INTRODUCING THE PROBLEM

'Demography' is the scientific study of human populations in their totality, involving empirical, statistical and mathematical aspects. The term is derived from the two Greek words: 'Demos' means the people and 'graphein' means to draw or to write. Thus, its meaning is to draw or write about people. A. Guillard, a French mathematician, first coined the term 'Demography' in 1855. Hauser and Duncan (1959) have distinguished two broad types of areas within the scope of the study population: (i) Demographic analysis, which focuses attention on the study of components of population variation and change, i.e., it is the study of the size, territorial distribution and composition of the population, changes therein, and the
components thereof which may be identified as natality, mortality, territorial movement (migration) and social mobility (change in status) ; and (ii) population study, where attention is devoted not only to population variables, but more importantly, to the relationships between population change and other variables - social, economic, political, biological, genetic, geographical and the like.

The size and growth of population has been viewed as an important factor underlying the development of any country ('development' here generally refers to sustained economic growth and improvement in the quality of life).

Based on past experience, it is hypothesized that societies are capable of regulating their own growth and this process of regulation follows a fairly recognizable pattern or series of stages and as certain conditions are met, a society will move from one stage to another along a fairly predictable course. This process is known as 'demographic transition'. The theory of demographic transition has been frequently put forward. It was pioneered by Thompson (1929) in the pages of the 'American Journal of Sociology'. Much comprehensive concept of demographic transition was introduced by Notestein (1953). Notestein presented the theory of demographic transition with explanations for the changes in fertility. However, the whole process is closely related to stages of economic development and industrialization.
Thus, the process of Demographic transition in the course of economic development may be briefly explained as follows: All nations in the modern era, which have moved from a traditional, agrarian-based economic system to a largely industrial, urbanised base, have also moved from a condition of high mortality and fertility to low mortality and fertility. In a way it is a general theory that describes the development which it presumes all population must undergo in the process of 'modernization'. Modernization is defined as the transformation in economic, social and political organisation and in human personality.

The population of the world has been growing on a massive scale during the second half of the last century. According to P.C. Alexander (1994),

"World population was only about 1 billion in 1800 AD and it took 130 years (1930) to add the second billion. However, it took only 30 years (1960) to add the 3rd billion, 15 years (1975) to add the 4th billion and only 12 years (1987) to add the 5th billion"

Thus, the increase in the world's population has been a recent phenomenon. Such population momentum has created immense problems.

In terms of the global population, India is the second most populous country in the world. According to the 1991 Census, the population of India is 846.3 million. With this, India's share in the world
population increased to 16 percent in 1991 from 15.2 per cent of 1981; and every seventh person in the world is now an Indian. As of today, India has already reached the one billion mark for her population. In India, 42,000 infants born every hour that is multiplying faster than any other nation (The Telegraph, 12 May 2000). According to 1991 Census the density of population in India is 267 persons per square kilometre.

In India, population growth declined from 24.60 per cent during 1971-81 to 23.85 per cent during 1981-91. Thus the annual growth rate of India's population of 2.14 per cent during the eighties is slightly less than 2.22 per cent recorded during seventies. This increment is mainly attributed to a large base population and reduction in death rates due to expansion of modern medical and public health measures. Birth rates, on the other hand, remain more or less stable, thereby increasing the rate of growth.

In India population trends are to a large extent conditioned by the interplay of physical, environmental, historical, political, economic, social, cultural and biological determinants operating at micro-levels. Many scholars have stressed the importance of small-scale studies with anthropological perspectives, or sample surveys. Such approach would provide in-depth examination of population levels, trends and differentials.

According to 1991 Census, the population of the state of Assam is 22.4 million, accounting for about 3 per cent of the country's
population. Between 1981 and 1991 the state's population increased by 24.24 per cent (the 1981 population was interpolated using the 1971 and 1991 populations, since no census was conducted in the state in 1981) almost at the same rate of increase recorded for the country as a whole (23.85 per cent). Population density per square kilometre for the year 1991 is 284 for Assam compared with 267 for India - as a whole.

It may be mentioned here that the district of Kamrup during the 1971-91 period has shown higher growth rate (64.69 per cent) than that of the state (52.44 per cent) of Assam.

It is common knowledge that rapid population increase leads to the rise of serious problems for the world as a whole. As a developing country, India faces more problems than the highly industrialized countries. Of the many different components, fertility and mortality are considered to be the primary forces behind the population change. Hence, the study of levels, trends and differentials of these components are fundamental towards rectification of population problems.

**FERTILITY**

Fertility is the most vital element which affects population change, particularly in developing countries. Fertility is defined as the actual reproductive performance of a woman or groups of women (Thompson, 1953). Human fertility is responsible for biological replacement and for
the maintenance of the human society. Every society replenishes itself through the process of human fertility. Thus, in population dynamics, fertility is a positive force through which the population expands, counteracting the force of attrition caused by mortality. Within the biological limits of human fertility, several social, cultural, psychological, as well as economic and political factors are found to operate and these are responsible for determining the levels and differentials of fertility.

MORTALITY

Mortality is another demographic variable which has played a dominant role in determining the growth of population. In fact, the single most important contribution of demography has been the noted sharp declines in mortality, rather than any rise in the fertility rates, and these have been responsible for bringing about a rapid growth of population.

Various biological, social, economic and cultural factors affect the health of an individual and consequently the mortality rate in society. When mortality is viewed from the demographic point of view, it is studied to determine changes in the population size and structure, rather than from the genetic angle. The most important factors for the demographic study of mortality are age and sex.
INFANT AND CHILD MORTALITY

Mortality which takes place within one year from birth, that is, children in the first year of life who have not yet reached age one, is termed as 'infant mortality'. Among all mortalities, infant mortality is considered one of the most significant components of population change since infant deaths account for a substantial number of all deaths and thus have an impact on the overall death rates as well as on the composition of the population.

Infant mortality consists of two components:

(i) neonatal mortality (deaths up to 28 days of life); and
(ii) post-neonatal mortality (from 1 month to 1 year of life).

Factors which affect neonatal deaths are primarily endogenous, such as, age of the mother, the birth order, prematurity, birth injuries and conditions arising from delivery hazards, weight at birth and also to some extent antenatal care of the mother, post-birth practices in the first month of life. On the other hand, post-neonatal mortality is attributable mostly to exogenous causes, such as, physical, environmental, biological, nutritional, economic, socio-cultural factors. Lack of medical care, neglect and faulty care may raise post-neonatal mortality greatly.

Child mortality occurs from the age of one year to fourteen years. A typical sex difference in child mortality is noticed, in that, life
expectancy at birth is substantially higher for females than for males; and females tend to survive all forms of diseases better than males. Generally, the explanations that are forwarded vary from differences in psychological stresses and living habits, to physiological and genetic differences, where males are believed to be more at a disadvantage than females (Conrad, 1962; Madigan, 1968; and Nayeye et al., 1971). However, many developing countries deviate from this pattern, whereby females are more at a disadvantage than males; mainly due to economic and socio-cultural reasons rather than biological ones, such as, lower status of women, relative bias reflected in the standard of diet and care (Das Gupta, 1990).

**FOETAL MORTALITY**

Abortions and still births, which are collectively known as reproductive wastage are not considered as mere deaths, but are considered as foetal deaths. Foetal mortality is defined as -

"death prior to the complete expulsion or extraction from the mother of a product of conception, irrespective of the duration of pregnancy" (WHO, 1970).

Any expulsion of the foetus which occurs before the foetus becomes viable, that is, capable of independent existence outside its mother, is known as an abortion. Abortion may be spontaneous or induced. The former is independent of human choice and results from involuntary
causes, whereas the latter is mostly dependent on voluntary decision, be it for socio-psychological reasons (which include sex-selective abortion of female foetuses), or fertility control or health measure. Spontaneous foetal losses are observed in both higher and lower order pregnancies at older and younger ages respectively (Pebley et al., 1985). When a birth does not show any other sign of life after being expelled from the mother it is known as a still birth. However, due to great deal of under-reporting it is difficult to assess foetal mortalities accurately.

REVIEW OF LITERATURE

There has been considerable development in the field of demographic studies and research in India in the last three decades. Various research centres and organisations have been showing special interest in population studies. The Central Statistical Organisation, Census Commissions, Demographic Research Centres, International Institute of Population Studies, Registrar General of India and National Sample Survey are some of the specialised governmental agencies. These organisations and agencies are collecting data on demography and population problems. Besides, various macro and micro level studies in the demographic field have been carried out by different investigators. The components of population dynamics cannot be independently interpreted or understood without comprehending the interplay of a multitude of determinants affecting their nature and magnitude in a population of a region, resulting eventually in demographic change. The review here focuses on a major group
of determinants, which greatly influence the components of population dynamics of a region.

Education, viewed as an indicator of human development, is considered to be one of the most important determinants of population components. The importance of education, especially that of women, has often been stressed as contributing to a decline in family size. Generally education of couples is associated with a lower level of fertility.

A study conducted in Lucknow city, reveals that the fertility performance of the couple has a negative association with education of the couple (Hussain, 1970). A similar association (inverse relationship) is also noticed in many studies carried out by the U.N. Mysore Population study (1961); Bhowmik, et al., (1971) among the Zemi women in Nagaland; NSS (1967); Driver (1963). In U.N. Mysore Population study, women with high school; or college education are found to have a smaller family than those with a lower educational attainment. Some other studies (Agarwala, 1972; Kesarwani, 1989; Bharati and Ghose Dastidar, 1990; Nag, 1998) reveal that fertility decreases with increase in educational level of women. In India, in an advanced state like Kerala, higher literacy status of women is held as an important factor contributing to fertility decline (Caldwell, et al., 1984).

Many researchers have shown the various factors, namely, socio-economic, biological, cultural, environmental factors, etc., and their

Most of the scholars are of the opinion that an inverse association exists between mortality and education, especially maternal education. Nag (1998) shows that the proportion of child loss seems to decrease with the advancement of educational attainment of women. The effect of education on mortality has been reported by many scholars (Ghose, et al., 1979; Jaiswal, 1979; Mukherjee, 1988; Rath and Mohapatra, 1988; Bharati and Ghose Dastidar, 1990; Kesarwani, 1989; Bhende and Kanitkar, 1988; Khan, et al., 1986; Rahman, et al., 1993). Caldwell (1979) has pointed out that maternal education is an important determinant in its own right, and demonstrated that different levels of child survivorship result from different levels of maternal education.

Several other studies suggested that infant and child mortality is associated with maternal education, especially in developing countries, including India (Chaudhury, 1982; Das Gupta, 1990). Therefore, education not only reduces fertility directly but also indirectly through reducing mortality (Cochrane, 1980).

Occupation, especially that of the husband, is used as an indicator of socio-economic status, and differential fertility is studied
according to the occupation of the husband. It has been found in some surveys in India that persons working as clerks, or those engaged in service and in the professions have the lowest fertility, while cultivators and labourers have the highest fertility (Driver, 1963; Sinha, 1979; Agarwala, 1977). Talukdar (1983) is of the opinion that the business people seem to have slightly higher fertility compared to manual labourers, teachers and service holders. Mahadevan (1979), however, reports that the fertility behaviour does not vary with occupation.

It has been found in several studies that the gainfully employed women have a smaller number of children than those who are not employed. Various research works in India suggest that women's employment may have at least one disadvantage: the survival of young children appears to be negatively affected if women work (Basu and Basu, 1991; Kishor, 1972). The same research suggests that gender differentials in child mortality, which in Indian context largely imply excess female mortality, are reduced when women work. Nag (1998) reports that female work-force participation in the service sector particularly, seems to lower fertility, as against their participation in the agricultural sector.

Many reports have shown the importance of biological variables like age at menarche and onset of menopause, affecting fertility. Menarche is one of the major factors responsible for differential fertility (Ghosh and Kumar, 1973). An enumeration of average age at menarche of girls of 24 countries gives the range as 10-18 years (Shah, 1958). Eighty
per cent of Indian girls are found to experience their first menstruation between 12 and 15 years of their age and about fifty per cent of them get married before they complete their fifteenth year (Sinha, 1979). Mandelbaum (1974) has observed that age at menarche in many societies also determines age at marriage.

Age at marriage is an important variable of population dynamics and growth. This is because marriage represents the socially sanctioned initiation of cohabitation and childbearing; and, any shift in this age can postpone or advance the beginning of reproductive span in societies. Raising the age of marriage, particularly of females, therefore, is seen by demographers and planners to be one of the policy alternatives "beyond family planning" that might be able to initiate or accelerate population growth changes on a major scale (Nag, 1998). Malthus was one of the earliest exponents who recognised age of marriage as an important factor; and believed that such preventive checks as delayed age at marriage affected fertility.

A number of studies conducted in India indicated lower fertility for women who married late (UN, 1961; Agarwala, 1962; 1966; Driver, 1963; Mukharjee, 1962; Jain, 1964; Wyon and Gordon, 1971; Singh, 1986; Mahadevan, 1989). Bhowmick, et al., (1971) found that women with earlier marriages are endowed with higher fertility. In contrast to this, Dandekar (1959) has failed to find out any such relationship. Several studies in India show that in order to achieve a substantial reduction
in fertility, the age at marriage for females should be increased to more than 22 years (Jain, 1975). Das Gupta (1973) and Ramu (1988) shows that age at marriage is higher in urban areas than in rural areas.

It has also been seen that mother's age at marriage influence the infant and child mortality rates (Nag, 1998). Abeykoon (1987) opined that age of women has a positive direct effect on child mortality. Infant mortality and pregnancy wastage are high both to the younger and the elder mothers (Agarwala, 1972; Mahadevan, 1986; Podder, 1975; Gandhi, 1989). Agarwala (1972) also reported high infant mortality in case of first birth orders.

The onset of menopause, among the Indian women was found to occur at an early age and reach the menopause when they are between 40 and 45 years of age with a mean age of 42.2 (UNO, 1952; 1961 and 1975). According to Bongaarts (1980), the mean age at menopause ranges from 44 to 50 years in developing countries. In Indian societies, age at menopause may play an important role, where acceptance of any fertility control method is usually limited, especially in the absence of any voluntary (fertility control method) or involuntary (sterility, illness) regulation of fertility.

Place of residence (rural / urban residence) is a universal explanatory variable of population components. Many studies reveal that fertility is lower in urban areas than in rural areas (Agarwala, 1972;
Jaiswal, 1979; Nag 1980; Sinha and Zacheria, 1984; Bhende, et al., 1988; Rath and Mahapatra, 1988). The Sample Registration System, (1992) as well as the National Family Health Survey, (1992-93) have shown higher fertility level for urban than for rural areas.

Rahman, et al., (1993) has stated that infant mortality is high in rural than in urban areas because of differences in standards of living, better accessibility and availability of medical care.

Society in India is still largely organised on the basis of caste and religion which affect the social, economic and political structure of the society and thereby influence the course of population change (Chaudhuri and Mukharjee, 1994). A number of studies conducted in different parts of the country show the religious difference in fertility behaviour (Majumdar, 1960; Mukharjee and Singh, 1961; Driver, 1963; Kurup and George, 1965; Krishnan, 1986). Nagi (1981) had occasion to observe that Moslem fertility is universally high and noticeably higher than that of non-Moslem countries at similar level of development. The UN (1961) surveys also reported that Muslim women had more children than Hindus in Mysore.

Ruzicka and Kanitkar (1973) reported the highest infant mortality among Muslims in Bombay and the lowest rate in such cases among Christians, the differentials being greater in the post-neonatal period.
The family being the most universal permanent institution of every society, has enormous influence on the life of an individual. And, therefore, family structure is believed to affect population components greatly. *Davis* (1955) theorized that extended family structure caused high fertility. However, a number of studies have found little or no relationship between nuclear family and fertility. *Kesarwani* (1989) reported that family structure does not show consistent and distinct impact on fertility.

The value of a son or the second son is an important determinant of high fertility (*Mahadevan and Sumangala*, 1987). The values of a son have also been indicated in many other studies (*UN*, 1961; *Chaudhury*, 1982; *Anand*, 1964). *Ramu* (1988) states that "couples with a strong preference for sons, or at least one son, are likely to go beyond their desired family size if their preferences are not achieved".

In India, incidence of female infanticide (*Wyon and Gordon*, 1971); high mortality of female children due to differential treatment, care (*Simmons, et al.*, 1982; *Das Gupta*, 1987, 1990; *Basu*, 1989); as well as incidence of sex-selective abortions of female foetuses (*Ramanamma and Bambawale* 1980; *UNICEF*, 1991); - all these factors seem to indicate preference for sons.

Family planning means to have children in a desired number and each child at a desired time (*Matsunga*, 1966). India, in 1952, became the first country in the world to have adopted an official family planning
programme, in order to solve the crucial problem of galloping population. It was reported by Agarwala (1972) that the rate of adoption of family planning is generally more among the urban dwellers than among their rural counterparts. A World Bank study reports that family planning programmes helped to reduce fertility in India by 40 per cent (PTI, 1991). Female sterilization (tubectomy) seems to be the most accepted method (Rao, et al., 1993; Mahadevan and Sumangala, 1987). It is stressed that any family planning programme cannot succeed under conditions of widespread illiteracy (Bogue, 1969; Bose, 1991; UNICEF, 1993).

WORK DONE IN NORTH - EAST INDIA

Studies in the field of demography and various problems related to demography in the north eastern India are very scarce. The first study of this sort dates back to 1958 when B.M. Das undertook a preliminary demographic study of a village inhabited by the Rabhas, a plain tribe of Assam. Similar studies were carried out on the Dimasas by Phookan (1969) and the Tai Phakes by Sharma Thakur (1982).

There are some occasional research papers published by different investigators on menarche and menopause (Rakshit, 1960; Das and Das, 1967; Srivastava and Goswami, 1968; Gogoi, 1972; Kar and Mahanta, 1975; Das, 1987; Das, et al., 1989) - and on fertility and mortality (Bhowmick, et al., 1971; Das and Das, 1973; Das and Devi, 1975; Barua 1983; Das and Das, 1982; Buzarbarua, 1984; Das and Das, 1992).
Bhowmick, et al., (1967) threw light on the reproductive life of the Zemi women of Nagaland. The study reveals that literate women have lower level of fertility than non literate women. Mahapatra (1970) undertook a study on the fertility of the Khasis. A similar study conducted in Meghalaya, reveals that fertility decreases with increase in educational level of the couples (Baruah, 1980). Baruah is of the opinion that differences in the religious affiliations (i.e., non - Christians and Christians) donot bring about any variation in the sphere of fertility of the Khasi population. Another study carried out by Chakrabarty (1995) on Jaintia women shows that in rural and urban areas, irrespective of their religious background, fertility increases with decreasing educational level of the couples, though wives' education have stronger influence on fertility. However, Chakrabarty found that in the rural areas, fertility of the Christian women is higher than that of the Hindu women. Both in the rural and in the urban areas and in all the religious groups, fertility is found to be higher among the women following night visit marriage system. Das and Choudhury (1979) studied the fertility and infant mortality of the Mishmis of Arunachal Pradesh.

The study on fertility and child mortality of different populations have also been studied. Child mortality among the Rabha was studied by Das (1958). Das and Das (1982) also studied child mortality among several population groups of rural Assam. Das (1991) studied fertility and child mortality among this Assamese caste groups, i.e., Brahmin and Koch of Mirza area in Kamrup district. The study reveals that socio-
cultural factors and biological variables, i.e., age at menarche, age at conception, age at first child birth, etc., have played a significant role in the variation of the fertility and child mortality. A similar study was carried out by Choudhury (1993) on Mishmis of Arunachal Pradesh. Chakrabarty (1995) has shown that among the Jaintias of Meghalaya, infant and child mortality to the illiterate couples are much higher than that of the educated couples. The Christians, however, show the lowest infant and child mortality both in the rural as well as in the urban areas. In the rural areas, the Hindus show the highest infant and child mortality. Kalita (1997) studied the Bodo-Kacharis and the Kalitas of Kamrup district, Assam. He found that in both the communities, wife's education is more effective in fertility control than the husband's education and the service holder wives show the lowest average fertility. An inverse relation of infant and child mortality with the education and occupation of the parents is observed in both the communities. He also found female sterilization is the most popular method of the contraceptive devices.

Choudhury (1982) had his focus on the demographic trends in Assam during the period 1921-71, whereas a study was made by Goswami (1985) on the population trends in the Brahmaputra Valley. Srivastava (1987) dwelt at length on a demographic profile of the North East. Das, et al., (1989) confined their studies on some aspects of demography of the Caste Hindus, Muslims and Mongoloids of Assam. Baruah (1991) in her study among the Keots, Karbis and the Sheikhs of Kamrup district has shown that with the rise of literacy and economic level, the number of family
planning acceptor has increased. The demography of the Tai Phakes of Assam was studied by Baruah (1992).

Adak (1993) has shown that the Khasis and the Mizos have the lower child mortality rate than the Garos due to the fact that the Khasis and the Mizos depend more on medical treatment than the Garos.

Buzarbaruah and Phookan (1986) in their study among the Mishings of Disangmukh of Sibsagar, Assam, show that pregnancy wastage is higher among the younger and the older mothers.

It is only fair to add that our review of literature is only illustrative and not exhaustive despite many studies cited above.

AIMS AND OBJECTIVES

Demographic research has attained a considerable degree of maturity in recent years. Considering the wide range of regional, ecological, ethnic, socio-economic and cultural variation, North East India seems to be a fertile field in the area of demographic research and it provides a unique opportunity to undertake demographic studies in order to understand the forces and factors responsible for fertility and mortality differentials. A review of earlier research works done in this field, however, reveals that not much systematic studies have been done so far in this region, more particularly in the urban areas. The present work, therefore, aims at examining the fertility and mortality of two populations of Guwahati city.
It is true that Guwahati was a small town before independence. But in the era of independence rapid growth and expansion of the city took place. The growth not only expanded boundaries of Guwahati but also increased the population to a large extent. The influx of people from outside Assam gives a cosmopolitan character to the population of Assam. Mixed population coming from different states, communities, linguistic groups and religions broke the isolation of areas dominated by particular communities. Different population groups are living in so diverse conditions that it is difficult to have a viable control over any variable.

After a preliminary survey, the researcher has chosen to concentrate her field work in the railway campus of Maligaon area of Guwahati. Maligaon railway colony is one of the biggest railway colonies in North East India. Here employees of the same occupational category not only get more or less the same salary but they are also allotted the same type of residential accommodation. The medical, recreational and other facilities are common to all the employees. The area was selected precisely because people here are exposed more or less to the same environmental conditions of the railway campus. However, they do react to different conditions of the socio-economic reality in terms of their native genius. Therefore, two distinct cultural groups, the Assamese and the Bengalis, living under the same environmental condition have been selected for the present study.

The present investigation basically aims at examining the variation of fertility and mortality among the two culturally distinct
population groups living under the same urban environment. It also seeks to examine as to how the socio-cultural factors of the two distinct population groups contribute their share in determining their respective fertility and mortality.

In order to achieve the primary objectives, the present study aims at examining the following:

1. The variation of population composition of the Assamese and the Bengalis.

2. How the fertility and mortality patterns of the two culturally district ethnic groups differ from each other under the same environmental condition.

3. Fertility and mortality patterns of each of the communities against their educational level, occupational categories, current age, etc.

4. The level of the family planning measures among the two communities.

5. The effect of family planning and cultural values on fertility.

6. Relationship between fertility and mortality.

7. How the fertility and the mortality pattern of the Assamese and the Bengalis of Guwahati city differ from that of the other rural communities of Assam.