2.1 Theoretical Issues on Fertility Determinants

Fertility is influenced by several factors, both economic and non-economic (social and cultural), apart from physiological factors that are relevant at the individual level. Various theoretical formulations in fertility over time have incorporated these factors in several forms. Among the economic models of fertility, the prominent are those developed by Leibenstein (1957) and Becker (1960). Leibenstein was the first to propound the view that number of children reflects an economically constrained choice in which income and price are conditioning variables. Becker's theory viewed children as any other consumer durable and stated that taste, costs and income jointly would determine the demand for children. Becker's model seemed comprehensive but was too economic in nature for the developing countries, for it didn't recognise fully the producer aspects of children (contribution to family income and old age support) and also the supply aspects and sex-composition of them, which are thought to be important in these countries.

Leibenstein, however, tried to emphasise the rationality behind the motivation with respect to family size. According to him, the parents will want an extra child if the satisfactions to be derived from it are greater than the costs involved. He discussed the demographic transition and hypothesized that in the subsistence level economies couples rationally desired large number of
children and the desired family size declined only with economic development.

Later models elaborated these concepts with further addition of other variables. Thus, Schultz's (1969) model, apart from economic and non-economic costs and benefits, considered mortality, family planning and necessary sociological variables. According to Schultz's hypothesis, births can be explained by three general factors, desired family size, mortality and uncertainty. The micro model was tested with Puerto Rican data. The work of Mueller and Freedman was an advance over that of Schultz. Mueller's (1971) important theoretical contribution referred to the non-monetary approach to economic costs and economic benefits of children; that is, parent's perception of the economic costs and benefits. This is because at the time of family decision making, actual costs of rearing children and actual benefits to be obtained could be uncertain.

Easterlin's (1969) work also was based on standard consumer choice theory, but its later versions, Easterlin (1972, 1975, 1978), incorporated 'taste' and supply variables generally neglected by the economic theories. The factors affecting the shift from natural fertility to deliberately controlled fertility were explained in terms of the factors affecting fertility regulation, which was viewed as a function of the level of motivation of the couples to control fertility and the perceived and objective costs of regulation. When motivation is determined by surplus over the demand of children, the three building blocks of this
A related advancement is the synthesis framework developed by Easterlin, Pollak and Wachter (1980) which has the family’s marital fertility determined by its preference for consumption, children and fertility regulation, and four constraints which are, a budget constraint, the household’s technology, a birth production function and an infant mortality function. Maximising the utility function subject to the budget constraint, the household’s technology, the birth function and infant mortality function yields the optimal solution values for the household’s decision variables. The tastes here are considered endogenous to the society, in which the individual lives and shifts in tastes take place through an interdependent preference mechanism, which allows for intrafamilial transmission of aspirations within the same or different generations. However, it needs to be noted that rational or utilitarian models of fertility are not confined to economics. Various researchers have presented decision-making models of fertility that are based on non-economic considerations too.

Thus, social scientists have considered the number of children born to a woman to be largely an outcome of social norms, economic considerations, and cultural factors that shape the fertility control behaviour of couples. A few early scholars drew on both traditions (for example Raymond Pearl, Gilbert Bute, Regine Stix) but their conceptual framework tended to be informal and eclectic. A more systematic approach was evolved by the French
demographer, Louis Henry and American sociologists, Kingsley Davis and Judith Blake when they first identified mechanisms through which socio-economic processes and human behaviour interact with biological aspects of human reproduction.

Davis and Blake (1956) systematically classified all the prominent determinants of fertility behaviour under three broad categories, together designated as 'intermediate variables', through which all social and economic factors must work in order to affect fertility. This classification has been widely acclaimed and has been used in several studies of fertility determinants. However, it has been criticized that the cultural basis of intermediate variables was not elaborated by the authors (Freedman, 1967; Nam, 1968; Tien, 1968;). A modification of these concepts is the recent work by Bongaarts (1982) and Hobcraft and Little (1982) in quantifying the effect of intermediate variables.

Ronald Freedman (1975) operationalised the intermediate variables into a conceptual model facilitating empirical research in the field of fertility behaviour. Specifying the causal relationship of various intermediate variables, he introduced 'family size norm' as a synonym for fertility behaviour at the attitudinal level, which enables the prediction of future fertility. Hill, Stycos and Back (1959) incorporated socio-psychological and demographic factors and adopted an interactional approach in formulating their frameworks. The influences of general value system and family size attitudes were considered intervening factors. Religious affiliation and social environment lead one to
internalise certain norms and values regarding children. Economic necessity and certain cultural ties, for example the need of male offsprings for old age security and for perpetuation of lineage, constitutes these norms. Thus, while Becker, Easterlin and Leibenstein expanded and empirically studied various aspects of value of children as satisfactions (benefits) and costs, the sociologists and the anthropologists made contribution to this by identifying factors from a cultural and societal viewpoint. Incorporating a multitude of such socio-cultural dimensions, the concept of value of children (Arnold et al., 1975) became yet another major additional determinant of fertility behaviour during the recent past.

Caldwell (1976) argues that it is the social transformation of the family through acquisition of new values which determines the fertility decline. According to him, during the process of transformation, the family relationship, especially between young and old, and males and females, move towards more egalitarian ones. Simultaneously, the division of labour, work responsibilities and priorities of work within families also change. Children will be viewed as expensive to maintain and the contribution from children to the family income will decline. In the process, both the concept and extent of dependency change. A large number of children becomes less desirable because of increased emphasis on modern education and skill formation, which are expensive. Children also appear to depress the current income of the family because working mothers develop the concept of opportunity cost which is readily converted into monetary terms based on the local wage rates. This
mechanism leads to a reversal of intergenerational wealth flows where the older generation has to forgo their current consumption in order to improve the quality of children and meet the demands of the younger generation while the anticipated tangible rewards from child bearing are not equally assured. Eventually, the situation leads to the first antenatal decisions. Obviously, Caldwell stresses that the fundamental choices are social ones and economic behaviour is rational only in so far as it is rational within the framework established by social ends. However, Caldwell again wrote that the conditions of stable high fertility and of subsequent destabilization, depended largely in the nature of economic relations within the family. Further, he explains, "it is the new western way of life, produced by the penetration of imported values which brings the decline in fertility, and hence, urbanization, high incomes and shifts in occupations are not the major forces in causing a decline in fertility. Such a way of life may precede development or even modernization" (Caldwell, 1977: 100).

However, in practice, there are deviations from theoretically expected associations between fertility and developmental variables. The changing norms and values on fertility with the changing socio-economic structure of the society, and the difference in the current and past-development processes are mainly responsible for such deviations. As Lorimer (1954) affirms, "the phenomenon `cultural inertia' which hampers any rational adjustment of reproductive patterns is the most important obstacle in the modern world". Some basic level of socio-economic development as propounded by the
threshold hypothesis (Freedman and Coombs, 1966) is necessary for widespread adoption of family limitation methods in the presently high fertility countries.

2.2 Review of Empirical Studies

A number of studies on fertility and family size desires have been done in India in the last few decades. The sources of demographic data for them have either been census or the surveys conducted by NSS (National Sample Survey) or a few other localised surveys. In many of the surveys, the sample size had often been small and the quality of data differed from one to another. Further, these scattered efforts, accomplished in different regions and times are generally not comparable. Many of them depicted only the first order relationship. Despite these limitations, it would be useful to know the findings of these previous Indian studies on fertility patterns among groups differentiated by factors like residence, family type, religion, caste, economic status, education and so on. However, to have certain broad agreement on the inter-relationships between fertility and socio-economic, cultural and demographic factors there is a need to look into the findings of similar studies in other countries too, both the developed and developing ones. Therefore, findings from a few important fertility studies in other countries are also being highlighted here.

2.2.1 Residence Background (Rural Vs. Urban)

The place of residence has been considered as a potent factor that influences fertility. It is believed that when fertility declines, it does not affect
uniformly all segments of the population, rather it is invariably the more enlightened and modernized segments of the population, which take the lead in resorting to fertility reduction. Since urbanisation is an important concomitant factor related to modernisation, the rural-urban differences in fertility arise at this initial stage. Instances where urban industrialism depresses the probability of marriage and marital fertility are evident in the history of developed nations (U.N., 1953; Kuznets, 1974). So urban residence is theoretically believed to be an important determinant of couple fertility. It is found that the larger the proportion of people living under urban conditions and earning their livelihood through non-agricultural pursuits, the lower is the fertility. Also by exposing couples to new thoughts, urban contact increases their desire for new ways of life, for which more children are a deterrent. There is immense literature pointing to the presence of an inverse relationship between urbanization and fertility across a wide range of less developed countries (U.N., 1973; Mason et al., 1971; Hawthorn, 1970).

In India, as per the little information available relating to earlier periods, the rural urban differentials in fertility were unimportant till about 1950. Two earlier surveys in Poona and its neighbouring areas (Dandekar and Dandekar, 1953; Sovani and Dandekar, 1955) revealed virtually no significant differentials in fertility between the urban and rural areas. The 1951 census also showed for various regions of India no consistent pattern for assuming a rural-urban gap in fertility. However, for Travancore-Cochin urban fertility (6.4 children) was lower than rural fertility (6.6 children). Comparison of NSS data of urban and rural

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couples for various marital durations concluded that there was no conspicuous rural-urban fertility differential, except the effect of early marriages in the rural sector (Gupta et al., 1955). However, metropolitan cities like Bombay, Calcutta and Madras had exhibited lower fertility than country areas even in the past (Davis, 1951).

But the NSS surveys (17-21 rounds) have consistently shown a lower birth rate for urban area than the rural area after 1960. Although the data were expected to suffer from underestimation in both the rural and the urban areas, this problem was stated to be not significantly different between the rural and urban parts (NSS, 1970). The NSS results were corroborated by equally consistent results of the sample registration system (Rele, 1974; Brahma, 1974). The data provided by NSS 19th round from the integrated household survey indicated the general fertility rate as 182 for the rural and 170 for urban area. The differential vanished when the corresponding marital rates were compared (211 and 216 for rural and urban). This implied that the lower urban birth rate was the resultant of existing rural urban differences in the age-sex composition. However, although the standardized rates reduced the difference, there remained a part to suggest that urban areas did exhibit a somewhat lower marital fertility, for, there were indications of urban women attempting to control their fertility during their late years of reproduction, especially after 35.

Robinson (1961), Rele (1972), and Das (1979) also found fertility in urban areas lower than that in rural areas. An analysis of 1971 census special tables
(Krishnan, 1986) observed clear rural-urban differentials for all religious groups. The two national fertility surveys (Registrar General, 1972, 1979) showed rural GMFR as 191 in 1972 and 170 in 1978. The corresponding urban rates were 173 and 144. Similar differences were noticed in the states. The rural-urban gap in GMFR for Kerala state was 4 points in 1972 and 9 points in 1978. The SRS estimates of fertility rates also reflected pronounced rural-urban fertility differentials. The 1986 SRS data revealed 32 points difference in GMFR. However, the gap narrowed down (to only 1 point difference) in the case of Kerala State. The Third All India Survey (ORG, 1990) also suggested that the rural couples consistently had a higher level of fertility than their counterparts in the urban areas. This was true in all age groups and for all zones. In the National Family Health Survey (NFHS) of 1992-93 (IIPS, 1995) which was conducted uniformly in 24 states of India, rural fertility (TFR) was lower in every state than the urban fertility. There was, however, a convergence of urban and rural fertility rates for states with low fertility. In four states with lowest overall fertility (Goa, Kerala, Tamil Nadu and Andhra Pradesh), rural fertility was only 12 percent higher than urban fertility, on average. In the remaining states, rural fertility exceeded urban fertility by an average of 35 percent, varying from 19 percent in Orissa to 58 percent in Jammu.

2.2.2 Education

Education plays a distinctly important role in the formation of small family norm and attitudes towards use of contraception. The Mysore Population Study (U.N., 1961) found a negative relationship between education and fertility in
India. When wives were classified on the basis of their educational achievement, those who could barely read and write and those with schooling up to middle level did not differentiate from one another (both had 5.3-5.5 children), but women with education beyond that level clearly differed from the former with 3.9 children (a difference of 1.5 children). The differences in fertility by level of education persisted after standardization by duration and age at marriage. In Driver's (1963) Central India Study the mean number of children ever born was 5.0 for uneducated fathers and 3.9 for the high school or college educated groups. When mother's education was examined the figures were 4.7 for the uneducated, 4.3 for the primary group and 3.4 for other upper category. In Mukherjee's (1961) study in Calcutta, wives who were illiterate, primary or secondary had 3.1-3.5 births while those with technical or college education had only 2.5-3.0 births. However, education of husbands did not differentiate couples with respect to their fertility level.

As per the National Sample Survey (1960-61), number of children ever born to women of completed maternity was 6.6 among those with less than primary schooling, while the same was 5.0, 4.6 and 2.0 births for those with middle, matriculate or university education, respectively. However, Srinivasan (1967) and Bhate (1961) did not find any consistent relationship between parent's education and fertility. Dutta (1961) could find only minor differences in the age standardized fertility rate for three differing educational groups, as 3.6, 3.4 and 3.3, respectively.
Coming to the more recent past, a large number of studies either in India or elsewhere have shown that female education has a negative effect on fertility (Coale, 1965; Mitra, 1966). Roy et al. (1986) found that women having husbands educated up to metric and above level had on average one child less than those whose husbands were either illiterate or literate without any formal education. When females were observed, the metric and above group possessed on an average 2 children less than those who were either illiterate or literate without any formal education. The Baseline survey in Rajasthan (NIHFW, 1982) observed that on average currently married illiterate women in age group 15-49 years had comparatively more children born than the literate and educated women.

A clear evidence of higher fertility among couples belonging to uneducated families was observed in a Varanasi Survey (Singh et al., 1985). The 1978 fertility survey (Registrar General, 1979) indicated a decrease of total marital fertility rate with the increase in the level of education both in the rural and urban areas. The Third All India Survey data (ORG, 1990) also suggested that the education of wives has a negative influence on fertility. The study further emphasised that the influence of education on fertility would be stronger only if the wife had at least some years of secondary schooling.

Coming to macro level, Caldwell (1980) described mass education as an important factor to be reckoned to control population growth. Analysing the district level data of 1981 census for 14 major states in India, Sharma and Retherford (1990) reported that literacy had not only direct influence on fertility.
but also indirect effects through intermediate variables like child mortality and age at marriage. In their study, an increase of 10 percent points in female literacy was found to reduce the total fertility rate by slightly less than half a child per woman. While the predicted total fertility rate for a district with 20 percent female literacy rate was about 5.1 children, the same for a district with 80 percent female literacy was about 2.3 children. On the whole, about half of the effect of female literacy rate on TFR was found indirect.

Cochrane (1979) has reported a number of studies as having shown strong negative effect on fertility. Berelson (1976) reported the universal relationship of education to completed family size as one of the most clear cut correlation in the literature. Holsinger and Kasarda (1976) have observed that education may influence fertility directly by altering attitudes and behavioral patterns of individuals and indirectly by affecting such factors as age at marriage, acceptance of family planning along with infant and childhood mortality.

Despite the findings reported so far, a certain lack of uniformity in the education - fertility relationship exists among countries. Hermalin and Mason (1981) noted the variation in the magnitude of the individual level effect of education from country to country. This leads to uncertainty in predicting the potential negative fertility effect of advancement in female education and sometimes contributes to a sceptical view of education and fertility relationship (Graf, 1979) and also a doubtful policy stand toward investment in education as the most effective way to reduce fertility in developing countries.
(Simmons, 1979). In this context, investigating the structure of the relationship between female education and fertility, Jain (1981) reported that lack of uniformity in the education-fertility relationship including its curvilinear nature observed across countries can be attributable to marked differences between countries in the average fertility of women with no education rather than to the presumed differences in the average fertility of the educated women. According to the data presented by Jain for 11 countries, the observed positive relationship between education and fertility need not imply an increase in demand for children; instead, it could be an artifact of the increased age at marriage associated with advances in female education. The relative shifts in the levels and effectiveness of two intermediate variables, breastfeeding and use of contraception, are to determine the nature of the relationship. His analysis suggested that advancement in female education can be expected to influence fertility behaviour even without simultaneous changes in other factors such as opportunity for participation in the paid labour force in the modern sector.

The World Fertility Survey (WFS) furnished an opportunity to explore the relationship between education and fertility using comparable data from a wide variety of settings in countries with varying levels of educational attainment and fertility. The surveys showed an overall pattern of decreasing fertility with increasing education (Weinberger, 1987). In about 40 percent of the countries, women with seven or more years of schooling had only half the level of current fertility of women with no education. Also, in most of the
countries contraceptive practice and age at marriage increased with increased education. Further, the negative association between mother's education and infant and child mortality has been proved beyond doubts in several recent studies (Cochrane et al., 1980; Hobcraft, McDonald and Rustein, 1984) which in turn is bound to cause a fall in fertility. Analysis of NFHS survey (IIPS, 1995) data revealed substantial differentials by education with current fertility declining from 4.0 children per women for illiterate women to 2.2 children per women for women with at least a high school education. Cohort fertility also was higher among illiterate women (5.3 children) than among women with at least a high school education (2.8 children).

2.2.3 Age at Marriage

Age at marriage is an important intermediate factor in the fertility process. In recent years it has assumed further significance as a principal factor contributing to the decline in fertility in several of the developing countries. In countries where reproduction is primarily confined within marriage, changes in the marriage-ages and the proportions of women married directly affect fertility. Due to this, rising age at marriage has been recognised as one of the important policy interventions beyond family planning that might be able to influence population growth changes on a major scale.

The Mysore Population Study (UN, 1961) confirmed that higher age at marriage was associated with lower fertility. Rele (1963) found in the data of Banaras (rural) the number of children ever born decreasing with increased age at
marriage. As per Agarwala's (1961) survey of villages near Delhi and Lucknow, Mukherjee's (1961) Calcutta survey and Balakrishna's (1971) study on Madras, females marrying after age of 19 years can have their fertility reduced by 0.5 to 1 child on the average. Jain (1975) noted that in rural Punjab females marrying below 18 had 5.7 children on an average as against 5.2 for those married between 18-22 years and 4.4 for those who married after 23 years. Agarwala (1965) showed that there was a probability of 30 percent decline in India's birth rate if female age at marriage could be raised from 15.6 to 19.2. A decline in total marital fertility rate was noticed with increase in age at effective marriage both in the rural and urban areas (Registrar General, 1961, 1979). The TMFR in the rural areas declined from 5.4 for early effective marriage (18 years or below) to 4.1 for late effective age at marriage (24 years and above). The corresponding figures in the urban areas were 4.6 and 2.5.

The nuptiality patterns have played a very significant role in many of the European demographic transitions (Spengler, 1938; Van De Walle, 1972; Glass and Grebenik, 1954). In Western Europe, late marriage and widespread celibacy had been the main mechanisms through which its fertility was brought to a low level. In Eastern and Central Europe, on the other hand, marriage generally occurred early and was also nearly universal and reduction in fertility was achieved mainly through reductions in marital fertility. However, an overall marriage reduction in terms of higher age at marriage and lower proportions married at different ages has characterized several early transitions in many other developed countries (Coale, 1974; Hajnal, 1965; Coale and
Tye, 1961; Blake, 1967). Davis (1963) also termed marital postponement as part of a 'multiphasic response' to lower fertility in a number of countries. As per Matras (1965), the social strategies to contain population ever occurred in a sequence as: i) traditional early marriage and uncontrolled fertility, ii) late marriages and uncontrolled fertility, iii) late marriages and controlled fertility and iv) early marriage coupled with controlled fertility. Ryder's (1965) classification in the context of western societies also had these four phases. Accordingly, Coale's (1974) analysis revealed that in the initial phases of demographic transition, early and universal marriage prevailed which slowly paved the way for late marriage and fairly common spinsterhood and then finally to a decline in marital fertility.

Analysing the data from several Asian countries, Cho and Retherford (1974) demonstrated that marital factors contributed substantially towards the reduction in fertility. In West Malaysia, about two thirds of the decline in crude birth rate during the sixties was attributed to change in the marital structure. The significant decline in CBR of Sri Lanka (40 in 1950 to 27 in 1975) was partly due to the change in age at marriage. Jones (1978) also provides several examples from South East Asia where rising age at marriage has played important role in major fertility declines. Lesthaeghe (1971) tried to analyse the impact of nuptiality on fertility and growth rate of a series of populations from developing nations where extramarital fertility was negligible and found out that nuptiality changes could produce the same effect on birth and growth rates as changes in marital fertility. The study concluded that an overall fertility reduction initiated
by decreasing marital fertility alone would fall considerably short of the targets in several developing nations. According to him, a growth rate as low as 1.5 percent is an unattainable target for countries without a change in nuptiality as well. Apart from the family size being reduced through reduced exposure to pregnancy risk (Baldwin, 1977), the delayed marriage can lead to a significant decline in birth rates through its effect on the length of generation (Coale and Tye, 1961). According to Ridley and Sheps (1966), age at marriage affects fertility by changing the fertility schedule and family building pattern.

In all the studies conducted in recent times by WFS, age at marriage and duration since marriage are the two variables considered to be important in understanding differentials in fertility. In this context, Trussel (1980) suggests that although age at marriage is a topic of interest to demographers in its own right, it has been singled out for intensive study primarily because of the impact of nuptiality on fertility.

2.2.4 Female Work Participation

Raising the level of women's employment has been considered one of the effective means to promote small family norm. The hypothesis behind such a proposition assumes that employment of females outside home often offers them opportunities to get satisfactions from activities other than child bearing and child rearing such as participation in productive tasks, increased social involvement and the economic independence through earnings, which enhance their status both within and outside the family. In such circumstances
to forgo employment would be counted as a cost incurred in having children. These contentions have received support mainly from the western nations during the period of their industrialization and economic growth while in the developing nations they have not been fully supported.

In the developed countries there is a large body of evidence that shows the trade-off between fertility and work and it forms the basis of most of the early theoretical arguments advanced by sociologists and demographers about the work fertility relationship. Colliver and Langlois (1962) found a negative association between work participation of women and their fertility in several metropolitan populations around 1950. Since child woman ratio was the fertility index that had been compared, the result at the outset was not considered by the authors as an indication of the fertility depressing effect of female work. This is because work participation could affect fertility also through reducing the percentages of females married. However, the relationship held even when the percentages of women married were controlled by partial correlation. In the metropolitan areas of U.S. in 1960, women's work participation was found negatively associated with various measures of fertility for eight categories of women grouped by colour and age. Drawing upon these findings, Colliver (1968) stated that communities with high female employment tended to have both low proportion of women married and also low marital fertility.

The studies of Eastern European countries too had similar observations. In the data of Hungary, Mazur (1968) and in the case of Poland, Piotrowski (1971)
reported lower fertility for females gainfully employed than of those not in the labour force. Jaffe and Azumi (1960) found the fertility of women employed within home in Puerto Rico and Japan similar to that of non-working women, but women working outside the home had markedly lower fertility. Stycos (1965) found for Lima and Peru no clearcut relationship between fertility and employment status per se, but working women in professional and technical categories and office workers had fewer births than housewives. Hungarian data (Klinger, 1963) also revealed a similar pattern, with women in non-manual occupations having lower fertility than those in manual and agricultural occupations. This evidence put forward one of the simplest hypotheses related to work and fertility that the female work outside the home usually creates a role conflict with her much expected familial role and the resulting strain leads to increased contraception if it is known and available (Weller, 1968, Stycos and Weller, 1967).

Consistent with the evidence cited above, the Growth of American Family studies (Freedman et al., 1959; Whelpton et al., 1966) found more contraceptive use by U.S. women working outside the home. However, simultaneously longer duration of work was found among the sub-fecund group. Investigating these conflicting issues with the data of the National Fertility Survey of 1965 and another large scale U.S. Survey data, Sastry (1973) observed that a major part of the variance in U.S. fertility associated with work was explainable by two intermediate factors which were age at marriage and marital duration. Fecundity and contraception could explain only the smaller part of the
variance. Describing the characteristic nature of U.S. fertility, the author commented that the low fertility syndrome noticed among the white women was associated with their high status jobs and it mainly resulted out of the general modernization process and was partly because of high age at marriage and contraceptive use. On the other hand, among the Blacks, the fertility was high irrespective of their work roles and it seemed to be demanded by the low socio-economic circumstances under which they lived.

Again, for U.S. data Mott and Shapiro (1983) found a clear link between fertility and later employment. However, there was no corresponding link between early work activity and later fertility; instead, a strong correlation between early employment and later attachment to work had been demonstrated which was shown to be independent of intervening fertility. Regarding female employment the authors stated that motherhood and employment had turned to be complements rather than substitutes for the American wives. A series of changes diffused widely, the low fertility expectation, concentration of childbearing in a short span and the high social value attached to female employment, has helped this process.

Nevertheless, Groat et al. (1976) and Clifford and Tobin (1977) have showed several dimensions of fertility behaviour as differentiated by variations in the extent, kind and timing of work-experience. Here the relationships held more for Whites than for Blacks or Indians. The authors concluded that rural populations were closer than urban populations to conditions of compatibility.
between work and childbearing. Also, under conditions where economic need rather than other choice promoted work activity, the role conflict being reduced through fertility control was reported to be less operative, a finding that has often found support in developing countries.

Australia is another example, where work-fertility relationship seemed negative but explanations behind it differed among groups. In the Australian census data for the 1950s, wives who worked outside home had fewer children than their house-bound peers. Obviously, the census data had the limitation that they could not help to investigate whether the wives had fewer children in order to work or the wives who had fewer children for other reasons found it easier to remain in the work force. In this connection, Ware’s (1976) Melbourne study found work-participation not a causal factor in the reduction of fertility, but it was fertility that influenced work participation. Unlike in the U.S., a great majority of the working wives in Australia were not career women devoted to non-familial roles nor did their family size depend on their work participation intentions. Australian wives did continue to work after marriage, but the general tendency was to forgo employment, whilst they had pre-school age children. While the earlier generation abandoned the paid employment after marriage, the cut-off point now has shifted to the birth of the first child. The study found low participation rates among mothers in their twenties and it reflected the lack of social acceptance and the facilities for working mothers of pre-school children rather than any trend away from work participation. For any duration of marriage and age, women who had a higher number of children were
found more likely to be absent from work.

However, there were career-oriented women whose fertility remained invariably low, but their percentage was notably low. The working wives with a higher educational level, high husband's income and lower family size for the most part were to claim that it was due to career interest rather than money that they continued their employment. Simultaneously, there were also other groups, especially immigrants from Southern Europe who were most likely employed almost at all parity levels. Thus, as Tein (1965) had hypothesized, career occupations did have a more depressing effect upon fertility than less career oriented employment. Despite this, for yet another group, the economic factors ruled over their fertility decisions. The members of this group continued employment throughout and it was found that a perceived need to contribute to family budget prompted their decision to work. Thus, it was an essentially disparate mix of social value system and economic intentions that caused fertility differentials in Australia. Despite these peculiarities, the author stated the link between work force participation and reduced fertility to be strong. Among Australian born wives with no fertility impairment prior to menopause, for women aged 40 and above the difference in average family size in each five year age group between those who had never worked since marriage and those who had worked continuously was approximately one child (Ware, 1976).

Turning to less developed countries, studies by Mueller et al (1971) and Stokes
and Haich (1980) found either a weak or no effect of female participation in work on fertility in Taiwan. It was stated that female labor force participation in that country mostly constituted an extension of domestic activities like working on the family farm or family business. Again, Speare et al. (1973) found work experience having lesser influence on fertility as compared to education among the Taiwanese women. In a similar line, Chaudhary (1978) found for the Bangladesh data education variables more related to the number of children ever born and use of contraception than working status of females. Although proportionately fewer working wives were noticed to have used contraception than the non-working when the analysis was confined to working women, the use of contraception increased with an increased length of work experience.

Investigating the roles of various institutional factors likely to shape the employment-fertility relationship, Mason and Palan (1981) noted that only when there is a decline in the extended households and a decreasing pool of domestic servants, can modernization of the economic system be expected to bring with it an inverse employment-fertility relationship. As to the role incompatibility theme, its major limitation had been stated to be its failure to incorporate into it the ideas about the variables that undergo changes during modernization, for example, the rise of formal educational system and the shift in net inter generational transfers (Caldwell, 1976) or the changes in status allocation and social mobility (Banks, 1954; Leibenstein, 1974).

In India the relation between female employment and fertility is an under
researched topic. Dandekar and Dandekar (1953) reported the fertility rate of women doing housework as compared with women employed outside to be high in city, but low in non-city areas of Poona. Sovani and Dandekar (1955) found fertility to be independent of women's employment status. In Driver's study (1963), employed wives had a higher number of children ever born than the unemployed ones. But these studies did not distinguish between status oriented occupations and employment in domestic services.

Minkler's (1974) survey in Delhi reported a lower fertility among educated female workers than among uneducated working females. A higher proportion of the educated working women were found to have practiced contraception than the uneducated. In terms of fertility preferences and average age at marriage also, differences were found between the two groups. But half of the educated and uneducated respondents belonged to joint families and were able to have extra support to look after children. So the problem of employment creating a role strain for mothers did not prevail. Dubey et al. (1975) reported for the residential colony of government employees in Delhi inconsistent results. In this study too, parent surrogates were almost equally present in all the groups. As per 1978 Fertility Survey (Registrar General, 1979), the marital fertility rates were lower among workers both in the rural (GMFR, 148; TMFR, 4.9) and urban areas (GMFR, 104, TMFR, 4.1) as compared to non-workers (Rural: GMFR, 179; TMFR, 5.2 and Urban: GMFR, 155; TMFR, 4.7).

In the Gandhigram study (Sastry and Sivaprakasham, 1987), the female work
outside the home on paid wages did not relate so strongly with fertility when all other relevant variables in the relationship were controlled. Instead, the relationship between work and fertility seemed to vary by social class position of families. In the low income group the working women seemed to have a slightly higher fertility than the comparable non-working group, but in the high income group working and non-working women had an identical fertility. In rural areas, the agricultural and plantation workers had a higher fertility. However, the majority of the working women reported that they were working only to supplement the family income and the educational level seemed strongly related to fertility than employment.

The Third All India Family Planning Survey (ORG, 1990) also brought out the fertility differential among couples according to the working status of wives. On an average, a working wife had a higher fertility than a housewife. However, the relationship varied between urban and rural areas. Similar observations are true at the zonal level as well. While the study pointed out the apparent anomaly in rural areas, it mentioned that it was not the working status that had a negative effect, it was the nature of employment the women was engaged in that influenced fertility behaviour. The study also presented the mean number of live births according to broad occupational categories of husbands. It showed that the fertility level was highest among cultivators (3.3) followed by semi skilled workers (3.1), while it was the lowest among the large businessmen and officers (2.5)
Besides, there is a direct relationship between age at marriage and female employment (Duza and Baldwin, 1977). However, this relationship is more pronounced in urban than in rural areas and among women who work for regular substantial remuneration. Because female employment can induce a movement toward female autonomy in various ways, it may also operate as another major alternative to early marriages.

2.2.5 Income

Income is a variable for which, when influence of other variables is taken into account, an association with fertility often seems to emerge, whether income is calculated in per capita terms for a region, or per family or per household member in the analyses of individuals or families. A major difficulty is that income is usually closely correlated with other socio-economic variables associated with fertility and thus attempts to separate out the particular role of income independent of education, female labour force participation and so on, are by no mean trivial exercises. Leibenstein (1974) argued that fertility is determined by a great number of factors, but upto a certain point motivations for large families would be predominant beyond which fertility is likely to decline with further gain in income. However, Repetto (1972) after reviewing various studies concluded that there was no strong evidence of a positive relationship. Heer (1966) argued that in the process of economic development, rising per capita income would have exerted an upward pressure on fertility, but this is countered by other factors associated with development such as increased education, rising cost of children and the declining levels of infant
mortality. Empirical studies have reached very mixed conclusions concerning the relationship between income and fertility. At the macro-economic level, the relationship tends to be negative, that is, the richest countries tend to have lower fertility than the poorer ones.

Recently there has been a growing awareness of the relationship between income distribution and fertility. It has been argued that the level of fertility may be affected by the distribution of income, apart from average level of income (Freedman, 1974). Kocher (1973) Rich (1973) and Bhattacharya (1973, 1975) suggested in their cross national studies that fertility is positively associated with income inequality. Repetto (1974, 1978, 1979) also found a positive effect of income inequality on the level of individual as well as aggregate fertility. According to Repetto, fertility is a non-linear and non-monotonic function of household income, positive at very low income levels and negative at high income levels. The negative stretch of the function dominates the relationship and has an increasing slope coefficient. Income gains are believed to reduce fertility here by increasing the proportion of families able to participate in the process of modernization. Since large number of families are concentrated at the lower end of the income scale and as they characterize high fertility the redistribution of income towards a more egalitarian pattern may result in an overall reduction in birth rates. However, income redistribution as a means of controlling population growth has not been seen as a feasible measure at both theoretical and policy levels. In this context, effects are indirect or have longer run consequences. In the short run the impact on fertility is positive as the poor
can afford earlier marriage and additional children, whereas in the longer run the higher incomes at the bottom of the economic scale may indirectly reduce birth rates by operating through such variables as health and education. Comparing income redistribution and other interventions with government programmes aimed specifically at lowering fertility, Simons (1979) concludes that direct approach has more likelihood of success and greater cost-effectiveness. According to Flegg (1979, 1980), Birdstall (1977), most of the above mentioned studies did not provide satisfactory analysis of the role of income distribution in the determination of fertility and hence the findings are questionable. Main problem with most of the studies is the omission of statistical controls for national family planning effort. In this context, in Winegarden's (1978) study which incorporated a family planning variable and was limited to developing countries, fertility was found positively, but not significantly affected by both the income share of poorer households and the level of per capita income.

There is a lack of inconsistency in previous Indian studies with regard to the relationship between income (wealth) and fertility. Some studies found a positive relationship (Majumdar,1960; Mukherjee,1961; Dutta, 1961), while others found a negative relationship (in NSS 4th round with monthly expenditure), no relationship or no consistent relationship (Driver,1963; Srinivasan,1967). However, the U.N. Mysore Population Study, using type of dwelling as an index of economic status of family found a positive association between completed fertility and economic status. Sovani and Dandekar's (1955) study in the Poona
District showed that as one descended occupational ladder, fertility declined in the city but remained constant in the non-city. But, in the neighbouring districts of Nasik and Colaba, the fertility rates of urban and rural women did not differ according to the occupational or income status of their husbands.

A study based on couples in Punjab villages who had been married at least 10 years also showed virtually no difference in fertility among occupational or income groups. But Sinha (1957) and NSS (1970) found the relationship to be inverse between fertility and income. Singh et al. (1985) from a Banaras village study reported a strong relationship between social status and fertility performance. The pattern of fertility potential revealed that if female and hence household gets upward shift in social status, fertility can be reduced to the desired level.

The 1978 fertility survey data (Registrar General, 1979) also indicated a decline in marital fertility rates with the increase in per capita monthly expenditure in both rural and urban areas. The Third All India FP survey (ORG, 1990) showed that the fertility level increased with an increase in income level upto Rs. 750 per month, and in the higher income groups the fertility level consistently decreased with the increase in the income level. However, after looking into the fertility level by religion, education and family income, the study concluded that social development (education) is the major influencing factor rather than the economic factors (income), on the couple fertility behaviour. While these are the micro-level findings at the national level, the distribution as well as
absolute level of income have been shown to be related to fertility (Ahluwalia, 1976) with greater equality in distribution being associated with lower fertility.

2.2.6 Religion

In India, religion has a special significance for population growth, as social behaviour is much influenced by practices which are subject to religious sanctions. It has been observed that age at marriage, remarriage, divorce, education, customs, taboos on sex etc. which have a great impact on fertility performance, vary according to the religion of the individual. The introduction of family planning as a national programme has added new dimensions in studying fertility differentials by religion.

Differentials in fertility according to religious groups have been reported in many studies. The first serious effort to deal with fertility differentials by religion in India was made by Davis (1951). In the absence of better quality data the study was based on census data, and child-woman ratio remained the basic measurement for differential fertility. It was found that the Sikhs had the highest child-women ratio of 841 followed by Tribals, Muslims and Christians with their ratios of 808, 770 and 741, respectively. The Buddhists, Hindus and Jains had still lower ratios, 698, 678, 624, respectively, while Parsis remained as a distinctively low fertility group with a child-woman ratio of 399.

In India Hindus dominate and although the proportion of all other religions is incomparably low, it is the Hindu-Muslim fertility differentials that have often been a subject of considerable attention among researchers. It is believed that
Muslims in India have a considerably higher fertility than Hindus both in the rural and urban areas. The Mysore population study revealed that ever married Muslim women had on an average a larger number of children than the Hindu women. Among the ever-married women above the age of 45 the average number of children born alive to the Muslim women was 5.7 in Bangalore city, 6.7 in towns and 5.0 in the rural areas. For the Hindu women, the corresponding average were 5.4, 5.2 and 4.8, respectively. The average for Christians (4.7 children), who were well represented only in Bangalore city, was less than that for the Hindus. Driver's (1963) findings also revealed some variation among religious groups in fertility. The mean number of children ever born was reported to be 4.8 for Buddhists, 4.5 for both Hindus and Muslims, and 4.3 for other religious group. When differences in present age were controlled, the weighted means were 4.9 for Buddhists, 4.5 for Hindus and 4.6 for Muslims and 4.1 for other religious groups.

Visaria (1974) based on fertility surveys and the NSS data mentioned that there were differentials in the marital fertility between Hindus and Muslims. The analysis of 1971 census fertility data by Das and Pandey (1985) explored the role of religion in influencing marital fertility. The study concluded that the differentials persisted even after controlling the effect of several major indices of social and economic development, such as urbanisation, wife's education and female age at marriage, which were presumed to influence fertility. The 1978 fertility survey data (Registrar General, 1979) also showed the highest fertility among Muslims both in the rural and urban areas. The general marital
fertility rate among Muslims was found as 188 in rural areas and 177 in the urban areas in 1978. The corresponding rates for other religious groups varied between 153 to 180 in the rural areas and 121 to 150 in the urban areas.

The Second and Third All India Family Planning Surveys (Khan and Prasad, 1983; ORG, 1990) showed that the level of fertility was highest among Muslims, followed by Hindus and the least among other religious groups. However, over time these religious differences have narrowed down as both among Muslims and Hindus the overall fertility levels have come down. The data showed that while the difference between the mean number of live births between Hindus and Muslims was 0.54 in 1980, it reduced to 0.49 in 1988.

A partial explanation for the observed differentials in marital fertility is likely to be the unequal acceptance of family planning methods by Hindus and Muslims (NSS 16th Round data). The lesser acceptance of family planning by Muslims than Hindus is indicated also by the data on the vasectomy camps in Ernakulam district of Kerala state (Soni, 1971; Krishnakumar, 1974). The first (1970), Second (1980) and Third (1988) All India Surveys conducted by ORG also reported a higher family planning usership among the Hindus as compared to the Muslims. The proportion of family planning usership among Hindus was found as 14, 36 and 46 percent in 1970, 1980 and 1988, respectively. The corresponding proportions for the Muslims were found as 8, 23 and 34 percent.

As per the NFHS, 1992-93 (IIPS, 1995), Muslims in India have higher fertility than Hindus while Christians, Sikhs, and other religious groups have their fertility lower.
than Hindus. On controlling education, although the religious differentials in fertility decreased to some extent, it still remained significant. In the first three education group the Muslim TFR was found 23-28 percent higher than Hindu TFR while for the small number of women in the highest education group the difference was 43 percent.

2.2.7 Son Preference

One of the frequently assumed reason for the high level of desired fertility in developing countries is preference for sons among parents for economic, social and religious reasons. In agrarian societies, sons have many responsibilities. They are a means to perpetuate tradition and the ancestral line, provide economic and old age support for parents, act as agents of change in life styles, customs and goals and fulfill the psychic role of providing love and affection as well as strengthening the marital bond (Basu et al., 1979; Jairoth, 1975; Khan and Gupta, 1985; Mahadevan, 1979; Mamdani, 1970). Among the various reasons for wanting children, economic benefits and old age security were the ones most frequently cited by Indian couples (Khan and Gupta, 1985).

Son preference is widespread not only in India, but also throughout the world, although the intensity of this preference varies across different countries and regions. Williamson (1976, 1983) noted it to be unusually strong in Arab countries, South Asia, in the rural areas of north America, Korea and India, moderate in sub-Saharan Africa, Turkey, Lebanon, Israel, Taiwan and China
and mild or no preference in the United States, Europe, Japan, Latin America and South-east Asia. The preference for a particular sex of the child is believed to have powerful effect on the number of additional children desired by parents, which in turn influences their decision to adopt or not to adopt a family planning method, eventually determining their completed family size.

A sizeable amount of work on this subject has been done in developed countries, especially the United States. Clare and Kiser (1951) examined the gender preference responses of husbands and wives in Indianapolis study and found that most couples tended to be satisfied with the sex of the children they had and the sex preference was an important determinant of fertility among relatively few couples. However, Pohlman (1967) criticized these findings and pointed out that the ex post facto statements of sex preference by parents are largely rationalizations and thus it is not surprising that sex preference does not appear as a significant influence in fertility dynamics. Freedman et al. (1960), Fancher (1956) and Seare et al. (1957) reported that sex of the existing children tended to affect the attitude of parents towards having another child. Later, Whelpton et al. (1966) also arrived at a similar conclusion. In this connection Westoff et al. (1961: P. 295) reports: "sex of the first offspring affects at least the length of the subsequent birth interval. Sex preference is an important motivating factor affecting fertility patterns including perhaps family size. Desired size of the family is not independent of a preference for a particular sex composition".
Similarly, Bumpass and Westoff (1970) reported from the Princeton study data that women had a stronger tendency to have another child if they had children of the same sex rather than of different genders. However, a number of recent studies on United States data (Waller, 1976; Ayala and Falk, 1971; Gray, 1972; Gray and Morrison, 1974; Centright et al., 1974) reveal a small effect of the gender of child on actual or intended fertility.

On the other hand, within the less developed countries of the world son preference dominates overwhelmingly. Yet, such a preference for sons is far from universal in developing countries and even where it exists it is tempered by the desire for at least one daughter. Son preference is strong in Korea (Park, 1978) Malaysia (Coombs and Fernandez, 1978), Taiwan (Chang et al., 1981; Freedman and Takshita, 1969), Bangladesh (Ahmed, 1981) as well as in various Muslim nations (Khan and Sirageldin, 1977) while there is little or no preference for sons in Thailand (Kamnua Silpa et al., 1982) and in Indonesia (Gille and Pardoko, 1966).

There is little empirical evidence concerning the extent to which fertility in India is directly influenced by the desire for sons or for a particular sex composition of children. Repetto (1972) after examining the data from North India concluded that among the general population son preference and number of living sons were not factors that influenced actual levels, rather the decisions on family size were more likely to be derived from economic consideration. Analysis of ORG All India FP survey data (1970) indicated that the number of living sons
had very little impact on the couple's fertility behaviour (Sarma and Jain, 1984; Freedman and Coombs, 1974). Analysing the same data and the NSS survey data of 1961, Mukherjee (1977) also found no meaningful relationship between sex composition of children after a certain parity and the proposition going for the next birth. On the other hand, Lahiri (1975) noted from the NSS data that in urban India the desire for an additional child fell quite rapidly as the number of sons increased. The desire for an additional child was twice or even more strong among persons with three or more daughters than among those with the same number of sons. The increase in willingness to use contraception with living sons, as noted by Morrison (1957), further supports the foregoing position. Likewise, Pholman (1967) reports, "among Indian males having vasectomies, the proportion with less than two daughters is significantly larger than the proportion with less than two sons".

Many a times inconsistent results are due to the methodological problems involved. There is no adequate direct measure of assessing sex preference and its relation to fertility behaviour. The sex preference effects can be studied only inferentially by comparing the behaviour of couples with different family compositions or through direct attitudinal questions. The sophisticated methods like the Coomb's Scales (Coombs et al., 1975) and the psychological decision making model (McClelland, 1979, 1983) are not applicable to generally available survey data. In the light of this, both attitudinal and behavioural measures (such as current use of contraception, parity progression etc.) are to be used. In this context, Das (1988) reports that the demand for a son, even
today, is still quite strong in the minds of Indian couples. The analysis of the Second All India Survey data (Khan and Prasad, 1983) and the data from Rural South Gujarat and Baroda city (Western Region) confirms a strong preference for sons in India, especially in rural areas. The study also showed a pronounced impact of sex composition on the current use of contraception both in the rural and urban areas.

Thus, the important theoretical formulations in demography relating fertility to various economic and social considerations and the several national and international research reviewed here suggest that differences in socio-economic progress (education, income, work status etc.) and a host of culturally affiliated psychological motivations (like son preference) are the significant factors that cause fertility differentials among individuals.