

Chapter-2

METHODOLOGY

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CHAPTER-2

METHODOLOGY

2.1: Study Area:

The entire data sources were collected from different villages of Hatighisa G.P. and Maniram G.P. of Naxalbari block, Buraganj G.P. and Raniganj-Panishali G.P. of Khoribari block and Matigara G.P. of Matigara block under Darjeeling district, West Bengal, India. Among them, Hatighisa and Maniram G.P. of Naxalbari block have lion share of Dhimal population. The previous literatures and present Dhimal population have identified the above said areas as habitation of all the Dhimals of West Bengal and India as well. However, absence of official records in the form of census or other documents makes it difficult to identify the villages and households having Dhimal population. Attempts were made to cover all the household of Dhimal population for demographic study as far as possible with the help of said population. A total of 158 household covering 900 individuals including 468 male and 432 female (as per first Survey 2003) were identified and surveyed for demographic interest. Household census collected in 2003 constitutes the principal basis of the present study, specially for demographic interests. Socio-cultural and physical characteristics of Dhimal have collected over entire villages, on the basis of data collected by household census, after find out suitable informants and random sampling respectively. Among them one household of Adhikari Bazar had been identified recently, after first phase of field survey, hence not included in the present study.

Almost all the villages in which Dhimals are inhabited are distributed around Naxalbari P.S., connected by metalled and/ or unmetalled road from main centre Naxalbari of a distance about 5 to 10 km and transported mostly by Rickshaw, Van, personal Bicycle or in many cases it is simply walking. The details about study area are described in Chapter-III as a part of the Place and the People under study.

2.2: Study Subjects:

All the Dhimial households of West Bengal (as per knowledge of reference population) were surveyed for the study except the bio-anthropological interest. For this selection of some part was inevitable. Attempts were made to pick up the sample at random as far as possible under field condition.

Two hundreds persons including 100 male and 100 female were selected for Somatometric measurements including Somatoscopic observations. To identify the health status of children a set of 88 boys and girls were taken for Somatometry of nutritional interest. Only physically normal male and female were selected for Somatometric measurements. The lowest age limit for both sexes, for Somatometric measurements, is 18 years and the upper age limit was taken as 55 years. Altogether 206 individuals of both sexes (in equal proportions) were examined for colour vision test. For Blood grouping (ABO and Rh) and Dermatoglyphics another set of 202 persons were selected of both sexes in equal proportions. In case of PTC taste sensitivity only 71 male and 54 female were selected for the present study. For colour vision test and PTC tasting ability male or female of any age group were considered for the study except below 5 years; whereas in case of Dermatoglyphics no age or sex consideration had taken into consideration except children below 5 years because of practical difficulty. For blood grouping, blood have been collected from healthy adults and non-pregnant women who weigh normal (or nearly normal) as per guidelines of Indian Council for Medical Research (ICMR, 2006). The sample size with age and sex consideration of the parameters may be summarizes as follows.

Table 2.1: Sample size and Age-Sex consideration of the traits

Sl.	Name of the traits/ parameters	Age group	Male	Female	Total
1	Somatometric measurements (including Somatoscopy)	18-55 years	100	100	200
2	Somatometric measurements (on children)	6-14 years	44	44	88
3	Colour Vision test	Above 5 years	103	103	206
4	PTC Taste	Above 5 years	106	106	212
5	Blood grouping	Above 18 years	101	101	202
6	Dermatoglyphics	Above 5 years	102	102	204

For selection of subjects in respect of social-cultural data, relevant information were collected from all head (or aged person) of the household irrespective of sex, which sometimes supplemented by other members whenever needed. Beside these some key persons of the society including traditional village council office bearers and members, members of modern political systems, service man and educated youth, are also interviewed. The details about study subjects including their distribution, historical development are described in Chapter-III as a part of the Place and the People under study.

2.3: Study Design:

The study is field setting research and based on anthropological approach in a holistic nature i.e. the study is a combined effort of biological and social-cultural aspects in true sense. The research may be categorized as descriptive or *Ex post facto* research as it intends to gather preliminary information of Indian Dhimals by describing the characteristics (both biological and social-cultural) of the group where researcher has no control over variables. Therefore the study is fundamental in nature as it aims to gather knowledge for knowledge's sake. The study is also a one-time research as research is confined to a single time period. On the other hand, as per characters of variables it is both qualitative and quantitative in nature. Overall it is Primary in nature i.e. most of the data has been collected from field, however, in some cases, specially whenever the study intends to identify changes in any sphere of life or identity of the group, data were supplemented by secondary sources.

2.4: Characters, Traits and Concepts ^{used for the} Study:

In the present study the number of characters selected, may be classified into three broad categories viz. characters of demographic interest, characters of morphological-genetic interest and characters of socio-cultural interest.

2.4.1: Demographic Characters:

Demographic data were collected through household census. Data on age, sex, ethnicity, marital status, education, occupation, family income, migration were recorded as socio-cultural parameter through a proforma specially prepared for the purpose. The data on Bio-events in the form of age at menarche, age at menopause, age at marriage, age at first birth, family planning, number of children including live birth, still birth and abortion, were collected from female population of appropriate stage. The estimation of age were enumerated with recall method, with reference to some important local events and compare with a known persons of identified ages, except some who had kept their age records specially the younger generation. To get a concrete picture on demographic situation following rates and ratios were recommended.

The sex ratio, as per demography, calculated as number of males per hundred females (Barclay, 1958). A contrasting definition of sex ratio for India, frequently used to compare the data of Indian census, also used for the study; which may be defined as number of female per thousand male (Srinivasan, 1998) and named as Female-Male Ratio, to distinguish between two. Beside Sex Ratio, Age Ratio, Dependency Ratio and Crude Literary Rate were calculated following standard formula (Srinivasan, 1998).

For fertility measures of the population child-woman ratio, crude birth rate, general fertility rate, age specific fertility rates, total fertility rate, general marital fertility rate and gross reproduction rate were calculated as suggested by Barclay (1958). The Nuptiality analysis was evaluated by using Crude Marriage Rate, General Marriage Rate, Age Specific Marriage Rate, Total Marriage Rate, Mean Age at Marriage and Singulate Mean Age at Marriage of the population by using standard techniques (Srinivasan, 1998).

Crude Death Rate, Age Specific Death Rate, Infant Mortality Rate, Neonatal Mortality Rate, Post-neonatal Mortality Rate, Cause Specific Death Rates and Maternal Mortality Rate and Ratios were enumerated to understand mortality behaviour of the population by using standard formula (Barley, 1958).

The measures of migration, which is internal as well as international in nature, have identified by using direct measurement from household census. The Crude Rate of

Migration, Rate of out Migration, in migration and Net Migration Rate were applied for the study following standard formula (Srinivasan, 1998).

As estimation of age is an important parameter for demographic study, extra care was taken to record age with minimum error. Due to lack of documents about date of birth, data have been collected using recall method and cross examined with their age, age of child, age of near relatives or after important events of the region.

Health status of the population has assessed using anthropometric measures. In general nutritional status was evaluated using Body Mass Index (BMI). WHO (1995) and BCIMS classification for Asians (Singh, 2005) were used to identify underweight, overweight and normal range of BMI of the population. Undernourishment of children is also classified after comparing the weight-for-age, height-for-age, weight-for-height with that of reference values of World Health Organization standard (WHO, 1983). The percentage of population below -2SD of reference data were classified as undernourished; and for severe undernourished percentage of population below -3SD of reference data were identified for the same .

2.4.2: Morphological and Genetic Characters:

2.4.2.1: Somatometric and Somatoscopic Characters:

In the present study 30 number of Somatometric characters, 17 indices and 21 numbers of Somatoscopic characters were selected which may have greater importance to study population variation, as suggested by International Biological Program (IBP) and various scholars (Weiner and Lourie, 1981; Singh and Bhasin, 1968; Nath, 1993).

Somatometric measurements were taken with the help of standard anthropometer, Martin's sliding calipers, Martin's spreading calipers, weighing machine and steel tape according to the standard methods and techniques as suggested by Martin 1928 (Sengupta, 1993). Subjects were informed about the measurements and measured after verbal consent. Among these 30 measurements, all measurements were recorded directly except four i.e. Upper Arm length, Forearm length, Thigh length and Tibial length which were calculated indirectly after subtracting two measurements prescribed by Singh and Bhasin (1968). Measurements were taken, by convention, on the left side

of the body wherever possible (Weiner and Lourie, 1981). The instrument recommended for taking each measurement, were used depending upon preferences according to measurements. The Somatometric methods and definition of landmarks as suggested by Martin and Saller 1956 (Sengupta 1993) were followed. Weight was recorded with the help of portable weighing machine and measured in kilograms with as minute as 0.5 kg as per scale. Other anthropometric measurements were recorded in millimeter but noted as centimeters. Technical Error of Measurements (TEM) was calculated as per formula of Perini et.al. (2005) and the results were found to be within the reference value.

Different indices, to understand population identity, have calculated using standard formula (Singh and Bhasin, 1968). The classification of some indices was considered for further division of the population. For classification of measurements and indices the classification proposed by Martin1928, Martin and Saller1956, Schalaginhafen1946 (Sengupta,1993), Lebzelter and Saller, Brugsch, Tschernorutzky and Pignet-Vervack (Singh and Bhasin, 1968) and WHO (1995) have been used.

Table 2.2: List of Measurements

A. Somatometric Measurements	Stature, Sitting Height, Total Arm Length, Total Leg Length, Biacromial Breadth, Bicristal Breadth, Body Weight, Upper Arm Length, Forearm Length. Hand Length. Hand Breadth, Thigh Length, Tibial Length, Foot Length, Foot Breadth, Head Length, Head Breadth, Horizontal Circumference of Head, Morphological Facial Height, Morphological Upper Facial Height, Bizygomatic Breadth, Bigonial Breadth, Minimum Frontal Breadth, Biocular Breadth. Interocular Breadth. Eye Breadth, Nasal Height. Nasal Breadth, Nasal Depth, Nasal Length.
B.Somatoscopic Measurements (including Behavioural Traits)	Skin Colour. Head Hair Colour, Head Hair form, Head Hair Texture. Occipital Hair Whorl (type and number), Beard and Moustache, Hypertrichosis of Ear. Eye Colour, Eye fold, Eye Opening- Height, Eye Obliquity, Nasion depression. Nasal profile, Nostril shape, Membranous Lip size- upper, Membranous Lip size- lower, Lip eversion, Alveolar Prognathism, Hand Claspings, Arm Folding, Handedness.
C. Indices	Relative Sitting Height Vertex (Cormic) Index, Relative Upper Extremities Index, Relative Lower Extremities Index, Relative Biacromial Breadth Index, Relative Bicristal Breadth Index, Ponderal Index, Body Mass Index, Length-Breadth Index of Hand, Foot Index, Cephalic Index, Morphological Facial Index. Morphological Uperfacial Index, Orbito-Jugular Index, Jugo-Mandibular Index, Jugo-Frontal Index, Nasal Index, Nose Elevation Index.

For Somatoscopic observation, as stated earlier, 21 numbers of characters were recorded because of their importance in population variation (Singh and Bhasin, 1968) from the same set of individuals who were measured for Somatometric characters. However two characters viz. beard and moustache development and Hypertrichosis of ear have been recorded only among the males. All of the observation were recorded without having any instrumental facilities; i.e. wholly depend upon eye estimation. The observations were recorded exclusively by researcher himself; therefore, the effect of researcher bias was minimized.

2.4.2.2: Genetic Characters:

2.4.2.2.1: Blood Groups:

Altogether 202 blood samples from healthy adult and non-pregnant women were collected for ABO and Rh (D) systems. Subjects were informed about the tests and blood was collected after verbal consent. The blood groupings were performed following standard method by agglutination test of Anti-A, Anti-B and Anti-D antisera (Bhasin and Chahal, 1996). The antisera A, B and D were collected from Avon Laboratory, Kolkata. Blood samples were taken by finger pricks and tests were done following 'direct method' at the field. Caution as suggested by manufacturer and other scholars was strictly followed. Known controls were frequently used during tests and doubtful cases were repeated until it removed doubts.

2.4.2.2.2: Colour Vision Test:

For colour vision test pseudo-isochromatic method in the form of Ishihara charts (1917) were applied. Subjects were informed about the tests and measured after verbal consent. Tests were conducted in the middle of the day (as much as possible); place were chosen without direct sunlight. Plates are held about 75 cm. from the subject at right angle to the line of vision. The subjects are advised to answer within three second for numerals and within ten second for tracing the line between two X's. Subjects able

to reads 17 or more of the first 21 plates correctly was diagnosed as normal; for illiterates, plates other than numeral (26-38) were used. Overall, the tests were conducted in accordance with the instruction supplied with the Ishihara charts for the said purpose.

2.4.2.2.3: Taste Sensitivity to PTC:

Taste sensitivity to Phenylthiocarbamide was carried out among 71 male and 54 female after having their verbal consent. Subjects were asked to wash their mouth before experiments. Chain smokers and heavy tobacco users were excluded for this particular trait. Solutions were prepared after serial dilution method and were analyzed by techniques of Harris and Kalmas (1949). The stock solution was prepared after 1.3 gm PTC diluted in 1 liter tap water and was labeled as Solution-1. It was further diluted 100% by mixing $\frac{1}{2}$ of the stock solution with $\frac{1}{2}$ liter of tap water and was labeled as Solution-2. The procedure was followed 13 consecutive times to obtain a series of 13 increasing dilution of PTC. To determine taste sensitivity sorting technique was used starting with weakest solution i.e. solution 13. One drop of solution was placed on the tongue and the subjects were asked to if they tasted anything or not? The process was repeated until the threshold value was confirmed.

2.4.2.2.4: Dermatoglyphics:

Rolled prints of the fingers and bilateral palmer prints were taken following standard method of Cummins and Midlo (1961). Subjects were informed about the tests and procedure and measured after their verbal consent. Before taking prints, the subjects were asked to wash their hands with soap and dry them with towel. The finger and palm impressions of both hands of subjects were taken on slightly glazed paper sheet, specially designed for the palmer prints on its centre and rolled finger prints on its margin. The classification of different Finger pattern were identified following Henry (1937), however, in some cases the three basic finger print patterns were identified following Galton (1892). In case of ridge count the general principles of Holt were followed, but Total Finger Ridge Count were calculated as the sum of ridges counts on

all the ten fingers, but only the large of the two counts of whorls is included (Holt, 1949). The Pattern Intensity Index is defined as number of triradii per finger (Cummins and Stegarda, 1938). The Furuhashi's (1927) Index is calculated after dividing the total frequencies of whorls by the total number of loops and multiply the quotient by hundred. Dankmeijer's (1934) Index is obtained by dividing the total frequency of Arches by the total frequency of whorls and multiplying the quotient by hundred. Monomorphic hand is defined as the condition when a hand has same pattern on all the five digits (Volotzkoy, 1936), whereas, in case of both the hands of an individual has identical patterns the phenomenon is defined as symmetrical hands. Bimanuals of the population have been tabulated after the method of Poll 1928 (Sengupta, 1993). The Main line endings have been formulated as per method of Cummins and Midlo (1961). The Main Line Index is calculated using the method of Cummins (1936). The *ab* ridge count is obtained by counting the number of ridges between *a* and *b* triradii (Fang, 1951). The *atd* angle is determined after joining *at* and *dt* triradius on palm (Cummins and Midlo, 1926).

2.4.3: Social-Cultural Characters:

2.4.3.1: Material Culture:

As per research design a continuous efforts have been made to extract information in all possible way using above noted methods and techniques to understand the present day material culture of the group as well as changes in respect of available documents. The following characters were identified for present study as a part of material culture viz. houses, furniture and household objects, dress and ornaments, food and drinks as well as gathering- hunting- fishing- agricultural implements of the society. In all cases more emphasis were given to collect information on traditional material culture and their changes throughout the history. For this present data were compared with available literature of anthropological interests.

2.4.3.2: Social Structure and Social Organization:

To understand social structure and social organization of the society another effort have been made to cover following aspects viz. marriage, family, clan, village organization, kinship, life cycle rites, religion and rituals, festivals etc. of the society. The field work and data collection for this phase involved collection of data of a qualitative nature on the structure and organization of the society through direct observation, interviews and other techniques as noted in the next section i.e. Data collection. In all cases, the traditional cultural traits received more emphasis with a note of recent changes and/ or influence of neighbours, if any.

2.4.3.3: Language:

The information on language in the form of vocabulary were collected in respect of English, however, for practical purpose it was translated to Bengali to make it clear among them. Special emphasis was given to collect data from women and elderly person of the society, as they are the great protector of language. However for classification of language as well position of Dhimal language I mostly depended on the study of Grierson (1909) and Chatterji (1951).

2.4.4: Concepts used for the Study:

In respect of these aspects, to define some concepts, frequently used during the study, is inevitable. Some of them are summarized as follows:

2.4.4.1: Race, Ethnic Group and Ethnicity:

The term 'race' usually refers to the classification of humans into groups or populations on the basis of concentration of various sets of heritable traits. Usually,

when biological differences within a species become sufficiently noticeable, biologist may classify different populations into different races. Some argued that race is a valid taxonomic concept to species other than human. Unfortunately, racial classifications of human have often been mystified with racism. This sort of misuse and socio-political misunderstanding are the key reasons why biological anthropologists have suggested not to use the term 'race' to human biological differences. American Association of Physical Anthropologists clearly stated that, pure races do not exist in the human species today, nor is there any evidence that they have ever existed in the past. However, racial classifications have often been used by scholars to understand and justify discrimination, exploitation, genocide and so on. (Ember et. al. 2006, AAPA, 1996)

As race is not a scientifically used category to classify human populations, in many cases it might better be described as ethnic groups. The term 'ethnic group' is derived from Greek word '*ethnos*' mean people or tribe. An ethnic group is a population or group of humans whose members supposed to identify with each other through a common heritage that may be real or presumed. The recognition of common heritage or traits may be cultural, linguistics, religious, shared history, behavioural or nationality as a whole. It also stresses more on endogamy. According to Barth, the term ethnic group is generally understood to designate a population "which is largely biologically self-perpetuating, shares fundamental cultural values, realized in overt unity in cultural forms, makes up a field of communication and interaction, has a membership which identifies itself, and is identified by others, as constituting a category distinguishable from other categories of the same order" (1969:10-11). Sometimes ethnic group may emerge as a part of socio-political process. Ethnicity, therefore, is a socially construct identity and not a genetically determined concept of human species. Some opined that ethnicity is fundamental in human life; it is a phenomenon inherent in human experience. However, anthropologists do not consider ethnic identity to be universal and inherent, rather as a product of inter-group interactions. (Banks, 1996, Eriksen, 1993)

2.4.4.2: Tribe and Scheduled Tribe (ST):

The word tribe comes from Old French '*tribu*' referring three ethnic division of Roman state. In Latin the word 'tribes' mean 'a social group'. However, in popular texts, it denotes a primary aggregate of population claiming their descent from a common ancestor. Considerable debate takes place regarding definition and characteristics of tribes. When local communities mostly act autonomously but there are kinship groups or associations that can potentially integrate several local groups into a larger unit (tribe), we say that the society has tribal organization (Ember et al. 2006). Sometimes, we erroneously used the term tribe to designate an entire society; however, their political system hardly permits the situation where entire society can act as a unit. Anthropologists frequently use the term to refer such societies organized largely on the basis of kinship bonds, usually a unilineal group like lineage or clan. Some theories state that it represents a stage in social evolution intermediate between bands and states.

In India, scholars and authorities have described them by different names viz. aboriginals, depressed classes, adivasi, backward Hindus, girijan, vanyajati and so on. The Constitution of India recognized almost all of them as Scheduled Tribes by The Constitution (Scheduled Tribes) Order 1950 and its subsequent modifications. The constitutional framework for safeguarding includes protective arrangements, compensatory discrimination and development of ST populations. It also declared that the State shall promote educational and economic interests of this section (ST) and also protect them from social justice and all type of exploitation. (Ministry of Law and Justice, Govt. of India, 2009).

2.4.4.3: Other Backward Classes (OBCs):

The term Other Backward Classes or OBCs is an administrative term. The Government of India classifies some Classes (other than SC and ST) of India as OBCs on the basis of social and economic backwardness. It is the responsibility of the Commissions to prepare the list. The list is dynamic in nature and supposed to change time to time considering social and economic situations of the classes. The first

Backward Classes Commission (Kalelkar commission) submitted its report in 1955, but was not accepted by Government. The second commission (Mandal commission) submitted the report in 1980 identifying 52% of total population as OBCs including Hindus and Non-Hindus. However, owing to the legal constraints 27% reservation was recommended. The Mandal Commission report and the announcement of Government that the report has been accepted and will be implemented created a national controversy and violent agitation all over the country, specially educational institutions. The Supreme Court of India in 2008 endorsed government's initiative but categorically reiterated that the "Creamy layer" of OBCs should be excluded from such reservation. (Ramaiah,1992; National Commission for Backward Classes, Govt. of India,2009)

2.4.4.4: Hindu Method of Tribal Absorption:

As name indicate it may defined as the process by which a tribal group supposed to be absorbed into the wider society (Hindu religion) by taking over their (wider society) customs, rituals, beliefs and other form of life styles. The process of tribal absorption is a prolonged and continuous process and going to be more complicated over time. Bose (1941) in his famous essay "The Hindu method of Tribal Absorption" identified absorption and assimilation as two major factors responsible for growth and expansion of Hindu religion in India. The poor tribals easily came within the fold of Hindu system; this is why, in India, we can find lot of similarities in respect of culture in between tribes and castes of Hindu religion. The tribes may retain principal elements of their beliefs and practices; but in addition to these, they supposed to share some of the gods and goddesses, even they used to attend different social festivals and ceremonies of Hindu religion. However, a tribe can be regarded as fully absorbed in the Hindu fold if the Brahmin priest of Hindu society ready to perform Brahminical ceremonies for them during three major events of life- birth, marriage and death. Bose, after examining the Juang tribe of Orissa, opined that the tribe gradually tagged on to the advanced production technology of plough cultivation, which led to the flow of cultural symbols from the higher level of economy and power of Hindu caste society to the tribal groups, till they ended up on caste groups. (Bose, 1941; Munshi, 1979)

2.4.4.5: Caste and Scheduled Caste:

The term 'caste' first used by Portuguese to describe their inherited class status. Since ancient time, Indian society has been divided into several hereditary endogamous castes or communities, called '*jati*'. It also describes social stratifications and social restrictions within communities. As per ladder of Indian caste hierarchy Brahmin placed at top followed by Kshatriya and Vaishya; their position never been contested by other. The Sudras stands at lowest position of the ladder and sometime treated as untouchables. Some scholar opined that caste systems are static, though others questioned about rigidity and stated that, ancient literatures suggests mobility of caste system, where one can attain higher status as per his/ her work (Srinivas,1962).

On the other hand, the term 'Scheduled Caste' is a political and administrative term, which indicates the names of castes listed under 'the Constitution (Scheduled Caste) Order 1950' and subsequent modifications by the President of India by his/her power conferred by clause (1) of article 341 of the Constitution of India (Ministry of Law and Justice, Govt. of India 2009).

2.4.5.6: Indigenous Community:

The original dictionary meaning of 'indigenous' suggests 'originating and living or occurring naturally in an area or environment'. However, in anthropology the term is to be used to describe any ethnic group of people who inhabit in a geographic region with which they have the earliest known historical connection, alongside more recent immigrants who have populated the region. In Hindi, the term 'Adivasi' means an original settler, however, sometimes refers to identify Tribal population; hence according to Roy Burman, Adivasi is a contentious term to denote tribes as Indigenous peoples of India. (Roy Burman, 2009).

2.4.5.7: Marginal Community:

The term marginal has been applied to a community or group across the world, who supposed to live under social, cultural, economic and linguistic deprivations, differential treatments and so on. They often affect by way of exclusion, discrimination,

omission, isolation as well rejection by others specially dominant ones. According to Siddiqui (2004) the term marginal may be applied in determining the position of an ethnic group in respect of social-cultural development within a society. To determine the marginality, its segregation, isolation, size of the population, occupational pursuits in low social status, as well as rigid maintenance of community boundary may be consider in respect of overall populations.

2.4.4.8: Sanskritization:

Srinivas in his dissertation, used the term to characterize the gradual upward movement in the social status of a low or middle Hindu caste, tribal or other groups, by means of adoption of social and religious practices (such as adopting vegetarian diet, Brahmin priests, Sanskrit mantras and other elements of Brahminical practice) that are associated with Brahmins or deemed prestigious castes (Srinivas, 1962). It has subsequently been found suitable to analyze historical trends such as assimilation and so on. However, it has been also criticized for various grounds.

2.5: Data Collection:

Data has been collected by researcher himself with the help of others (as acknowledged) and was undertaken several times between June 2003 and August 2008 among all the Dhimals residing in Darjeeling district of West Bengal, India. For this the study itself is an ethnographic study also, as it supposed to provide a descriptive study of Dhimal populations in the form ethnographic report. However it also relies on some secondary research in the form of reviewing available literatures.

Collection of entire field data may be classified into two types – a detailed household census and observation in one hand and measuring Somatoscopic, Somatometric and some genetic characters on other hand.

The demographic and some of the socio-cultural data were collected by using household scheduled including drawing genealogies on it and filled in by the researchers on the field. Beside household survey the primary data for socio-cultural aspects were collected by using observation method (whether it is in the form of structured or unstructured observation, participant or non-participant observation as well as controlled or uncontrolled observation), personal interviews (whether in the

form of structured or unstructured interviews, as well as focused, clinical or non-directive interview) and case studies as well. Beside these, informal group discussions were also arranged for data collection and cross checking validity of collected data. The informants were interviewed in Bengali, as most of the Dhimal can understand and express their view through Bengali. The interview were conducted after taking prior appointment and verbal consent from informants/ subjects and conducted at the residence or place of work during leisure time. Sometimes data were supplemented by photography.

The Somatometric and genetic data were collected by using standard procedures. For this a cross sectional study was conducted among selected people by random sampling as much possible in the field condition. Secondary data were collected from published or unpublished documents including books, journals, Govt. records, thesis as well as news articles of newspapers. The above said data were utilized for the present study after assessing reliability, suitability and adequacy of the same.

2.6: Data Analysis:

The data of present study is of two types -qualitative and quantitative. Qualitative data i.e. in-depth knowledge about Dhimals specially in respect of social-cultural aspects was analyzed as per observer impression. Analytical induction was done after identified similarities between various social phenomenons in order to develop ethnographical note on Dhimals under study.

Quantitative data, obtained after personal in-home survey and measurements, tabulated and considered for different descriptive statistics. Beside frequency distribution and percentages of different portion of the population, arithmetic mean, median, standard deviation and standard error have been calculated using standard formula (Madrigal, 1998). The calculations were also conducted by using PAST version 1.34 software (Hammer et. al, 2001).

Allele frequencies of ABO blood system have been estimated by Maximum Likelihood Estimation as suggested by Vogel and Motulski (1997) and Mourant et. al (1978) as well. Allele frequencies and other statistical calculation of PTC tasting ability have been calculated after Harris and Kalmus (1949). Allele frequencies of other genetic traits were calculated using standard formula (Vogel and Motulski, 1997).

2.7: Organization of Chapters:

The thesis comprised of ~~eight~~ major chapters with several sub titles. Among them the first one is *Introduction* and contains introducing the problem and objectives of the study after review of almost all the literature containing topics on Dhimal, specially of anthropological interest. The second one is *Material and Methods*, which simply describes the study subjects as well as methods and techniques of collecting and analyzing of field and other data. The third one i.e. *the Place and the People under Study* is devoted to historical and present day description of Dhimals and the regions (and villages) as a whole. As the name indicates the fourth one is the description of *Demographic and Socio-Economic profile of Dhimals under study*. The fifth one (*Morphological and Genetic Characteristics*) is devoted to explore the Somatometric, Somatoscopic and genetic profile of Dhimals under study. The sixth ^{and} ~~seventh~~ *Material Culture, Social Structure and Social Organization* intends to identify the said profile of Indian Dhimals with an emphasis on recent changes. The last chapter i.e. *Major Findings, Concluding Remarks and Recommendations* supposed to assemble all the major findings from previous chapters, conclusion about their present status as well as recommendation from author's end.

2.8: Problems and Limitations:

The study was limited to all identified Dhimal families (as suggested by Dhimals) of Darjeeling district, West Bengal, India. The study could not incorporated Dhimals of Nepal because of political and other disturbance of the region as well as time and monetary constraints. The residence of said population (Nepal) is also another constraint that desist me to work outside country.

Beside these, I have to overcome some problems during rapport establishment and to communicate the aims and importance of the study as well as conducting some measurements specially collecting blood, tasting PTC and taking finger print in some cases. I am also facing difficulties to identify different age related parameter due to non availability of records and lack of recall for the same. All the problems were overcame or minimized during long field survey by way of thorough discussion and answering their questions. Some educated persons were inquisitive about the report; for these, findings of report were read out before some groups (specially informants) for check, cross check and corrected accordingly.

**DHIMALS OF NAXALBARI BLOCK IN
DARJEELING DISTRICT ^{of} WEST BENGAL
-A FIELD STUDY**