CHAPTER I

REVIEW OF LITERATURE ON INFANT MORTALITY

Mortality of children under the age of one year is considered to be a sensitive indicator for the socio-economic and health conditions prevailing in a community. It is also reflected on the state of public health, environmental sanitation, socio-economic development and attitudes of the people towards the importance of human life. Moreover, an understanding of the infant mortality and its determinants have crucial importance not only for demographers, but also for the planners, medical personnel and health administrators. Literature on infant mortality is relatively immense and has a long history. Number of studies have been undertaken on different aspects of the determinants of infant mortality.
in many countries including India. While the related literature on infant mortality, some of the studies have emphasized on the extent and pattern of infant mortality and few others have focused on the causes of infant mortality and few others have attempted to study the role of different socio-economic, cultural, environmental sanitation, health and demographic factors on infant mortality. But both the quality and quantity of research on infant mortality is meagre. Hence, there is a great need to undertake research on factors affecting infant mortality. The present chapter deals an extensive review of related literature available on infant mortality.

I. SOCIO-ECONOMIC DETERMINANTS

A. Educational Status of Parents

Education is one of the important socio-economic factors for the differentials in infant mortality. Education of the parents, particularly mother's education has greater influence on survival of infants/children. The studies carried out hitherto, showed that education has a negative association with infant mortality and positive association with life expectancy (Ruzicka and Kanitkar, 1972; and Gandotra et al., 1980). Many studies have emphasized that, increase in parental education is associated with the decline in infant mortality (Chandrasekhar, 1972; Brass, 1979; Cochrane, 1980; Gwatkin, 1980; Caldwell and McDonald, 1981; Farah and Preston, 1982; Martin et al., 1983; Mosley, 1983 and Palloni, 1983).
Educational status of mother had been reflected the level of understanding about personal hygiene, better nutrition and health awareness, utilization of preventive and curative health services like ante-natal, post-natal care, and care of the baby (Srivastava et al., 1980). Education also affects the level of understanding or ability to follow not only attending the clinics but also follow the instructions given by health personnel and realize when a child should be taken to hospital (Meegama, 1980). Education brings change in the traditional values and norms which have influence on children's health. Educated parents have less superstitious and less fatalistic attitude in their outlook. When the parents are more educated, the better would be the child care and less would be the infant mortality (Caldwell, 1979; Caldwell and McDonald, 1981).

A micro-level study on infant mortality in Uttar Pradesh carried out by Khan (1988) revealed that, education of the mother was negatively associated with infant mortality. The level of infant mortality among babies born to illiterate mothers is much higher than that among the offspring of mothers who had some years of schooling (IMR 223 Vs 187 per 1000 live births). A cross-national study carried out by Jain (1984) in an analysis of infant mortality differentials in Indian states, found that the infant mortality rate for India among the mothers with no education was 145 and it decreased to 71 for the mothers with primary education. While comparing
infant mortality rate in different primary health centres in Karnataka state with different levels of literacy, the infant mortality rate was found low in primary health centres where percentage of illiterate women was low and medical care facilities were more (Badri, 1979).

Virtually in every country, infant mortality used to decrease consistently with increasing education. In Cameroon, mortality among infants has declined from 116 per 1000 live births for the mother who had no formal education to 64 among those who seven or more years of schooling (Chidambaram et al., 1985). The analysis of infant mortality differentials by mother's educational status brings out a consistent inverse relationship between the two. Infant mortality rate was absolutely high (83.3 per 1000 live births) among illiterate mothers. It declined to 20.6 per 1000 live births consistently with increase in educational status of mothers (Srivastava and Saksena, 1981). While stressing the strong association of infant mortality and parental education, Simmons and Bernstein (1982) declared that, "if we think of mortality as primarily a biological process then the role of education may work largely through its influence on variables such as birth practices. Alternatively, if we think of mortality as an outcome of a resource allocation process then education may work by influencing the importance of parents place on individual children, differentiated by parity and sex".
B. Occupation

Occupation of mother can be suggested as a better explanatory variable as compared to father's occupation in infant and child mortality analysis (Farah, 1981). Although occupation is considered as a source of income, and occupational mobility may change their behaviour of personal health through modification and adjustments of individual's views about life and death. It directly affects the time intensity of rearing children. It may also interrupt the schedule of child breastfeeding or completely terminate it earlier.

The analysis of infant mortality by father's occupational categories revealed that the incidence of mortality was minimum in 'professional jobs' and the highest (100 per thousand live births) in the category of 'Labourers and Farming' in an urban setting (Arora et al., 1979; and Srivastava, et al., 1980). According to Registrar General of India (1979), higher infant mortality rate was reported in working mothers than non-working mothers both in rural and urban areas. This was attributed to the increased chances of mothers neglected child care, early weaning, early introduction of bottle feeding, which were leading to more mortality among infants as compared to non-working mothers. Infant mortality is still higher among those engaged in agriculture, mining, wage labourers and crafts as against the professionals administrators and clerical workers have been experienced lower infant mortality (Yawarat Porapakkham, 1986).
C. Income

Income is an important economic variable that influences the infant mortality. There is ample evidence that the survival of infant is positively associated with the income of family (Adelman, 1963). It has been argued that the poor have consistently higher probabilities of death than the rich even if both groups have equal access to publicly owned health services (Antonovsky, 1967). The families with higher levels of income are associated with good food, better clothing, more space, better sanitary facilities and more utilization of maternal and child health services which in turn lead to lower probabilities of infant deaths (Preston, 1985).

A rise in the real income per head in the household would lead to a corresponding decline in the level of infant mortality. Vimala Kumary (1988) in a study on infant mortality among Fishermen in Kerala, found that the highest percentage of deaths were experienced by parents belonging to the income group of Rs.2001/- to Rs. 3000/- and it was the lowest for those who are in the income range of Rs.4001/- to Rs. 5000/- and above. In a study conducted by Mahadevan (1989) in Indian states, reported that the family income has a pronounced negative association with infant mortality. It has been noted that the lowest income groups with an annual income of Rs.5000/- and below, the proportion of infant mortality is significantly higher in Andhra Pradesh (23.5%) and still higher in Uttar Pradesh (43.7%).
A study on determinants of child mortality in Jordan by Tekce and Shorter (1984) documented that "household income is a measure of the family's capacity to purchase health through market inputs such as food, medical services and household amenities which affect positive association with child survival". History shows that a higher level of income is associated with higher expenditure on food, shelter and sanitation and this has a positive influence on child survival. Mortality data in Pakistan indicates that the risk of infant mortality is 75 per cent higher for an infant of lowest income groups than the infant of highest income groups (Mohammad Irfan, 1986).

D. Socio-economic Status of Family

Mortality rates particularly infant mortality is negatively associated to the different levels of social and economic conditions (Patel and Murphy, 1983). Goldscheider (1971) stated that economic development has an important factor which helps to decline mortality during infancy and increases the expectation of life during childhood. Analysis by Frederickson (1961) revealed that economic development by increasing percapita food consumption was responsible for the decline of infant mortality. The other earlier studies have showed that the overall improvement in the socio-economic conditions led to dramatic decline in the occurrence of deaths among children (Hauser, 1959; Stockwell, 1966; McDermott, 1966 and Kass, 1971).
Antonovsky (1967) and De Carvaho and Wood (1978) stated that the poorer have consistently higher probabilities of death than the richer even if both groups have equal access to health services. Any improvement in the socio-economic conditions of a family would produce of higher survival chances for children (Leibenstein, 1954 and Nelson, 1956). Recently the study of Preston (1980b) revealed that the development of socio-economic conditions played pivotal roles contributing to 50 per cent of the overall decline in mortality during the period of II post world war. On the basis of a classification into five socio-economic groups in France, infant mortality rate is found to vary by a ratio of 1 to 1.6 between the groups with the highest and lowest socio-economic conditions (Jacques Valline, 1980).

Despite improvements in medical and health services for public in industrial societies a profound negative association is existed between socio-economic status and infant mortality rates (Brooks, 1975b; Antonovsky and Bernstein, 1977). Gortmaker (1979) reported that the poorer families presumably lose more children during the first year of life due to less and inadequate standards of nutrition, sanitation, housing, medical and health care. The differentials in infant mortality by socio-economic status are linked to biological factors such as month of gestation, height of mother and weight of infant at the time of birth (Chowdhury, 1982).
E. Type of Family

According to Mahadevan (1989) type of family is classified into extended/joint family, transitional family (nuclear family with additional members) and nuclear family. A study conducted in Indian states, it is reported that infant mortality is the highest in nuclear families in all the states and the lowest is found in joint families. Since infants are more vulnerable to quick infection than children, infants would be given more personal attention and care in a joint family, because of the availability of other members in the family who would be absent in a nuclear family.

The structure of the family unit and the presence (or absence) of a supportive community environment were found to be the important factors for the survival of children (Simmons et al., 1982). It has been argued that mothers who live in nuclear families without the assistance of older women, particularly to take care of infants are likely to have more difficulties in bringing up their children as compared to the mothers who live in an extended/joint family environment. Mohammad Omer (1987) stated that the child mortality is uniformly less in joint families than transitional families and nuclear families.

F. Status of Women

According to several studies and historical experiences,
it is well known fact that improvement in socio-economic status of women used to bring down the infant and childhood mortality (Schultz, 1980; Smucker et al., 1980; Palloni, 1981; Kurup, 1982; and Mahadevan et al., 1985). But it is a long term and costly endeavour to raise the living standard of women to an optimum level to bring down the desired level of infant and childhood mortality. Improvement in status of women would take a long way in minimising neonatal, infant and childhood mortality as they are primarily responsible for child rearing practices during this vulnerable period of life (Mahadevan, 1984).

II. DEMOGRAPHIC DETERMINANTS

A. Levels, Trends and Differentials

Despite the obvious importance and widespread interest in infant mortality in India, the data on the subject has been quite weak. Though there are no accurate data about the trends on infant mortality, enough evidence is there to show that infant mortality is still very high. Even after three decades of planning, infant mortality rate remains high in India i.e., 105 per 1000 live births (1981) as compared to the level in the developed country (Japan 5 in 1982) and some of the developing countries like Sri Lanka 32 (1982) and China 67 (1982).

India has made an appreciable progress in improving
its overall health conditions since the beginning of the century. While the crude death rate (CDR) has dropped from 47 (1910) to 19 (1960) and further to 12.5 by 1981, where as the infant mortality rate (IMR) has dropped from 204 to 139, and further to 105 over the same period (Khan, 1988). Also, wide variations are there in infant mortality between the states like Kerala (31), Gujar (108), Rajasthan (109), Madhya Pradesh (127), Orissa (130) and 152 in case of Uttar Pradesh (R.G. of India, 1986).

Moreover, infant mortality rate of India is widely varied between the rural and urban areas. Rural areas in India are still under developed, both economically and socially. On an average, a child in a rural area has to face 1.8 times greater risk of dying in the first year of life than a child in urban areas (Roy et al., 1979). The national average of the rural infant mortality rate of 114 is almost double to the urban rate of 66 per 1000 live births (R.G. of India, 1986). It is seen that in several states in India where the infant mortality rates have declined, the urban rates show a larger decline than the rural infant mortality rates (Leela Visaria, 1988). This is true in the case of Andhra Pradesh, Assam, Rajasthan, Tamil Nadu, and Uttar Pradesh. The proportion of infant deaths to total deaths are varied from state to state and is reported to be the highest (35 per cent) in Uttar Pradesh and lowest (17 per cent) in Kerala (R.G. of India, 1983).
In the caste hierarchy of India's population, higher infant mortality rate was found in the lowest caste groups as compared to the highest caste groups (Davis, 1951; Omran and Standley, 1976; Mahadevan, 1979). Among 'Zemi' tribal women of Nagaland, the infant mortality rate was 86 per 1000 LBS (Bhowmik et al., 1971). A study by Vimala Kumary (1988) reported that among fishermen community of Kerala, the Muslims have experienced higher infant mortality rate (129 per 1000 live births) as compared to the Christians (116 per 1000 live births). Goldscheider (1971) revealed that, out of every 1000 babies born 35 babies did not live long enough to celebrate their first birth day in Mali of Africa. Mahadevan et al., (1985) conducted a study on infant and childhood mortality in South Central India and found that the infant mortality rate is over 35 per cent and 30 per cent among Muslims and Harijans respectively. Ruzicka and Kanitkar (1973) observed in Greater Bombay the lowest infant mortality rates were found among Christians while the highest rates were noticed among Muslim women. Salil Basu (1986) reported that Bhattras tribal group of Madhya Pradesh, exhibit the highest rate of infant mortality (148.6 per 1000 live births) and the lowest rate is found among Kurias (85.4 per 1000 live births). Similarly, higher neonatal mortality rate was found among Bhattras (102 per 1000 live births) as compared to Maria (46).
B. Maternal Age

When maternal age is considered, mortality rates are the lowest among infants and children of women who are in the age group of 20-29 years. Compared with the infants of women age of 20-29, infant mortality was 33 per cent higher when the mothers were under age 20, 14 per cent higher when mothers were 30-39 years of age; and 43 per cent higher when mothers were 40 years or older (Rutstein, 1983). The influence of maternal age on infant and child health is more pronounced during the first year of life (Arrtiaga and Hobb, 1980; Chidambaram et al., 1985; and Rutstein, 1983). This pattern reveals the importance of the biological effects of the mother's age, such as the mother's physical immaturity at a young age and the greater risk of premature birth and low birth weight babies at younger and older ages of mother (Rinehart et al., 1984).

A study by Leela Visaria (1988) reported that the infant mortality rate showed a U-shaped or J-shaped relationship with the age of mothers. She states "A very young mother is biologically not fully mature, so that the probability of pregnancy-related complications are high. Also, young mothers, being inexperienced, may not be able to take proper care of the young infants, even though they receive considerable support from their kin group. Similarly, beyond the age of 30, the risk of pregnancy complications apparently increases because of the increasing inflexibility of the female
reproductive organs". In the Kabul study (WHO, 1978), infant mortality rates in the age groups 15-19 and 35-44 were 134 and 155 per 1000 LBS respectively. The corresponding rates for 20-24, 25-29, and 30-34 were 131, 95 and 86 per 1000 LBS respectively.

Stoeckel and Chowdhury (1972) study of Matlab Thana in Bangladesh, revealed that neonatal mortality rates clearly described higher for both young mothers (below 20 years) and older mothers (above 35 years). Swenson (1981) said that the neonatal and post-neonatal mortality rates are higher for infants born to mothers whose age was under 18 years and as well as above 39 years. Similarly, higher infant mortality rates were noticed among the women aged 15-19 years and 35-44 years. The lowest risks of infant mortality were recorded for the mothers in the age group of 20-34 years (Kessner et al., 1973; Omran and Standley, 1976; Frank, 1982; and Khan, 1988).

C. Age at Marriage

Age at marriage is considered as one of the important bio-social factors which has a bearing on the chances of survival of the newborn. A high infant mortality is often associated with younger age at marriage of mothers (less than 20 years), while it declines thereafter with the increase in the age at marriage of mothers (Mahadevan, 1985). In rural
areas of U.P. the infant mortality rate is higher (175 per 1000 live births) among the women who married below 18 years and the rate is declined with increase in the age at marriage of women. Similar inverse relationship has also been found in the states of Orissa, Rajasthan, and Tamil Nadu (R.G. of India, 1981).

In a study of child mortality (Mohammad Omer, 1987), revealed that the child mortality manifests a clear and distinct negative association with the age at marriage of women. In other words, the survival of child is positively associated with age at marriage. The data showed that the child mortality is significantly higher among the women who married at the ages of 9-13 years and declined when the age at marriage of women is raised. The findings of Adioetomo (1983) supported the contention that babies born to mothers who married early tend to have higher risk of mortality, particularly during infancy. In Indonesia, babies born to mothers who married before 17 years had risk of mortality is 30 per cent higher than the mothers who married at the age of 20 years or more (Utomo and Meiwita, B. Iskander, 1986).

The analysis of infant mortality among fishermen community showed that mothers age at marriage had a strong negative association with the highest percentage (65.2) of infant deaths as compared to the lowest age at marriage i.e., the women married less than 17 years. The least percentage of
(11.3) infant deaths, occurred where the age at marriage of the mothers was more than 20 years (Vimala Kumary, 1988). A micro-level study on infant mortality by Khan (1988) stated that girls in Uttar Pradesh enter into the reproductive process at a very early age (mean age at marriage was about 14 years), which exposes both mother and child to a high risk of morbidity and mortality. Some of the main reasons for marrying daughters at an early age are: (a) to conform to the tradition; (b) to preserve the chastity of their daughter, and (c) to reduce financial liabilities.

D. Age of Mother at Birth of the Child

Age of the mother at birth of the child also a significant impact upon the survival of children. Quite obviously a number of studies conducted in various parts of the world revealed that the rate of infant loss among women younger than 20 years has been observed to be very high, it is lowest between 20-30 years and starts increasing beyond the age of 34 years (Heady and Morris, 1955; Stoeckel and Choudhury, 1972; Balakrishnan, 1978; Meegama, 1980; Cochrane and Zachariah, 1983). In a study conducted by Somoza (1980), stated that the rate of infant mortality is higher for children born to the women whose age is under 19 years, it is lower for women who are in the age group of 20-29 or upto 34 years and it raises again among those aged above 35 years.
In a study of infant mortality in Uttar Pradesh (Khan, 1988) revealed that the infant mortality rate was higher (285 per 1000 live births) when the age of the mother at child birth was less than 19 years; it was dropped to around 199 for those aged between 20-29 and assumed the lowest (174) for those women delivering between 30-34 years of age. A similar finding was reported by Agarwala (1972) where they explained a U-shaped curve for infant mortality with the age of the mother at birth. Infant mortality was higher when the mother's age at child birth was below 20 years, decline gradually to a minimum between the ages 25-30 and again raises slowly in the beginning and more steeply thereafter.

Besides, Chidambaram et al., (1985) also stated that "the infant loss is very high for the children born to women are very young or relatively old". In terms, mortality among infants/children is relatively higher for mothers whose age at birth of a child is below 20 years and lower for the mothers who gave birth at the age of 20-29 years, and then steeply raised as the age of the mother is increased (Chandrasekhar, 1972; Nortman, 1974; Omran and Standley, 1981; and Rutstein, 1983).

In a study conducted by WHO (1976), it is reported that the premature births, unwanted pregnancies, unstable marital unions, lack of knowledge and experience in child care threaten the survival of infants born to young mothers and the
same may be the cause for the high neonatal and post-neonatal mortality rates among the infants born to mothers below 20 years of age.

E. Birth Order

It is well evident that several studies viz., Yerushalmy, 1938; Morris and Heady, 1955; Wyon and Gordon, 1962; Shah and Abbey, 1971; Omran, 1976; Stoeckel and Chowdhury, 1972; Simmons et al., 1978; Palloni, 1981; Mahadevan et al., 1985; conducted an infant mortality in different parts of the world showed a 'U' or a shallow "u" or a reverse 'J' shaped curve in its relationship with birth order. The level of infant mortality is quite high at first and second orders of birth and lower for third order of birth and again high for fourth and higher order of births (United Nations, 1954). Srinivasan (1979) observed that the infant mortality rate in most populations is slightly higher for the first birth than for the second, third births and that these rates rise again sharply from the fourth birth onwards.

A cross-cultural study on family formation pattern and health carried out by Omran and Standley (1981) reported that the infant mortality rates described as U-shaped or reversed J-shaped curve in relation to birth order. Also it is reported that high mortality risks for the first born children and for children of the birth order of 6 and over;
while for children of birth orders 2 to 5, the risks were usually lower. One of the high infant mortality countries viz., Kenya, Nepal (World Fertility Survey data) showed that first born children are at greater risk of dying during infancy than are those born later and there is a tendency for mortality rates to rise at birth orders above six (Chidambaram et al., 1985).

A longitudinal study conducted in Punjab (Khanna) concluded that relatively higher mortality rates were evident for first birth as well as for seventh order births (Wyon and Gordon, 1971). The first child in almost all the cultures has got the greatest risk of mortality during infancy and least for second and third order of births (Srivastava and Saksena, 1981). Since, an association between infant mortality and birth order, it is described as either U or reverse J shaped pattern in several Indian studies on infant mortality (Stockel and Chowdhury, 1972; Bhattacharya, 1980; Gandotra, 1980; and Mahadevan et al., 1985).

A micro level study on infant mortality in Uttar Pradesh conducted by Khan (1988) indicated that the infant mortality rate for the first and second order of birth was between 237 and 241 per 1000 live births, gradually it dropped to 208 for the third birth order and further declined to 196 for fifth birth order; but it increased again from the sixth birth order onwards. The highest mortality is found during infancy for the first birth and least among second and the
risk of infant mortality tends to increase after the third birth orders. The fate of fifth child is always worse than the fate of the third child (Chandrasekhar, 1972). The results of a study in Tunisia (Suchindran and Adlakha, 1985) revealed that the infant mortality was declined from 68.2 for first birth to 57.3 for 3-4 order of births and rises to 108.4 for the birth order of 7 or more.

Birth Interval

The data from both developed and developing countries reveal that the shorter the duration of birth interval, the higher the risk of infant mortality (Yerushalmy et al., 1956; Gandotra et al., 1982; Fortney and Higgins, 1983; Hobcraft et al., 1983; De Sweemer, 1984; Trusell and Pebley, 1984; and McNamara, 1985). Among the studies in less developed countries, the Khanna study (Wyon and Gordon, 1972) in Punjab, showed that preceding intervals of less than two years were associated with greater neonatal and infant mortality. More recently Wolfers and Scrimshaw (1975) found that higher risk of miscarriage and still birth were noticed for very short and very long inter-pregnancy intervals. A minimum risk for post-neonatal mortality was found for intervals of about 3 years.

Chandrasekhar (1972) stated that "shorter the time of interval between the termination of a gestation and beginning
of the next conception, greater the risk to the survival of the baby. In other words, the desirable intervals of 3 or 4 years between births ensures optimum survival rates. Infants born within two years of birth interval are subjected to higher risk of mortality during infancy as compared to those who born 2-3 years of birth interval (Rutstein, 1983). The findings was supported by Woodbury (1925) in his study found that the rate of infant mortality is 146.7 per 1000 LBS for birth intervals of less than 2 years and it was dropped to 84.9 for the birth intervals of 4 or more years. Apparently neonatal mortality is extremely higher where preceding birth intervals are very short (less than 12 months) and this is caused in part of premature births. Neonatal mortality steeply dropped until interval lengths of 30-35 months (Eastman, 1944; Potter, et al., 1965; Balla et al., 1974; Chowdhury, 1974; and Swenson, 1981).

In a study of Khan (1988) also confirmed the above trend. He found that the infant mortality rate was the highest (378) when the birth interval was 12 months or less. The level of infant mortality has declined by 27 per cent (257) when the interval increased to 12-24 months; by about 50 per cent (180) for the interval 25-36 months; and by 72 per cent (99) when the interval was 37-48 months. George Adansi (1985) in a study of demographic patterns in Ghana, found that the infant mortality rate (104.5 per 1000 live births) is higher
for the intervals of less than 2 years, while it dropped to 33.1 when the interval increased to 4 years and above.

Nearly in all WFS study, infants born within two years of birth interval were more likely to die than those born two to three years after the previous birth. In Bangladesh, for instance, the mortality rate was 185 for infants born within two years after the previous birth and 89 for infants born after an interval of two to three years. The impact of birth interval was apparent, however, even in such low mortality countries as Panama, where the mortality rate was 52 for infants born less than two years after the previous birth and dropped to 33 for infants born after an interval of two to three years (Chidambaram et al., 1985).

G. Fertility and Infant Mortality

The relationship between fertility and infant mortality has occupied the central place in the field of demographic research which determines the rate of population growth. The theory on demographic transition by Frank Notestein (1945) and Kingsley Davis (1945) stated that the reduction in mortality would lead to a reduction in fertility, because parents would need to bear more number of children in order to have fewer children as they desired.

It is clear and profound evident that the infant mortality has a positive association with fertility, i.e., as
the number of infant deaths increases, correspondingly the chances of getting more children is increased. On the other hand, the probability for the survival of children is negatively associated with the more number of live births. Several micro-level studies have confirmed that the families are with more number of children are greatly influenced by the experience of infant mortality (Wyon and Gordon, 1971; Bacon and Mason, 1972; Chandrasekhar, 1972; United Nations, 1973; Sinha, 1975; Agarwala, 1975; and Mahadevan et al., 1985; and Pebley, 1985).

As Jain (1975) stated that "fertility and mortality interact between themselves in various ways. Declining death rate implies a reduction in infant and child mortality, which may directly or indirectly increase the birth interval and hence to reduce fertility. A sample survey of Turkey conducted by Bacon and Mason (1972) reported that "those couples who have experienced an infant death, expect more children than do couples without such experience". Further, a recent cross cultural study conducted in rural Andhra Pradesh, Mahadevan et al., (1985) noticed a direct positive relationship between the number of infants died and fertility uniformly in all the three cultural groups viz., Muslims, Harijans, and Caste Hindus.

Chaudhury (1982) observed that the processes by which infant and childhood mortality affect the level of fertility
may be termed as the biological replacement, insurance effects and social norm. He is of the opinion that "on account of high mortality situation, parents may strive to have additional births which may lead to increase the fertility level. A longitudinal study in Punjab conducted by Wyon and Gordon (1971) concluded that "until parents have good assurance that live born children will survive, parents are unlikely in restricting the present family size.

Knodel (1968) said that the infant mortality may be partly responsive to fertility either a direct corrective to excessive births or as an indirect consequence of the pressure of excess births on real income and thus on nutrition and health." While analysing the Tunisian data, Suchindran and Adlakha (1985) found that the rate of infant mortality increased from 64.1 when the previous baby survived to 143.9 when the previous baby died and they concluded that by reducing fertility, substantially infant mortality can be reduced. In a study of Saksena and Srivastava (1984) stated that parents who expect a high proportion of their children to die, ensure their family survival by having more children than they would, if all the children planned had good chance of survival. Increased child survival will permit parents to have fewer children and fertility will decline as a result of decrease in mortality among children (Pebley, 1985).
H. Infant Death by Age and Sex

A recent study in Central India conducted by Mahadevan et al. (1985) revealed that the single largest proportion (40 per cent) of infant deaths took place during the first week after delivery and about 55 per cent of deaths during the entire neonatal period. Further, when infant mortality is considered in detail by month-wise, it was highest within the first month, followed by the second and it tapers down subsequently and increases again after fifth month when infant feeding is resumed and again it declines (Chandrasekhar, 1972).

A study on regional variations in infant mortality in India by Jain (1984), a distinction is made between neonatal and post-neonatal mortality. Neonatal mortality is higher in Uttar Pradesh (93 per 1000 live births), followed by Andhra Pradesh (89), Madhya Pradesh (83), Assam (77), Maharashtra (58) and the lowest is in Kerala (27). Post-neonatal mortality is noticed as higher in Uttar Pradesh (79 per 1000 live births) followed by Tamil Nadu (69), Orissa (62), Rajasthan (59), Assam (43), Andhra Pradesh (31) and the lowest is in Kerala (15). Registrar General of India (1980) stated that at all India level, neonatal mortality rate is noticed as 77 per 1000 live births followed prenatal mortality rate (67) and post-neonatal mortality rate (52). As Gunasekaran (1988) reported that 58.8 per cent of the total deaths were
occurred during the first month (neonatal period) in Madurai district of Tamil Nadu.

Sex differentials in infant mortality is well documented by several studies conducted in India and elsewhere, confirmed that the infant mortality among males is invariably higher as compared to females and particularly during the neonatal period (Audikesavulu Naidu, 1977; Bhattacharya et al., 1980; D'Souza and Chen, 1980; Meegama, 1980; Imaizumi et al., 1985; Khan, 1988 and Leela Visaria, 1988). As Naeye et al., (1971) explained that higher infant mortality among males during neonatal period could be attributed to biological reasons. One of the important reasons is females have two chromosomes and with males have one, which probably confers a survival advantage on females and also male infants are more exposed to outside environment and subjected to various types of restrictions.

According to Barr and Stevenson (1961) the infant mortality rates (under one year of age) during the period from 1949 to 1950 in England and Wales were higher for males (16.7 per cent) as compared to females (10.6 per cent). Benjamin (1968) stated that during infancy and early childhood, boys are generally more vulnerable to some birth hazards (prematurity, malformation, birth injury and to infection), perhaps as a result of some biological factors. Sex differentials of infant mortality rates for different provinces of India
are examined by Bali Ram (1989) and explained that the four Southern Provinces consistently had lower mortality rates for females than for males, while the rates for both sexes were generally similar in the central region. On the contrary, in all the Provinces of North except for Jammu and Kashmir, showed higher infant mortality among females than males.

III. HEALTH VARIABLES

Place of Delivery

Professor Dugald Baird (1953) stated that "child birth is a natural event and should take place at home and many homes are unsuitable for even a normal confinement and the deliveries conducted by untrained dais which leads to higher mortality during infancy". The occurrence of infant deaths may be attributed to the non-availability of hospitals, lack of physicians care and the deliveries which took place at home (Chandrasekhar, 1959).

In an analysis of post war experience of infant and child mortality in Sri Lanka, showed that the infants who are delivered in an institution (hospital), have the benefit of better health care facilities which can reduce the death rate of infants from immaturity and debility (Meegama, 1980). As Simmons et al., (1978) reported that higher proportion of births in rural areas of developing countries are taken place at home, attended by relatives or traditional dais
are the major determinants of the outcome and survival chances of the new borns.

Gunasekaran (1988) correlates of infant mortality in Madurai of Tamil Nadu, indicated that the infant mortality rate (110 per 1000 live births) was higher among the babies born at home and it declined to 68 when the babies delivered at maternal and child health centres (MCHC). A cross cultural study on pregnancy and child birth in rural Orissa carried out by Saraswati Swain (1976) reported that domiciliary delivery is always preferred and people obtain the assistance of the untrained elderly women, usually a widow called as village midwife. Another recent study on health care among tribals of Madhya Pradesh, conducted by Salil Basu (1986) confirmed that most of the deliveries took place at home attended by elderly ladies of the households. Services of trained health personnel are utilized only when the delivery was difficult or beyond the capacity of the untrained dai to handle it."

Birth Attendant

Although Maternal and Child Health (MCH) services are available even today, most of the deliveries were attended by indigenous and untrained peripheral female workers or by relatives. The influence of this factor continues to affect the high incidence of infant mortality (Mahadevan, 1984).
The level of infant mortality by type of birth attendant shows large variations in Uttar Pradesh. The infant mortality declined by 14 per cent when deliveries were attended by the untrained midwives instead of family members or neighbours, and 31 per cent when births were attended by trained professionals rather than family members and neighbours (Khan, 1988). This finding is supported by a large number of studies carried out in various centers. In a longitudinal study in rural Karnataka conducted by Badri et al., (1979) reported that the infant mortality rate was found to be higher for births attended by untrained personnel (108 per 1000 live births) rather than attended by trained personnel (87).

The results of a retrospective study conducted in the rural areas of Uttar Pradesh by Leela Visaria (1988) stated that the level of tetanus mortality is three times higher among babies delivered by untrained birth attendants as compared to the deliveries conducted by trained birth attendants. In an another prospective study in Karnataka (Reddy and Sholapurkar, 1983) found that the infant mortality rate was about 20 per cent lower among the deliveries conducted by trained birth attendants than the children born with the help of untrained birth attendants. There is ample evidence that the infant and child mortality in rural areas, as well as urban areas are lower when the deliveries are attended by trained medical personnel as compared to attended by indige-
nous/untrained dais (UNICEF, 1984). In Thailand, Khanjansthiti et al., (1983) found a considerable decline in infant mortality when assistance was provided by midwives rather than the traditional birth attendants at the time of delivery.

Studies conducted in Malaysia have shown that infants delivered by an untrained birth attendants have higher rate of tetanus mortality (34 per 1000 live births) than among the infants delivered by a trained birth attendant (12 per 1000 live births) or by a trained midwife (Chen, 1976). Early neonatal mortality is very high in most developing countries. A larger proportion of births in rural areas of these countries delivered at home, conducted by relatives or traditional dais who practices unhygienic/unscientific method of delivery led tetanus mortality during infancy (Meegama, 1985). Walia (1979) also stated that natal and post-natal care are in the hands of a trained birth attendant is found to lower both maternal and infant mortality.

Chandrasekher (1972) has observed that infant and maternal mortality was higher among the births attended by traditional birth attendants (TBAs) than those attended by trained personnel. Vijayakumar (1982) in his study on the impact of trained dais on maternal and child health (MCH) services in rural Chandigarh, found that dais have succeeded in curtailing the infant and maternal mortality rates. Further, it is observed that dais are fully aware of their role in promot-
ing MCH services, had led to a dramatic decline in infant mortality associated with neonatal tetanus which is a major killer of babies. A study in tribal areas of Nasik district of Maharashtra by Kuriyan (1985) observed that the untrained dais continue to conduct deliveries under unhygienic conditions which led to tetanus has become one of the reasons for high infant mortality.

C. Cutting the Umbilical Cord

The cutting of umbilical cord is a ritual conducted in accordance with a strict set of rules in most cultures including our own. For example, it was formally a custom among tribals of Madhya Pradesh, the placental cord is cut with an arrow head (Tir) in case of male child and with a knife (Kadri) in case of female child (Sail Basu, 1986). In the studies of Leela Visaria (1988) conducted in rural areas of Chandigarh and Madhya Pradesh, different instruments were used for cutting the cord, in Chandigarh both the trained and the untrained birth attendants used shaving blades or domestic scissors. In case of Madhya Pradesh the trained dais did not use readily available instruments such as kitchen knives or even sickles for cutting the cord, but the untrained birth attendants used either shaving blade or kitchen knives over domestic scissors, which might have caused more neonatal deaths.
In another pioneer study conducted by Mahadevan et al., (1989) reported that cutting the umbilical cord with kitchen knife, old blade and sickle are harmful and led to neonatal tetanus mortality among the new borns. Similarly, Vimala Kumary (1988) also reported that the infant mortality was higher among the infants whose deliveries were took place in their homes, attended by untrained dais and used kitchen knife to cut the umbilical cord rather than infants who were born in hospital attended by the doctors/nurses and used sterilised scissors to cut the umbilical cord.

Leininger (1979), in a study of New Guinea found that it is a more recent practice of the midwives to cut the umbilical cord with a bamboo knife that has been heated on an open fire. In a similar manner, Romeny and Romeny (1983) stated that among Mixtecs of Mexico, the place of newly born infant on a clean straw mat, tie the umbilical cord with a thread and then cut it with scissors heated over a handle made of grease. Simmons et al., (1979) reported that unsterilized instruments like common kitchen knife, sickle and old blade are used for cutting the umbilical cord are another killer of the babies.

D. Dressing of Umbilical Cord

It was noted that after cutting the umbilical cord it was dressed with different materials and resulted to different levels of infant mortality. Mahadevan et al., (1984)
reported in their study on infant mortality in India, a variety of materials ranging from harmless to fatal were applied by the untrained persons for dressing the cord. These preparations consisted of ash/mud taken from earthen stove, areca nut powder, pepper, Jajikaya (mysistica fragrance), Vamu (zeera), latex from creepers, talcum powder and medicated powder. Besides this, use of unsterilised knife and blade for cutting the cord together contributed to higher infant mortality. Further, Chandrasekhar (1972) reported that the majority of Indian mothers followed various customs regarding dressing of umbilical cord. It is also noted that the infant mortality particularly neonatal mortality is higher for the infants whose cord is dressed daily with ash, cow dung or black clay rather than turmeric paste mixed with hot ghee, because the plausible reason is that turmeric may have anti-septic value and hot ghee sterilises it.

In a study of rural Orissa conducted by Saraswati Swain (1978) found that the daily dressing of the cord is done by the village dai takes a little of the warm oil or ghee in her thumb and gently presses it on the cord close to the umbilicus which is believed to help early healing and protect the child from neonatal tetanus. As Deshpande et al., (1989) pointed out that untrained dais are still continuing with traditional and crude procedures in conducting deliveries, such as burning cut ends of umbilical cord with lamp to prevent sepsis/infection and administering have made medicines
for dressing the cord which may adversely affect on the survival of infants.

**Antenatal Care**

Antenatal care in general has two primary objectives. They are first, to conserve the health of the expectant mother during pregnancy, and secondly, to enable her to produce a healthy child with the highest possible potentiality of developing into a healthy adult (Chandrasekhar, 1972). In the words of a British study (1948) stated that the antenatal care for each expectant mother under regular supervision viz., monthly during the first four months, then fortnightly until the eighth month, and thereafter weekly until confinement would minimise the incidence of premature births, still births perinatal and neonatal deaths. According to Das Gupta (1951), it is found that in India prematurity and immaturity are outstanding causes of infant mortality in the neonatal period and that the state of health of the mother during pregnancy and her nutritional condition play an important part in the incidence of infant mortality. It is also reported that every expectant mother should receive expert care during the entire period of pregnancy so as to safeguard her and her infant, and thus help to save many precious lives. This would result in lowering the present infant mortality rate.
As United Nations (1984) stated that proper utilization of health care facilities have a favourable impact on the level of infant mortality. The prime objective of antenatal care is to achieve at the end of a pregnancy, a healthy mother and a healthy baby. Ideally this antenatal care should begin soon after conception and continue throughout pregnancy. The survival of children during infancy is greatly influenced by the antenatal care provided to mothers during pregnancy (Schwartz, 1962). High death rate lay in the fact poor antenatal care was associated with low birth weight; but even when children of the same birth weight were less likely to survive, if their mothers had failed to make adequate use of the available antenatal services (Douglas, 1964). Further, Talwar (1988) stated that the risk of mortality during infancy for mothers who did not utilize antenatal services was found to be 1.74 times higher than for those who had utilized these services.

Causes of Infant Death

Many studies have been dealt with causes of infant mortality in different parts of India with primary data viz., Pisharoti et al., (1971) in Tamil Nadu; Wyon and Gordon (1971) in Punjab; Ruzicka and Kanitkar (1973) in Bombay; Simmons et al., (1978) in Uttar Pradesh; Smucker et al., (1980) in South Asia; Mahadevan et al., (1985) and Bhandari et al., (1988) in Rajasthan.
A pioneer study on infant mortality by Gunasekaran (1988) reported that about 36 per cent of the neonatal deaths caused by tetanus, 16 per cent by diarrhoea and other gastro-intestinal causes, and another 13 per cent to obstetric causes. Of the post-neonatal deaths, 39 per cent were attributed to diarrhoea and another 12 per cent to other gastro-intestinal causes. Another study conducted by Mahadevan et al., (1985) in South Central India, found that the maternal factors such as prematurity, malnutrition, birth asphyxia, neonatorum and delivery complications were responsible for higher infant mortality. Waterborne diseases (diarrhoea, dysentery, etc.) occupy the second place among the causes of infant mortality. Air-borne diseases were the third major cause of death which ranged from 11 to 17 per cent.

While analysing the causes of infant death for Bangladesh, United Nations (1984) observed two important causes of death among infants. They were, tetanus appears to account for about a quarter of all deaths (37 per 1000 live births) and respiratory and diarrhoeal deaths (13 per 1000 live births) are the next in important. Similarly, Malini Karkal (1985) stated that one in five infants is in the ages of above four weeks were died because of diarrhoea and gastro-enteritis. While gastro-enteritis and pneumonia were the most common and major killer of infants during the post neonatal period (Odhiambo et al., 1984).
According to Mohammad Irfan (1986) it is noted that the infective and parasitic deaths claimed the greatest proportion of lives in infancy (60 per cent) followed by congenital anomalies, birth injuries, difficulties in labour and prenatal causes (20 per cent) and malaria following next in importance. Similarly, Jones (1978) reported that one-third to one-half of deaths under age five in Latin America were due to diarrhoeal diseases. In Thailand, diarrhoeal diseases are the leading cause of sickness and death. The problem is especially severe in children aged under five, who accounted for about 50 per cent of all deaths due to diarrhoea (Ramaboot Sawat, 1986).

Another study conducted by Simmons (1978) and Smucker et al., (1980) in Uttar Pradesh, found that tetanus is the main cause of infant mortality (200 per 1000 live births), due to unscientific way of cutting of the umbilical cord by indigenous dais who used an unsterilised instruments. The Khanna study (Wyon and Gordon, 1971) stated that deaths occurred mostly during the first one month of life were due to birth-associated difficulties and tetanus. Causes of infant mortality from the second month and above were due to diarrhoea, pneumonia, measles, typhoid fever and tuberculosis. It is also noted that diarrhoea was the major single cause of death during infancy which is as high as 29 per 1000 live births.

In an Asian study by Goldman (1984) noticed that the
major causes of infant mortality is due to neonatal tetanus with diarrhoeal diseases and acute respiratory infections are being the other two major causes for post-neonatal deaths. A variety of causes including prematurity, low birth weight, pregnancy and delivery complications are great responsible for perinatal mortality which contribute to higher infant mortality. Another study of Kabirullah (1985) conducted a study on infant mortality, found that 44 per cent of all deaths were occurred during infancy were mainly due to tetanus followed by gastro-intestinal disorders (16 per cent) and respiratory tract infections (11 per cent). An analysis of infant mortality in rural areas of Rajasthan (Bhandari et al., 1988) indicated that about one-third (30 per cent) of all infant deaths caused due to pneumonia followed by birth asphyxia (18.2 per cent) and diarrhoea (16.7 per cent).

IV. CULTURAL FACTORS

Culture used to act as a potential guide for the behaviour of individuals, affected their organised social life and brought changes in value system. Culture had a pronounced association with the values attached to the type of marital relationship, desire for extra/additional children, preference for son, kinship interaction, perception of infant mortality, use of traditional and modern medicines, traditional and religious beliefs, abortions etc.
Type of Marital Relationship

In Indian context, consanguineous marriages are quite common among all the cultural groups, particularly tribals. Two-third of South Indian people give preference to the consanguineous type of marriages, which are arranged between the children of uncle-niece, matrilateral and patrilateral cross-cousins among both in traditional and modern societies (Kumar et al., 1977).

Studies on the correlation of consanguinity with negative attributes of reproduction, which includes abortions, miscarriages, still births, infant and child mortality (Sanghvi, 1966). Many studies have attempted to evaluate the effects of consanguinity on mortality (Conterio, 1969; Mukherjee et al., 1974; and Rao, 1977). Regarding, the empirical effects of inbreeding on mortality rate, major studies showed abortions plus miscarriages, still births, infant and child deaths are significantly higher among consanguineous couples rather than non-consanguineous couples (Rao and Inbaraj, 1967; Conterio, 1969; Basu, 1975; and Kumar et al., 1977).

The study of Awadi et al., (1986) among Kuwait populations showed higher prenatal and post-natal losses among consanguineous than non-consanguineous groups. Although Tanakz et al., (1964) found maternal effect on the rate of infertility, suggesting that the difference could be due to differen-
tial mortality of embryos, they later found significant effect on maternal inbreeding on parental mortality.

A study on effects of inbreeding on mortality carried out by Yamaguchi and others (1970) reported that the cumulative mortalities in the first year of life are significantly higher in the consanguineous marriages than in the non-consanguineous groups. In another study on genetic and biological consequences of mortality changes by Imaizumi (1986) said that the decline in consanguineous marriages brings about a reduction in the rates of neonatal and post-neonatal mortality.

### B. Desire for Extra Children

Several micro-level studies carried out hitherto, have confirmed that the desire for extra/additional children increases with the increase in the level of infant mortality (Hassan, 1966; Rutstein, 1974; Chowdhury et al., 1976; Chowdhury, 1982; and Mahadevan, 1989). High infant and child mortality is considered as one of the deterrent factors in the adoption of small family size norms in developing countries, because successful reproduction requires high fertility to offset high mortality (Davis, 1945; Notestein, 1945). In other words, couples do not merely want babies but surviving offspring. Since the probability of infant survival may be required to produce more children than necessary (desi-
Red) in the hope that at least a few would survive into adulthood.

Choudhury (1982) stated that, in high mortality societies, parents may fear the loss of children, given their personal experience with death in the family. Therefore, they may strive to have additional births in order to replace or insure themselves against possible risks of child loss. As a result, insurance/replacement effect operates in anticipation of perspective high child mortality community rather than actual mortality, which is significant in societies characterised by high family size norm. Retrospectively, Chowdhury et al., (1976) have hypothesised that woman who has experienced more infant deaths may desire to have additional children than the woman who has not due to replacement or insurance effect and high family size norm.

The hypothesis of compensating by having additional额外 children on account of infant mortality stands decisively confirmed in the study of Mahadevan (1989) conducted on interaction between fertility and mortality in Indian states. Further, significantly more women who experienced infant mortality wanted to have extra babies to replace the babies died with additional one in all the three states of Uttar Pradesh, Kerala and Andhra Pradesh. In an another study on infant mortality among fishermen community in Kerala conducted by Vimala Kumary (1988), revealed that the highest incidence
of infant mortality (78 per cent) was occurred, among the mothers who wished to have three extra children rather than mothers who have no desire for extra children for compensating the probable loss of infants. Hassan (1966) assumed that the desire for extra children has a positive association with the experience of infant mortality. It may be for compensating the probable loss of infants or for ensuring the survival of an optimum number of children or to replace the infants lost with extra ones.

C. Son Preference

The preference for a son is an essential factor contributing to the value of children. Lambadis of Andhra Pradesh (Census of India, 1961) are also giving preference to sons instead of daughters in every activity for the reason, that sons remain in the family and look after the parents in their oldage. Rao (1970) stated that the birth of a son in the Jatapu community of Andhra Pradesh is a more gleeful event than that of a daughter, because the son perpetuates the family lineage, inherits the property and stands by their side and helps them in their oldage.

Conceptually, preference for son is viewed as an important cultural factor in developing countries as compared to developed countries. The structure of the rural family and its social atmosphere is a motivating factor for having
more number of sons, to achieve social prestige and to perform some rites and rituals. Due to very strong dominant value of son, most of the couples in rural areas produce more number of unwanted daughters in the process of getting the desired number sons. According to Bhatia (1978), parents do not stop having children unless they have achieved a desirable number of sons and unless they have ensured that at least one or two sons will survive which leads to higher incidence of infant mortality through the higher fertility. Further, Sheps (1963) stated that a high mortality society requires many children be born. Parental desire for surviving sons, given high fertility rates, would be a significant influence on infant mortality even if there were no unplanned births.

In traditional subsistence and agrarian societies particularly in patriarchal societies, sons are considered as economic and non-economic utilities viz., sons contribute to the family's economic resources by working on the farm; family name is reserved through son; sons are expected to carry out death rituals; they support the parents during old age and sons are considered as assets in village factional politics (Arnold et al., 1975; Nag, 1978; and Westoff et al., 1963). In addition to this, the value dimensions for son(s) are deep-rooted in the socio-economic, cultural and traditional values with superstitious beliefs. It is a belief
that the birth of a male child enhances the prestige and economic position of the family to such an extent that parents may welcome an additional birth in the expectation that it will be a male birth. Due to various reasons, the preference for son may lead the couple strive to go beyond their desired family size, which has a significant influence on the experience of infant mortality through higher fertility among them (Mahadevan, 1989).

D. Kinship

Kinship is a system of relationship by which individuals are tied to one another. Also, the interpersonal relationships are restricted to the kinsmen and the kinship ties bind them together. In all the societies people are found in groups by various kinds of bond. These bonds are based on ties between spouses, known as affinal kinship, their relations on either side, known as affinal kins, between parents and children and children of the same parents, called sibling. The system of kinship varies with the variations in the pattern of society. There could be patrilineal or matrilineal kins, primary or secondary kins (Jaiswal, 1979). In the Indian context, almost all the tribals maintain kinship relations and they have strong kinship bonds (Jaganathapathy et al., 1976). It has been suggested that the mother-in-law in extended families is the key figure influencing the decision of daughter-in-law on the number and spacing of children and family size.
Traditionally, tribals have close attachment and strong beliefs towards their kins viz., mother-in-laws, mothers, grand-mothers etc., used to advice the pregnant and lactating mothers to have better care for both the mother and children, by using traditional medicines for the health of infants and objecting the intake of certain foods and medicines during pregnancy and lactation period, which may have an indirect influence for the incidence of infant mortality (Gurumurthy, 1984). Similarly, kinswomen also act as a birth attendant and conduct the deliveries in most cases of their relations as well as in their village. Most of the kins are traditionally bound and did not have proper knowledge about the importance of scientific deliveries. In contrast they have been conducting deliveries in an unscientific manner by using unhygienic instruments for cutting the umbilical cord, which leads to more mortality during infancy (Saraswati Swain, 1978).

E. Perception of Infant Mortality

The decline in infant mortality should be followed by the awareness and the trend of change in infant deaths during the recent decades. This will have an impact on the behaviour of parents to have more number of children or to limit the size of family. Heer (1983) argued that, if there was a high infant mortality, couples would be highly motivated to procreate more children than they normally desired.
A study conducted by Mahadevan (1979) in Tamil Nadu, revealed that there was a decrease in the level of infant mortality as perceived by the people as a whole. It is also noted that 64 per cent of Gounders; 55 per cent of 'Others' and 44 per cent of Harijans perceived that the infant mortality is decreased now a days as compared to the past one decade. Similarly, Gurumurthy (1984) conducted a study on Yanadis of Andhra Pradesh, showed that 71 per cent perceived the incidence of infant mortality has decreased as compared to the last two decades and the remaining 29 per cent felt that the incidence of mortality has not changed and there was an increase in the incidence of infant mortality.

A retrospective study on interaction between fertility and mortality by Mahadevan (1989) revealed that when asked whether the occurrence of infant mortality is as high nowadays as in the past, an overwhelming percentage of women in Andhra Pradesh (91.5) and in Kerala (96.4) answered negatively as against 59 per cent of the women in Uttar Pradesh. In contrast further Ramanujam and Ibrahim (1987) stated that Muslims in Tamil Nadu, 65.3 per cent of women perceived that the infant mortality has decreased as compared to 10 years ago and remaining 14 per cent and 6.7 per cent are perceived that infant mortality level is same and increased respectively.

\[\text{Abortion}\]

Abortion is known as foetal mortality from voluntary
and involuntary causes. Abortions are of two types namely, spontaneous caused by biological defects, and induced abortion which is by involuntary causes. In the Indian context, a social stigma is attached to abortion, i.e., the women who in the rural areas resorted to abortion is treated as if she committed a great sin or crime, and even her parents were blamed that they were encouraging immorality in the community (Gurumurthy, 1984). As Tietze (1979) observed that illegal abortions are frequently performed by unqualified persons under insanitary conditions, resulting in an increased risk of infection and other complications.

Several studies reported that the practice of induced abortion is very much influenced by many socio-economic and cultural factors and the adoption rate varies accordingly (Nag, 1962; Bhowmik et al., 1971; Howthorn, 1970 and Omran and Standley, 1976).

The ethnographic accounts of pre-industrial societies indicated that abortion was generally practised among them (Chaudhury, 1982). The abortion is also practised by Chenchus of Andhra Pradesh, when they indulged in illicit sexual contact and to avoid the fury of the husband or the community. The method used for it was eating papaya fruit in the first month of pregnancy. The other methods are, use of herbs and leaves for inducing abortion (Census of India, 1961). According to Bhowmik et al., (1971), the Zemi tribal women of
Nagaland have 28 per cent and 5.2 per cent of first and second abortions respectively and also they had an experience of 0.38 miscarriages and abortions per woman. Mandelbaum (1966) in his study of human fertility in India reported that out of every 100 pregnancies, 10 are natural abortions and 15 are induced abortions.

G. Marriage Patterns

There are several patterns of marriages viz., marriage by elopement, by capture, by exchange, cross-cousin, uncle-niece, gandharva etc. Marriage by elopement means, a man and a woman join together and elope in love to different place away from their parents and live together as couple. 'By capture' means, when the girl is not interested, she is taken by force and then the marriage has to take place. By exchange marriage we mean, parents offer their daughter in marriage for exchange to daughters-in-law, cross-cousin marriages are also common in both traditional and modern societies i.e., marriages are arranged between the children of brother and sister (Gurumurthy, 1984).

Monogamy, polygamy and polyandry are the most common types of marriages. Monogamy means, singular marriage, in which an individual is institutionally permitted to have only one spouse at a point of time (Johnson, 1973). Whereas polygamy means plural marriages. It has several types including polygyny and polyandry. Polygyny is the institution of
marriage that permits a man to have two or more wives at a time. In case of polyandry, it is the institution that permits a woman to have more than one husband at the same time. If the husbands are all brothers, it is called fraternal polyandry (Bierstedt, 1963). On the other hand, polyandry is a rare type of marriage now-a-days, but it is sporadically seen in all the Asian countries and still prevalent in India as well. Shashi (1978) stated that the practice of fraternal polyandry type of marriages are common among the tribes of 'Kinnaurs', 'Jaunsar-Bawar', and 'Khasas' of Himalayas.

V. MATERNAL NUTRITION, BREASTFEEDING AND WEANING

Food is the chief source of essential nutrients which the body needs for its well-being. Balanced food is indispensable for health in all stages of life and for satisfactory growth during infancy and childhood. Therefore, nutrition is a vital component of the complex concept of health. Indeed, the relatively high mortality rates in less developed countries as compared to developed countries are due to the differences in the state of nutrition (Anker and James, 1980).

Intake of Nutritional Diet

According to Devadas (1971) it is noted that the nutritional status of an individual is fairly influenced by the
intake of nutritional foods and the choice of foods in the family, apart from various other social and economic dimensions. A cross cultural study on infant mortality conducted by Mahadevan et al., (1985) in South India, revealed that the intake of nutritious foods like rich proteins, vegetables, cereals etc., have a negative association with infant mortality. It is also noted that better nutritional diet helps to physical growth of mother during pregnancy, which improves the birth weight of the child and survival. King (1972) in a study, has clearly specified that from the nutritional point of view, non-vegetable proteins are rated superior to the vegetable proteins. Hence, the intake of non-vegetable proteins may contribute to better health status both for mother and children.

The dietary intake is only one of several factors that may influence the nutritional status of an individual. If an individual's consumption (particularly mother) of a certain essential nutrient is habitually lower than the recommended dietary allowance, he may be at risk of nutritional deficiency or lower physiological requirement (Kenneth, 1984). Martorell et al., (1980) have reported that on average reduction of nearly 20 per cent in the daily intake of nutritional diet of children is associated with the common symptoms of diarrhoea and respiratory infections.
Maternal Nutrition

Generally women during their pregnancy deprived of getting sufficient nutritious foods. Gopalan (1974) reported that "over 30 per cent of pregnant women in India, in the last stage of their pregnancy have suffering from severe anaemia". Such malnutrition during pregnancy has been responsible for low-birth-weight and poor nutritional status of the infants and is a major factor underlying the infant mortality. The effects of malnutrition are far more severe when it occurs in the vulnerable groups viz., pregnant women, nursing mothers, infants, and children. Malnutrition during pregnancy is responsible for anaemia, premature and immature births, which led to higher maternal and infant mortality (Wattal, 1958).

Several empirical studies have confirmed about the influence of maternal malnutrition on infant mortality in various countries (Chandra, 1971; Lechtig et al., 1979; Chen, 1980; UNICEF, 1984 and Venkatacharya, 1985). It is reported that in many developing countries maternal malnutrition has been implicated as an important cause for high infant mortality rate. Nutritional status of the mother resulting out of food habits, choice of foods, social and economic status of the mother has greatly influenced not only for the health of the mother and children but also on mortality (Mahadevan et al., 1985). It is found that among low socio-economic
groups of women who work more during their pregnancy generally have poor health (Baird, 1947 and Anderson et al., 1965). The WHO (1965) expert committee illustrated that the association between maternal malnutrition and low birth weights, contribute a high foetal and infant mortality rates especially in the developing countries.

Intake of inadequate nutritional foods during pregnancy has adversely affect on foetal growth and as a result of it a higher proportion of low birth weight babies are found (Chen, 1980). A study on malnutrition, morbidity and mortality (Martorell and Teresa, 1984) showed that improvements in maternal nutrient diet are associated with lower mortality rates during infancy and early childhood. An analysis of the children of India by UNICEF (1984) stated that cultural traditions of intra-family distribution of food is rooted in rural areas that women have to eat at last and often eat the least both in quality and quantity. This inadequate diet cannot meet the demands of the body during pregnancy and lactation and thereby depletes her health leading to malnutrition and illhealth.

Food Taboos During Pregnancy

Some of the cultural beliefs and practices also put women in a disadvantageous position and aggravate the problem of malnutrition among them. A micro level study on infant
mortality in Uttar Pradesh (Khan, 1988) found it is a commonly held belief that the process of delivering a healthy child is very painful and could prove risky for both mother and child, and therefore, pregnant women should avoid high calorie diets. However, it was found that all families, rich or poor, in the last two to three months of pregnancy the women eat rice with ghee. Some of the families believe that it works as a lubricant and ensures smooth delivery of the child. As Shah (1984) illustrated that the wrong belief in choice of foods results the women to take too little food during pregnancy. Besides, the women are undertaking too much of physical work which causes to anaemic and the foetal growth is low which consequence of increases the risk of low birth-weight of the baby.

In India, generally the pregnant woman is advised to eat moderately, so that the foetus does not grow too large, but it leads to delivery complication. She is often forbidden to eat certain types of vegetables, sweets, meat and fish. Such foods are avoided on the belief that they may harm the foetus, produce certain deformities in the child or some times leads to the risk of mortality or precipitate a miscarriage (Bhatia, 1981). In an another study in South India conducted by Luzzi (1980) has found that 80 per cent of women avoided foods like papaya, brinjal, gogu, groundnuts, chicken, fish etc., during their pregnancy period, on the grounds that they cause 'heat' in the body and might induce abortion.
A study on bio-social determinants of infant mortality among fishermen community in Kerala (Vimala Kumary, 1988) showed that an higher proportion of infant deaths were occurred among the mothers, those who did not avoid certain kinds of food items like, jack fruit, papaya, banana, eggs and fish.

D. Food Taboos During Lactation

A study of Mathews (1979) revealed that certain diseases are believed to be transmitted to the infant/children through the mother's milk, when the mothers eat certain foods and so avoided during lactation. A study on child care and child rearing among the Gonds conducted by Sampath (1958) reported that the mother needs especially good nourishment in the beginning when the child is born and has to provide adequate milk to the new-born baby. However, no special food is provided either to the child or to the mother. It is almost impossible to provide good food when the mothers are not afford to take rest even for a week at home after the child birth. The usual simple food is provided to the mother and it is made into liquid form. As Bhatia (1981) pointed out that certain foods like, meat, egg, fish, and vegetables (Tomato, pumpkin, ridge gourd etc.) are generally avoided by the lactating mothers believing, if the mother eats those foods tend to children suffer from diarrhoea or cold or cough.
Saraswati Swain (1978) on the study of customs and beliefs associated with pregnancy and child birth in rural Orissa, observed that lot of restrictions on the diet pattern of lactating mother during the post-natal period for at least 5 to 6 months. She is allowed to take rice, dal and some boiled vegetables like drumstick, brinjal and plantains which are considered to be harmless for the child. The popular belief is that the child would suffer from diarrhoea and gastric upset, if the mother had rich foods other than these. A study of socio-cultural and health care among tribals of Madhya Pradesh (Salil Basu, 1986) showed that a specially prepared connection from various herbs 'Kasa Pani' is provided to the mother on the third day after the delivery. The idea behind giving 'Kasa pani' is that it gives soothing effect, helps in recovering the energy lost at the time of delivery and also acts as a sort of antibiotic for both mother and children. Tan et al., (1970) reported that culturally many societies restrict the diet of the lactating mother in order to protect the health of the infant and these ideas may also reinforce the concept that mother's milk may be unhealthy.

E. Weaning/Supplementary Food Practices for Children

The practice of weaning-supplementary food is a momentus biological and social transition which the infant originally deriving all nourishment from mothers milk becomes accustomed
to the usual foods of his/her society (Winkoff, 1980). Many studies have indicated different types of weaning/supplementary food practices and their association with child survival (Baertl et al., 1970; Mata and Wyatt, 1971; Rao, 1979; Teckce and Shorter, 1984; Mahadevan et al., 1985 and Leela Visaria, 1988).

A study conducted by Baertl et al., (1970) in Peru, found that there is a significant difference in infant mortality between an experimental group which received supplementary foods and the group which did not. Mata and Wyatt (1971) stated that the practice of weaning/supplementary foods like solid foods (home made) and cereals which may be less in quality, contaminated by the way it is used or stored and their introduction at an early age may harm to the health of infants. A socio-cultural study on health practices of the 'Jaunsaris' in Uttar Pradesh by Rizvi (1986) found that the infants usually start weaning with semi-solid foods which is prepared with rice cooked in surplus water to make it dilute called as 'Kangri'.

A cross-cultural study on infant and childhood mortality in South India by Mahadevan et al., (1985) stated that higher incidence of infant mortality is caused due to the ignorance of mothers, religious practices, poverty and also non-availability of better nutritious foods as most of the infants were deprived of protein rich foods in their early days of
infancy. It is also reported that the type of weaning/supplementary foods introduced first were solid/liquid (home made) made from locally available foods and a gruel made from parboiled rice, which are poor nutritive with carbohydrate and these weaning foods lead to indigestion and have significant affect on infants health (Mahadevan et al., 1989).

Further, Leela Visaria (1988) noticed that, after about six months, when breast milk is not adequate for the growing child, children are given supplementary milk (generally, diluted with water because undiluted milk is considered 'heavy food) and other foods which are essentially carbohydrates, staples such as rice are believed to be light and easily digested by the infants, which improves nutritional status of infants and influence on child survival. Das and Ghosh (1986) studied on child health care among Santhals of Bihar, found that there are certain beliefs among them which prohibit them to the use of other animals milk for the rearing of their babies. Cow's and Goat's milk are generally avoided as they believe that it is too heavy and may cause indigestion or stomach disorder to the babies.

F. Pre-lacteal Feeds

In traditional societies most of the mothers have given different kinds of pre-lacteal feeds to the infants during the first three-days before starting the regular breastfeeding. Generally, it is observed that there are certain customs
and beliefs amongst the different cultural groups, wherein the newly born infants were given sweetened water, etc., besides the breast-milk of other lactating mothers. In different parts of India, various studies have shown an association between the prelacteal feeds and its influence on health of the infant (Chandra, 1978; Priyani, 1981; Mahadevan et al., 1985; Leela Visaria, 1988 and Vimala Kumary, 1988).

A pioneer study conducted by Mahadevan et al., (1985) revealed that the practice of pre-lacteal feeds given to the new borns with sweetened water, honey, goat's or donkey's milk, Kasturi and gorojanam and neem oil for the first two or three days before regular breastfeeding. It is also believed that the newly delivered mothers milk (colostrum) was harmful to infants and might affect their health. On the contrary the first milk has many advantages i.e., the colostrum which has rich in immunoglobulins and other nutritional factors. When the infants are not fed with colostrum and breast milk, they are exposed to a number of morbid conditions (Chandra, 1978 and Priyani, 1981).

As Leela Visaria (1988) reported that breastfeeding is not initiated for first three days, the new borns are given some pre-lacteal feeds, which consists of some herbal concoctions, called 'gutti' or often mixed with ghee or honey or even 'castor oil'. This feed is believed to cleanse the infants system. Plain water with honey, sugar or jaggery
is normal pre-lacteal feed. These feeds were given with the manner, a piece of cotton or a rag is reportedly dipped in the feed and drops are squeezed into the baby's mouth. In another study on determinants of infant mortality among fishermen by Vimala Kumary (1988) showed the mortality differentials in relation to the pre-lacteal feeds, higher infant deaths were occurred among those who fed their infants with dry grape juice, combination of sugar or sugar products, which may led to respiratory disorders.

A study in Rajasthan and East Uttar Pradesh conducted by Srivastava (1971) found that the grand-father (in case of male child) or the grand-mother (in case of female child) puts a little ghee mixed with sugar or jaggery into the mouth of the new born child. In case of East Uttar Pradesh, it is also noted that as soon as the child is born, woman taking some rice and water into her mouth and spills over the mouth of the new born child. According to Dube (1959), a doti is dipped in honey and a drop or two of that honey is put into the mouth of the new born child. In China, after the child is delivered, a few drops of sweetened water puts into the mouth of infant (Yang, 1947).

Breastfeeding

A substantial amount of research has been undertaken to explore the advantages of breastfeeding practices and
their relationship with survival of infants. Breastfeeding is expected to be beneficial to child health and development. As Ajello (1982) pointed out that the "breast-milk presumed to be hygienic, nutritionally well adapted to an infant's requirements and confers a unique immunological protection on the infant". Therefore, better survival chances are expected for breastfed infants, especially under conditions of poverty and ignorance. Huffman and Lamphere (1984) stated that numerous nutrients available in breast-milk, which is an important contributor to the child's immunologic defense system and increases resistance against the disease. The anti-infective properties in breast-milk are also reducing morbidity, as demonstrated by a lower rate of otitis media, gastro-intestinal illness and allergies among breastfed infants (Cunningham, 1981).

Initiation of Breastfeeding

It is well recognised that colostrum which is secreted by the mother during the first 7 to 10 days is rich in many nutrients and anti-infective factors, which protect the infant from infection (Mahadevan et al., 1989). McClelland et al., (1978) stated that the anti-infective properties of mother milk has humoral and cellular in the prevention of gastro-enteritis. Oski and Stockman (1980) stated that "mother's milk has human colostrol cells and that kill the common pathogens in the new born". Cameron and Hofvander (1983) reiterated
that for the first few days the breast secretes colostrum has a higher protein substances containing antibodies, which help to immunise the infant against infections, particularly gastro-enteritis.

Leela Visaria (1988) summarized that breastfeeding is initiated at least 24 hours after birth and often after 48 or 72 hours; valuable colostrum is discarded. However, interestingly in the three tribal groups in Himachal Pradesh, Madhya Pradesh and the Nilgiris (Tamil Nadu) the new born were breastfed within 6 to 12 hours after birth. A pioneer study on infant and childhood mortality in India by Mahadevan et al., (1985) showed that the largest proportion of infant mortality among the Muslims (45 per cent) the Harijans (36 per cent) and the Caste Hindus as well (35 per cent) occurred in the absence of breastfeeding during the period of first 5 days after birth. Similarly, Butz et al., (1982) noticed that an additional week of full breastfeeding in the first month of life reduces 16 deaths per 1000 live births.

Breastfeeding is by far the best means to provide, appropriate nutrition as well as protection against infections. During the first 3 or 4 days, mother does not secrete milk but instead a yellowish fluid called colostrum which contains certain vital nutrients and also helps the baby to develop immunity against many infectious diseases (Sharma, 1986). Jelliffe and Jelliffe (1978 and 1982) reported that breast-
feeding is highly nutritious consisting colostrum, which is protective due to its composition and its content of immunologic substances against bacterial infection of the gastrointestinal tract, allergies, obesity, and certain metabolic and other disorders.

Chandrasekhar (1972) reiterated that no food is probably required by the new born during the first 24 to 48 hours of life. During the first two or three days after the baby is born, the breasts do not secrete milk but a yellowish fluid colostrum, which is good and protect the health of the new born. On the contrary, in most parts of India there is a staunch belief that colostrum or the first milk is harmful and so it is avoided. Ghosh (1966) conducted a study in South India and found that the practices regarding the time of commencement of breastfeeding is considerably varied and it is noted that greater proportion of mothers in Bombay (66 per cent) and Pondicherry (56.1 per cent) have given breast-milk on the third day after the baby is born.

H. Duration of Breastfeeding

Breastfeeding is a common practice among rural women and the duration is varied from society to society depending upon their cultural practices. In fact, prolonged breastfeeding for about 23 months is common among the lower socio-economic groups in India (Belawady, 1980). A pioneer study on
infant and childhood mortality in India conducted by Mahadevan et al., (1985), revealed that longer duration of breast-feeding is significantly reduced the infant mortality. Similar findings have been reported from several studies particularly in Germany (Knodel, 1978), in Bangladesh (Kent, 1981), and in Bolivia (Koopman, 1983).

Duration of breastfeeding bears a direct relationship to the nutritional status of the child and even the incidence of mortality during infancy (Woodbury, 1922; Knodel, 1978; Wray, 1978). The effect of breastfeeding on child survival appears to be primarily dependent on the duration of unsupplemented breastfeeding. It was observed in the study of Butz et al., (1982) that the infants who were fully breastfed during the first month of life and reduced mortality risk both in the first month and in the next 5 months of life regardless of feeding status in the latter period. Infants who survived the first 6 months subsequently had lower mortality, if they were fully breast-fed in the first 6 months.

Studies that attempt to measure hormonal or cellular components must be able to control for several factors. The quantity and duration of breast-milk produced the larger affect of anti-infective properties and they encourages the survival of infants (Carlsson et al., 1976; Reddy et al., 1977; Chandra, 1982 and Miranda, 1983). Similarly, Winikoff (1981) revealed that a profound inverse relationship has
been existed between the infant mortality and duration of breastfeeding among the children who breastfed fully.

Numerous studies have found a profound negative association between the duration of breastfeeding and the incidence of morbidity and mortality among infants (French, 1967; Larsen and Humer, 1978; Mata, 1978; Cunningham, 1981; Idris et al., 1981; Janowitz et al., 1981; Lepage et al., 1981; and Kumar et al., 1981).

A study by Wray (1978) which differentiated between fully breastfed and partially breastfed infants, typically found more mortality among those who breastfed partially as compared to fully breastfed infants. Puffer and Serrano (1973) found that a similar evidence among children up to two years of age, breastfeeding was up by 85 per cent and infant mortality was down by more than 40 per cent. Moreover, studies in four countries of Latin America and the Caribbean have showed that infants breastfed for less than six months (or not at all) were 6 to 14 times more likely to die in the second 6 months of life than the babies, who were breastfed for 6 months or more (Wray, 1978).
(A) Sugalis in Anantapur District - An Overview

The Region and the District

Andhra Pradesh is the fifth largest state in area and fifth most populous state in India. It occupies the Eastern side of peninsular and South-East of India. The state, situated between the latitudes $12^\circ - 14'$ and $19^\circ - 54'$ N and the longitudes $76^\circ - 50'$ and $84^\circ - 54'$ E displays a considerable amount of diversity in its physiographic, socio-economic and historical conditions which led to the formation of three regions viz., Coastal Andhra, Telangana, and Rayalaseema. The Rayalaseema region where the present study area is situated is named after Sri Krishnadevaraya, the mighty Vijayangara ruler who ruled this region during the 16th century. It consists of Anantapur, Chittoor, Cuddapah, and Kurnool districts, which are lying in the Southern plateau of the Rayalaseema region. This is bounded by Tamil Nadu on the south, on the East by the Nellore and Guntur districts of Andhra Pradesh as well as by the Bay of Bengal. On the west by the Karnataka state and on the North by the Thungabhadra river as well as Mahabubnagar district of Andhra Pradesh.

Further, Anantapur district lies mostly in western part of the state of Andhra Pradesh, between the latitudes $13^\circ - 41'$ and $15^\circ - 14'$ N and longitudes $76^\circ - 47'$ and $78^\circ - 76'$ E This is bounded by Kurnool district on the North and on the
East by Cuddapah and Chittoor Districts. On the south and west by Karnataka state is lined.

The Tribes

Andhra Pradesh has the highest tribal concentration in South India. There are 33 notified scheduled tribes in Andhra Pradesh with a population of 31.76 lakhs (Census of India, 1981), which accounts for 6.15 per cent of the total tribal population of India. The Rayalaseema region of Andhra Pradesh, has 17 notified scheduled tribes, of which there are 9 scheduled tribes in Anantapur district. Each tribe has its own habitat and environmental set up, dialect, socio-cultural traditions and historical way of life. They differ in size and distribution. Sugalis is one among them (see Table 1). The population of Sugali tribe (43.26 per cent) is the single largest tribal group in Rayalaseema region, followed by the Yerukala (26.16 per cent), and the Yanadi (24.22 per cent). In case of Anantapur district, Sugali is the single largest tribal group with the population of 43,345 (Census of India, 1971) i.e., 54.5 per cent of the total population of Sugalis in Rayalaseema region.

Origin

The Sugali seems to have been one of the ancient tribes of India since their name is found in old works like Dasa-kumar Charitra written by Dandi in the 11th and the 12th
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Tribe</th>
<th>District-wise Population</th>
<th>Total</th>
<th>%</th>
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<tr>
<td></td>
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<td>Anantapur</td>
<td>Chittoor</td>
<td>Cuddapah</td>
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<tr>
<td>1.</td>
<td>Bagatlas</td>
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<td>3.</td>
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<td>1,048</td>
<td>226</td>
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<td>4.</td>
<td>Kattunayakans</td>
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<td>26</td>
<td>46</td>
</tr>
<tr>
<td>5.</td>
<td>Konda Dhoras</td>
<td>8</td>
<td>3</td>
<td>4</td>
</tr>
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<td>6.</td>
<td>Konda Kapu (Reddis)</td>
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<td>7.</td>
<td>Kotia</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8.</td>
<td>Koya's or Gouds</td>
<td>82</td>
<td>585</td>
<td>46</td>
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<tr>
<td>9.</td>
<td>Kulias</td>
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<td>36</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>Malis</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>11.</td>
<td>Manne Dhoras</td>
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<td>398</td>
<td>-</td>
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<td>12.</td>
<td>Mukha/Nooka Dhoras</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>13.</td>
<td>Reddi Dhoras</td>
<td>-</td>
<td>167</td>
<td>-</td>
</tr>
<tr>
<td>14.</td>
<td>Savaras</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>15.</td>
<td>Sugalis</td>
<td>43,345</td>
<td>15,515</td>
<td>7,874</td>
</tr>
<tr>
<td>17.</td>
<td>Yerukalas</td>
<td>17,333</td>
<td>11,774</td>
<td>8,335</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>62,662</td>
<td>67,079</td>
<td>25,013</td>
</tr>
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</table>
centuries. On the basis of this reference H.M. Elliot (1869) has described the Sugali as some ancient tribe which was in existence during 4th century B.C. Further, in Rayalaseema region of Andhra Pradesh Sugalis are called 'Lambadis' in Telangana they are identified as 'Banjaras'. Edgar Thurston (1909) in his castes and tribes of South India, treats 'Lambada' is synonym of Lambani, Banjara or Brinjari, Boipari, Sugali or Sukali. Sugali is a currupt word of Supari (Betal nut) indicating that they were formerly traders of Supari. However, many speculations have been advanced on the origin of the Sugali. They are classified as:


Various etymological meanings of the word Banjara are given in the Gezetteers: (a) it is another form of the word 'VANJARA', burners and inhabitants of woods, (b) it is a derivation of the word 'BIRANJAR', meaning a rice carrier, (c) the true derivation is perhaps from the word 'VANIJA' (trader) which is also the common root for the words like 'BANIYA', and 'BANAJIGA', and (d) may be the derivation from the sanskrit word 'VANACHARA' (wanderer in the forest) indicating the nomadic character of the tribe (Nanjundaiah and Iyer, 1928). The regional names like Lambadi or Sugali are supposed to have been derived from the Sanskrit words such as 'LAVANA', meaning of salt, and hence, the Lambans being the salt carriers and sug-wala (good cowherd).
With regard to racial explanation, it may be stated on the basis of physical appearance, that the Sugalis have descended from Rajasthan, Gujarat and Punjab. This fact is also confirmed by a study of their main physical features of Sugalis: the prominent nose, long face, projected chin and fair skin colour, which have placed them nearer to the people of North India rather than to those of South India.

The linguistic speculation as well as the celebration of North Indian festivals like Holi by the Sugalis support the racial explanation which points out that the Sugalis are of North Indian Origin. Their dialect shows connections with North Indian languages like Hindi, Rajasthani and Punjabi. However, the Sugali dialect in South India is mixed with the surrounding Dravidian languages.

Identity of Sugali

By and large Sugalis are the beautiful tribe. A typical Sugali is dolichocephalous, with a well built body of tall stature yellow skin, oval face, black or brown eyes, long hair and straight nose (Nanjundayya and Iyer, 1928). The hair of a Sugali woman is worn in ringlets or plaits dangle in front and sides providing a rhythmic movement keeping pace to their lovely gait. They wear a coarse, multi-coloured petti-coat, an open-backed bodice, and an odni or over-cloth. They prefer red and yellow colours for their spacious
frocks and tight bodice linked with cowries. They wear heavy costumes to which glistening cowries and rustling beads are stitched to enrich the effect of their natural beauty and is sufficient to identify them as Sugalis. They also add massive rings of ivory round their arms as substitutes for lighter precious metal bracelets used by others. In addition, married women wear the boron bangles. The number of boron bangles tell about their social status. The ornaments for a male are a silver bangle worn on the upper arm of the right hand and on the left wrist. Also, they wear finger rings made of silver on the fourth finger of the left hand. Men wear white dhoti with short trousers and more frequently gaudy turbans and caps in which they indulge on festive occasions and are easily distinguishable from other men in the south.

Economy

With the advent of the British rule, the Sugali lost much of their traditional occupation of transporting goods on the back of pack of bullocks due to the introduction of mechanized transport and laying of roads and rail lines by the Government. Hence, they depended upon the forests for their livelihood by cutting wood and collecting other forest products. Being, illiterate and lacking technical skills, they degenerated and look to crimes like robbery, dacoity, cattle-lifting and kidnapping of children until the middle of the last century.
Sugali men and women took up collection of forest produce and later, agricultural wage labour on the farms of neighbouring peasants out of sheer economic necessity. Thus, after 1880s forest labour, sale of forest products and pastoralism became their main occupation. However, by 1930 the forest works had ceased to provide them enough earnings because of deforestation, strict implementation of forest protection measures and declaration of some forests as reserved forests. This situation compelled the Sugali men to turn their attention towards agricultural and other types of labour in order to supplement the earnings of their women. Now the Sugalis have new opportunities to work for their socio-economic betterment. Now-a-days, most of them have taken to pastoral-agriculture and various types of labour, although a few (as in western Rajasthan) still carry on their traditional occupation like salt trade, preparation of country liquor.

Settlement

Since the Sugalis are nomadic, inhabiting in plain as well as hilly areas. They live in detached clusters of rude huts called 'THANDAS' located at some distance from the established village(s), constructed mostly oblong, sometimes square thatched houses, which are unplanned pattern without streets. Siraj-ul-Hassan (1920) writes that the Banjara Thandas are always on the move, but during the rainy months they encamp on the outskirts of the villages, generally
on some dry spots where there is sufficient fodder for the cattle, tents are made of coarse stout cloth fastened with ropes. The thatched huts of Sugalis consist of only one room with no way except the door way. The same room is used for all the purposes such as kitchen, dining, bed room etc., without privacy.

Living Conditions

Sugalis mostly live in a primitive or barbarous conditions. Guha (1931) stated that "scheduled tribe has a primitive way of living, habitation in remote, less easily accessible areas, and nomadic habits and love for drink and dancing". The living conditions of Sugalis on the whole are deplorable because of the greater incidence of poverty, inadequate water and public health and infrastructural facilities. That is to say, many of them find it difficult to have daily bath, normally the bath have once in two or three days and sometimes once in a week. Cheap clothes and earthenware utensils are widely used. Comforts and luxuries are totally absent. Due to poverty, ignorance, and unhygienic environment, children, especially infants, succumb to early illness in large number. When they suffer from fever and other ailments, they used to take indigenous medicines instead of going to hospitals or consult doctors.

Political Organisation

Each thanda (hamlet) or caravan has a chief with the
designation of 'NAYAK' (Headman). The thanda is named after the headman, whose word is low, he is treated with reverence and credited with supernatural powers. The 'Nayak' exercised complete authority over his men, settle disputes in the community/village, and directs the movements of caravan and they will abide by his judgement. Further, he plays an important role and has all rights to punish the guilty if any one is involved in anti-social activities such as robbery or other crimes. Also, he is privileged to receive a fee on the remarriage of a widow outside her family and on the discovery of a witch.

Social Custom

Sugalis staple food is Jowar. Also they eat all kinds of meat including fowls and pork. Both men and women are addicted to heavy drinking. Country liquor like toddy and arrack are the favourite beverages. Songs and dance are in their blood, their expression of art consists essentially of chants, poems, dances, and operas on mythological history. Some of these chants manifest the story of these nomads from 'Rajaputana'. The Sugalis are ranked below the cultivating castes and the high caste people like Brahmins do not accept drinking water from them. Further, the Sugali community is not closed to outsiders. Such outsiders (Jangud) who are either kidnapped or adopted would be recognised as proper Sugali after seven generations only.
Religion

According to 1891 Mysore Census report, the Sugalis are vaishnavaita's and their principal deity is Lord Krishna. They also worship Lord Venkateswara and Hanuman (the monkey God). In addition, they also worship few deities such as "Mithu, Bhukia, and Siva Bhaia, and village Goddesses such as Poleramma, Mallelamma, Ankalamma, Peddamma, Maremma, Banasankari devi, and Banjare devi".

Sugalis believe in magic and witch-craft. They attribute a prolonged illness, a cattle murrain, a sudden death or other misfortune to witch-craft. The cause of these is known through the witches who help the bewitched person's family by charging fee in finding out the witch. After the birth of a child the mother is kept uncleaned for five days and made to live in a separate hut. On the sixth day she washes the feet of all the children in the hamlet, feeds them and then returns to her husband's unit.

Sugali marriage rituals are very lengthy. Their marriages are frequently held during the rainy season, as they usually move during the remaining period. At a betrothal the bridegroom and his friends come and stay in the village next to that of bride. The two parties meet on the village boundary where the bride price ranging from Rs.35/- to Rs.1000/- and four bullocks is fixed. At the time of betrothal the
parties go to a liquor shop and betel leaves and a large handful of sugar would be distributed to each and every body. Prior to marriage the prospective bridegroom has to spend a fortnight or a month in the bride's house and all the time he has to blind-fold himself to disable himself from seeing or speaking to the bride. This is really a wonderful custom.

The sex life among the Sugalis is healthy. They have a high code of morality, they never allow a widow to go out of the family and if an elder brother marries and dies without offspring, the younger must marry the widow. If the elder brother dies having offspring, and the younger brother wishes to marry the widow. The custom here referred to is said to be practised, because 'Sugriva', the ancestor of the Sugali, who married his elder brother Vali's widow. If the widow prefers another man and elopes with him, the relatives of the first husband claim compensation.