adult members. School attendence among the Oraons were higher than the santals and Mundas in the 5^{+}-15 years age groups. Percentage of higher education i.e., Madhymik, graduation was considerably higher among the Santals than the Mundas and Oraons. But in general percentage of literate persons were found to be higher in number in the Oraons (21-24%) than the Santals (18.02%) and Mundas (20.42%) [Table 3a.]

Table - 6.34 Division of work among different age groups in Santal Society (1996-97)

Status	Age groups	Domestic/ house hold works		Economic/ subsistence works		Socio Political		Socio Cultural	
		M	F	M	F	M	F	M	F
Infancy	0-1	0	0	0	0	0	0	0	0
Childhood	1^{+} - 15								
Early childhood	1^{+}-15	0	1	0	0	0	0	0	0
Childhood	5^{+} - 12	1	1	2	1	0	0	0	0
Late Childhood	12^{+} - 15	1	2	3	3	0	0	0	0
Adolescence	15^{+} - 18	2	4	3	4	0	0	0	0
Adult hood:									
Early youth	18^{+} - 25	3	4	4	4	1	1	1	1
Late youth	25^{+} - 35	3	4	4	4	3	1	3	1
Grown up	35^{+} -55	2	4	3	3	4	0	3	2
Old ages	$55^{+}\uparrow$	2	2	2	2	4	0	4	1

Degree of involvement :
0 - Nil; 1 = assistance only; 2 = assistance 75%, independently 25%; 3 = assistance 50%, independently 50%, 4 = 100% independently.

Table 6.35 Division of work among different age groups in Munda Society (1996-97)

Status	Age groups	Domestic/ house hold works		Economic/ subsistence works		Socio Political		Socio Cultural	
		M	F	M	F	M	F	M	F
Infancy	0-1	0	0	0	0	0	0	0	0
Childhood	1^{+} - 15								
Early childhood	1^{+}-5	0	0	0	0	0	0	0	0
Childhood	5^{+} - 12	1	2	1	1	0	0	0	0
Late Childhood	12^{+} - 15	1	2	2	3	0	0	0	0
Adolescence	15^{+} - 18	3	4	3	4	0	0	0	0
Adult hood:									
Early youth	18^{+} - 25	4	4	4	4	1	1	1	1
Late youth	25^{+} - 35	4	4	4	4	3	2	3	2
Grown up	35^{+}-55	2	4	3	3	4	0	4	2
Old ages	$55^{+}\uparrow$	2	2	2	2	4	0	4	1

Degree of involvement :
0= Nil; 1 = assistance only; 2= assistance 75%, independently 25%; 3 = assistance 50%, independently 50%; 4= 100% independently.

Table - 6.36 Division of work among different age groups in Oroan society (1996-97)

Status	Age groups	Domestic/ house hold works		Economic/ subsistence works		Socio Political		Socio Cultural	
		M	F	M	F	M	F	M	F
Infancy	0-1	0	0	0	0	0	0	0	0
Childhood	1^{+} - 15								
Early childhood	1^{+}-5	0	0	0	0	0	0	0	0
Childhood	5^{+} - 12	1	2	1	1	0	0	0	0
Late Childhood	12^{+} - 15	1	2	2	1	0	0	0	0
Adolescence	15^{+} - 18	2	4	3	3	1	1	0	1
Adult hood:									
Early youth	18^{+} - 25	3	4	3	4	1	1	0	1
Late youth	25^{+} - 35	3	4	4	4	3	2	1	2
Grown up	35^{+} -55	2	4	3	3	4	2	3	2
Old ages	$55^{+}\uparrow$	2	2	2	2	4	0	4	1

Degree of involvement :
0- Nil; 1 = assistance only; 2 = assistance 75%, independently 25%, 3= assistance 50%, independently 50%; 4= 100% independently.

6.5 Education :

Table - 6.37 and Fig - 6.19 presents data on number and percentage of levels of education among the three communities. Table - 6.38 and Fig - 6.20 show number and percent of individuals at different levels of education in various income groups. It is observed that there is a clear co-relation between education level and income group. For example, the present tribals in the 30,000/- above categories were 10.1, 25.7, 53.7 and 64.5 in the primary level, grade VIII, Madhyamik and graduate levels. Similarly, below 10,000/- category percent tribals in the different educational classes were 46.4, 27.6, 8.0 and 3.0.

Table - 6.37 Total number and % of literate individuals among the santals Mundas and Oraons.

Education	Santal		Munda		Oraon	
Level	No	%	No	%	No	%
Primary	258	10.13	378	13.56	226	15.00
VIII grade	131	5.14	140	5.03	48	3.19
Madhyamik	57	2.24	40	1.44	39	2.59
Graduation	13	0.51	11	0.39	07	0.46
Total	459	18.02	569	20.42	320	21.24

Table - 6.38 Number of individuals at various levels of education in different income groups among the three communities.

Education level	Community	No. in different income groups per annum (in Rupees).			Total
		Below 10,000/-	10,000 - 30,000/-	Above 30,000/-	
Primary	Santal	112	111	35	258
	Munda	180	178	20	378
	Oraon	108	86	32	226
Total		400 (46.4)	375 (43.5)	87 (10.1)	862
VIII Grade	Santal	46	46	39	131
	Munda	29	89	22	140
	Oraon	13	14	21	48
Total		88 (27.6)	149 (46.7)	82 (25.7)	319
Madhyamik	Santal	4	23	30	57
	Munda	3	20	17	40
	Oraon	4	09	26	39
Total		11 (8.0)	52 (38.2)	73 (53.7)	136
Graduate	Santal	Nil	3	10	13
	Munda	Nil	3	08	11
	Oraon	01	4	02	07
Total		01 (3.0)	10 (32.3)	20 (64.5)	31

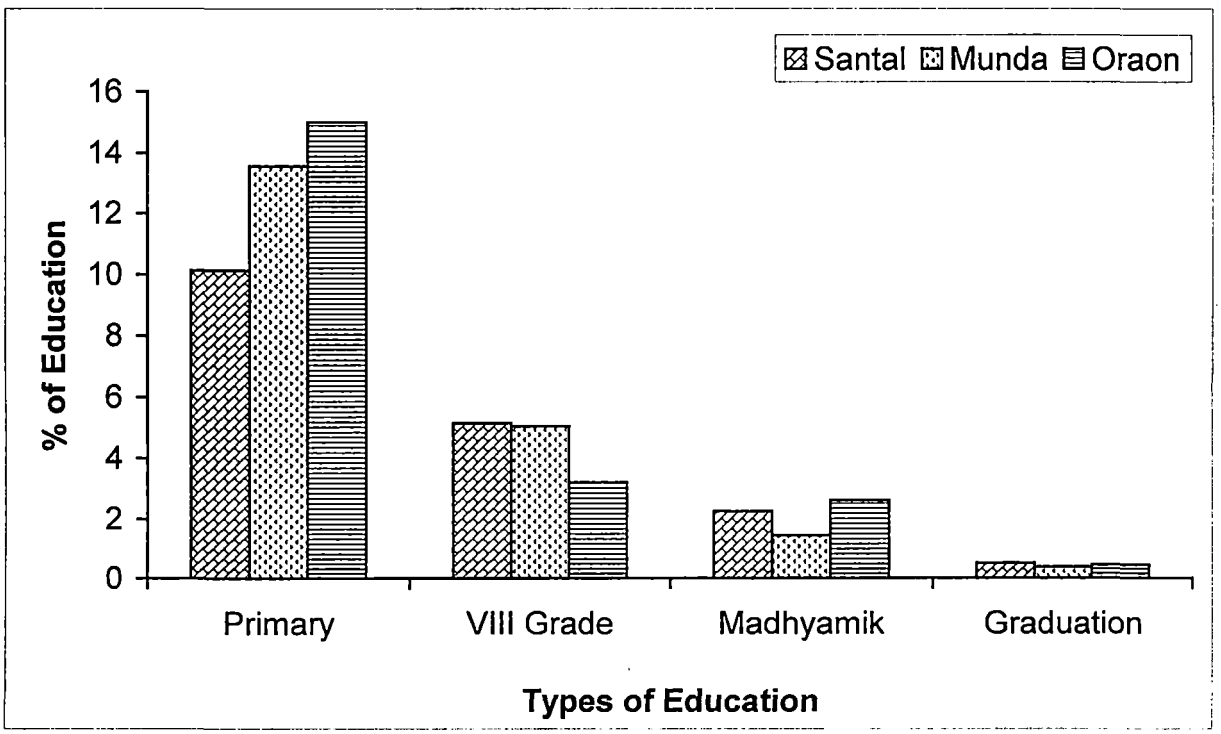


Fig. 6.19 : Percentage of education of the Santal's, Munda's and Oraon's at Hili Block.

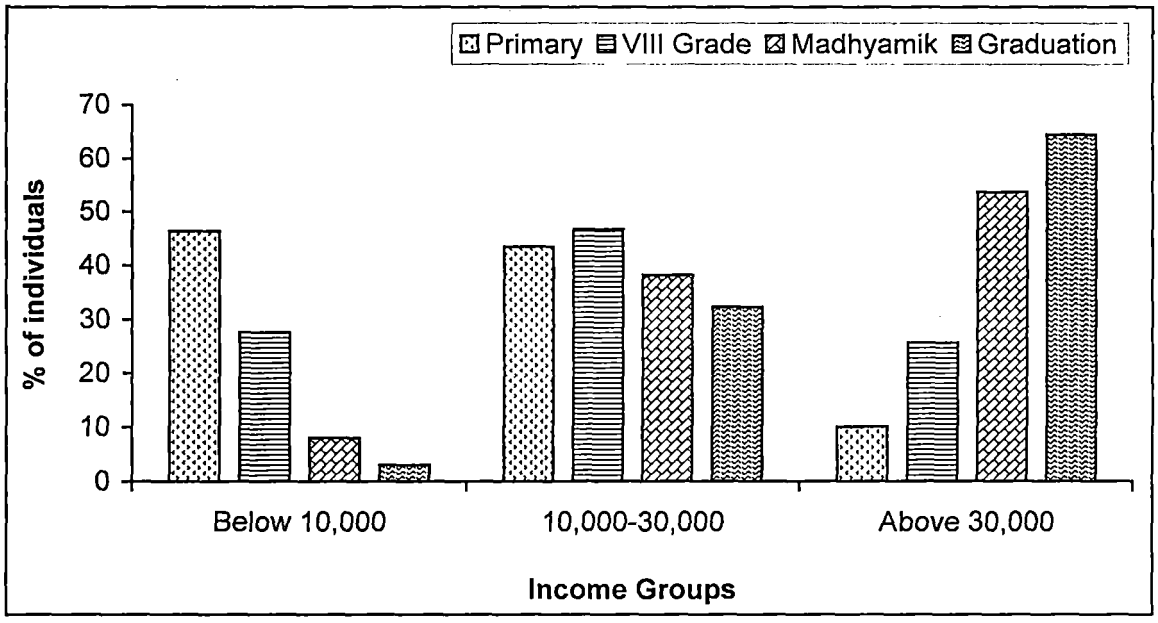


Fig. 6.20 : Percentage of individuals at different levels of education in various income groups in 2000.

An Oraon family near their house.

An affluent Munda family poses for the snap with a Bamboo grove in the background.

Folk medicine man in front of his house with his family.

7. Distribution pattern of ABO gene among the tribals (Santal, Munda and Oraon):

7.1 Introduction :

Blood groups carry various types of genetic information in man. ABO blood groups follow certain pattern of inheritance (Epstein and Othenberg, 1908; Bernstein, 1925; Landsteiner and Levine, 1928; Race and Sanger, 1962). The distribution of these blood markers in a population usually stays at genetic equilibrium (Mondal, 1992). Genetical analysis of ABO blood group reveals a variety of diseases, which are found among various tribal and nontribal populations (Gupta and Raichoudhury, 1980; Kulkarni and Agarwal, 1987; Kshatriya and Kapoor, 1991). In extant native American populations, ABO system, HLA and other genetic markers are consistent with genetic differentiation occurring concomitantly with colonization (Tourret et al., 2000). Genetic differentiation of human populations to a large extent depends on frequency of ABO blood groups (Piplai et al., 1985; Pandey et al., 1992).

The present study reports the findings on phenotypic and genotypic frequencies of ABO blood groups among the Santals, Mundas and Oraons at Hili Block.

7.2 Materials and methods:

A total of randomly selected 755 Santals, 794 Mundas and 433 Oraons of both sexes served as subjects of this study. The individuals belonging to A, B, AB, O and Rh^+ and Rh^- groups were detected by mixing one volume of 1 to 2% cell suspension to one volume of anti-A, anti-B and anti-Rh reagents in tubes (4×50 mm). After mixing the tubes were allowed to stand for one hour at room temperature and results were read for agglutination by naked eye. All negative results, however, were confirmed under microscope.

The phenotypic and genotypic frequencies of ABO blood groups in randomly mating populations of the three ethnic communities were evaluated with the help of gene frequencies (p, q and r) based on the data presented in the table 7.1 and 7.2. The frequency of AA, AO, BB, BO, AB and OO genotypes in a population at equilibrium are p^2, 2 pr, q^2, 2qr, 2pq and r^2 respectively.

7.3 Results and discussion:

The present study reveals four types of blood groups (A, B, AB and O) with Rh^+ and Rh^- factors in the Santals, Mundas and Oraons at Hili Block. Blood group 'B' with Rh factor are much higher among the Santals (33.25%) and Oraons (34.64%) in comparison to the Mundas (30.35%), but 'A' blood group is lower among the Oraons (28.64%) than the Santals (32.85%) and Mundas (31.99%). AB blood group with Rh factor among the three ethnic communities are closer to each other i.e. Santals (9.80%), Mundas (8.82%) and Oraons (9.01%). On the other hand percent O blood group individuals among the Santals (24.10%) is lower compared to the Mundas (28.84%) and the Oraons (27.71%) (Table – 7.1).

Phenotypic frequencies of A, B, AB and O groups have been found to be 0.3285, 0.3325, 0.0980, 0.2410 in Santals, 0.3199, 0.3035, 0.0882, 0.2884 in Mundas and 0.2864, 0.3464, 0.0901, 0.2771 in Oraons respectively (Table – 7.1). AB, AA, AO, BB, BO, OO genotypes are observed in the three ethnic communities and their genotypic and phenotypic proportions are presented in table – 7.2.

From Table – 7.3 it is evident that the gene frequencies of A (p), B (q) and O (r) of Santals are 0.2427, 0.2453, 0.5120; of Mundas are 0.2306, 0.2201, 0.5493 and of Oraons 0.2103, 0.2493, 0.5404 respectively.

Table – 7.4 shows the genotypic frequencies of AA, AO, BB, BO, AB, OO are 0.0589, 0.2485, 0.0602, 0.2512, 0.1191, 0.2621 respectively in the Santal populations based on table – 3. Among the Mundas the genotypic frequencies are 0.0532, 0.2533, 0.0485, 0.2418, 0.1015 and 0.3017, where as comparable figures in the Oraons are 0.0442, 0.2273, 0.0622, 0.2694, 0.1049 and 0.2920 respectively.

Comparing the χ^2 value (5.8670) of Santal populations with Fisher's table (7.82), df-3 at 5% level, it has been found that the probability value lies between 0.10 to 0.20. Thus the difference is statistically significant ($P< 0.05$). In Mundas, the χ^2 value (2.5528) lies between 0.20 to 0.30 and χ^2 value of Oraon is 1.6001

Table – 7.1 : ABO blood group frequency among the Santals, Mundas and Oraons at Hili Block.

Types of blood groups	Number of individuals			Phenotypic frequencies			Percent		
	Santal	Munda	Oraon	Santal	Munda	Oraon	Santal	Munda	Oraon
A	248	254	124	0.3285	0.3199	0.2864	32.85	31.99	28.64
B	251	241	150	0.3325	0.3035	0.3464	33.25	30.35	34.64
AB	74	70	39	0.0980	0.0882	0.0901	9.80	8.82	9.01
O	182	229	120	0.2410	0.2884	0.2771	24.10	28.84	27.71
Total	755	794	433	1.00	1.00	1.00	100.00	100.00	100.00

Table – 7.2 : Genotype and phenotype proportion of ABO blood groups in a randomly mating population.

Blood groups	AB	A	B	O
Genotypes	AB	AA, AO	BB, BO	OO
Proportion of Genotypes	2pq	P^2 , 2pr	q^2 , 2qr	r^2
Proportion of phenotypes	2pq	$P^2 + 2pr$	$q^2 + 2qr$	r^2

* p = frequency of gene A; q = frequency of gene B; r = frequency of gene O
From Strickberger (15).

(Table-7.5&7.8) which lies between 0.30 to 0.50 at df-3 against Fisher's χ^2 table. Thus in both Mundas and Oraons the P-values are much less than determinant level 0.05 ($P<0.05$) These showed that the discrepancy from equilibrium was not significant and had a high probability of occurrence in normal sample of an equilibrium population.

Phenotypic frequencies of ABO blood group distribution of the Santals, Mundas and Oraons are different from that of the Totos (Pal and Sinha, 1990), Mixed Indians, Ladakhies and Rajasthanis (Nei and Roychoudhury, 1982; Dutta and Sen, 1974; Lall and Hurkat, 1977) which is shown in Table – 7.6.

Table – 7.3 : Calculation of gene frequency for A(p), B(q) and O(r) among the Santals, Mundas and Oraons

Phenotypes	No. observed			Frequency			$\sqrt{\text{Frequency}}$			Gene frequency		
	Santal	Munda	Oraon	Santal	Munda	Oraon	Santal	Munda	Oraon	Santal	Munda	Oraon
B+O	433	470	270	0.5735	0.5919	0.6236	0.7573	0.7694	0.7897	p= 0.2427	p=0.2306	p=0.2103
A+O	430	483	244	0.5695	0.6083	0.5635	0.7547	0.7799	0.7507	q=0.2453	q=0.2201	q=0.2493
O	182	229	120	0.2410	0.2884	0.2771	0.4909	0.5370	0.5264	r= 0.5120	r=0.5493	r=0.5404

Table –7.4 : Determination of genotypic frequencies among the Santals, Mundas and Oraons.

Phenotypes	Phenotypic frequencies			Genotypic frequencies			No. of different genotypes		
	Santal	Munda	Oraon	Santal	Munda	Oraon	Santal	Munda	Oraon
A	0.3285	0.3199	0.2864	AA (p^2)=0.0589	AA (p^2)=0.0532	AA (p^2)=0.0442	44.50	42.20	19.10
				AO(2pr)=0.2485	AO(2pr)=0.2533	AO(2pr)=0.2273	187.60	201.10	98.40
B	0.3325	0.3035	0.3464	BB(q^2)=0.0602	BB(q^2)=0.0485	BB(q^2)=0.0622	45.40	38.50	26.90
				BO(2qr)=0.2512	BO(2qr)=0.2418	BO(2qr)=0.2694	189.70	192.00	116.70
AB	0.0980	0.0882	0.0901	AB(2pq)=0.1191	AB(2pq)=0.1015	AB(2pq)=0.1049	89.90	80.60	45.40
O	0.2410	0.2884	0.2771	OO(r^2)=0.2621	OO(r^2)=0.3017	OO(r^2)=0.2920	197.90	239.60	126.50
Total				**= 1.0000**	**=1.0000**	**=1.0000**	**755.00**	**794.00**	**433.00**

Table – 7.5 : Observed and expected frequencies for the ABO Phenotypes among the Santals, Mundas and Oraons.

	Phenotypes														
	A			B			AB			O			Total		
	Santal	Munda	Oraon	Santal	Munda	Oraon	Santal	Munda	Oraon	Santal	Munda	Oraon	Santal	Munda	Oraon
Observed number	248	254	124	251	241	150	74	70	39	182	229	120	755	794	433
Equilibrium frequencies	(p^2+2pr) N			(q^2+2qr)N			(2pq)N			(r^2)N			N		
Expected	232.10	243.30	117.50	235.10	230.50	143.60	89.90	80.60	45.40	197.90	239.60	126.50	755	794	433
χ^2 (with yates correction)	1.0218	0.4276	0.3064	1.0088	0.4338	0.2424	2.6380	1.2656	0.7667	1.1984	0.4258	0.2846	5.8670	2.5528	1.6001

Table –7.6 : Comparative phenotypic frequency distribution of ABO Blood group among the Santals, Mundas, Oraons, Totos, Mixed Indian, Ladakhies and Rajasthanis.

ABO blood group	Number observed							Phenotypic frequency						
	Santal	Munda	Oraon	Toto	Mixed Indian	Ladakhy	Rajasthany	Santal	Munda	Oraon	Toto	Mixed Indian	Ladakhy	Rajasthany
A	248	254	124	22	235	31	831	0.328	0.319	0.287	0.171	0.235	0.215	0.238
B	`251	240	150	74	369	41	1214	0.333	0.304	0.346	0.574	0.369	0.285	0.349
AB	74	70	39	18	106	09	252	0.098	0.088	0.090	0.139	0.106	0.063	0.073
O	182	229	120	15	290	63	1181	0.241	0.289	0.277	0.116	0.290	0.437	0.339
Total	755	794	433	129	1000	144	3478	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table – 7.7 : ABO gene frequencies among the Asian Mongoloids, Rajasthanis, Totos, Santals, Mundas and Oraons.

Allele	Gene frequency					
	Asian Mongoloid	Rajasthani	Toto	Santal	Munda	Oraon
A	0.27	0.1709	0.1716	0.2427	0.2306	0.2103
B	0.17	0.2404	0.4705	0.2453	0.2201	0.2493
O	0.56	0.5887	0.3579	0.5120	0.5493	0.5404

Among the Totos phenotypic frequencies of blood group B is as high as 57.40% (Pal and Sinha, 1990) which is considerably higher than that of the Santals (33.25%), Mundas (30.35%) and Oraons (34.64%) (Table – 7.1).

On the basis of ABO gene frequency distribution, it is apparent that the three ethnic groups (Santal, Munda, Oraon) are closer to Asian Mongoloids and Rajasthanis and far from the Totos (Table – 7.7).

Nei and Roychoudhury (1982) showed that the proportion of loci that are polymorphic in the three races i.e., Caucasians (whites), Africans (Blacks), Asians (Mongoloids) ranged from 45 to 52% for proteins and from 34 to 56% for blood groups. The average heterozygosity per locus ranged from 13 to 16% for proteins and from 11 to 20% for blood groups. In view of these findings the mythical nature of the concepts of pure races becomes apparent. Members of a race are not genetically pure in the sense of sharing a uniform genetic identity nor does genetic uniformity apply even to members of the same family. Gene frequencies observed among the three ethnic groups reflect that they are different from each other due to the transmission of their unchanged genetic materials from generation to generation.

Table – 7.8 : ABO gene distribution among the Santals, Mundas and Oraons.

Ethnic groups	Blood groups	No. observed	Phenotypic frequencies	genotypic frequencies	χ^2 value	P value
SANTAL	A	248	0.3285	0.3074	5.8670	P<0.05
	B	251	0.3325	0.3314		
	AB	74	0.0980	0.1191		
	O	182	0.2410	0.2621		
MUNDA	A	254	0.3199	0.3065	2.5528	P<0.05
	B	241	0.3035	0.2903		
	AB	70	0.0882	0.1015		
	O	229	0.2884	0.3017		
ORAON	A	124	0.2864	0.2715	1.6001	P<0.05
	B	150	0.3464	0.3316		
	AB	39	0.0901	0.1049		
	O	120	0.2771	0.2920		

Blood group test under progress in a laboratory.

Collection of blood by the author for blood group test.

8. Aspects of child labour among the tribals (Santal, Munda & Oraon) :

8.1 Introduction :

Child labour is one of the most intricate problems in almost all developing countries including India. It has many facets some of the prominent ones are: social, micro-macro economical and purely humanitarian consideration. The child labourers are deprived of the pleasures and pains of childhood including education, play and the natural ways of growing up to a subadult and adult in time. This disturbs the development of their personality permanently. Often the child labourers are abused, maltreated and sexually exploited by their employers.

Significant studies on different aspects of child labour problems have been conducted by various authorities both in India and abroad such as : Rehman (1992) on education of deprived children in Delhi; Choudhury (1996) on dynamic profile of child labour in India;Chandra(1997) on problems and issues on child labour in India; Deol (1998) on child labour in sports goods industry; Agarwal (1999) on street children in New Delhi; Vidyasagar and Kumarababu (2000) on child labour in match industries at Sivakasi; Bimal (2000) on problems of working children; Sekhar and Mohammed (2001)on child labour in home based lock industries of Aligrah;Goyal(2004)on child labour in the sports goods industry in selected bastis of Jalandhar; Yates (1981) on Narcissistic Traits in abused children in U.S.A.; Browne and Davis (1989) on early prediction and prevention of child abuse in New York.

Quite a number of cottage and small scale industries in developing countries substantially depend on child labourers who thankfully work on half or even less of adult wages but produce an out put of at least three fourth of adults. This fact enables the entrepreneurs to become competitive on their products in the global market. Thus in developing countries large proportion of labourers are children and subadults in various manufacturing small to medium size industries such as: Carpet weaving, fire works, packing box, garment factories, brick fields, grill factories, cycle repair shops, motor gurage, carpentry, tea gardens, tea shops, restaurants-hotels, groceries, as maid or domestic hand, cattle rearing, agricultural works and even as prostitutes. The child labourers substantially augment the income of their families. This is one of the main reasons for poor couples to go for large family.

The situation in developed world is very different. As such we have to think of child labour problem, anew. We cannot go on simply dittoing western philosophy and model regarding child labour. We need to chalk out a frame work to solve our problem in our own ways taking into consideration all the relevant socio-economic aspects of our country. In doing that we have to consider several factors such as huge population, vast unemployment problem among all sections of our population irrespective of education-training and general socio-economic aspect of our country.

Globally, out of an estimated 211 million children who are engaged in some form of economic activity between the ages 5-14, 186 million children fall within the accepted ILO definition of child labour (Sekhar and Khurana, 2004). The Asian Pacific region harbours the largest number of child workers in 5-14 age group, 127 million constituting 19% of the total population of children (ILO, 2002). Overall, more than 2/3 rds of child labourers are engaged in hazardous jobs (Sekhar and Khurana, 2004).

In 1991, the total number of child labourers were about 0.712 million in the West Bengal comprising 6.31% of the total child population and the figures for India were 11.3 million and 1.34% respectively (Census records 1991). Thus, West Bengal herbours a

significantly higher percentage of child labourers compared to India as a whole. In the present study area, Hili Block percent child labourers among the Santals, Mundas and Oraons were 14.96,20.92 and 12.31 respectively in 1996 which despite decline to 10.54, 13.60 and 10.34 in 2004, is still about double the West Bengal figure.

No substantial information is available on the child labourers of the ethnic communities in the Hili Block. This article attempts to study of the various socio-economic aspects associated with child labour in three ethnic communities inhabiting the block.

8.2 Results and Discussion:

Table-8.1 presents sex wise data on number and percent of child labourers among the three communities in 1996 and 2004. Percent child labourers found was 14.96, 20.92 and 12.31 respectively among the Santals, Mundas and Oraons in 1996 but it declined to 10.54, 13.60 and 10.34 in the said communities in 2004 due to developmental activities. Percent male child labourers among the Santals, Mundas and Oraons were 16.15, 18.60 and 15.46 in 1996 which declined to 8.95, 12.57 and 9.65 in 2004. Similar decline in percent female child labourers is also observed. Higher percentage of child labourers among the Mundas as indicative of their lower socio-economic conditions compared to the other communities.

Although child labour phenomenon is of common occurrence among the communities in the Hili Block, it is rarely found in the below eight years age group. Table-8.2 shows that a higher percentage of Santal children (18.00%) of 8-10 years age group are engaged in some kind of commercial work in comparison to the Mundas and Oraons.

Table-8.3 shows that higher family size ie., above six is common among the Mundas than the other fellow communities.

Table-8.4 shows that more children from low income families join the labour force at a higher percentage than high income families. The relation between child labour and family income is statistically significant ($r = 0.981$ at 2 df. $P < 0.05$).

Table-8.5 shows clear difference among the communities with regard to educational level of the child labour force. While more than 50% child labour of the Santals and Mundas (56.4 % and 64.7 % respectively) were illiterate, only 47.6% were so among the Oraons. This indicates that not only the Oraons are more careful regarding the education of their children but also more open to allow their children to earn.

Nature of work open to the tribal children are mostly limited to agricultural, cattle rearing and household ; and different combinations of the three types mentioned. It is found that a little more than a third male and female

Table 8.1: Sex-wise number and percent distribution of child labourers among the three ethnic communities in 1996 and 2004.

Community	Year of survey	No. of male children	No. of male child labour	No. of female children	No. of female child labour	Total no. of children	Total no. of child labour
Santal	1996	192 (53.19)	31 (16.15) (8.59)	169 (46.81)	23 (13.61) (6.37)	361	54 (14.96)
	2004	190 (51.35)	17 (8.95) (4.59)	180 (48.65)	22 (12.22) (5.95)	370	39 (10.54)
Munda	1996	172 (46.74)	32 (18.60) (8.70)	196 (53.26)	45 (22.96) (12.23)	368	77 (20.92)
	2004	191 (50.93)	24 (12.57) (6.40)	184 (49.07)	27 (14.67) (7.20)	375	51 (13.60)
Oraon	1996	97 (49.74)	15 ((15.46) (7.69)	98 (50.26)	9 (9.18) (4.62)	195	24 (12.31)
	2004	114 (56.16)	11 (9.65) (5.42)	89 (43.84)	10 (11.34) (4.93)	203	21 (10.34)

Figures in the parenthesis indicate %

Table –8.2 : Number and percent distribution of child labourers in different age groups among the three communities in 2004.

Age group	Santal		Munda		Oraon	
	No.of child labour	%	No.of child labour	%	No.of child labour	%
8-10	07	17.95	05	9.80	01	4.76
10-12	20	51.28	25	49.02	14	66.67
12-14	12	30.77	21	41.18	06	28.57
Total	39	100	51	100	21	100

Table-8.3 : Number and percent distribution of child labour according to family size.

Family size	Santal		Munda		Oraon	
	No.of child labour	%	No.of child labour	%	No.of child labour	%
4	07	17.95	06	11.76	04	19.05
5	12	30.77	18	35.29	05	23.81
6	17	43.59	12	23.53	06	28.57
7	01	2.56	08	15.69	02	9.52
8	01	2.56	03	5.88	03	14.29
9	-	0.00	01	1.96	-	0.00
10	01	2.56	03	5.88	01	4.76
Total	39	100	51	100	21	100

children of all the three communities are engaged in agricultural work. Household work alone or in combination with agricultural work is almost exclusively done by the female children. Where as cattle rearing alone or in combination with agricultural work is always done by the male children (Table-8.6). This indicates some sort of taboo or tradition. It may be mentioned that cattle rearing requires physical strength and often the livestocks required to be lead to pastures far away from home which is not safe for female children. The child labourers of the Hili Block mostly work under three wage systems ie., on daily, monthly and yearly wage basis. They are commonly paid in terms of money and rarely through commodities such as paddy / rice etc.

Table-8.7 shows that more than 70% child labourers (boys and girls) are under daily wage system and marked gender difference is not observed which is however prominent in the monthly and yearly wage system. More girls work under monthly wage system than boys. The picture is almost the reverse in the yearly wage system. Overall there is hardly any difference among the communities with regard to wage system of child labourers.

Although the female child labourers are just as efficient as their male counter parts; they are paid less under all the wage regimes. This is probably because the employers take for granted that they are less efficient in work, physically weaker and are not courageous enough to protest against wage discrimination. There appears to be no difference among the tribal communities with regard to gender discrimination as such male and female child labourers of all the communities are taken together for analysis. Table-8 presents data on mean earnings of male and female child labourers under daily, monthly and yearly wage system. It is found that in case of daily wage system the difference between mean wage of male and female child labourers is more than nine times the combined S.E. Thus, the difference is highly significant.

Similarly, the difference between the means of male and female child labourers in case of monthly wage system is more than three times the combined S.E. Thus, this difference is also highly significant. On the other hand the difference between the average for male and female child labourers in case of yearly wage system is only 1.6 times the combined S.E. and thus the difference is

Table-8.4 : Distribution of child labour according to their family income.

Income per year	Santal		Munda		Oraon	
	No.of child labour	%	No.of child labour	%	No.of child labour	%
5000-10,000	30	76.92	37	72.55	15	71.43
10,000-15,000	07	17.95	11	21.57	04	19.05
$15,000^{+}$	02	5.13	03	5.88	02	9.52
Total	39	100	51	100	21	100

Table –8.5: Distribution of child labourers according to their education.

Educational status of child labour	Santal		Munda		Oraon	
	No.of child labour	%	No.of child labour	%	No.of child labour	%
Illiterate	22	56.41	33	64.71	10	47.62
Bellow primary	15	38.46	16	31.37	08	38.10
Upper primary	02	5.13	02	3.92	03	14.28
Total	39	100	51	100	21	100

Table-8.6 : Distribution of child labourers according to nature of work.

Community	Nature ofwork											
	Agricultural		Cattle rearing		house hold		Agricu house ltural & hold		Agricu ltural & Cattle rearing		Cattle Rearing house & hold	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Santal	14	15	01	-	-	05	-	02	02	-	-	-
Munda	17	19	-	-	-	-	-	06	07	-	-	02
Oraon	07	09	01	-	-	01	-	-	03	-	-	-

Table-8.7 : Distribution of child labourers according to nature of wage system.

Community	Nature of wage					
	Daily		Monthly		Yearly	
	Male	Female	Male	Female	Male	Female
Santal	14	15	00	05	03	02
Munda	16	19	01	04	07	04
Oraon	07	09	02	00	02	01
Total	37	43	03	09	12	07

Table-8.8 : Sex wise average wage of the child labourers under different wage systems in the tribal communities.

Parameters	Wage structure					
	Daily		Monthly		Yearly	
	Male	Female	Male	Female	Male	Female
Mean and S.D.	24±2.09	20±1.52	383±23.57	322±26.15	925±220.32	736±273.49
Number	N=37	N=43	N=03	N=09	N=12	N=07
S.E.	0.412		16.16		121.36	

not statistically significant. Although, the girl child labourers wage is in general less than their male counterparts (Table-8.8).

So the apprehension that the female child labourers are discriminated against with regard to wage is substantiated quantitatively. This tendency however, is in common in India, if not globally.

Table-8.9 shows that there is hardly any gender discrimination with regard to night residency of child labourers. Because 76.90% male and 77.90% female child labourers stayed in their own home at night and the rest in employers home. However, in case of Oraons no girl child labourers were allowed by the parents to stay in the employers home. It appears that the tribal communities at Hili Block despite their concerns on exploitation of the child labourers in the employers home sometimes allow their wards to stay in the employers home under compelling circumstances.

Table-8.10 shows that out of 111 (one hundred and eleven) child labourers in the block only 25 (22.50%) stayed in the employers home. However, out of this 25 children only 5 (20.00%) stayed in employers home when the distance is above 10 kilometers from own home. Surprisingly, all 5 child labourers who stayed in the employers home at night are girls and belong to Santal Community. On the other hand no Munda or Oraon children (Boys or Girls) stay in the employers home which is beyond 10 km. from their own. This probably indicates that the Santals are least concern regarding exploitation and abuse by the employers.

8.3 Conclusion:

Increase in population inevitably triggers a chain reaction such as : increase in unemployment and underemployment a feeling of frustation and disenchantment towards established norms of the society- unrest-violence and cessation. Job situation in the country is extremely competitive- so much so that a well qualified individual from even upper socio-economic layer remains unemployed for years. Thus it would be more pragmatic for a child from a lower socio-economic level to go for an apprenticeship for any kind of job from the childhood rather than venturing to get proper education / training for a long time and then enlisting his / her name as educated unemployed. At that point he / she will be unable to settle for any thing less than a white coller job for which he / she

Table-8.9 : Distribution of child labourers according to their night residency.

Community	Stayed in own home		Stayed in Employer's home		Total child	
	Male	Female	Male	Female	Male	Female
Santal	14	15	03	07	17	22
Munda	18	21	06	06	24	27
Oraon	08	10	03	00	11	10
Total	40	46	12	13	52	59

Table-8.10: Distribution of child labourers according to distance of night residence from their own home.

Community	Distance of employers home from own home			
	Up to 10 k.m.		Above 10 k.m.	
	Male	Female	Male	Female
Santal	03	02	00	05
Munda	06	06	00	00
Oraon	03	00	00	00
Total	12	08	00	05

has acquired proper education and training. It sounds well to utter good sayings such as: a child must be allowed to enjoy his childhood as is often done by westerners but in attempting to achieve that a child may end up being a trustrated youngman incourse of time causing enormous harm to himself and to the society in most under developed countries. The traditional way of life in India was that a kid learns the profession of his family from the childhood so that in time he acquires proficiency and expertize in the job and becomes a responsible citizen. The system was not actually altogether bad-after all. Higher education and training is good only if the surrounding situation of the individual child permits it. Child labour violates a range of child rights. Children are deprived of their right to education, play, leisure and all the necessities for proper development of mental, physical, psychological and spiritual growth. Children being future assets of any country, their arrested growth affects the country as a whole in the long run. Societies with large number of working children will be producing more and more illeterate citizens, devoid of skills that a country needs for development. This also adversely affects national development. This is the commonly accepted analysis of child labour problems through out the world. However, each country must solve its problem taking into consideration all the associated socio-economic and political realities prevailing in the country. Our country, for example, is a highly populous, democratic, secular country with approximately 1/4 population belonging to minority communities. As such, no Government has been courageous enough to undertake tough measures to curve population.

There are various welfare programmes to address the child labour problem in our country but often there is a serious mismatch among the programmes. The sheer magnitude and the complex nature of the problem calls for more intensive and cost effective approaches for its control. There is a need for a concerted and well-coordinated

Child labours feeding goats.

Tribal children leading goats to a field.

Grazing of Cattle in a public field.

A child labour ploughing a field.

A tribal child labour grazing a cow of his master.

A Munda girl feeding her goats.

A Santal child labour preparing the paddy field of his master.

An Oraon child labour ploughing his master's land with the help of bullocks.

A Santal old man ploughing paddy field with the help of bullocks.

A Munda man ploughing his land for paddy plantation with the help of bullocks.

effort among different Government departments on the one hand and different sections of the civil society on the other.

The most enduring steps towards decreasing child labour problem would be to improve the economic conditions of the families which supplies the child labourers into the work force. The provision of assistance in the form of income generating assets under different rural development and poverty eradication programmes needs to be provided to such families. An improvement in the economic condition of the families also brings about significant change in the attitude of families towards decreasing family size and sending the children to schools. Apart from legislative measures, there is an urgent need to give proper importance to the supportive measures for child labour.

9. Traditional Folk Medicines among the Tribals :

9.1 Introduction :

This topic presents some information on folk medicine practiced by three tribal communities inhabiting about 30 tribal Mauzas in the Hili Block, Dakshin Dinajpur, West Bengal. It has been widely recognized that most tribal communities over the years have accumulated a huge body of knowledge in utilizing locally available medicinal plants in the cure of specific diseases (Johannes, 1975; Mitra and Jain, 1991; Bhar gave, 1983). Currently there is a general trend in finding out and utilizing the wisdom of ethnic communities not only in curing diseases but also in storage of grains, and production of milk products and beverages. This account is a part of broader study on ecologic and socio-economic aspects of the Santals, Mundas and Oraons in the Hili Block.

9.2 Methods

Ethno botanical methods adopted by Schultes (1992). Mitra and Jain (1991) and and Johannes (1975) were followed. Herbarium sheets of the medicinal plants were prepared which were identified by Prof. A.P. Das, Department of Botany, NBU. The tribal medicinemen were interviewed together information regarding use of the plant or parts there of in the preparation of the medicine for specific diseases, and the dose and frequency as per age of the patients. To begin with the ethnic medicinemen were reluctant to part with any information. However, on repeated assurance that the information obtained from them would be used for research and for the good of mankind in the long run, they cooperated. The patients were also interviewed separately to crosscheck the information provided by the medicine men and also the efficacy of the treatment.

9.3 Results and Discussion :

To Stop Bleeding -

(a) Name of plant : common name-Red leaf; tribal name - Lal Pata ; scientific name *Aerua scandens* ; family Amaranthaceae.

Preparation and Dosage:

About 10grams of grinded fresh wet red leaf is to be applied in the cuts for remedy. Large sized cuts (2 inch long and ½ inch deep or more) are also heeled without any stitch with the application of this leaf.

(b) Name of the plant : common name - Marigold ; tribal name - Khusbibaha ; scientific name *Togetes petula* ; family - Asteraceae.

Preparation and Dosage:

Grinded fresh wet marigold leaf about 10 grams is to be applied into the cut. The bleeding will stop soon.

(c) Name of the plant : common name - Durbagash ; tribal name - Dubi gash ; scientific name - *Cynodon dactylon* ; family - Poaceae.

Preparation and Dosage:

Durba gash is in use for small cuts. About 5 grams of fresh wet grinded durba grass is to be applied with their saliva in the cut.

Body pain, Headache and Fever -

(a) Name of the plant : common name - Patharkuchi ; tribal name- Hanuman thaba ; scientific name - Kalanchoe pinnata; Family - Crassulaceae.

Preparation and Dosage :

About 20 grams of wet patharkuchi leaves is to be grinded and applied on the forehead. It cures headache within a few minutes. But if there is fever along with headache, it is to be applied twice or thrice a day for two or three days, as necessary.

Abdominal Pain -

(a) Name of the plant : common name - Bonkola ; tribal name - Birkaira ; scientific name - *Rhaphidophora hookeri.* Family - Araceae.

Preparation and Dosage :

About 5 grams of fresh wet infloroscence is rendered into a paste by crushing with a quarter tea spoonful salt. The preparation is to be taken before meal once or twice according to necessity. This is a sure remedy for abdominal pain.

(b) Name of the Plant : common name - Kalomegh (creat) ; tribal name - Kalmegh ; scientific name - *Andrographis paniculata;* Family - Acanthaceae.

Preparation and Dosage:

About 3 grams of dried kalomegh leaves is to be grinded and taken before meal twice a day with water. Three grams of leaf preparation is to be taken once. It may be continued for 2-3 days if needed.

Pain in the Lumber Region -

(a) Name of the plant : common name - Bishjarak ; tribal name - Isaowar ; scientific name - Ampelocissus sikkimensis; Family - Vitaceae.

Preparation and Dosage:

About 50 grams of wet root of Bishjark is pulverized and strained. The filtrate is then heated with 100 grams of ghee. About 10 grams of warm preparation is to be applied in the painful portion twice a day for 7-8 days. Only warm ointment is to be applied.

Caugh and Chest Pain -

(a) Name of the plant : i. common name - Kalozira ; scientific name - *Nigella sativa.* Family name – Ranunculaceae,

ii. Common name - Dry chilli ; tribal name - Rahar Marich ; scientific name - *Capsicum frutescence;* Family - Solanaceae.

Preparation and Dosage:

Ten grams of Kalozira and 3 grams dry chilli are fried in mustard oil and crushed to powder together. Then 2-3 grams of the powder is taken with salt, mustard oil (2ml) and little warm rice (about 100 grams) as meal. No vegetables or soups are to be taken twice a day for 3-4 days.

Toothache -

(a) Name of the plant : i. common name - Akando ; tribal name - Akaona ; scientific name - *Calotropis gigantia.* Family name - Asclepiadaceae. ii. Common name - Batal ; tribal name - Chipchirip ; scientific name - Sida rhombifolia : Family - Malvaceae.

Preparation and Dosage:

A Suitable piece of Batal branch is used as toothbrush. Then the milk of Akando about (1ml) and quarter tea spoonful salt are mixed. The mixture is applied to the ached tooth with the help of a Batal branch. After application of this mixture, pus and blood may come out from this spot. It is to be applied according to necessity. If there is injury in the ached area, batal leaves are to be munched and applied. By this procedure toothache can be cured completely.

Blood Dysentery-

(a) Name of the plant : common name - Tamarind ; tribal name - Jojo ; Scientific name – *Tamarindus indicus;* Family - Fabaceae.

Preparation and Dosage :

Three small balls are made by grinding 6-7 grams of fresh, tender and wet tamarind leaves. Then one ball and ½ teaspoonful salt is mixed in 200 ml of water the mixture is taken before meals thrice a day for three days.

Diarrhoea and Gastro-Intestinal Disturbance -

(a) Name of the plant : common name - Mango tree ; tribal name - Uldari ; scientific name - *Mangifera indica.* Family - Anacardiaceae.

Preparation and Dosage:

About 30 grams of wet rind of old mango tree is grinded and taken thrice a day (10gm each time) before meal. It may be taken one day more if necessary.

(b) Name of the plant : common name - Jambu tree ; tribal name - Koddari ; scientific name - *Sygygium cuminii.* Family - Mytraceae.

Preparation and Dosage :

About 30 grams of wet rind of old Jambu tree is to be grinded and taken thrice a day before meal.

It may be noted that for diarrhoea or GI tract problem sometimes they take limewater thrice a day.

Jaundice -

(a) Name of the plant : common name - Seora tree ; tribal name - Sarhadari ; scientific name - *Streblus asper* ; Family - Moraceae.

Preparation and Dosage :

About 80-90 grams wet tender leaves of seora tree is boiled in 2 liter of water until the volume is reduced to half. Ten ml of clear extract is to be taken 4-5 times a day before meals for 15 days or more. If necessary the treatment may be continued for a month.

Asthma -

(a) Name of the plant : common name - Banyan (Bot) tree ; tribal name - Barhichepej ; scientific name -*Ficus bengalensis*; Family - Moraceae.

Preparation and Dosage :

About 5 grams of banyan fruits that are half consumed by bats are fried in mustard oil and taken thrice a day before meals for a month. The preparation is to be made fresh each day.

(b) Name of the plant : common name - Dumar ; (fig), tribal name - Loachepej ; scientific name - Ficus carica; Family - Moraceae.

Preparation and Dosage :

About 4-5 grams of Dumur fruits that are half consumed by bats is fried in mustard oil and taken once a day before meals for one month. The preparation is to be made fresh each day.

Tuberculosis -

(a) Name of the plant : common name - not known ; tribal name - Andhey Gendheri ; scientific name - *Amaranthus viridis*; Family - Amaranthaceae.

Preparation and Dosage :

About 40-50 grams of wet root of Andhey Gandhery is grinded and mixed with ½ liter water. Ten ml of preparation is to be taken four times a day before meals for 8-10 days. When blood coughing ceases then about 4-5 grams of wet Kanta Kachu is fried in mustard oil and taken thrice a day for 4-5 days before or after each meal.

Permanent Sterility for Women -

(a) Name of the plant : common name - Tamato tree ; tribal name - Kurche ; scientific name - Lycopersicon esculentum; Family - Solanaceae.

Preparation and Dosage :

About 100 grams of wet tomato root grinded and mixed with ½ liter of water is to be taken by the patient at a time on completion of her menstural cycle before meal. The fallo-pian tubes are claimed to get wrinkled after taking this medicine. Thus the ovum cannot pass into the uterus and fertilization is stopped.

(b) Name of the plant : common name - not known ; tribal name - Varveri ; scientific name - Ocimum basilicum. Family - Lamiaceae.

Preparation and Dosage :

The wet sprout and leaves of Varveri is pulped into three balls 0f 40-50 grams each. Now one ball is blended in ½ liter of water, the preparation is taken by the patient on completion of her cycle at a time. The treatment is to be continued over three consecutive days following completion of cycle.

Augmenting Fertility for Women -

Name of the plant : common name - Kanta Kachu ; tribal name - Kanta Jara ; scientific name - *Lassia spinosa.* Family - Araceae.

Preparation and Dosage :

Approximately 50 grams of wet root of Palash tree is grinded mixed with ½ liter of water. The whole preparation is to be taken after the completion of the cycle before meal. The medicine is to be continued for three consecutive days and each time fresh preparation is to be used. Sexual intercourse is to be continued over the treatment period and afterwards.

Diabetes -

(a) Name of the plant : Common name - Ulat Kambal; tribal name - Ulat Kambal; scientific name - *Abroma augusta*; Family - Sterculiaceae.

Preparation and Dosage :

The wet root of Ulat Kambal, 20-25 grams is grinded and mixed with ½ liter of water. The preparation is taken once daily for seven days in empty stomach. It may be continued for some more days if necessary.

Common Goiter -

(a) Name of the plant : Common name - Dhutura, tribal name - Dotro; scientific name - *Datura metel*; Family - Solanaceae.

Preparation and Dosage :

Wet roots of Dhutura about 20-25 grams is grinded with little amount of water. The preparation is applied once a day on the affected area for 1½ -2 months. The amount of medicine will depend upon the size of the affected area.

In sum, it may be mentioned that as human population is continuing to increase unabated, more disease causing organisms are acquiring resistance to conventional drugs and at the same time new diseases are evolving : the necessity to find unconventional sources of medicine is becoming urgent. The observations described here are hoped to provide some such sources.

The Folk medicine man showing *Sida rhombifolia*, a medicinal plant used for toothache.

Streblus asper, a medicinal plant used for jaundice

Folk medicine man showing *Ocimum basilicum*, a medicinal plant used for permanent sterility for women.

Tamarindus indicus a medicinal plant used for blood dysentery

Lassia spinosa, a medicinal plant used for tuberculosis.

The santal medicine man showing a medicnal plant, *Abroma augusta* used to cure diabetes.

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Traditional Folk Medicines among the Santal, Munda and Oraon Communities in the Hili Block, Dakshin Dinajpur, West Bengal

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Abstract

Folk medicinal practices among the Santals, Mundas and Oraons inhabiting the Hili Block, Dakshin Dinajpur, West Bengal are discussed in depth. Plants used for 15 kinds of common ailments including blood dysentery g astro-intestinal tract disturbance, abdominal pain, jaundice, asthma, tuberculosis, enhancing fertility and sterility in women. The preparation of the medicine, amount and frequency of dosage are also discussed.

This paper presents some information on folk medicine practiced by three tribal communities inhabiting about 30 tribal Mauzas in the Hili Block, Dakshin Dinajpur, West Bengal. It has been widely recognized that most tribal communities over the years have accumulated a huge body of knowledge in utilizing locally available medicinal plants in the cure of specific diseases (1—3). Currently there is a general trend in finding out and utilizing the wisdom of ethnic communities not only in curing diseases but also in storage of grains, and production of milk products and beverages. This account is a part of broader study on ecologic and socio-economic aspects of the Santals, Mundas and Oraons in the Hili Block.

Methods

Ethnobotanical methods adopted by Schultes (4), Mitra and Jain (2) and Johannes (1) were followed. Herbarium sheets of the medicinal plants were prepared which were identified by Prof A. P. Das, Department of Botany, NBU. The tribal medicinemen were interviewed to gather information regarding use of the plant or parts there of in the preparation of the medicine for specific diseases, and the dose and frequency as per age of the patients. To begin with the ethnic medicinemen were reluctant to part with any information. However, on repeated assurance that the information obtained from them would be used for research and for the good of mankind in the long run, they cooperated. The patients were also interviewed separately to crosscheck the information provided by the medicine men and also the efficacy of the treatment.

Results and Discussion

To Stop Bleeding

(a) Name of the plant : common name Red leaf ; tribal name Lal Pata ; scientific name *Aerua scandens* ; family Amaranthaceae

Preparation and Dosage

About 10 grams of grinded fresh wet red leaf is to be applied in the cuts for remedy. Large sized cuts (2 inch long and $\frac{1}{2}$ inch deep or more) are also heeled without any stitch with the application of this leaf.

(b) Name of the plant : common name Marigold ; tribal nam e Khusbibaha ; scientific name *Togetes petula* ; family Asteraceae.

Preparation and Dosage

Grinded fresh wet marigold leaf about 10 grams is to be applied into the cut. The blee-

ding will stop soon.

(c) Name of the plant : common name Durbagash ; tribal name Dubi gash ; scientific name *Cynodon dactylon* ; family Poaceae.

Preparation and Dosage

Durba gash is in use for small cuts. About 5 grams of fresh wet grinded durba grass is to be applied with their saliva in the cut.

Body Pain, Headache and Fever

(a) Name of the plant : common name Pathar kuchi ; tribal name Hanuman thaba ; scientific name *Kalanchoe pinnata*. Family Crassulaceae.

Preparation and Dosage

About 20 grams of wet pathar kuchi leaves is to be grinded and applied on the forehead. It cures headache within a few minutes. But if there is fever along with headache, it is to be applied twice or thrice a day for two or three days, as necessary.

Abdominal Pain

(a) Name of the plant : common name Bonkola ; tribal name Birkaira ; scientific name *Rhaphidophora hookeri*. Family Araceae.

Preparation and Dosage

About 5 grams of fresh wet infloroscence is rendered into a paste by crushing with a quarter tea spoonful salt. The prepation is to be taken before meal once or twice according to necessity. This is a sure remedy for abdominal pain.

(b) Name of the plant : common name Kalomegh (creat) ; tribal name Kalmegh ; scientific name *Andrographis paniculata*. Family Acanthaceae.

Preparation and Dosage

About 3 grams of dried kalomegh leaves is to be grinded and taken before meal twice a day with water. Three grams of leaf preparation is to be taken once. It may be continued for 2—3 days if needed.

Pain in the Lumber Region

(a) Name of the plant : common name Bishjarak ; tribal uame Isaowar; scientific name *Ampelocissus sikkimensis*. Family Vitaceae.

Preparation and Dosage

About 50 grams of wet root of Bishjarak is pulverized and strained. The filtrate is then heated with 100 grams of ghee. About 10 grams of warm preparation is to be applied is the painful portion twice a day for 7—8 days. Only warm ointment is to be applied.

Caugh and Chest Pain

(a) Name of the plant : i. Common name Kalozira (Black cumin) ; tribal uame Kalozira ; scientific name *Nigella sativa*. Family name Ranunculaceae. ii. Common name Dry chilli ; tribal name Rahar Marich ; scientific name *Capsicum frutescence*. Family Solanaceae.

Preparation and Dosage

Ten grams of Kalozira and 3 grams dry chilli are fried in mustard oil and crushed to powder together. Then 2—3 grams of the powder is taken with salt, mustard oil (2 ml) and little warm rice (about 100 grams) as meal. No vegetables or soups are to be taken during this period. The preparation is to be taken twice a day for 3—4 days.

Toothache

(a) Name of the plant : i. Common name Akando ; tribal name Akaona ; scientific name *Calotropis gigantia*. Family name Asclepiadaceae. ii. Common name Batal ; tribal name Chipchirip ; scientific name *Sida rhombifolia*. Family Malvaceae.

Preparation and Dosage

A suitable piece of Batal branch is used as toothbrush. Then the milk of Akando about 1 ml and quarter tea spoonful salt are mixed. The mixture is applied to the ached tooth with with the help of a Batal branch. After application of this mixture, pus and blood may come out from this spot. It is to be applied according to necessity. If there is injury in the ached area, batal leaves are to be munched and applied By this procedure toothache can be cured completely.

Blood Dysentery

(a) Name of the plant : common name Tamarind ; tribal name Jojo ; scientific name *Tamarindus indicus*. Family Fabaceae.

Preparation and Dosage

Three small balls are made by grinding 6—7 grams of fresh, tender and wet tamarind leaves. Then one ball and 1/2 teaspoonful salt is mixed in 200 ml of water the mixture is taken before meals thrice a day for three days.

Diarrhoea and Gastro-Intestinal Disturbance

(a) Name of the plant : common name Mango tree; tribal name Uldari; scientific name *Mangifera indica*. Family Anacardiaceae.

Preparation and Dosage

About 30 grams of wet rind of old mango tree is grinded and taken thrice a day (10 g each time) before meal. It may be taken one day more if necessary.

(b) Name of the plant : common name Jambu tree ; tribal name Koddari ; scientific name *Sygygium cumini*. Family Mytraceae.

Preparation and Dosage

About 30 grams of wet rind of old Jambu tree is to be grinded and taken thrice a day before meal.

It may be noted that for diarrhoea or GI tract problem sometimes they take limewater thrice a day.

Jaundice

(a) Name of the plant : common name Seora tree ; tribal name Sarhadari ; scientific name *Streblus asper*. Family Moraceae.

Preparation and Dosage

About 80—90 grams wet tender leaves of seora tree is boiled in 2 liter of water until the volume is reduced to half. Ten ml of clear extract is to be taken 4—5 times a day before meals for 15 days or more. If necessary the treatment may be continued for a month.

Asthma

(a) Name of the plant : common name Banyan (Bot) tree ; tribal name Barhichepej ; scientific name *Ficus bengalensis*. Family Moraceae.

Preparation and Dosage

About 5 grams of banyan fruits that are half consumed by bats are fried in mustard oil and taken thrice a day before meals for a month. The preparation is to be made fresh each day.

(b) Name of the plant : common name Dumur ; (fig), tribal name Loachepej; scientific name *Ficus carica*. Family Moraceae.

Preparation and Dosage

About 4—5 grams of Dumur fruits that are half consumed by bats is fried in mustard oil and taken once a day before meals for one month. The preparation is to be made fresh each day.

Tuberculosis

(a) Name of the plant : common name not known ; tribal name Andhey Gen-

dheri ; scientific name *Amaranthus viridis*. Family Amaranthaceae.

(b) Name of the plant : common name Kanta Kachu ; tribal name Kanta jara; scientific name *Lassia spinosa*. Family Araceae.

Preparation and Dosage

About 40—50 grams of wet root of Andhey Gandhery is grinded and mixed with 1/2 liter water. Ten ml of the preparation is to be taken four times a day before meals for 8—10 days. When blood coughing ceases then about 4—5 grams of wet Kanta Kachu is fried in mustard oil and taken thrice a day for 4—5 days before or after each meal.

Permanent Sterility for Women

(a) Name of the plant : common name Tomato tree ; tribal name Kurche ; scientific name *Lycopersicon esculentum*. Family Solanaceae.

Preparation and Dosage

About 100 grams of wet tomato root grinded and mixed with 1/2 liter of water is to be taken by the patient at a time on completion of her menstrual cycle before meal. The fallopian tubes are claimed to get wrinkled after taking this medicine. Thus the ovum cannot pass into the uterus and fertilization is stopped.

(b) Name of the plant : common name not known ; tribal name Varveri; scientific name *Ocimum basilicum*. Family Lamiaceae.

Preparation and Dosage

The wet sprout and leaves of Varveri is pulped into three balls of 40—50 grams each. Now one ball is blended in $\frac{1}{2}$ liter of water, the preparation is taken by the patient on completion of her cycle at a time. The treatment is to be continued over three consecutive days following completion of cycle.

Augmenting Fertility for Women

(a) Name of the plant : common name Palash (Bastard teak) ; tribal name Marut dari ; scientific name *Butia monosperma*. Family Fabiaceae.

Preparation and Dosage

Approximately 50 grams of wet root of Palash tree is grinded and mixed with $\frac{1}{2}$ liter of water. The whole preparation is to be taken after the completion of the cycle before meal. The medicine is to be continued for three consecutive days and each time fresh preparation is to be used. Sexual intercourse is to be continued over the treatment period and afterwards.

Diabetes

(a) Name of the plant : common name Ulat Kambal ; tribal name Ulat Kambal ; scientific name *Abroma augusta*. Family Sterculiaceae.

Preparation and Dosage

The wet root of Ulat Kambal, 20—25 grams is grinded and mixed with $\frac{1}{2}$ liter of water. The preparation is taken once daily for seven days in empty stomach. It may be continued for some more days if necessary.

Common Goiter

(a) Name of the plant : common name Dhutura ; tribal name Dotro ; scientific name *Datura metel*. Family Solanaceae.

Preparation and Dosage

Wet roots of Dhutura about 20—25 grams is grinded with little amount of water. The preparation is applied once a day on the affected area for 1 $\frac{1}{2}$—2 months. The amount of medicine will depend upon the size of the affected area.

In sum, it may be mentioned that as human population is continuing to increase unabated, more disease causing organisms are acquiring resistance to conventional drugs and

at the same time new diseases are evolving : the necessity to find unconventional sources of medicine is becoming urgent. The observations described here are hoped to provide some such sources.

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Bio-Resource Utilization by the Santals, Mundas and Oraons in the Hili Block, Dakshin Dinajpur, West Bengal

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Abstract

The Santals, Mundas and Oraons co-inhibit in 29 Mauzas of the Hili Block of Dakshin Dinajpur for over 100 years. Despite living in close contact with one another, inter community marriage is rare or non-existent. However, their ways of living and manner of resource utilization is mostly similar. To make a living they perform a variety of activities such as agriculture, animal husbandry, daily-wage labor, trading of forest collections and liquor, hunting, fishing and capture-collection of various animals and plants. Of the subsistence activities trading of firewood, daily wage-labor and agriculture provide them with more than three fourth of their caloric requirements. The three communities differ insignificantly on percent contribution in most subsistence activities except hunting-fishing-animal collection and trading of liquor. Participation of women folks in the subsistence-activities is higher in trading of firewood and other forest produces but less in all other subsistence activities as compared to men. Rearing of domestic animals, however, is the sole preoccupation of the ladies.
Key words : **Bio-resource utilization, Santal, Munda, Oraon, Hili block, Dakshin Dinajpur.**

Study of the ethnic communities in the present state of socio-political environ of India is not only important but a necessity. Tribal people of the present study at Hili block as also others elsewhere often suffer from the notion that they are being left out from the mainstream society of the country. This feeling generates discontent, dissent and distress in them and emboldens them to dissociate from the general developmental activities of the country. Study of the patterns of resource utilization by different ethnic communities is important not only in identifying existence of possible unutilized niches in their ecosystem and suggesting proper strategy for their exploitation on one hand and also in determining resources they are over-exploiting to the determent of the resource ill question and themselves. Significant studies in different aspects have been conducted by various authorities both in India and abroad (1–13). The objective of the present study is to determine resource utilization pattern of the three tribal communities at Hili block with particular emphasis on hunting-capture-collection (HCC), daily wage labor, forest collections and livestock rearing.

Hili block is situated at the Indo-Bangladesh border. Three rivers (two major and one minor) namely, Ghagra, Jamuna and Chiri encircle the block. The major terrestrial habitat types of the block are: bushes, dense forest and riverside grassland. Aquatic habitats of the block on the other hand are represented by rivers, bills, flooded-paddy fields, ponds, jhills and ditches.

(Professor A. P. Das, Department of Botany, NBU graciously identified the plant specimens. Animal specimens were identified by experts at ZSI, Calcutta).

Methods

Data were collected from house to house survey and field observations. Detailed survey was conducted for enumeration of human and livestock population of the village. The age-sex of the cattle were recorded for each household. The age of the cattle reported by their owners were found to be fairly accurate because it coincided well with 30–35% cases where it was checked by a veterinarian. Verification of data is possible by repeating the procedure once or twice, where each successive survey acts as a check on the previous count (11). The weight of fresh dung of the experimental cattle in the field were taken separately and oven dried

at 75 – 80 C to constant weight. Energetic value of dried dung was taken to be 4.26 kcal/g (14). The work performed by each bullock was converted in terms of kcal/hour which was approximately 433 kcal/hour (11, 15–17). The energetic value of milk of the study cattle was taken to be 829 kcal/kg for milk containing 4.7% fat (17, 18). All the reported data were verified and cross-checked with those obtained from other sources before finally accepted for consideration. The data were analyzed qualitatively and quantitatively and those obtained from direct observations agreed well with reported ones.

Often the hunting, fishing, and collection spots were visited in company with the tribal groups to determine the manner of their activity and the amount of materials obtained. Plant and animal materials collected were first sorted out. The materials were grouped into animal and plant categories and weighed. Animal specimens were preserved in 70% alcohol. Herbarium sheets were prepared with the plant specimens.

Results

The resource utilization pattern in the three tribal communities at the Hili block is similar in general. This could probably be a function of living in close proximity with one another for over a century and due to the fact that they are mostly cut-off from their own main-stream populations elsewhere. Subsistence activities of the tribal communities of the Hili block include a host of activities such as hunting-fishing-collection of animals, cultivation in own land, daily-wage labor, preparation -sale of alcohol, small trade, forest collection, (mainly green vegetables and fire wood) for own consumption and sale and rearing of domestic animals. The common terrestrial and aquatic fauna utilized by the tribals in the Jungles and water bodies of the block are shown in the Tables 1 and 2, respectively.

The tribal communities maintain some taboo in consumption of certain animals found in the block. For example, the Santals do not consume crows and kingfishers, similarly the Mundas do not take bats, jungle cats; and the Oraono the porcupines, frogs, bats, wood cutters, crows, jungle cats and kingfishers.

In general hunting among the tribal communities has ceased to be a major subsistence activity mainly because of paucity of preferred game species due to massive deforestation on one hand and enactment of laws prohibiting hunting on the other. Hunting nowadays is mostly

Table 1. Utilization of Terrestrial Fauna by the Santals, Mundas and Oraons at Hili block (1996-97).

Common name	Santal name	Munda name	Oraon name	Scientific name
Jungle cat	Runda	Gara	Bando	*Felis* sp.
Indian hare	Tulai	Lambha	Lambha	*Lepus ruficandatus*
Guinea pig	Asulgudu	Beniposh	Beniposh/ baramusa	*Cavia porcellus*
Indian porcupine	Jhink	Chhedar	Chhedar	*Hystrix indica*
Rat	Godo	Indur	Musa	*i. Bandicota bengalensis* *ii. Ratus rattus*
Wild boar	Birsukri	Jangli sukor	Jangli kisshi	*Sus cristatus*
Bat	Bakdur	Bakdul	Bakdul/Badri	*Pteropus giganticus*
Dove	Otum	Ghughu	Ghughu	*Streptopelia* sp.
Wood cutter	Kath thokra	Katil thokra	Kath thokra	*Picus* spp.
Pea fowl	Marah	Mayur	Mayur	*Pavo cristatus*
Sparrow	Hatiuri	NA	Chocha charai	*Passer domesticus*
Wild fowl	Birsim	Ban murgi	Jangli kher	*Gallus* sp.
Wild duck	Sherali	Genrey	Genrey/ Bali hansh	
Pigeon	Paora	Kaptor	Kaptor	*Columba livia*
Crow	Kanhu	Kauoa	Kauoa	*Corvus Splendens*
Kingfisher	Kikir	Kil kila	Kil kila	*Alcedo* sp.

Table 2. Utilization aquatic fauna by the Santals, Mundas and Oraons at Hili block (1996-97).

Common name	Santal name	Munda name	Oraon name	Scientific name
Turtle	Hara	Kachhua	Kachhua	*Chelone* sp.
Frog	Bardha rotey	Holabang	Bang	*Rana tigrina*
Punti fish	Punti hako	Punti masri	Punti masri	*Barbus puntio*
Singi fish	Sishing hako	Kanos masri	Kanos masri/ Shingi masri	*Heteropneutes fossilis*
Magur fish	Mangri hako	Magur masri	Magur masri	*Clarius batrachus*
Tangra fish	Ranreh hako	Tengra masri	Tengra masri	*Mystus* sp.
Blind serpent	Bambi	Cuchia	Cuchia	*Amphipnous cuchia*
Climbing perch	Rodgo hako	Kai masri	Kai masri	*Anabus testudenius*
Snake heads	Ganrai hako	Santhi masri	Santi masri	*Channa punctatus*
Crab	Katcom	Khokra	Kai.kro	*i. Potamon Atkinsonianum* *ii. Cancer* sp.
Prawn	Iccha hako	Jal masri	Ichla masri	*i. Palaemon* sp. *ii, Macrobranchium rogenburgii*
Apple snail	Gungha	Ghungi	Ghungi	*i. Pila globossa* *ii. Brotia costula*
Mussel	Jhinuk	Jhinuk	Jhinai	*i. Lamellidens marginalis* *ii. Anodonta* sp.

ritualized to some religious activity on some particular days of the year such as Holi, Pousparbon, X-mass (for the Christian tribals), Kalipuja, Soharai, Dalpuja, 1 January and Gai (worship of bow and arrow). However, despite all constraints few Santal and Munda families still hunt considerably.

Table 3 shows comparative accounts of number and percent families participating in hunting-capture-collection of animals, total and

Table 3. Contribution of hunting-capture-collection of different animal items in the diet of the Santals, Mundas and Oraons at Hili block (1996-97). *Figures in the parentheses indicate %; -Means absent; ±Indicate SE.

Hunt-capture - collection of animals	Number and percent families practicing			Amount/year (kg)			Average amount hunted-captured-collected/family/ year (kg)		
	Santal	Munda	Oraon	Santal	Munda	Oraon	Santal	Munda	Oraon
Mammals and birds	135 (23.89)*	137 (23.46)	67 (21.33)	3651.75 (10.39)	3733.25 (10.12)	1440.50 (6.15)	27.05±0.9	27.25±0.50	21.50±0.32
Turtle	13 (2.30)	11 (1.88)	07 (2.23)	68.25 (0.19)	82.50 (0.22)	45.00 (0.19)	5.25±0.46	7.50±0.44	6.43±1.28
Frog	29 (5.13)	25 (4.28)	-	275.5 (0.78)	156.25 (0.42)	-	9.50±0.57	6.25±0.31	-
Fish	287 (50.80)	281 (48.12)	235 (74.84)	13058.50 (37.15)	11450.75 (31.05)	9928.75 (42.38)	45.50±0.67	40.75±0.62	42.25±0.22
Crab	18 (33.45)	195 (33.39)	113 (35.99)	1086.75 (3.09)	1033.50 (2.80)	595.00 (2.54)	5.75±0.14	5.30±0.12	5.27±0.14
Prawn	21 (3.72)	23 (3.94)	25 (7.96)	63.00 (0.18)	75.00 (0.20)	65.00 (0.28)	3.00±0.23	3.26±0.31	2.60±0.21
Snail	251 (44.42)	297 (50.86)	187 (59.55)	16440.50 (46.77)	20005.50 (54.24)	11220.00 (47.89)	65.50±0.79	67.36±0.81	60.00±0.38
Mussel	56 (9.91)	51 (8.73)	23 (7.32)	406.00 (1.15)	344.25 (0.93)	132.25 (0.56)	7.25±0.24	6.75±0.30	5. 75±0.24
						Total	168.8	164.42	143.8

Table 4. Average time spent/adult on different subsistence activities among the three ethnic communities at Hili block (1996-97). *Figure in the parentheses indicate %..

Activity	Time spent (hours/year/adult)					
	Male			Female		
	Santal	Munda	Oraon	Santal	Munda	Oraon
Hunting-fishing-collection of animals	150.30 (8.03)*	159.30 (8.23)	100.75 (6.37)	90.45 (4.86)	100.00 (5.97)	85.50 (5.08)
Agricultural work in own land	550.15 (29.40)	530.45 (27.41)	400.15 (25.30)	350.00 (18.80)	370.15 (22.08)	220.45 (13.11)
Day labor	600.00 (32.07)	655.00 (33.84)	630.50 (39.86)	450.00 (24.18)	400.50 (23.90)	475.15 (28.25)
Preparation and selling of alcohol and other small trade	225.15 (12.03)	205.50 (10.62)	150.25 (9.50)	90.00 (4.84)	80.00 (4.77)	-
Forest collection	345.45 (18.46)	330.30 (17.07)	300.00 (18.97)	555.30 (29.83)	500.00 (29.83)	550.50 (32.74)
a. Sell of forest produces	27.52 (1.47)	26.32 (1.36)	23.90 (1.51)	44.24 (2.38)	39.84 (2.38)	43.86 (2.61)
b. Consumption of forest produces by self	3.16 (0.17)	3.02 (0.16)	2.75 (0.17)	5.09 (0.27)	4.58 (0.27)	5.04 (0.30)
c. Firewood	314.76 (16.82)	300.96 (15.55)	273.35 (17.28)	505.97 (27.18)	455.58 (27.18)	501.60 (29.83)
Domestic rearing	-	54.75 (2.83)	-	325.50 (17.49)	225.40 (13.45)	350.00 (20.81)

average amount obtained per family per year. A high percent of families practice fishing and snail collection in all the three communities. Percent participation of Santal and Munda families in different capture-collection activities is mostly similar and differ substantially from that of the Oraons. For example, about 75, 60 and 8% Oraon families participate in fishing, snail and prawn collection as compared to 51, 48, 3.7% and 44, 51, 3.9% in the Santals and Mundas, respectively. The Oraons also hunt less than the others. A gain unlike the Santals and Mundas the Oraons do not consume frogs at all. It is also observed that although the Santals and Mundas are more or less similar in their food habits, the Santals prefer frogs more than the Mundas whereas the latter prefer turtle more than the former. If may be pointed out that average animal food materials hunted-captured-collected by a Oraon family per year is 143.80 kg as compared to 168.80 kg and 164.42 kg in the Santals and Mundas, respectively.

Various forest produces contribute substantially in the diet of most tribal societies including Santals. Mundas and Oraons in the present study. While animal food items are solely used for self-consumption, some of the plant produces collected are sold in the market for cash.

Table 5. Number of households, human and domestic animals reared by the Santals, Mundas and Oraons at the Hili block (1999). *Figure in parentheses indicate animal/human.

Ethnic community	Households	Human	Cattle	Goats	Sheep	Chicken	Ducks	Pigs
Santal	565	2547	1820 (1.40)*	965 (2.64)	150 (16.98)	2403 (1.06)	225 (11.32)	663 (3.84)
Munda	584	2787	1672 (1.67)	1872 (1.49)	50 (55.74)	1553 (1.79)	305 (9.14)	342 (8.15)
Oraon	314	1506	1305 (1.15)	885 (1.70)	28 (53.79)	1105 (1.36)	355 (4.24)	451 (3.34)
Total	1463	6840	4797	3722	228	5061	885	1456

Time invested in a particular activity by an individual is a reliable index of the relative importance of that activity in the life of the individual in question. This is sometimes called time-budget. Table 4 shows time spent by Santals, Mundas and Oraons at the Hili block on different subsistence activities. Six major subsistence activities of the tribals have been considered. For convenience, some of the smaller activities have been lumped with certain major activities. It is found that all three communities invest more time in three categories of subsistence activities, i.e., agricultural work, and day labor and forest collection. The time-budget strategy of the three communities are in general similar, however, investment of time by the Santals and Mundas are more similar than the Oraons. For example, Oraon males and females do little hunting, agricultural work and preparation selling of liquor but more day labor. Division of labor among the sexes is also not conspicuous. Both sexes invest some time in almost all the activities except that the Santal and Oraon males do not perform any domestic rearing while Oraon females are not involved in liquor preparation and selling. Besides the females in all the communities put more time in forest collection and domestic rearing while the males give more time in the rest of the subsistence activities.

Table 5 shows no of households, human and domestic animals reared by the three ethnic communities while all the tribes at Hili block maintain all the common domestic animals it is observed that the Santals keep sheep and chickens more, the Mundas keep more goats and the Oraons keep more cattle, ducks and pig in terms of animal man ratio. The Oraons obtained substantially lesser amount of animal food materials from hunting-capture-collection (HCC) activities (Table 3). The deficit probably is met through more animals rearing activity. Table 6 shows daily average wet weight, dry weight and dry wt/wet wt ratio of dung produced by three age sex categories of tribal cattle.

Table 6. Daily per capita dung production and dry matter among the tribal cattle (kg).

Age class	No. of cattle	Mean per capita dung poduction and dry matter		
		Wet weight	Dry weight	Dry weight/ wet weight
Adult♂	1439	11.25	2.37	0.210
Adult♀	1295	8.5	1.74	0.205
Below 3 years (sub-adult)	2063	2.25	0.57	0.253

Table 7. Caloric output through dung of tribal cattle.

Age class	Mean daily caloric output per cattle through dung (dry wt)	Daily total production (kcal)
Adult♂	2.37 × 2.13 = 5048.1 kcal/♂	7264215.9 kcal
Adult♀	1.74 × 2.13 = 3706.2 kcal/♀	4799529 kcal
Below 3 years (sub-adult)	0.57 × 2.13 = 1214.1 kcal/sub-adult	2504688.3 kcal

Table 7 presents caloric output through dung production for the tribal cattle. Daily total dung production is converted in terms of kcal taking 2.13 kcal/g of dry cattle dung (14). Total daily energy production through dung by the cattle population = 14508432 kcal/day (Table 7). Hence total yearly energy production through dung = 5317477680 kcal/year. In India use of cow dung as fuel varied from 40% (14) to 75% (19). However, cow dung is used not only as fuel but also as fertilizer in the crop fields.

The number of lactating cows and their average milk production is estimated in Table 8. This estimation is done during the three survey periods in 1999. Table 8 shows total number of lactating cows and their yearly calorific value. Daily milk production per cow is only 2.25 kg,

Table 8. Total no. of lactating cows and yearly caloric value. Energy conversion of milk is done by 829 kcal/kg (17, 18).

No. of lactating cows	Daily milk production/ cow (kg)	Daily total milk production (kg)	Yearly total milk production (kg)	Yearly caloric value (kcal)
466	2.25	1048.5	382702.5	3172603725

Table 9. Total number of workable bullocks and yearly total energetic value.

No. of workable bullock	Working hours/ day/ bullock	Working days/year/ bullock	Working power/day/ bullock (HP)	Yearly total energetic value (kcal)
1207	4.25	205	2.87	455710305.5

which is considerably lower than high milk producing varieties.

Bullocks are employed by the tribals for ploughing from the age of about 5½ years. Workable male tribal cattle population during 1999 is 1207 (Table 9). A bullock works on average for 4.25 hours a day and is used on average for 205 days a year. A team of two bullocks usually operate at 1.35 horsepower, i.e., an expenditure of 0.675 HP/bullock. 1 HP is the work done at the rate of 642 kcal/hour (15–17) and thus the work-rate of a bullock is approximately 433.35 kcal/hour. Thus, work accomplished by all the workable bullocks in a year amounts to : 433.35 kcal/hr × 4.25 hr/ day × 205 days/year × 1207 = 455710305.5 kcal/ year.

Table 10 presents total energetic output from dung, milk, and work of tribal cattle in the Hili block is 5317477680 kcal/year, 3172603725 kcal/year and 455710305.5 kcal/year respectively.

Discussion

Despite low human population, favorable climatic regime and a number of rivers and rivulets, that promote growth of forests and games; there is severe decline of forest area and games solely because of indiscriminate deforestation in the block. This is evident from Tables 1 and 2. Meager success from HCC activities compelled tribal populations to concentrate more on other subsistence activities. The Oraons differ considerably from the Santals and Mundas in their animal food habits and procure less of it on average/year.

As omnivores human beings feed from several tropic levels and they depended on hunting

Table 10. Total energetic output (kcal/year) of cattle reared by the Santals, Mundas and Oraons at the Hili block 1999.

Age class	Average number of cattle	Calorie obtained/year (kcal/yr) Dung	Milk	Work
Adult♂	1439	2651438475	-	455710305.5
Adult♀	1295	1751828085	3172603725	-
Below 3 years (sub-adult)	2063	914211120	-	-
Total	4797	5317477680	3172603725	455710305.5

and gathering for their subsistence for over 99% of their evolutionary history (8). At present, however, in most enlightened ethnic communities, agriculture, daily-wage labor and small trade complement substantially to their subsistence in addition to hunting and forest collection because the latter two means are inadequate to meet the total requirement due to colossal disappearance of forests in most parts of the world.

Unlike certain tribes such as Aka (20), Ju-hoan (21), the women folk of the tribal communities at Hili block do not accompany their husbands or male members during hunting-fishing-forest collection., because there is no apprehension of rape and violence from males of other groups. The female members, however, accompany other adult members, both male and female in most of their hunting capture-collection endeavors. In other words, tribal women of Hili block apprehend little or no assault and violence in their outdoor activities. Hardy (22) opined that co-operation in hunting reduce the risk of violence on women. Lower investment of time by the tribal women in outdoor subsistence activities also provide them with opportunities to invest more in infant-child care (23, 24), domestic core and domestic rearing.

Tribal communities at Hili rear a variety of domestic animals out of which cattle and chicken are most common. Almost all-tribal families irrespective of community rear one or two cattle, which serves them in various ways to meet their subsistence.

Conclusion

Tribals at Hili block are in a state of transition from hunter-gatherer community to settled agriculturist-gatherer-laborer society. This probably is due to their contact with mainstream society as also due to nonavailability of game animals in the forest of the region. In this connection it may be mentioned that wildlife conservation strategy of our country should have some provision for utilization of game animals as food by tribals who traditionally depend on this resource. Projects to popularize cultivation of some common fruits, mushroom cultivation and animal husbandry particularly involving cattle, goats, pigs, and chicken have enormous potential in enhancing socio-economic transition of this tribal people.

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Aspects of Child Labor among the Santals, Mundas and Oraons at the Hilli Block, Dakshin Dinajpur, West Bengal, India

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Abstract

Children occupy an important position in a society. However, in India a large number of children work as paid/unpaid workers in various sectors. The incidence of child labor in India is one of the highest in the world. High population, poverty coupled with illiteracy on the part of parents are the main causes behind child labor. In India, inspite of various legislative measures and constitutional provisions which forbid employment of children below 14, the practice of child labor exists quite significantly in almost all sectors of economic activities. This is also the general picture in most developing countries.

Key words : **Child labor, Santhals, Mundas, Oraons.**

Child labor is one of the most intricate problems in almost all developing countries including India. It has many facets some of the prominent ones are: social, micro-macro economical and purely humanitarian consideration. The child laborer is deprived of the pleasures and pains of childhood including education, play and the natural ways of growing up to a subadult and adult in time. This disturbs the development of their personality permanently. Often the child laborers are abused, maltreated and sexually exploited by their employers.

Significant studies on different aspects of child labor problems have been conducted by various authorities both in India and abroad such as: Rehman (1) on education of deprived children in Delhi; Choudhury (2) on dynamic profile of child labor in India; Chandra and Suman (3) on problems and issues on child labor in India; Deol (4) on child labor in sports goods industry; Agarwal (5) on street children in New Delhi; Vidyasagar and Kumarababu (6) on child labor in match industries at Sivakasi; Bimal (7) on problems of working children; Sekhar and Mohammad (8) on child labor in home based lock industries of Aligarh; Goyal (9) on child labor in the sports goods industry in selected bastis of Jalandhar; Yates (10) on narcissistic traits in abused children in USA; Browne and Davis (11) on early prediction and prevention of child abuse in New York.

Quite a number of cottage and small scale industries in developing countries substantially depend on child laborers who work on half or even less of adult wages but produce an out put of at least three fourth of adults. This fact enables the entrepreneurs to become competitive on their products in the global market. Thus in developing countries large proportion of laborers are children and subadults in various manufacturing small to medium size industries such as carpet weaving, fire works, packing box, garment factories, brick fields, grill factories, cycle repair shops, motor garage, carpentry, tea gardens, tea shops, restaurants hotels, groceries, as maid or domestic hand, cattle rearing, agricultural works and even as prostitutes. The child laborers substantially augment the income of their families. This is one of the main reasons for poor couples to go for large family.

Globally, out of an estimated 211 million children who are engaged in some form of economic activity between the ages 5–14, 186 million children fall within the accepted ILO definition of child labor (12). The Asian Pacific region harbors the largest number of child workers in 5–14 age group, 127 million constituting 19% of the total population of children. Overall, more

than two-third of child laborers are engaged in hazardous jobs (12).

Methods

In 1991, the total number of child laborers was about 0.712 million in the West Bengal comprising 6.31% of the total child population and the figures for India were 11.3 million and 1.34% respectively (Census records 1991). Thus, West Bengal harbors a significantly higher percentage of child laborers compared to India as a whole. In the present study area, Hili Block percent child laborers among the Santals, Mundas and Oraons were 14.96,20.92 and 12.31 respectively in 1996 which despite decline to 10.54, 13.60 and 10.34 in 2004, is still about double the West Bengal figure.

No substantial information is available on the child laborers of the ethnic communities in the Hili Block. This article attempts to study the various socio-economic aspects associated with child labor in three ethnic communities inhabiting the block using information gathered from reports, literature, and personal interview methods with people of the study area.

Results and Discussion

Table 1 presents sex wise data on number and percent of child laborers among the three communities in 1996 and 2004. Percent child laborers found was 14.96, 20.92 and 12.31 respectively among the Santals, Mundas and Oraons in 1996 but it declined to 10.54, 13.60 and 10.34 in the said communities in 2004 due to developmental activities. Percent male child laborers among the Santals, Mundas and Oraons were 16.15, 18.60 and 15.46 in 1996 which declined to 8.95, 12.57 and 9.65 in 2004. Similar decline in percent female child laborers is also observed. Higher percentage of child laborers among the Mundas indicates their lower socio-economic conditions compared to the other communities.

Although child labor phenomenon is of common occurrence among the communities in the Hili Block, it is rarely found in the below eight years age group. Table 2 shows that a higher percentage of Santal children (18.00%) of 8–10 years age group are engaged in some kind of commercial work as compared to the Mundas and

Table 1. Sex-wise number and percent distribution of child laborers among the three ethnic communities in 1996 and 2004. Figures in parentheses indicate percent.

Community	Year of survey	No. of male children	No. of male child labor	No. of female children	No. of female child labor	Total no. of children	Total no. of child labor
Santal	1996	192 (53.19)	31 (16.15) (8.59)	169 (46.81)	23 (13.61) (6.37)	361	54 (14.96)
	2004	190 (51.35)	17 (8.95) (4.59)	180 (48.65)	22 (12.22) (5.95)	370	39 (10.54)
Munda	1996	172 (46.74)	32 (18.60) (8.70)	196 (53.26)	45 (22.96) (12.23)	368	77 (20.92)
	2004	191 (50.93)	24 (12.57) (6.40)	184 (49.07)	27 (14.67) (7.20)	375	51 (13.60)
Oraon	1996	97 (49.74)	15 (15.46) (7.69)	98 (50.26)	9 (9.18) (4.62)	195	24 (12.31)
	2004	114 (56.16)	11 (9.65) (5.42)	89 (43.84)	10 (11.34) (4.93)	203	21 (10.34)

Table 2. Number and percent distribution of child laborers in different age groups among the three communities in 2004.

Age group	Santal No. of child labor	Santal Percent	Munda No. of child labor	Munda Percent	Oraon No. of child labor	Oraon Percent
8–10	07	17.95	05	9.80	01	4.76
10–12	20	51.28	25	49.02	14	66.67
12–14	12	30.77	21	41.18	06	28.57
Total	39	100	51	100	21	100

Oraons.

Table 3 shows that higher family size i.e., above six is common among the Mundas than the other fellow communities. Table 4 shows that more children from low income families join the labor force at a higher percentage than high income families. The relation between child labor and family income is statistically significant ($r = 0.981$ at 2 df. $P < 0.05$).

Table 5 shows clear difference among the communities with regard to educational level of the child labor force. While more than 50% child labor of the Santals and Mundas (56.4% and 64.7% respectively) were illiterate, only 47.6% were so among the Oraons. This indicates that not only the Oraons are more careful regarding the education of their children but also more open to allow their children to earn.

Nature of work open to the tribal children are mostly limited to agricultural, cattle rearing and household and different combinations of the three types mentioned. It is found that a little more than a third male and female children of all the three communities are engaged in agricultural work. Household work alone or in combination with agricultural work is almost exclusively done by the female children. Whereas cattle rearing alone or in combination with agricultural work is always done by the male children (Table 6). This indicates some sort of taboo or tradition. It may be mentioned that cattle rearing requires physical strength and often the livestock required to be lead to pastures far away from home which is not safe for female children. The child laborers of the Hili Block mostly work under three wage systems i.e., on daily, monthly and yearly wage basis. They are commonly paid in terms of money and rarely through commodities such as paddy/rice.

Table 3. Number and percent distribution of child labor according to family size.

Family size	Santal No. of child labor	Santal Percent	Munda No. of child labor	Munda Percent	Oraon No. of child labor	Oraon Percent
4	07	17.95	06	11.76	04	19.05
5	12	30.77	18	35.29	05	23.81
6	17	43.59	12	23.53	06	28.57
7	01	2.56	08	15.69	02	9.52
8	01	2.56	03	5.88	03	14.29
9	00	0.00	01	1.96	00	0.00
10	01	2.56	03	5.88	01	4.76
Total	39	100	51	100	21	100

Table 4. Distribution of child labor according to their family income.

Income per year	Santal No. of child labor	Santal Percent	Munda No. of child labor	Munda Percent	Oraon No. of child labor	Oraon Percent
5000–10,000	30	76.92	37	72.55	15	71.43
10,000–15,000	07	17.95	11	21.57	04	19.05
15,000	02	5.13	03	5.88	02	9.52
Total	39	100	51	100	21	100

Table 7 shows that more than 70% child laborers (boys and girls) are under daily wage system and marked gender difference is not observed which is however prominent in the

Table 5. Distribution of child laborers according to their education.

Educational status of child labor	Santal No. of child labor	Santal Percent	Munda No. of child labor	Munda Percent	Oraon No. of child labor	Oraon Percent
Illiterate	22	56.41	33	64.71	10	47.62
Below primary	15	38.46	16	31.37	08	38.10
Upper primary	02	5.13	02	3.92	03	14.28
Total	39	100	51	100	21	100

Table 6. Distribution of child laborers according to nature of work.

Community	Nature of work											
	Agricultural		Cattle rearing		House hold		Agricultural & house hold		Agricultural & cattle rearing		Cattle rearing & house hold	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Santal	14	15	01	-	-	05	-	02	02	-	-	-
Munda	17	19	-	-	-	-	-	06	07	-	-	02
Oraon	07	09	01	-	-	01	-	-	03	-	-	-

monthly and yearly wage system. More girls work under monthly wage system than boys. The picture is almost the reverse in the yearly wage system. Overall there is hardly any difference among the communities with regard to wage system of child laborers.

Although the female child laborers are just as efficient as their male counter parts, they are paid less under all the wage regimes. This is probably because the employers take for granted that they are less efficient in work, physically weaker and are not courageous enough to protest against wage discrimination. There appears to be no difference among the tribal communities with regard to gender discrimination as such male and female child laborers of all the communities are taken together for analysis. Table 8 presents data on mean earnings of male and female child laborers under daily, monthly and yearly wage system. It is found that in daily wage system the difference between mean wage of male and female child laborers is quite high and highly significant.

Similarly, the difference between the means of male and female child laborers in monthly wage system is more than three times the combined SE. Thus, this difference is also highly significant. On the other hand the difference between the average for male and female child laborers in yearly wage system is only 1.6 times the combined SE and thus the difference is not statistically significant. Although, the girl child laborers wage is in general less than their male counter parts (Table 8).

So the apprehension that the female child laborers are discriminated with regard to wage is substantiated quantitatively. This tendency however, is in common in India, if not globally.

Table 9 shows that there is hardly any gender discrimination with regard to night residency of child laborers. Because 76.90% male and 77.90% female child laborers stayed in their own home at night and the rest in employers home. However, among Oraons no girl child laborers were allowed by the parents to stay in the employers home. It appears that the tribal communities at Hili Block despite their concerns on exploitation of the child laborers in the employers home sometimes allow their wards to stay in the employers home under compelling circumstances.

Table 10 shows that out of 111 child laborers in the block, only 25 (22.50%) stayed in the employers home. However, out of this 25 children only 5 (20.00%) stayed in employers home when the distance is above 10 kilometers from own home. Surprisingly, all 5 child laborers who stayed

Table 7. Distribution of child laborers according to nature of wage system.

Community	Nature of wage					
	Daily		Monthly		Yearly	
	Male	Female	Male	Female	Male	Female
Santal	14	15	00	05	03	02
Munda	16	19	01	04	07	04
Oraon	07	09	02	00	02	01
Total	37	43	03	09	12	07

Table 8. Sex wise average wage of the child laborers under different wage systems in the tribal communities.

Parameters	Wage structure					
	Daily		Monthly		Yearly	
	Male	Female	Male	Female	Male	Female
Mean and	24±	20±	383±	322±	925±	736±
SD	2.09	1.52	23.57	26.15	220.32	273.49
Number	N=37	N=43	N=03	N=09	N 12	N 07
SE	0.412		16.16		121.36	

Table 9. Distribution of child laborers according to their night residency.

Community	Stayed in own home		Stayed in Employer's home		Total child	
	Male	Female	Male	Female	Male	Female
Santal	14	15	03	07	17	22
Munda	18	21	06	06	24	27
Oraon	08	10	03	00	11	10
Total	40	46	12	13	52	59

in the employers home at night are girls and belong to Santal Community. On the other hand no Munda or Oraon children (boys or girls) stay in the employers home which is beyond 10 km from their own. This probably indicates that the Santals are least concern regarding exploitation and abuse by the employers.

Conclusion

Increase in population inevitably triggers a chain reaction such as increase in unemployment and underemployment a feeling of frustation and disenchantment towards established norms of the society- unrest-violence and cessation. Child labor violates a range of child rights. Children are deprived of their right to education, play, leisure and all the necessities for proper development of mental, physical, psychological and spiritual growth. Children being future assets of any country, their arrested growth affects the country as a whole in the long run. Societies with large number of working children will be producing more illiterate citizens, devoid of skills that a country needs for development. This also adversely affects national development. This is the commonly accepted analysis of child labor problems throughout the world.

There are various welfare programs to address the child labor problem in India but often there is a serious mismatch among the programs. The sheer magnitude and the complex nature of the problem calls for more intensive and cost effective approaches for its control. There is a need for a concerted and well-coordinated effort among different government departments on the one hand and different sections of the civil society on the other.

Table 10. Distribution of child laborers according to distance of night residence from their own home.

Community	Distance of employers home form own home			
	Up to 10 km		Above 10 km	
	Male	Female	Male	Female
Santal	03	02	00	05
Munda	06	06	00	00
Oraon	03	00	00	00
Total	12	08	00	05

The most enduring steps towards decreasing child labor problem would be to improve the economic conditions of the families which supplies the child laborers into the work force. The provision of assistance in the form of income generating assets under different rural development and poverty eradication programmes needs to be provided to such families. An improvement in the economic condition of the families also brings about significant change in the attitude of families towards decreasing family size and sending the children to schools. Apart from legislative measures, there is an urgent need to give proper importance to the supportive measures for child labor.

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