CHAPTER - III

MATERIALS AND METHODS
In this chapter, we shall discuss about the materials collected and methods that have been applied for the present study. Fieldwork for the present study was conducted among the Khongsai Kukis in Saikul sub-division and Imphal town of Manipur.

**Selection of sample localities:** For the purpose of data collection, a total of seven villages namely, Songlei Mongbung, Maoyang, Ng. Phainom, Lhungjang, New Boljang, Old Boljang and Twichamphai in Saikul sub-division; and four localities namely Khongsai Veng, K.C.C. Campus, Langol and National Game village in Imphal town were selected. Saikul sub-division will represent the rural area whereas Imphal town will represent the urban area.

**Collection of Data:** Data for the present study were collected from 127 married women in Imphal town and 335 married women in Saikul sub-division, who are aged between 15 and 49 years by adopting deliberate sampling method where sample selection was done based on the ease of access. However, a complete enumeration of the households was made for demographic information from the two study areas. Data collection was carried out in three phases. The first phase of field work was carried out between August and October 2007 in all the selected localities of Imphal town. In the second phase, data were collected from three out of the seven villages in Saikul sub-division, namely Songlei Mongbung, Twichamphai and Lhungjang between September and November, 2008. The third and final phase of data collection was carried out at the remaining four villages, namely, Maoyang, Ng. Phainom, New Boljang and Old Boljang between January and March 2009.
Nature of data

Demographic data: The demographic data were collected through interview schedule for household census and other demographic parameters like fertility and mortality of children from the mother or head of the family. The nature of demographic data collected for the present study was based on those parameters as suggested by World Health Organisation (1967) and Mahadevan (1986). These are:

a) Individual household records like name of informant, date and place at which record is taken, clan, tribe, religion, total number of family members, age, sex, marital status, birth order, place of birth, place of residence, occupation, education, income and expenditure of household, etc.

b) Fertility records which include pregnancy history of each married women, present age of the mother, age at marriage, age at each conception, total number of live births, birth order, name, age, sex and marital status of each offspring.

c) Mortality records like numbers of dead children, sex, date of birth, age at death, causes of death, number of reproductive wastage (spontaneous or induced abortion and still births) etc.

d) Social proximates: These include occupation, education, monthly income of the household, monthly expenditure of the household, age at marriage and religion.

Such data were collected by interviewing the ever-married women aged 15-49 years from the sample with the help of interview schedule.
Data on biological determinants: Data on all possible biological determinants have been collected from the study population. These include age of the mother, age at marriage of the mother, order and interval between births, causes of death, ABO and Rh blood group compatibility, etc.

(a) Age of the mothers: For the present study, current age of the mothers was classified into four age groups: (i) $\leq 25$ years, (ii) 26-35 years, (iii) 36-45 years and $\geq 46$ year. We have taken 25 years as a generation length for both the study areas as suggested by Glass (1956).

(b) Age at marriage of the mothers: Age at first marriage has a profound impact on childbearing because women who marry early have on average a longer period of exposure to pregnancy and a greater number of lifetime births. Information on age at first marriage was obtained by asking respondents the month and year, or age at when they started living with their first partner (NHFS-2) (IIPS, 2000).

(c) Serology: Blood samples were collected from parents, following the standard techniques suggested by Lawler and Lawler (1951) and Mourant (1954). Blood samples were obtained by pricking the fourth finger of the left hand of each subject with the help of sterilized disposable needle. Before pricking, the finger was cleaned with absolute alcohol and dried. Anti-A, anti-B and anti-D sera were used to identify the ABO blood group and Rh-factor.
(d) ABO Blood Groups: One drop of anti-A sera and the same amount of anti-B sera were first taken on a micro slide. Then an equal volume of suspended red cells were added to each of the anti-A and anti-B sera, and mixed thoroughly by stirring with a glass rod. Agglutination of blood cells was carefully observed. If there was reaction with both anti-A and anti-B sera, the blood type was considered as AB blood group. If the agglutination occurs only with anti-A, then it was blood type A, and similarly, if it reacts with anti-B, it was considered as blood type B. If there were no reaction in both anti-A and anti-B sera, then it was O type blood group.

(e) Rh (D) blood groups: For Rh blood grouping, one drop of anti-D sera was taken in a clean micro slide and an equal amount of red cells was added to it. It was then thoroughly mixed by stirring with a glass rod. After incubating for a minute, the result was noted. Then the blood samples were typed as Rh negative (Rh−) and Rh positive (Rh+) with the absence and agglutination respectively.

(f) Birth order: This for the present study was divided into 1st, 2nd, 3rd, 4th, 5th and 6th+ birth orders.

(g) Birth interval: Data on each birth interval was collected from the mothers and then recorded in terms of months.

(h) Causes of death: For the present study, data on causes of death were classified into (i) cold and/or respiratory disorders, (ii) intestinal disorders (include
diarrhoea and typhoid), (iii) immunizable diseases, (iv) unknown/accident and (v) other health problems (malaria, fever, BP stroke, cancer, and congenital diseases).

Data on socio-economic determinants: Information relating to social determinants of fertility and child mortality like family size, family types, education, household income, occupation of parents, child care, sanitation, household characteristics, etc. were collected as suggested by Mahadevan (1986).

(a) Family size: The size of the family affects fertility and mortality in different ways. For the present study the family size was classified into three categories. The individuals who lived in a household with less than 5 family members were considered as Small Family Size. The household which has 5-6 family members and more than 6 family members were considered to be Average/Middle and Large Family Size respectively.

(b) Types of family: Questions on types of family include nuclear and joint types of family.

(c) Education: Education plays an important role in influencing fertility and child mortality. In countries where the percentage of literates is high, rate of fertility and child mortality is low. Data on educational attainment of individuals in the present study were arbitrarily classified as: (i) Illiterate (those individuals who could not read and write), (ii) Primary Level of Education (those individuals who attain their education upto class VIII), (iii) Secondary Level of Education
(those individuals who studied upto classes IX – X) and (iv) **Higher Secondary and above** Level of Education (those individuals who attain their education from XI standard and above).

**(d) Occupation:** Data regarding occupation of the parents in the present study include housewife (in case of mothers), services, cultivators and others (business, carpentry, etc.).

**(e) Income:** Data on household income were collected from the informants and were cross-checked taking into consideration some aspects of socio-economic conditions such as condition of the house, types of occupation, amount of land owned, monthly expenditure, etc. Data on monthly household income of the family were classified into three quartiles ($Q_1=$ First Quartile, $Q_2=$ Second Quartile and $Q_3=$ Third Quartile) with the help of Microsoft Office Excel, 2007 as follows:

- **Above 75th percentile (>$Rs. 10200) = High Income Group**
- **50th to 75th percentile (Rs. 7000 to 10200)= Middle Income Group**
- **Below 50th percentile (<Rs. 7000) = Low Income Group**

**(f) Consanguinity:** Each of the marriages was specially investigated with the view to find out the degree of consanguinity between couples before their marriage. These include marriages between uncle-niece/first cousins/second cousins, etc.

**(g) Types of house:** These include questions on whether the house is *kaccha/pucca/semi-pucca/double storied*. 

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(h) *Types of toilet*: Questions on types of toilet include: no toilet, septic tank, drainage, public toilet and own pit.

(i) *Types of cooking*: These include smoke emitting *chullah*, stoves, smokeless *chullah*, L.P.G., firewood and charcoal.

(j) *Source of drinking water*: Questions on source of drinking water include unprotected well, protected well, hand pump, pond reservoir, streams, rivers, PHE pipe water and village pipe water.

**Data on Family Planning Method**: Information regarding knowledge and use of contraceptive methods were collected from married women (aged 15 to 49 years) with the help of interview schedule based on those included in the NFHS-2 (IIPS, 2000). The questions on family planning method consist of the followings:

(a) *Awareness of Family Planning Method*: This includes questions which are related to knowledge of contraceptives or family planning methods.

(b) *Source of Family Planning Method*: This includes questions about the source of family planning method. The sources are categorized as doctor (private and government), ANM, newspapers, magazines, family and friends, etc.

(c) *Attitude towards Family Planning*: This includes questions regarding positive and negative attitudes towards family planning methods. Mothers were asked whether they accepted or opposed the family planning method.
(d) Adoption and Methods of Family Planning: These include questions related to adoption of family planning methods. The contraceptive methods consists of pill, intra-uterine device (IUD) such as copper T, condom, female sterilization, male sterilization, safe period, withdrawal, use of herbal medicine, etc.

Data on reproductive history: Data on reproductive history of the each mother were collected from the study population with the help of interview schedule which consist of the followings:

(a) Age at menarche: Information on age at menarche was collected from all the married women (aged 15-49 years) in order to find out whether it has an impact on fertility and child mortality.

(b) Number of infant deaths: This includes number of infant deaths below 1 year of age.

(c) Number of child deaths: Information on number of child deaths have been collected from mothers whose child dies. Although child mortality rate is the number of child deaths between 1 and 4 years of age (WHO, 2008; NFHS-3), we had considered up to the age of 14 years, as this age group is generally considered as childhood stage.

(d) Number of abortions: These include questions regarding the number of abortions including date, month and year of the abortion. For the present study, abortion has been divided into two types i.e., spontaneous or induced abortion and still births.
Data on antenatal and post-natal care: Information was collected from each woman on specific problems during their pregnancies and whether they received any antenatal check-ups. Women who received antenatal check-ups were asked about the check-up timings (in months) of their first to last pregnancies and total number of check-up during pregnancy. The respondents were also asked whether they received tetanus injection, iron/folic acid tablets during their visits to antenatal care centres. The availability and non-availability of health centres/medicine facilities/clinic were also recorded from the respondents. Some of the most important data on antenatal and post-natal child care are classified as follows:

(a) Number of visits: This includes questions about attending and number of antenatal check-up.

(b) Stage of pregnancy at first abdominal check up: These include questions about the stage of pregnancy at first ANC visit and whether women received iron/folic acid tablet and tetanus injections. The stage of pregnancy was divided into 3 stages, i.e., first trimester (the first three months of pregnancy), second trimester i.e., (the second three months of pregnancy) and third trimester (the last three months of pregnancy).

(c) Place of delivery: This includes questions regarding the place of delivery—hospital, clinic and home.

(d) Reasons for no antenatal check up: This question is for those women who did not go for antenatal check-up during pregnancy. The reasons are: lack of
knowledge, no visit of ANM, financial burden, socio-cultural barriers, far
distance of hospital/clinic, did not feel necessary, not permitted by husband,
etc.

(e) Antenatal disease: This includes questions regarding any health problems
faced by each woman during pregnancy like swelling of hands and feet,
paleness, weakness, tiredness, dizziness, visual disturbance, bleeding,
convulsions, no movement of foetus, vomiting, fever, headache, etc.

(f) Post-natal disease: This included information regarding health problems that
occur to mothers during the first week from delivery. They are fever, headache,
excess bleeding, dizziness, severe jaundice, low abdominal pain, vomiting, etc.

Besides, information regarding any additional diet taken during and after
pregnancy was also collected from each woman who had pregnancy records in the past
years in order to find out whether they have any relationship with fertility and child
mortality in the study population.

Data on immunization and child care: Data on several areas of importance to child
health, vaccination status of children and treatment of childhood illness were collected
from mothers having child born in the last 5 years from the date of interview. Mothers
were asked whether colostrums were fed to their children and also the availability of the
vaccination/immunization card. If a card was available, the dates when the child received
vaccinations against each disease was noted down. If the mother could not show a
vaccination card, she was asked whether the child had received any vaccinations. For the
present study we selected four types of vaccinations viz, polio, Bacillus Calmette Guerin (BCG), whooping cough and measles. Information on immunization coverage is important for monitoring and evaluation of the Expanded Programme on Immunization (EPI). In short, an attempt was made to follow as far as possible to those guidelines given by the NFHS-2 (IIPS, 2000).

**Data on child morbidity**: The health status of a population is reflected in the levels of morbidity and the treatment behaviours of its members. Data on morbidity was based on “self-reported illness experience” of a subject as generally adopted in surveys, which did not involve clinician (Strickland and Ulijaszek, 1993; Garcia and Kennedy, 1994; Strickland and Tuffrey, 1997). The term “morbidity” in the present study was defined simply in terms of the number of illness in the last 28 days time before field work. Morbidity of the children upto 14 years of age was recorded as has been reported by their parents. Any child reported to be at least two days ill was classified as being “ill”. Data on child morbidity for the present study was classified as follows:

(a) **Cold and/or respiratory disorders**: These included cough + runny nose + headache, cough + runny nose headache fever, fever cough, cough alone, swollen glands cold, ear problem, breathing problem, chest pain sore throat, tuberculosis. The prevalence of acute respiratory infection was estimated by asking mothers whether their children upto 14 years of age had been ill with a cough accompanied by short, rapid breathing which was chest related in the past 28 days preceding the survey.
(b) Intestinal disorders: These included diarrhea, dysentery, worms and vomiting, fever, bleeding from stool, stomach pain and heart pain.

(c) Diarrhea/dysentery: Diarrhea is one of the single most common causes of death among children under the age of five years worldwide, following acute respiratory infection (NHFS-3) (IIPS, 2007). Deaths from acute diarrhea are most often caused by dehydration due to loss of water and electrolytes.

(d) Malaria: Malaria contributes to high levels of malnutrition and mortality. It is also a major contributory cause of death in infancy and childhood in many developing countries.

(e) Tuberculosis: Tuberculosis is contagious and spreads through droplets that can travel through the air when a person with the infection coughs, talks, or sneezes.

(f) Fever: Fever is a major manifestation of malaria and other acute infections in children. Like malaria, fever also contributes to high levels of malnutrition and mortality.

(g) Others: These included sores/boils, fever alone, chicken pox, typhoid, scabies, jaundice, body pain, headache alone, malnutrition, weakness and other symptoms.
Data on statistical analysis: The required statistical analysis have been applied for the presentation of data mentioned above, keeping in view the objectives of the present study. Special attention has also been given to find out the various bio-social determinants that are associated with fertility and child mortality. All data were managed and analyzed using SPSS (PC Software), version 16 in which the level of significance was set at 5%. Some of the data were also calculated manually. The analysis was first carried out to present the basic demographic structure of the Khongsai Kuki population of Saikul subdivision and Imphal town of Manipur in terms of age, sex and marital status, which were based on household census data. The sex ratios for different age groups were calculated with the ideal sex ratio of 1:1. The t-test (2-tailed) was used to determine the statistical significance of the differences between two means like age at menarche, age at marriage, age at first child birth, etc. The differences between proportions were tested, using chi-square ($\chi^2$) test. One way analysis of variance (ANOVA) was used to test the differences between more than two means by assuming such means as independent.

Coefficient of correlation (r) was tested to find out an association between two continuous variables. The relationship between two variables may be positive or negative or scattered. When one variable increases, the other tends to increase (e.g. the child mortality rate increase as the age of mothers increases) – this is positive correlation. But there are relationships that are negatively correlated – as when one variable decreases, the other tends to increase (e.g. the child mortality rate decreases as the maternal educational level increases). Again, there are variables in which there exists no relationship. The value of correlation coefficient ranges from +1 to -1. The value of 'r' when closer to +1
indicates highly positive correlation; a value of ‘r’ closer to 1 indicates a highly negative correlation and when the value of ‘r’ = 0, then it indicates no association between the two variables.

Multiple regression analysis was done to estimate the coefficients of the linear equation, involving one or more independent variables that best predict the value of the dependent variables. For example, we may predict a number of live births (the dependent variable) from independent variables such as age, educational level, income level, etc. However, in the present study, we are interested in testing whether the coefficient regression (B) is significant or insignificant after taking into consideration more than one independent variables.