CHAPTER IX

SUMMARY AND CONCLUSION

The study dealt with the important issue of estimation of district level mortality and fertility measures. Endeavors have been made to develop procedures to estimate infant and child mortality, life expectation at birth, construction of life tables and estimation of total birth rate, female birth rate, gross reproduction rate and net reproduction rate before and after allowing for migration at district level of India.

This research contributed in adding another feather to the already famous Brass type methods of estimation of child mortality by being able to remove the inconsistencies in the estimates produced in case of some data sets of child survivorship. Another aspect of this research is that it proposed two simple ways of estimating life expectancy at birth for the districts using very limited data easily available from censuses and surveys which otherwise seems to be a Herculean task in the absence of reliable age distribution of deaths from vital registration. The first of these models uses only two independent variables; infant mortality rates and proportions of persons aged 65 years and above and the second method uses only infant mortality rate as the independent variable to predict life expectancy at birth. Possibly another contribution of this research is the construction of life tables for the districts of India. Once the life tables for the districts are available, it will, possibly encourage more in-depth study on district level mortality and fertility and other related areas where life table finds its application. Providing the conventional fertility measures at district level and the impact of migration on population growth of the districts may help in better understanding of the population dynamics at district level and the social scientists may gain a foothold in analyzing the socio-economic factors determining the population flows. Yet another possible contribution of the research is the creation of the data base software package for comprehensive presentation of the mortality and fertility measures of the districts including the life tables. Such data base at district level may be helpful to the policy makers in view of delegation of powers by the constitution of India to Panchayati Raj Institutions to form local self-government and to undertake developmental programmes.
Methods and models are based on platforms of some ideal hypothetical conditions and are subject to certain limitations. The procedures developed in the present research also have their own limitations. Some of the limitations are visibly obvious. The most prominent of them is the reference period of the estimates. In many situations, particularly, the model developed for estimating life expectancy at birth uses data from two different sources which are centered at different time points though not distantly apart. Similarly, the other retrospective estimates based on data from censuses and surveys are centered on different time points depending on the measures estimated. However, considering that the demographic measures do not change drastically over short time period, it is believed that the estimates produced in this research is relevant for a time period centered on the year of reference of these estimates. Another limitation is that the infant mortality estimates could only be estimated after the completion of the census which takes place in a ten year interval. Consequently, mid census estimates could not be provided. Also, the proportions of persons aged 65 years and above are obtained from censuses and therefore not available for the intermediate years. Another limitation is that the life tables generated were based on regression method of curve estimation and holds only for those values of the independent variables which are not too far from the range of values entered for building the estimating equations. In case the life expectancy at birth of a district is far away from the range of values of life expectancy at birth of the state to which it belongs, the life table of such districts could not be generated.

Further complications crept up in adjusting data for the districts due to formation of new districts between 1991 and 2001. These new districts have been created either by splitting a large district into two districts or by cutting off smaller parts from more than two existing districts to form a new district. In the former case the data could be adjusted in studies where both the 1991 and 2001 census data were used. However, for the districts created between 1991 and 2001 the 1991 data were not available. This situation is tackled by adding the 2001 data of the new district to the district it originally belonged in 1991. In the latter case, for the large districts from which only a small part was taken away to form new districts or transferred to other districts the data could not be adjusted. However, considering the large populations of these large districts, it is hoped that leaving out a small part from them will have a trivial effect on the estimates.
Apart from these limitations other limitations may come to the fore which were not apparent yet as and when further studies will take place in this field.

The chapters in this thesis are linked to each other in a chain like manner; every estimate is related to the previously estimated measures. We have taken every care so that no systematic error occurs by checking and rechecking the estimates with other available information.

Though the objective of the research is to develop procedures for providing district level estimates of mortality and fertility measures at the district level of India, the analysis of the estimates creeps up as a by-product. Discussion and analysis of the results of the research were carried out in the corresponding chapters. Without reiterating such discussions, a general summary is intended here.

The most striking result of the research is the increase in the infant mortality in the so called developed states and union territories and declining of infant mortality in some of the less developed states, though marginally. This followed suit with the rapid decline in infant mortality and considerable gain in life expectancy at birth in 2010 achieved by the districts which had high infant mortality and low life expectancy at birth in 2001 in contrast with the marginal decline in infant mortality and marginal gain in life expectancy at birth during 2001-2010 in the districts which were better off in 2001 in terms of these two measures. It has also been found that in some districts life expectancy at birth declined during 2001-2010 in contrast with the declining mortality trend in India. These findings could stand as challenges to the policy makers and to the social scientists to analyze the possible causes of complacency in development activities, health care facilities, sanitation, environmental pollution due to rapid urbanization, population growth, living hazards, etc. It may also raise a pertinent question to the demographers and health workers that even in the face of continuous socio-economic development, stagnation or retardation may occur in the average life span of the population due to the causes that depends on genetic, climatic, geographical and other factors. Medical and biological scientists may get interested in determining the biological factors affecting the human longevity of the population of the districts.

India is passing through a phase of fertility decline moving from high to moderate or low fertility as reflected by the fertility decline in its constituent states. The
districts also reflected the same pattern. The decline in fertility is rapid in the high fertility districts in comparison to the districts with moderate and low fertility. Flow of population from high fertility region to low fertility region is a natural phenomenon. The districts in India are no exceptions. The study of impact of migration on the growth of population in the districts of Kerala and Assam re-establishes this theory beyond doubt. The low fertile districts of Kerala are recipient of net immigration (except Idukki). In Assam, the high fertility districts have experienced emigration while the low fertility districts have experienced immigration. The levels of migration in the districts are of course different depending on the levels of fertility of the districts.

No research could be termed complete in any field and is only a step forward for achieving a larger goal. Any use of the results of this research, in planning and implementation of development policies and any encouragement on in-depth study of the mortality and fertility at the district level of India, would make this research meaningful. Even any criticism, describing the flaws of this research and any attempt developed there upon, would make this research a success.