CHAPTER 5  MATERIAL AND METHODS

5.1 Study area: The study will be undertaken in the area of Rural Health Training Centre (RHTC), Department of Community Medicine, Rama University, Kanpur.

5.2 Study participants: Study subjects are local residents of selected the village from RHTC area in Kanpur.

5.3 Inclusion criteria for subjects: Women, who were ever married and born in between 1931 to 2000, would be included in the study.

5.4 Exclusion criteria for subjects: The following category of women would be excluded from study-
   - Who are unmarried.
   - Born before 1931 and after 2000.
   - Who are unable to give their history because of mental illness, physical disability.
   - Who were not signing the informed consent.

5.5 Ethical approval:
The study has been approved by the Ethics Committees of Rama University, Kanpur. Informed consent in the local language will be taken from subjects during filling designed questionnaire, in written.

5.6 Questionnaire and tools for measurement:
Subjects will be interviewed with the help of pre-designed and pre tested schedule to elicit the information pertaining to socio-demographic characteristics such as religion, caste, type and size of family, educational level, age at consummation of the marriage, age at first pregnancy etc.

5.7 Sampling technique, Data Collection & Analysis method:
In the field of research, cohort analysis has frequently been applied to study of the age at consummation of the marriage, age at first pregnancy, age at menarche and age pattern of first marriage. The study will be under taken in the area of Rural Health Training Centre, Department of Community Medicine, Rama University, Kanpur.
A cross sectional study design will be adopted for this study in a community area.

In the first stage 30 clusters will be selected from 25 villages of Shivrajpur Block district Kanpur Sahar, where cluster defines a village whose population is more than 25000. In each cluster we divide all eligible population into seven birth cohort and in each cohort we do complete enumeration by conducting house to house survey using designed questionnaire. The birth cohorts will be taken from 1930 to 2000 with decade difference. Data will be analyzed by using R 3.1.1 package , SPSS 21.0 Version software, Mat lab & Microsoft excel.

We will be adopting two methods for Nuptiality estimation for rural population.

**5.8 Sampling distribution method:**
Data from each birth cohort have thirty distinct samples which will be selected from thirty distinct clusters. By using all samples we will estimate required statistics like age of marriage, age of first pregnancy, age at menarche etc. we will also estimate distribution and observe its pattern. Consequently, we compare birth cohort from each other and correlate social, environmental & judicial components which influence the statistics pattern.

**5.9 Construct Nuptiality Table:**
In this method, the basic data for the calculation of nuptiality rates will be the proportions in the decade synthetic birth cohorts 1931-1940, 1941-1950, 1951-1960, 1961-1970, 1971-1980, 1981-1990 and 1991-2000. The decade synthetic cohort for a particular decade will a hypothetical cohort subjected to the average marriage experience of the decade in question. The method followed for the estimation of nuptiality rates for a decade will be adopted from that of Mertens (1965) \[^{19}\]. Then retrospectively trace all cohorts of single persons over time from the youngest age at which marriage may occur. We assume the incidence of mortality to be the same for the single as for the total population and the single population to be depleted by two modes of decrement, namely, marriage and death. The following symbols will be used:

- \( P_x \) = population living at age \( x \);
- \( S_x \) = number single at age \( x \);
- \( s_x \) = proportion single at age \( x \);
$n_x$ = five-year Nuptiality rate, i.e., the probability that a single person at age $x$ will marry during the next five years.

Following Mertens (1965), the basic equation for the estimation of the five year Nuptiality rate is as follows:

$$5n_x = \{s_x - s_{x+5}\}/sx$$

By utilizing the proportions single in the respective decade synthetic cohort (Agarwala, 1962) and using the above equation, it is possible to calculate the basic function $5n_x$, in a Nuptiality table.

The proportions single are recorded in quinquennial age groups. These quinquennial proportions are converted to proportions single $s_x$ at exact age $x$, at an interval of five years, by combination of Sprague's multipliers and graphic graduation and linear interpolation (Jaffe, 1960; Saveland and Glick, 1969). Having obtained $s_x$, the basic functions for the construction of nuptiality tables for different decades are calculated by using the method outlined above.

Finally, to arrive at a smooth series of values of five-year nuptiality rates, these $5n_x$ values are graduated by the graphic method of graduation. These values are further adjusted by inspection of their third differences to ensure a greater degree of smoothness.

Once the nuptiality rates have been obtained, the appropriate tables will construct. In the construction of gross tables, the principle of single decrement table will followed (Saveland and Glick, 1969; Grabill, 1945; Malaker, 1971), the primary function being $5n_x$ the five-year Nuptiality rate. For construction of net tables, the principle of multiple decrement tables will followed (Malaker, 1971; Benjamin and Haycocks, 1970; Kumar, 1967). The mortality rates, $q_x$, will be borrowed from the appropriate Actuarial Reports.

Consequently, we compare nuptiality table of all birth cohort from each other and correlate social, environmental & judicial components which influence the nuptiality rate.
5.10 Implications of study:-
This study may help us to determine the extent to which marriage and hence probabilities of marrying had been fluctuating over time; how the mean ages at marriage had been changing over time; to what extent the proportions of women who ever marry were fluctuating; and the average number of years a single life was expected to live before marriage and its trend over time.

In this study we provide a detailed examination of nuptiality pattern and differentials in rural, U.P., with focus mainly on age of entry into marital union, marital stability and pregnancy outcome among cultural groups in rural U.P.

This Study may shed important light on impact of government rules, act and policy on fertility differentials such as drastic reduction in marital fertility, discourage early marriage and early initiation of childbearing.