Chapter 1

INTRODUCTION
1.1. INTRODUCTION

Studies relating to sex ratio of a nation or a society is one of the most important characteristic features of Demographic studies. Such studies have wide reflection on the economic, social and political life of the society and holds wide ranging implications for policy formulations as well. Sex ratio summarises the relative cumulative life chances of the different sexes from even before birth through to death. It indicates the relationship not only with population growth but also with socio-economic status of the population. Traditionally the measures of the sex ratio have been used most often as descriptive tools. Increasingly, however, the sex ratio is viewed as an independent variable having important implications for a wide variety of social outcomes including marriage, marital and non-marital fertility, family formation, age at marriage, sexual behaviour, marital instability and many other aspects of marriage, family formation and gender roles. Sex ratio assumes added importance because it shapes the broad contours of the future trend of the nature of work participation rate, reveals the extent of poverty of a nation, its socio-economic structure and more importantly, the status of women in the society.

Perusal of the sex ratio for the various nations of the world reveal that women outnumber men in most developed nations, where as the opposite is the case in respect of developing and underdeveloped nations. Even though males outnumber females at birth, women tend to out number males substantially in more developed countries. This is due to excess male mortality during infancy which is primarily a biological phenomenon. In these countries, more males than females die at all ages and in most societies upto the age at which maternal mortality becomes possible, more male children die than female children. This is the reason for which in countries like Europe and North America, sex ratio tends to average around 1.05 mainly reflecting certain survival advantages that women seem to have over men in
the absence of serious anti-female bias in the intra household resource allocation. Infact, there is fairly strong medical evidence to the effect that given similar care and attention, the survival rates of females exceeds that of males. This happens to be the case in developed countries, whereas the opposite happens in case of developing and underdeveloped countries, India being no exception. The average sex ratio in India is around 0.93 – one of the lowest in the world [Dreze and Sen: 1995]. It is not only the high extent of female mortality at birth but the survival of women even at adult ages which are attributed to be the major factors for unfavourable sex ratio. There is much direct evidence in India and in the other countries with a sharp deficit of women of relative neglect of the health and well being of women, leading to survival disadvantages of females vis-à-vis males over a long period.

However, not all poor regions of the world have very low sex ratio. It has been observed that with regard to sex composition, the distinction between developed and less developed world is sometimes not that markedly sharp as it has been with mortality and fertility. The most developed continent of North America and most backward continent of Africa display preponderance of females over males. Thus the ratio of females to males in the Indian population is remarkably low compared with the corresponding ratio not only in Europe and North America but also in Subsaharan Africa where the ratio is more than unity. Thus, the problem is particularly serious for the country of India and calls for special investigation into the factors determining the low survival rates of females in India.

It is seen that despite the evident biological advantages that women seem to have over men in survival and longevity there is a remarkable preponderance of surviving men over surviving women. This had led to the development of the concept of the 'Missing women' by Amartya Sen which shows the deficit of women in the total population [Sen: 1992]. According to Sen, using the sex ratio of
Subsaharian Nations of 1.022, where there is little female disadvantage in terms of relative mortality but where life expectancy is no higher and fertility rates are no lower than those of the other developing countries, it is estimated that there are 44 million missing women in China, 37 million in India, a total of more than 100 million world wide [Dreze and Sen: 1993].

In spite of remarkable achievement in the post independence period in terms of health and education in India, the sex ratio is witnessing a consistent decline from year to year which has been subject of much speculation and investigation. The sex ratio which was as much as 972 in 1901 has gone down to 930 in 1971. As the population grew in numbers at high rates since independence, female deficits were increasing both in absolute and relative terms. After 1971, the sex ratio has been fluctuating within narrow limits. It improved marginally to 934 in 1981 only to fall to the all time low of 927 in 1991, but it rose slightly once again to 933 in 2001.

The decline in sex ratio that characterised the greater part of the 20th century attracted much attention and professional research. The consensus among demographers is that the deficit are the result of discrimination against the females giving rise to their higher mortality compared to that of males which is due to social rather than biological factors. The social unpopularity of the female child, the women’s low status with low levels of education and employability and the excessive child bearing which may also be partly due to women’s low status are major contributory factors in the higher rate of mortality among females. Females in India are the victims of two types of discrimination: Gender discrimination and class discrimination. For example, severe malnutrition among females is the result of their class situation and this objective class situation when mediated by patently unequal gender relations, produces further deprivation of females. This fact of gender discrimination therefore explains the fact of women being greater victim in matters of nutrition, health care, education, job opportunities and wage rates etc. Class and
gender discrimination that females have to suffer neutralises the superiority provided by nature to the females in matters of survival during infancy and later periods of life [Gupta : 1997]. Sen has linked the analysis of sex ratio variations with the issue of allocative behaviour within the household and higher female mortality which according to him is due to unequal access to life sustaining resources can be seen as a case of 'entitlement failure'. Miller termed this 'extended infanticide'.

Although the census of 2001 has registered an improvement in sex ratio compared to previous census, but the attention got shifted to sex ratio among children which have steadily worsened. One of the objectives of academic research is to provoke discussion on matters of importance and declining child sex ratio is one such concern. The newspaper headlines and media panalist decried how prosperity was marginalising women and aggressive family planning campaigns were proliferating female foeticide or infanticide. If the declining trend continues any further, the nation may be faced with serious socio economic problems which is bound to adversely affect the future developmental prospects, both directly as well as indirectly.

Development in modern times is not confined any more to a strong economic infrastructure alone. It is now well recognised that economic development and consequently national development is meaningless or rather impossible without human development and human development is impossible without gender equality. As long as women are excluded from the development process, development will remain lop sided. It was naively assumed that the flow of benefits from the development efforts will trickle down automatically to all sections of the people, men and women alike. However, experience reveals that benefits of development has largely bypassed women as revealed from the relatively lower proportion of females in Indian population. According to 2001 census, we have 35 millions fewer women than men in India which has been increasing overtime. This clearly indicates the
fact that the benefits of socio-economic development which occurred in India is not being shared equally by two sexes of the population. Infact, the process of modern development has largely contributed in lowering the sex ratio and might continue to affect the sex composition in India in near future also.

From this, it can be said that negligence of a strong social infrastructure of which sex ratio is an important component can seriously retard the over all growth process of a nation since development analysis cannot be really divorced from gender categories and sex specific observations. There is therefore an integral relationship between the pattern and trend of sex ratio and the extent of socio-economic development of the nation concerned. Just as various socio-economic factors can determine the trend in sex ratio, similarly the sex ratio in turn can shape the socio economic scenario of a nation. Hence studies and research relating to sex ratio needs to be encouraged so that findings of such work can occupy a crucial place for policy formulation.

One of the interesting features of sex ratio in India is that it is very much uneven throughout the country. There are some states in which sex ratio has been well above the all India average e.g. – Kerala, Tamilnadu etc. Again, there are some states where sex ratio is always lower than the national average. Unfortunately, Assam is placed on the later category. However, Barak Valley which is located in the southern part of Assam has interesting sex ratio trend where since 1951, the sex ratio has been rising continuously, the high incidence of poverty, density of population and immigration across the border notwithstanding.

Thus Barak valley offers an ideal case for studying the determinants of sex ratio trends because while in India, the ratio is declining continuously except for a marginal improvement in 1981 and in 2001, in Barak Valley, the ratio after experiencing persistent decline till 1941, started rising steadily thereafter. One thing
worth while to mention here is that, the sex ratio in Barak Valley was below the national average upto 1971 census but from 1991 census, it has been registering higher sex ratio compared to all India figure. In 1991, the ratio in the valley was 936 as against 923 in case of Assam and 927 at the all India level and according to the provisional census report of 2001, it is 941 in comparison to 932 and 933 for Assam and India respectively. It is also quite relevant to mention here that right from the beginning of the last century (i.e., 1901 census) uptill 2001, Barak Valley registered much higher sex ratio compared to Assam. Thus, the region shows satisfactory achievement as against the all India as well as state of Assam so far as sex ratio is concerned. So this study which intends to find out the inter connection among the determinants of sex ratio may play an important role in the effort of further improving the ratio in the valley. However, very few studies on this aspect at macro levels and infact no studies at micro level are so far available. In order to get adequate insight and minute details of the problem, it would be necessary to carry on investigation not only on macro level but also at the micro level. The proposed study aspires to present an analysis at both macro level on the basis of secondary data and micro level to be supported properly by field studies. All these features have prompted us to under take the present study with particular reference to Barak Valley region. Moreover, the suggestions for solving these problems coming out from this study will certainly be helpful to the policy makers in making policy decision and which will make a positive contribution in this field.

1.2. Implications of Declining Sex Ratio

A monotonically declining sex ratio over time is not good for any society since there could be many socio-economic, psychological and demographic consequences. There may be far reaching implications of overall declining in sex ratio in the country especially, the imbalance or the disproportion of sex ratio in reproductive and working age group, much difference in the sex ratio of rural and
urban areas etc. will be affecting the demographic, economic, socio-psycho structure and pattern of the society.

Decline in the proportion of females specially in marriageable and reproductive groups will affect the marriage institution itself. It may give rise to early marriage as many bridegrooms feel insecure in getting a bride at a later age. In his study on various factors affecting age at marriage, Gulati (1969) found low sex ratio to induce early marriages. If one looks at marriage practices in India, child marriages, even cradle marriages have been prevalent in Northern Region, particularly Rajasthan [Anantharam:1989]. Early age at marriage not only gives rise to higher birth rate but also high death rate in the form of high infant and child mortality and high maternal mortality.

The fewer proportion of females in the composition of population will enhance the divorce rate and other familiar problems which is dangerous to the welfare and growth of the society. Polyandry may emerge on the scene and there may be growing conflict and violence. A shortage of women does not lead to their increasing valuation but to greater restrictions and control over them. The increasing intensity of violence against women in all domains of life is testimony to this. The fewer proportion of women will lead to the break down of family system. It will promote individual families and cause compulsory calibacy of fewer males without any marriage due to the shortage of female proportions of the population. It may cause lowering of mortal standard especially in urban areas because this is a factor which may by responsible for prostitution and other sexual evils. For example Punjab in India which had substantially low sex ratio gave rise to illegal traffic of females, a similar phenomenon witnessed in frontier area settlements for the earlier period in the United States [ibid].
Decline in the number of female will adversely affect their participation in working force by lowering down the female participation rates. It has been found that if there are more men than women, the scope for increasing female participation will be reduced. On the other hand, if sex ratio is higher i.e., if there are more women than men, the scope for increasing female participation is generally enhanced.

Female work participation in economic activities has been recognised as an important correlate of sex ratio in literature also [from Bardhan : 1974, Miller : 1981, Murthi et al : 1995 to Agnihotri : 2000]. All have established a link between female work and female worth. Shivkumar (1995) further substantiates the relation when he finds that increased work participation of women in the state of Manipur is very much instrumental in contributing to low infant mortality. "Manipur having a more favourable impact on child survival than in other parts of the country is also the tradition of strong collective action that accompanies the high rate of women’s work participation in the state".

From the above it can be said that the shortfall of women in total population will not only adversely affect their work participation but it will also have its effect on child health and survival. Moreover, the low sex ratio will increase the exploitation of women and results in loss of women labour which is considered to be highly valued with economic productiveness. The fewer proportion of women will decrease the national income by creating an environment of less motivation to work hard and lead to lower productivity of the economically active population. Psychologically also this imbalance will pose a problem. Because of the continuous deficit, the social problems like disintegration of moral, social institution might take place.
1.3. Objectives of the Study

The main objectives of the study are therefore to,

(i) Examine the overall trend and pattern of the Sex Ratio at the all India level and for the state of Assam with special reference to Barak Valley.

(ii) Analyse the main factors responsible for the current trend of the Sex Ratio in India as well as in Assam.

(iii) Make an investigation of the factors responsible for the current trend of Sex Ratio in Barak Valley with particular reference to different community, linguistic and religious groups.

(iv) Identify the main factors in quantitative terms that are responsible for the current behavioural pattern of sex ratio in Barak Valley.

1.4. Hypotheses

The main hypotheses of the study are as follows:

(i) Economic development measured in terms of rise in Gross Domestic Product and growth of real per capita income had very little impact upon the Sex Ratio in Barak Valley. Though in most nations, economic development had a positive effect in improving the Sex Ratio, the same is not true in case of Barak Valley.

(ii) Improved status of women in a society also improves the Sex Ratio, as the contribution and role of women in such a society for developmental purposes is increasingly accepted and thus women in such a society are accepted as equal partners in growth process. Another hypothesis of the study will therefore be that the improved status of women in Barak Valley had a positive contribution in shaping the trend of Sex Ratio in the valley.
(iii) It is also hypothesised that low socio-economic status of the people of the region measured in terms of poor and inadequate infrastructural facilities particularly in the social sector has adversely affected the pattern of Sex Ratio.

(iv) The Sex Ratio in Barak Valley varies significantly by religious, linguistic and socio-economic status of individual households.

1.5 Data Source and Methodology of the Study

As mentioned earlier, the study proposes to examine the behavioural pattern of sex ratio in Barak Valley at both macro and micro levels. Thus the study will have to use both secondary data and primary data.

The main sources of secondary data are the publication of government and semi government agencies like reports of various censuses, National Family Health Survey, Ministry of Human Resource and Development, office of the Registrar General, Sample Registration System, Statistical Handbook of Assam and Cachar, Statistical Profile of Barak Valley. The information collected from secondary sources are classified and analysed in the light of our objectives. Extensive use of tabular analysis are also made to derive the overall idea regarding the changes in sex ratio over time and the identification of the crucial determinants of the same. Use of graphical methods have been emphasised upon, so as to derive an overall idea relating to the movement and behaviour of the variables determining the sex ratio.

The major part of the work however, deal with primary data collected by carrying out field survey for the three districts of Barak Valley. It is based on the method of purposive multistage stratified sampling technique. For this purpose, each of the three districts are divided into blocks and from each district, we have selected two blocks. From each of these blocks, three villages have been selected.
out of which 20 families are interviewed in each village. Our sample size happens to be 360.

Information through questionnaire prepared for the purpose have been focused to seek information on occupation and income of the household, family size, sex, age, literacy, the magnitude of nutritional differences among males and females, health care services available, son preference if any and the nature of attention and care accorded to girl child, record of mortality of the family for the last two decades and last but not the least, occurrences of pre-natal deaths if any. Information are obtained through the method of personal enquiry directly by the researcher.

After collection of the data, the same have been tabulated, processed and analysed. Standard statistical tools are applied for establishing the inter-connection and interactive nature of the various determinants.

In order to test the hypotheses outlined above, we shall examine the relationship between the sex ratio and their determinants, with the help of the information obtained by the use of the following models.

Studies have revealed that infant mortality is one of the important determinants of sex ratio since the ratio is often experienced to be favourable to females in those areas where infant mortality is found to be low with marginal sex differential. This implies that excess female mortality in infancy will adversely affect the sex ratio and vice versa. Consequently sex ratio is considered to be a negative function of female infant mortality.
Therefore the first model that we adopt is as follows:

\[ SR = a - b \text{Fim} \]  \hspace{1cm} (1)

Where \( \delta SR / \delta \text{Fim} < 0 \)

and \( \text{Fim} = \) Female infant mortality

It is also observed that female literacy has significant impact in determining the sex ratio of a nation. Female literacy and educational attainment enhances women's status by increasing her age at marriage improving nutrition and health care, and enlarging employment opportunities and gives her greater freedom and increases her ability to take independent decisions. It also brings about social change and development by lowering the required dowry and marriage cost and therefore contribute towards balanced sex ratio, so that sex ratio is an increasing function of female literacy. Therefore, the next model that we specify is as follows:

\[ SR = a + b \text{Lit} \]  \hspace{1cm} (2)

Where \( \delta SR / \delta \text{Lit} > 0 \)

and \( \text{Lit} = \) Female literacy

The next model that we have specified is by taking dowry as another explanatory variable to measure its impact on sex ratio. It has been found that there exists a strong causal relationship between sex ratio and dowry since higher the dowry, lower the sex ratio and vice versa. Thus sex ratio can be taken as a negative function of dowry.

\[ SR = a - b \text{Dow} \]  \hspace{1cm} (3)

Where \( \delta SR / \delta \text{Dow} < 0 \)

and \( \text{Dow} = \) Dowry
It is to be highlighted here that son preference is found to be a very important factor responsible for declining sex ratio in India. Knowing well that it can drastically change the sex ratio of a region, we have developed our next model by incorporating son preference as an explanatory variable to measure its impact on sex ratio in this region. Consequently, it is considered to be negatively related with sex ratio.

\[ SR = a - b \cdot \text{Son p} \quad (4) \]

Where \( \frac{\delta SR}{\delta \text{Son p}} < 0 \)

and \( \text{Son p} = \text{Son Preference} \)

In addition to the above crucial variables, female work participation not only in the primary and secondary sector but also in the tertiary sector improves the position and status of women. Experience reveals that higher female work participation is associated with greater gender equality in survival since it acts as an important component of female entitlement. Therefore, sex ratio can be considered as an increasing function of female work participation.

\[ SR = a + b \cdot \text{Fwp} \quad (5) \]

Where \( \frac{\delta SR}{\delta \text{Fwp}} > 0 \)

and \( \text{Fwp} = \text{Female work participation} \)

It is postulated that higher age at marriage improves the status of women which in turn improves the sex ratio. This is because while higher age at marriage reduces the risk of infant and maternal mortality thereby improving a women's health status, on the other hand, it opens up wider horizon for better education and learning which improves her overall status.
Consequently, sex ratio will be an increasing function of age of female at marriage and we can thereby specify the next model as

\[ SR = a + b \text{Mar}_\text{age} \]  \hspace{1cm} (6)

Where \( \frac{\delta SR}{\delta \text{Mar}_\text{age}} > 0 \)

and \( \text{Mar}_\text{age} = \text{Age at Marriage} \)

It is to be highlighted here that so far we have made use of simple regression analysis in an attempt to identify the best set of independent variables. However, to examine whether the explanatory power of the model improves or not, we have used multiple regression analysis where we use more than one independent variables in a single model. The first regression model is developed by incorporating two independent explanatory variables, namely \( Fwp \) and \( \text{Lit}_f \)

\[ SR = a + b Fwp + c \text{Lit}_f \]  \hspace{1cm} (7)

To further examine the explanatory power of the model, we have attempted to develop our next model by incorporating three explanatory variables, viz, \( Fwp, \text{Lit}_f \) and \( \text{Mar}_\text{age} \) and the model that we specify is as follows:

\[ SR = a + b Fwp + c \text{Lit}_f + d \text{Mar}_\text{age} \]  \hspace{1cm} (8)

The next model is developed by including other explanatory variables and in that process, we now add another variable \( \text{Fim} \) and specify the following model,

\[ SR = a + b Fwp + c \text{Lit}_f + d \text{Mar}_\text{age} - e \text{Fim} \]  \hspace{1cm} (9)

The explanatory power of the model can be put into test further by incorporating another important variable, \( \text{Son}_p \), into our model. Consequently, the next model that will be developed by us is as follows,

\[ SR = a + b Fwp + c \text{Lit}_f + d \text{Mar}_\text{age} - e \text{Fim} - f \text{Son}_p \]  \hspace{1cm} (10)
To capture the essence of the overall economic as well as socio-economic variables for the determination of sex ratio, we have included all the six explanatory variables in our final model which we can specify as follows,

\[ SR = a + b \ Fwp + c \ Litf + d \ Mar_{age} - e \ Fim - f \ Son_p - g \ Dow \ldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsldotsld..