FERTILITY TRANSITION IN INDIA

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AASTHA LAKSHMI

CENTRE FOR THE STUDY OF REGIONAL DEVELOPMENT
SCHOOL OF SOCIAL SCIENCES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI-110067
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जवाहरलाल नेहरू विश्वविद्यालय
JAWAHARLAL NEHRU UNIVERSITY
Centre for the Study of Regional Development
School of Social Sciences
New Delhi-110067

CERTIFICATE

This is to certify that the dissertation entitled "**Fertility Transition in India**" comprises the work done in the School of Social Sciences, Jawaharlal Nehru University for the partial fulfillment of the degree of Master of Philosophy. This work is original and has not been submitted in part or full for any other degree or diploma of any other University.

Aastha Lakshmi
(Candidate)

Prof. Saraswati Raju
(Chairperson)

Chairperson
Centre for the Study of Reg. Dev.
School of Social Sciences,
Jawaharlal Nehru University
New Delhi - 110 067

Prof. S. K. Nangia
(Supervisor)

Tel. : 2671 7557, 2671 7676, 2671 7575 Fax : 91-011-2671 7586

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INTRODUCTION

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INTRODUCTION

1.1 INTRODUCTION:

Over the course of last century, changes in birth rate and death rate have transformed the character of life for virtually every society and family on the planet. Decrease in mortality has led in most parts of the world to reasonable expectations that parents will see virtually all of their children survive infancy. Most parents can expect to live to see their grand children. Although the new demographic patterns are most common in advanced industrial societies, they are on the near term horizon for most societies around the globe. If human progress is to be measured by longevity and fertility control, the last century and the second half of it in particular, have no historical parallel for the advancement of human condition.

In recent years the field of population studies has spawned a variety of new ideas, conceptual and measurement framework and theories of demographic change. Fertility transition is one of them.

Fertility Transition can be defined as a process of progressive reproductive change akin to social change and can be best understood as a continuous evolution that tends

to sustain itself in ways that make additional change more likely (Guilmoto and Irudaya Rajan, 2005, p. 3).

Almost all the developing societies are currently experiencing Fertility transition, at varying pace and levels. It is generally accepted that the pace of fertility transition is closely associated with the levels of socioeconomic development.

In 1952, India became the first country in the World to launch a family planning programme aimed at decreasing population growth. But since then, one keen observer has aptly put it; it has been "a saga of great expectations and poor performance" (Visaria and Chari, 1998, p. 96). The overly optimistic demographic goals that have been set in various planned documents and policy statement have been continuously put off to the extent that such statements now fail to enthuse anyone.

However, fertility levels have fallen since 1971, but at a much slower rate than what is anticipated. In a vast country like India, with its considerable demographic diversity and heterogeneity and varying levels of socioeconomic development among states, the levels and phases of fertility decline vary significantly from one state to another. It is well recognized that there exists large interstate fertility differentials within the country, with the states of Bihar, Haryana, Madhya Pradesh, Orissa, Rajasthan, and Uttar Pradesh considerably lagging behind other states in their levels and pace of decline in fertility.

The differentials are striking if we compare these states with Southern states of Andhra Pradesh, Kerala and Tamil Nadu and the coastal state of Goa, which have already reached the replacement level of fertility. South India was a precursor of this demographic reversal because of the spectacular fall of its birth rates. Fertility transition has indeed been crux of the matter ever since mortality started its slow decline from the 1920s onwards and the impact of mortality variations on the overall demographic growth has now been seriously reduced.

The present study is to document the process of fertility change in India, with a focus on North -South divide.

1.2 LITERATURE SURVEY:

FERTILITY TRANSITION: DEFINITIONS AND CONCEPT:

Fertility issues have received ample attention in the literature. As a first step in identifying priority areas for future research, it is useful to summarize briefly the major work of past and highlight the gaps that are revealed.

Fertility transition is identified as a decline from a plateau of natural fertility leading to replacement level fertility within a relatively short time (Hirshman, 2001, p. 119).

According to Coale (1992) modern economic development is accompanied by a major reduction in fertility of married couples; this change is designated as Fertility Transition.

K. O. Mason (1997) explains Fertility Transition as long term decline in the number of children from four or more per woman to two or fewer.

Further, R. Lee and Cyrus Chu (2000) assess Fertility Transition as a narrower concept than Demographic Transition; the latter also incorporates the decline in mortality and the changes in a population age distribution caused by changing vital rates.

According to Guilmoto and Irudaya Rajan (2005), "Fertility Transition is mainly a process of progressive reproductive change akin to social change and can be best understood as a continuous evolution that tends to sustain itself in ways that make additional change more likely".

FERTILITY TRANSITION: TRENDS AND LEVELS:

Fertility Transition since World War-II have typically been fast with fertility reaching replacement level in 20 to 30 years after the onset of the decline for those countries that have completed the transition.

C. R. Malaker (1997) while discussing 'population growth' and 'trends in fertility decline' in developing countries, says that in almost all countries there has been a phase of decline in fertility though transition will not occur at the same time and with the same speed in all developing countries. The Total Fertility Rate (TFR) of the less

developed regions has been declining continuously though their levels and trends vary markedly from region to region. In Africa TFR remained at a very high level of 6.6 children per woman during 1950-55.It declined marginally to reach a value of 6.2 around 1990.Looking at the future according to the medium variant, TFR will decrease to approximately 3 children per woman in 2025. There has been a marked decline in Asia, particularly in East and South East Asia. In Asia whereas TFR was around 6 in 1950s, the same has fallen to 3 in the 1990s. The decline is projected to reach a value of 2 in 2025. The fastest decline in Asia is primarily due to low fertility in East which has already attained a replacement level of fertility and is likely to reach below replacement level in 2005.

J. Knodel (1977) traces that modern Fertility limitation was largely absent prior to a secular decline in Marital Fertility both in Europe and Asia. Charles Hirshman and Y. J. Young (2000) discuss fertility Transition in South East Asia. Age Specific Fertility rates, Total Fertility rates and change in rates have been cited as evidence of Fertility Transition.

Over the past five decades numerous studies have explained levels, trends and differentials of fertility in India. Using the age distribution of the 1961 and 1971 Indian censuses, Adlakha and Kirk (1974) concluded that the level of fertility during the early 1960s did not differ from the level of early 1950s. As they summarized their findings: "The crude birth rate in India declined by between 7 and 10 percent, from a level of about 45 in 1951-61 to about 40.5-42.0 in 1961-71" (Adlakha and Kirk,

1974, p. 400). Extending the same data up to the 1981 census, Rele (1987) concluded that the total fertility rate remained stable at around 6 during the 1950s and into the first half of 1960s. The turning point in Indian fertility seems to have occurred around 1966, with an estimated TFR of 5.8 in 1971-76, 5.3 in 1971-76, and 4.7 in 1976-81. The estimate levels and trends of fertility for 14 major Indian states showed remarkable geographic consistency, with northern states having higher fertility than the southern states in 1961-66 and, with only slight modifications, in 1971-81.

Jain and Adlakha (1982) corroborated that the fertility rate in India before 1961 was high and stable. Their analysis indicated that the crude birth rate in India fell from 41 births per thousand in 1972 to 35-37 in 1978 and the decline was primarily caused by declining age specific fertility rates. As in the case of two national surveys, analysis of age distribution of the censuses of 1971 and 1981 suggested that a major fertility decline was underway during the intercensal period (Preston and Bhat, 1984). A large share of this decline probably occurred in late 1970s; the fertility reduction seems to have been slightly faster in southern states.

Assessing the degree of heterogeneity in fertility behavior within Indian states, Guilmoto (2000) concluded that fertility decline began in periphery along the coasts in the extreme south, and spread progressively to encircle the region around the Ganges valley, the heart of traditional India, where fertility has scarcely declined. The Hindi-speaking core region is characterized by high fertility, an entrenched patriarchal system, economic underdevelopment, predominance of Brahminical

influences, and exclusion of women from education In south India, Kerala has long been recognized for its rapid fertility transition, occurring in the absence of significant economic development as conventionally measured. Female literacy is the single most cited indicator in explaining this achievement. A few studies have also focused on the recent fertility experience of Tamil Nadu and of south India in general. Tamil Nadu is notable for achieving replacement level fertility without reaching Kerala's high level of female literacy or its low level of infant mortality. Using the state-level indicators of fertility a number of researchers grouped Indian states into two demographic regimes: south with low fertility and north with high fertility.

Very few studies pertain to fertility levels and trends at district level in India. Guilmoto and Irudaya Rajan (2001) focus on spatial structuring of reproductive behaviour in India at district level.

James and Subramanian (2003) look at the experience of Andhra Pradesh. They discuss that TFR has fallen from nearly 4.6 children per woman in 1970s to 2.5 children by 1997, a decline in tune of 2 children per woman during 26 year period.

FERTILITY TRANSITION: THEORIES:

K. O. Mason (1997) suggests that fertility theories can be used on three distinct time scales, and which scale is chosen can influence the nature and success of the theory. On a millennial time scale, the focus is on why all fertility declines have occurred during the last 200 years rather than, say, five centuries earlier or five centuries later.

On a centennial scale the question is why fertility transition in different countries or world regions have occurred first in Europe and its colonial offshoots during the nineteenth and early twentieth centuries approximately one century later in much of Asia and Latin America, and only recently in most of sub-Saharan Africa and Arab Middle East. Finally on a decadal scale, the question is why fertility decline began in one decade rather than another-for example, in the 1880s rather than 1890s.

Among all theories pertaining to fertility transition, for most demographers, the 'granddaddy' of fertility transition theories is classic demographic transition theory as described by Thompson (1930) and Notestein (1953) (Mason, 1997, p. 444). This theory attributes fertility decline to changes in social life that accompany, and are presumed to be caused by industrialization and urbanisation. These changes initially produce a decline in mortality, which sets a stage for-or by itself may bring about-fertility decline by increasing the survival of children and hence, the size of families. Urbanization and industrialization also create a way of life in which rearing more than a few children is expensive enough to discourage most parents from having large families.

Some theorists have given sociological explanation for the decline in fertility. Arsene Dumont suggests that an urge to rise in social scale brings down fertility. In the social scale a person least burdened with necessary burdens-that is, a person with a small family-will rise faster.

The ideational theory enunciated by Cleveland and Wilson (1987) attributes the timings of fertility transition to the diffusion of innovation and the way in which new technologies or forms of behaviour spread within a population. Cleland and Wilson emphasize that in case of birth control diffusion may be actively encouraged by government policies and programmes or it may occur in more spontaneous manner. They recognise that Africa poses a difficult case for pure diffusion theory. In Africa, parents want large number of surviving children. Under these conditions, information is unlikely to result in a fertility decline, although birth control may be adapted to desirable birth spacing.

Further Kingslay Davis (1963) in his 'theory of change and response' explains the decline in birth rates in developed countries. He says that it is known that even before the secular decline of birth rates in industrialised countries mortality rates had started declining, as a result of which the rates of natural increase had gone up. This happened in North West Europe as well as in Japan. The danger of this demographic situation of sustained increase was realised by people in industrialised countries and they responded by quickly postponing marriage embracing conception, utilising abortion and migrating outward.

The neoclassical microeconomic theory of fertility (Blake 1968; Schultz 1973) emphasizes three proximate determinants of couples' fertility choices: the relative cost of children versus other goods, the couple's income, and their preferences for children versus competing forms of consumption. This theory provides a quantifiable

framework for investigating fertility change, but as the theory is silent about the environmental and institutional conditions that change costs, income, or preferences, and thereby trigger fertility declines. Thus, in addition to problems in the theory's internal logic elaborated by Robinson (1997), the microeconomic theory of fertility decline can be faulted for adding little to classical demographic transition theory when it comes to insight into the institutional conditions conducive to fertility transitions.

Easterlin's framework (1975) elaborates the microeconomic fertility model by adding to it a sociological variable, the supply of children. The Eastrelin framework explains in terms of three proximate determinants: the supply of children, that is, the number of children that parents would bear in the absence of deliberate fertility control; the demand for children, or the number of surviving children they would like to have; and the cost of fertility regulation, where the costs are psychic, social and monetary costs. This framework has been useful for organising thinking about fertility decline.

Caldwell's theory of wealth flows (Caldwell 1976) attributes fertility decline to the emotional nucleation of the family, a change that may be triggered by either economic or cultural forces. At the heart of the theory is the idea that nucleation makes children, not parents the net beneficiaries of family life, a process that Caldwell calls the reversal of familial 'wealth flows'.

Some alternative hypotheses regarding fertility decline have been advanced in the past. One view virtually suggests: 'reduce mortality- infant and child mortality particularly- and fertility will take care of itself'. When the mortality rates have declined to a level at which couples feel confident of the survival of the minimum number of children they wish to have, the fertility rates may fall faster than the mortality rates (Rao, 1973). Though according to this view there may be a strong linkage between mortality and fertility, and fertility decline may be 'induced' by declining mortality, it is difficult to generate this proposition; there may be some socio-economic variables which are essential for such inducement to remain effective.

Although there are many theories of fertility decline, each containing important ideas, none provides for complete explanation for all known fertility declines.

Theoretical debates continue on how best to explain both the historical record of fertility decline in developed countries and the ongoing fertility transition in the developing world.

To resolve the debate over fertility transition it is most important to develop a research tradition on an explicit conceptualisation of how the many and varied dimensions of socio-economic development are linked to each other and to lowered fertility.

DETERMINANTS OF FERTILITY TRANSITION:

On the determinants of fertility change, the literature generally consists of statistical analysis involving individual, conceptual, and policy variables. The best of these studies offer insights into the responsiveness of fertility to specific interventions. When combined with cost information, the results can guide the design of appropriate policies to influence fertility. Past research can be roughly divided by discipline and by methodology. Three fairly large clusters of research can be considered under the headings of general socio economic studies, the microeconomics of fertility, and psychological approaches.

Socioeconomic determinants of fertility in developing countries can be classified according to level of analysis. A macro level analysis, with countries as unit of analysis, has attempted to determine threshold values of socioeconomic indicators that presage fertility decline (Kirk, 1996); to test the aggregate fertility effects of variables thought to be particular significance, such as the distribution of income (Repetto, 1979); and to assess the importance of family planning programme efforts relative to socioeconomic factors in recent fertility declines (Mauldin and Berelson, 1978). Closely related to this tradition, but carried out at household level are a large number of correlation and regression analysis of fertility. In these analyses fertility is arrayed against one or more explanatory variables-for example, household income, women's employment status and education. The accumulated empirical findings from these findings broadly confirm, what one might expect, that there is an inverse

relationship between variables measuring some dimensions of development or modernity and fertility.

For example the theme of women's status and roles encompasses an array of issues ranging from women's participation in economic life to their relative power in household decision making. Charles Hirshman and Y. Young (2000) suggest that much of the effect of socioeconomic development on fertility is mediated by the structure of women's role inside and outside the family. In their study pertaining to South East Asia they find that a substantial portion of fertility decline can be explained by temporal shift in women's status.

Dreze and Murthi (2001) in their study of fertility, education and development in India establish that the connection between female education and fertility is robust and female literacy has a negative and highly significant effect on fertility. Further, they suggest that women's education has potentially far-reaching role in fertility decline.

But some of the detailed results often show inconsistency for example Graff (1979) gives a sceptical appraisal of most widely accepted generalization- negative relationship between education and fertility. Certain of the difficulties associated with interpretation of these variables are due to an imprecision in specifying intermediate or proximate variables (Davis and Blake, 1956) through which socio-economic factors operate to effect fertility. The famous work by Bongaarts (1978) giving a

simple but powerful framework for analyzing these proximate determinants puts socioeconomic interpretations of fertility change on more secure footage.

Some of the studies have put emphasis on cultural factors in determining fertility transition. Various studies in North America and Europe have found notable differences between Catholic and non-Catholic, Christian and Jewish and Christian and Muslim Fertility (Mosher & Hendershot, 1984). Some studies show that the fertility behaviour of couples belonging to a particular religion is influenced by various factors. Couples at different socioeconomic settings may make different decision in spite of belonging to same religion (Alagarajan, 2003). Thus, change in the socio-economic levels of religious groups can bring changes in fertility levels.

Among the various socially-rooted determinants of fertility, the desire to have a son in the family has been quite significant. Although all societies in the world consider a family complete at the attainment of a son yet there are certain societies where there is a strong social or psychological pressure to have a son in the family due to certain customs and compulsions. One major insight on this subject comes from Dyson and Moore (1983), who see the low status of women in society as a common cause of son preference and high fertility. This conclusion receives further support from another argument, namely that son preference and high fertility derive from a common root, i.e. the economic and other advantage of having male children (Basu, 1989).

Another approach to fertility determinants focuses more narrowly on economic calculus of fertility choices. Econometrically, the empirical applications of economic models have often represented a substantial advance over ad hoc specifications of sociological analysis. Nevertheless, despite the greater statistical sophistication and more elaborate interpretations that result one is still dealing with regression coefficients usually involving the same set of variables as before. Further more the same in consistencies in estimated relationships between variables such as female education and fertility that are apparent in sociological literature persist among these studies.

If one accepts the Assumptions of these theories, the internal working of the households is revealed, but they are silent on what is going on outside the household. To some extent economists are constrained by poor and inadequate data and it is quite likely that better test of theory and sharper insights would follow from better data. The problems of limited scope and abstraction from larger settings remain, however, regardless of the quality of data.

A substantial number of studies of fertility determinants have focused on psychosocial aspect of fertility and fertility decision. The numerous KAP (Knowledge, Attitude, and Practice) surveys conducted in 1960s provided a large amount of information of cross-national information on fertility attitudes and preferences in addition to data on contraceptive. The extent of unmet need of

contraception that these surveys suggested gives an important impetus to the development of family planning programs in many countries of developing world.

Mason (1997) emphasises the importance of changing perceptions in bringing fertility changes. He talks about three changes: Changes in perception of child survival probabilities, changes in perceptions of child costs and benefit and changes in perception of the costs of postnatal versus prenatal controls (where costs incorporates social, psychological and financial costs).

Other psychosocial research includes attempt to underlying personality attributes such as components of 'individual modernization' to fertility (Williamson, 1970; Rosen and Simmons, 1971), as well as exploration of relationship between inter-spousal communication and contraceptive use (Yaukey, 1967).

Finally a great deal of research has been devoted to identifying and measuring the perceived costs and benefits (both economic and non-economic) of Children. Bulatao's (1981) has discussed the demand of children as revealed by the stated perception of respondents as an intermediate aspect of fertility determination. In addition, while some progress has been made in associating certain kinds of value shifts with fertility decline, the interpretation of these associations, as in the case of social and economic variables, is problematic when abstracted from the broader institutional and material context in which behaviour is situated.

The important facts about fertility transitions which have come out of this literature survey are as follows.

Fertility transitions occur under a variety of institutional, cultural, and environmental conditions; they occur when combinations of conditions are sufficient to motivate or enable a substantial portion of the population to adopt birth- prevention measures on a parity-specific basis.

Within a given geographic/ cultural region, the first country to undergo a fertility transition is likely to have experienced cultural, social structural or environmental changes that encourage fertility limitation. Other countries in the region that are not experiencing similar cultural, structural, or environmental changes may undergo transitions through the example set by the first country.

The speed with which influences travel from one country to another depends on a variety of factors, including the quality and population coverage of communications and transportation infrastructures, the extent to which a common language is shared, the nature of informal social networks, the power and stance of local and national leaders, and whether state policy promotes birth control.

Mortality decline is usually necessary condition for fertility decline, but is not normally a sufficient condition for that decline.

The number of surviving children that families can accommodate varies across pre-transitional populations.

When the number of surviving children exceeds the family's capacity to accommodate them, parents will resort to some form of offspring controls. These controls may be postnatal or prenatal, but in the absence of family planning programs, are initially more likely to be postnatal (migration, infanticide, adoption, child marriage) than prenatal (contraception).

The type of postnatal controls couples use depends not on whether too many or too few children are surviving to adulthood, but also on the forms of control that are culturally, environmentally, or structurally available or acceptable.

When the number of surviving children exceeds the family's capacity to accommodate them, changing conditions that effectively close off the pre-existing postnatal controls will encourage a switch to prenatal controls, especially if aided by state policy programmes.

1.3 AREA OF STUDY:

Since the introduction of Sample Registration System Data in the second half of the 1960s, there is fairly large information on the levels of fertility in India. However, there is certain amount of scepticism on the quality of SRS estimates of fertility particularly in the initial years. The analysis nevertheless, is carried out without

making any adjustment. Table 1.1 represents percentage annual decline in Total Fertility Rates (TFR) for India and sixteen major states for various periods since 1971.

The performance of states in fertility transition depicts that states in Northern India are far behind the states of south. On the basis of decline rates Punjab and Kerala are the pioneers in their respective regions with an average annual decline rate of 1.82 and 1.79 respectively during 1971-2001. On the other hand Uttar Pradesh with a decline rate of 1 percent per year and Karnataka with 1.52 percent per year stand last in their respective region. Therefore, Karnataka, Kerala, Punjab and Uttar Pradesh have been chosen for a detailed investigation and a comparative study of Northern and Southern states.

1.4 OBJECTIVES:

The following objectives have been pursued through the present paper:

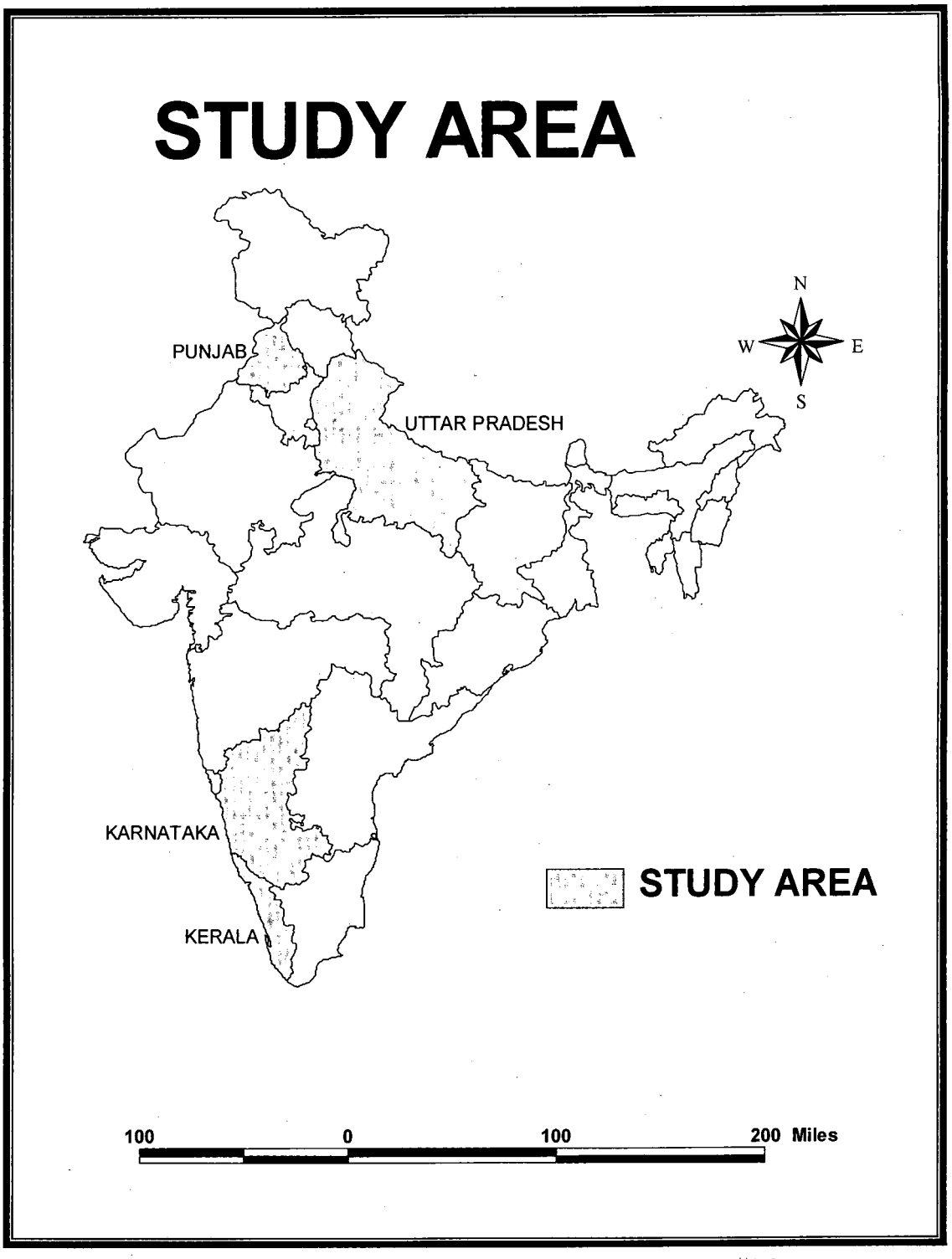
- To analyze the process of fertility transition in India.
- To examine the contribution of demographic, economic and social factors which have led to fertility decline in India.
- To compare the fertility differentials in Northern and Southern states of India.

Table 1.1: Percentage Annual Decline in TFR in India and States, 1971 to 2001

	1971-76	1976-81	1981-86	1986-91	1991-96	1996-01	1971-2001
INDIA	1.15	1.63	0.89	2.33	2.11	1.18	1.28
ANDHRA PRADESH	1.70	1.40	1.50	4.32	2.76	1.60	1.70
ASSAM	4.73	0.48	0.00	3.41	1.18	0.63	1.45
BIHAR	N.A.	N.A.	1.05	2.22	1.25	0.00	0.70
GUJARAT	2.81	2.45	1.86	2.56	2.35	0.67	1.64
HARYANA	1.88	2.76	1.32	2.44	2.93	1.71	1.67
HIMACHAL PRADESH	N.A.	1.00	1.05	2.78	4.52	0.83	1.42
KARNATAKA	3.18	0.54	0.00	2.22	3.75	1.54	1.52
KERALA	4.88	1.94	2.86	4.17	1.05	-1.11	1.79
MADHYA PRADESH	0.70	1.09	2.31	-0.43	2.55	0.49	0.99
MAHARASHTRA	4.00	0.00	0.56	1.71	2.50	2.14	1.48
ORISSA	0.83	1.30	2.33	1.58	2.29	1.94	1.39
PUNJAB	3.40	1.82	2.50	1.71	2.50	2.86	1.82
RAJASTHAN	2.86	0.74	-1.15	3.27	1.74	0.48	1.16
TAMILNADU	1.03	1.62	3.53	3.57	1.74	0.00	1.54
UTTAR PRADESH	2.09	0.67	0.69	8.57	1.15	0.82	1.00
WEST BENGAL	N.A.	N.A.	2.38	2.16	4.24	1.54	1.43

SOURCE: Registrar General of India, Ministry of Home Affairs, New Delhi, Sample Registration Bulletins, April, 1971 and October, 2001

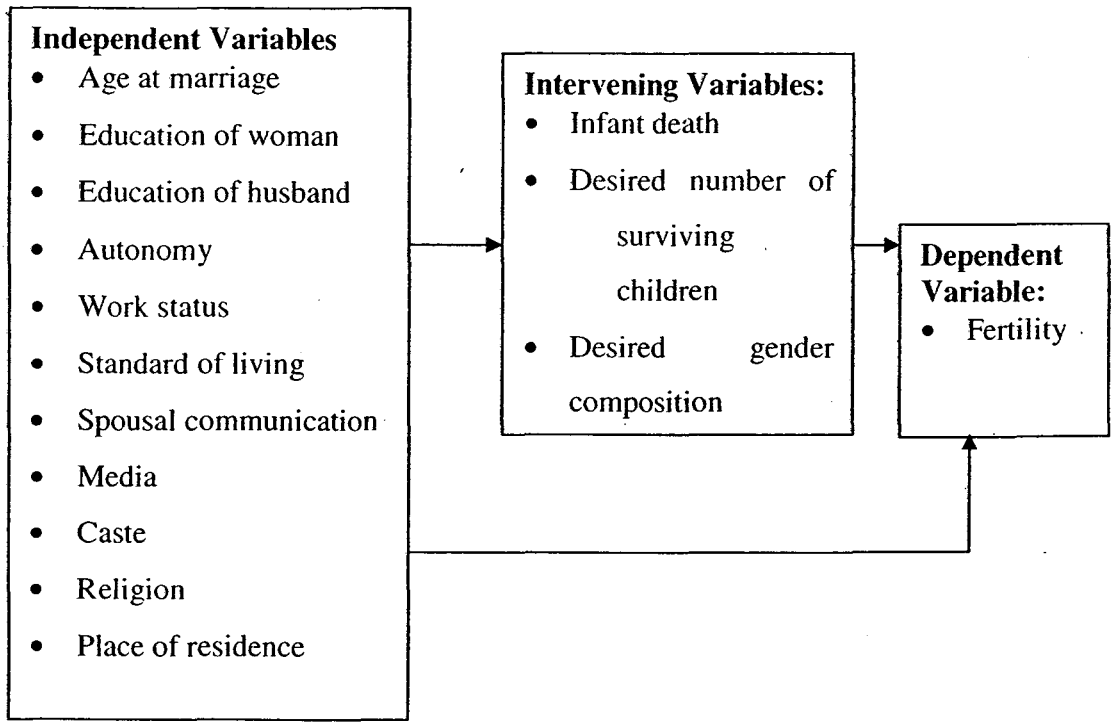
Map 1.1



1.5 CONCEPTUAL FRAMEWORK:

The conceptual framework helps in understanding the interrelationship between independent, intervening and dependent variables. The following figure illustrates that the socio-economic variables have direct and interactive effects on intervening variables which in turn have an impact on the fertility levels. It also depicts that some important changes in pre existing socio-economic and ideational conditions lead to change in levels of fertility.

Figure 1.1: Conceptual Framework



1.6 RESEARCH QUESTIONS:

The present work seeks to analyze following research questions:

- What are the trends of fertility decline in India across the states?
- What are the present fertility differentials within the country?
- What are the demographic, economic, social and administrative changes which have had a role in fertility transition?

1.7 DATA SOURCE:

In order to study the process of fertility transition empirically, following data sources have been used:

- Census of India 1971 to 2001: In the national periodic census a question on the number of births during the previous year is asked. Thus from census of India the following information about fertility are available:
    a) The number of births during last twelve months,
    b) The number of children ever born,
    c) Census age distribution.

    From census tabulation one also gets information on literacy, place of residence, religion, ethnicity etc. which have been used in analysis of determinants of fertility behaviour.

- Sample Registration System: In the absence of dependable vital rates from civil registration, the Office of the Registrar General, India, initiated a scheme of sample registration of births and deaths in India known as 'Sample Registration of Births and Deaths in India: Rural in 1964-65 on a pilot basis. The scheme became operational on full scale for both rural and urban areas from 1969-70 and was popularly known as 'Sample Registration System (SRS)'. The scheme envisages a large-scale demographic sample survey based on a dual record system.

  The main objective of SRS is to provide reliable annual estimates of birth and death rates at the state and national levels for rural and urban areas separately. It also provides various other measures of fertility and mortality.

- The National Family Health Survey: The National Family Health Survey (NFHS) which is a household sample survey was carried out in 24 states and National Capital Territory of Delhi during 1992-93. The NFHS has collected data from nationally representative sample of 89,777ever-married women in age group 13-49 from 88,562 household.

  During 1998-99 a second round of the NFHS, called the National Family Health Survey (NFHS-2) was conducted. The NFHS-2 covers a representative sample of about 90,000 ever- married women in age group 15-49 years, from 25 states in India. NFHS-1 and NEHS-2 provide state level estimates on various demographic and health parameters.

1.8 VARIABLES:

In order to analyze the factors affecting fertility transition Total Fertility Rate is used for a state level analysis. However, for the individual level analysis Children ever born would be used as a dependent variable.

DEPENDENT VARIABLES:

- Total Fertility Rate:

Total Fertility Rate is dependent variable at state level.

- Children Ever Born:

Children Ever Born to ever married women of age 15-49 years is dependent variable at individual level.

INDEPENDENT VARIABLES:

Census data:

- Education of the woman
- Education of the man
- Religion
- Caste
- Place of residence

SRS data:

- Child mortality

NFHS data:

Intervening Demographic variables

- Infant death
- Desired number of surviving children
- Desired sex composition of surviving children

Independent Variables

- Age at marriage
- Education of woman
- Education of husband
- Autonomy
- Work status
- Standard of living
- Spousal communication
- Media
- Caste
- Religion
- Place of residence

To study the interrelationship of these dependent, intervening and independent variables following methodology has been used.

1.9 METHODOLOGY:

STATISTICAL METHODS:

- Univariate Analysis

  Levels and Trends of fertility across states have been calculated.

- Bivariate analysis

  To assess the existing association between Independent and Dependent variables Co-Relation Matrix has been derived.

- Multivariate analysis

  To analyze the degree of relationship existing between Independent and Dependent variables 'Multiple regression analysis' for state level data and 'Logistic regression analysis' for individual data have been done.

CARTOGRAPHIC METHODS:

Maps displaying Total Fertility Rates at different points of time and decline in TFR at state level have been prepared. Line Graphs, bar diagrams, age and sex pyramids have been used to represent statistical data.

1.10 CHAPTER SCHEME:

The study is divided into five chapters. First chapter is an introduction to the study. It contains literature survey, introduction of study area, objective of the study, conceptual framework, data source, a brief introduction of variables, methodology applied in the study. Second chapter deals with the trends and levels of fertility

transition in India. Total Fertility Rate (1971-2001) and rate of decline in Total Fertility Rate has been analyzed in this chapter. Further change in age structure has also been explained in India and four states viz. Karnataka, Kerala, Punjab and Uttar Pradesh in order to understand the trends of fertility transition. Third chapter provides an overview of determinants of fertility transition. A state level analysis has been done to find out the role of different factors leading to fertility transition in India for 1981, 1991 and 2001. The fourth chapter is a comparative analysis of four North Indian and South Indian states based on NFHS-I and NFHS-II. The changes occurred in demographic, social and economic conditions in selected states during the period between surveys have been discussed. The impacts of social, cultural and economic variables on dependent variable (children ever born) have been assessed in all the four states. Chapter five is a summary of previous chapters with some concluding remarks. The policies and programmes related to fertility in India have also been discussed. This chapter also provides an overview of India's demographic progress in last five decades.

1.11 SUMMARY:

With a brief understanding of process of fertility transition and its possible causes put forward by various scholars, we are able to understand the magnitude and geography of fertility decline in India. The study of literature and conceptual framework will provide direction in unraveling the path followed by demographic change within Indian society. Within the context of India's cultural, economic and geographical diversity, the present work seeks to update our knowledge on magnitude of regional

variations in fertility transition in India. The following chapters are an attempt to describe and analyze the trajectory of fertility decline in India with a focus on North-South divide.

CHAPTER 2

FERTILITY TRANSITION IN INDIA: LEVELS AND RECENT TRENDS

CHAPTER 2

FERTILITY TRANSITION IN INDIA: LEVELS AND RECENT TRENDS

2.1 INTRODUCTION:

Current demographic trends reveal that the annual average population increase among the developing counties is more than twenty times than that of the developed world. Although the Crude Death Rates (CDRs) in both the groups are low, the average Crude Birth Rates (CBRs) in developing countries are nearly three times more than that of the developed countries.

Virtually all nations have experienced a decline in death rate sometimes before birth rates began to fall. Until recently, population change in developing world mainly reflected changes in death rates. Now the average death rate in the developing world stands at about 9 per thousands and more than 90 developing countries with youthful population have death rates that are currently below the average death rates experienced in the mature population of the developed world (Yadav and Sinha, 2003, p. 23). Birth rate trends in the developing countries will be the main determinant of population size just as they have been for decades in the developed world.

Indian fertility levels prior to the introduction of birth control were moderately high, yet below the levels that have been observed in many developing countries. Despite early age at marriage and the universality of marriage, periods of sexual abstinence and other cultural practices have kept the level of natural fertility lower than in European societies and have resulted in a fertility pattern in which Indian women completed childbearing early.

Analysis of available data indicates that fertility had declined substantially after mid 1960s. Prior to 1960 fertility in India was relatively high and remained virtually constant. Our knowledge on the level of fertility is sketchy for this period because of paucity of information on important demographic variables. For the period 1951-61, available estimates suggest that the crude birth rate was about 45.For the next decade 1961-71, different estimates of the birth rate based on census data of 1961 and 1971 vary between 40.5 and 42.0.

2.2 FERTILITY TRENDS:

Since the introduction of Sample Registration System Data in the second half of the 1960s, there is fairly large information on the levels of fertility in India. However, there is certain amount of scepticism on the quality of SRS estimates of fertility particularly in the initial years. The analysis nevertheless, is carried out without making any adjustment. Total Fertility Rates (TFR) and percentage annual decline in TFR for India and sixteen major states for various periods since 1971 are given in table 2.1 and table 2.2 respectively.

Table 2.1: Total Fertility Rate in India and States, 1971-2001

	1971	1976	1981	1986	1991	1996	2001
INDIA	5.2	4.9	4.5	4.3	3.8	3.4	3.2
ANDHRA PRADESH	4.7	4.3	4	3.7	2.9	2.5	2.3
ASSAM	5.5	4.2	4.1	4.1	3.4	3.2	3.1
BIHAR	N.A.	N.A.	5.7	5.4	4.8	4.5	4.5
GUJARAT	5.7	4.9	4.3	3.9	3.4	3	2.9
HARYANA	6.4	5.8	5	4.67	4.1	3.5	3.2
HIMACHAL PRADESH	N.A.	4	3.8	3.6	3.1	2.4	2.3
KARNATAKA	4.4	3.7	3.6	3.6	3.1	2.6	2.4
KERALA	4.1	3.1	2.8	2.4	1.9	1.8	1.9
MADHYA PRADESH	5.7	5.5	5.2	4.6	4.7	4.1	4
MAHARASHTRA	4.5	3.6	3.6	3.5	3.2	2.8	2.5
ORISSA	4.8	4.6	4.3	3.8	3.5	3.1	2.8
PUNJAB	5.3	4.4	4	3.5	3.2	2.8	2.4
RAJASTHAN	6.3	5.4	5.2	5.5	4.6	4.2	4.1
TAMILNADU	3.9	3.7	3.4	2.8	2.3	2.1	2.1
UTTAR PRADESH	6.7	6	5.8	5.6	5.2	4.9	4.7
WEST BENGAL	N.A.	N.A.	4.2	3.7	3.3	2.6	2.4

SOURCE: Registrar General of India, Ministry of Home Affairs, New Delhi, Sample Registration Bulletins, April, 1971 and October, 2001

Table 2.2: Percentage Annual Decline in TFR in India and States, 1971 to 2001

	1971-76	1976-81	1981-86	1986-91	1991-96	1996-01	1971-2001
INDIA	1.15	1.63	0.89	2.33	2.11	1.18	1.28
ANDHRA PRADESH	1.70	1.40	1.50	4.32	2.76	1.60	1.70
ASSAM	4.73	0.48	0.00	3.41	1.18	0.63	1.45
BIHAR	N.A.	N.A.	1.05	2.22	1.25	0.00	0.70
GUJARAT	2.81	2.45	1.86	2.56	2.35	0.67	1.64
HARYANA	1.88	2.76	1.32	2.44	2.93	1.71	1.67
HIMACHAL PRADESH	N.A.	1.00	1.05	2.78	4.52	0.83	1.42
KARNATAKA	3.18	0.54	0.00	2.22	3.75	1.54	1.52
KERALA	4.88	1.94	2.86	4.17	1.05	-1.11	1.79
MADHYA PRADESH	0.70	1.09	2.31	-0.43	2.55	0.49	0.99
MAHARASHTRA	4.00	0.00	0.56	1.71	2.50	2.14	1.48
ORISSA	0.83	1.30	2.33	1.58	2.29	1.94	1.39
PUNJAB	3.40	1.82	2.50	1.71	2.50	2.86	1.82
RAJASTHAN	2.86	0.74	-1.15	3.27	1.74	0.48	1.16
TAMILNADU	1.03	1.62	3.53	3.57	1.74	0.00	1.54
UTTAR PRADESH	2.09	0.67	0.69	8.57	1.15	0.82	1.00
WEST BENGAL	N.A.	N.A.	2.38	2.16	4.24	1.54	1.43

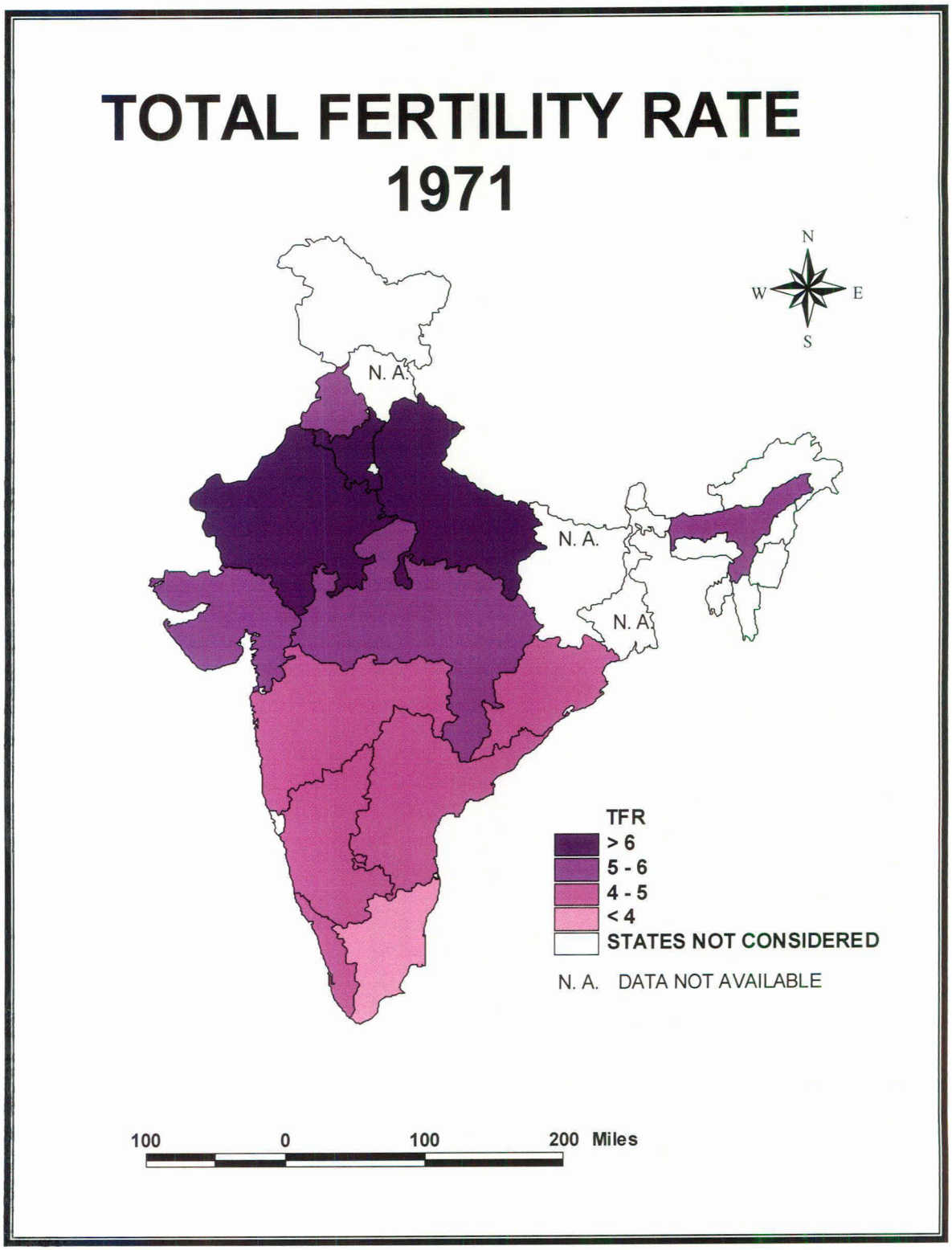
SOURCE: Registrar General of India, Ministry of Home Affairs, New Delhi, Sample Registration Bulletins, April, 1971 and October, 2001

These tables confirm significant decline in fertility rates at all India level. Fertility has dropped substantially in India and she has passed through various stages of fertility transition. There are three phases of fertility transition in India.

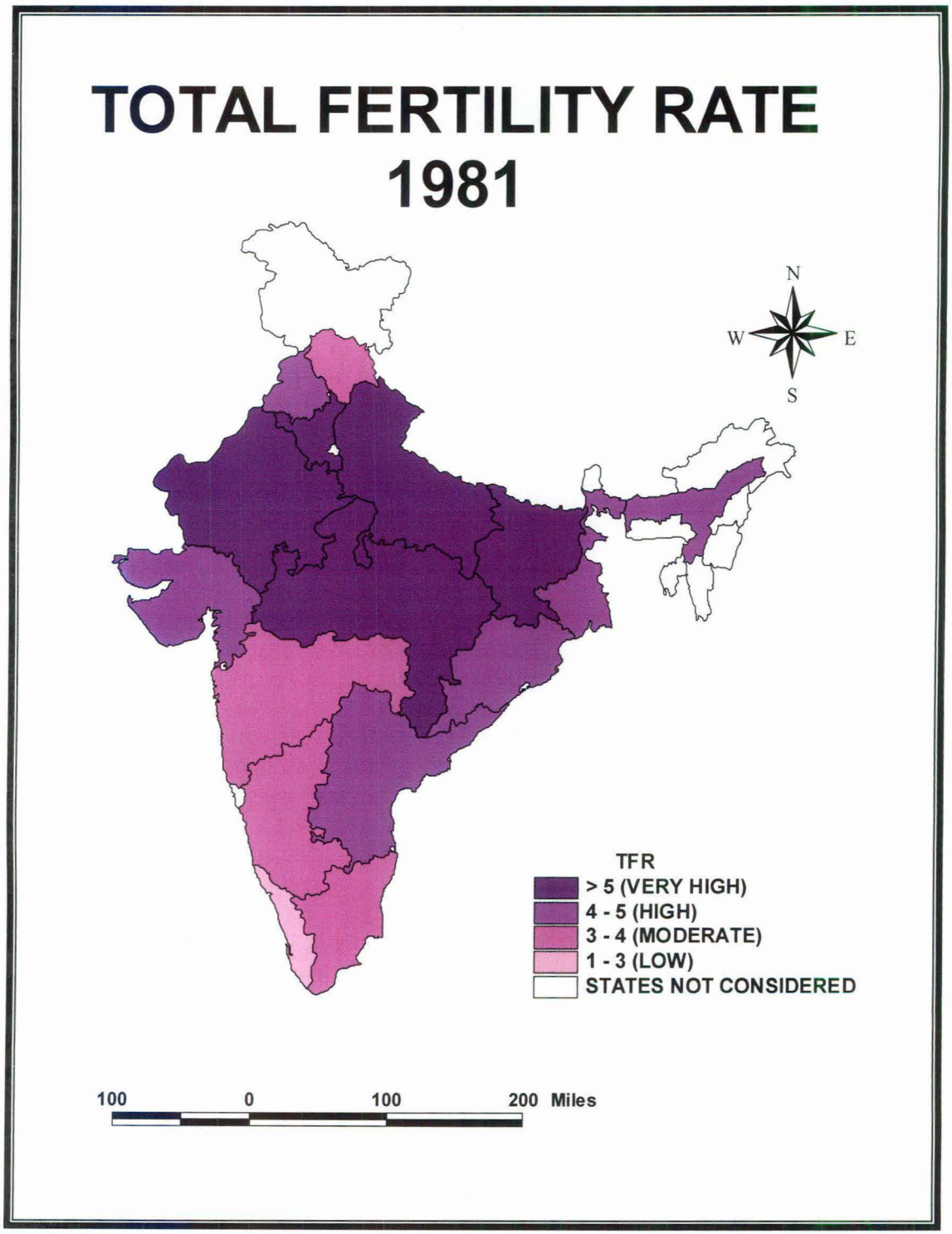
1. First Phase (1971-1981): A large share of this decline occurred in late 1970s, as the TFR declined from 5.2 in 1971 to 4.9 in 1976 and further to 4.5 by 1981. Fertility declined mainly due to strong push to sterilization programme during emergency period.
2. Second Phase (1981-86): The pace of decline slowed down in early 1980s. This was an impact of setback of the programme effect of excesses exercised during the emergency period.
3. Third Phase (1986 onwards): This is a period of rapid decline in fertility where TFR declined from 4.3 in 1986 to 3.2 in 2001. It is a normal period without excesses or setbacks.

On an average women in India now give birth to only 3.2 children as compared to about 5 children in early 1970s.During 1971-2001 our country has witnessed 1.28percent annual decline in fertility Rates (Table2.2).The percentage annual decline in TFR during 1971-76 was 1.15 which declined to .89 between 1981 and 1986. The decline hovered around 2 percent per year during 1986-96 and then came down to 1.18 percent during 1996-2001.

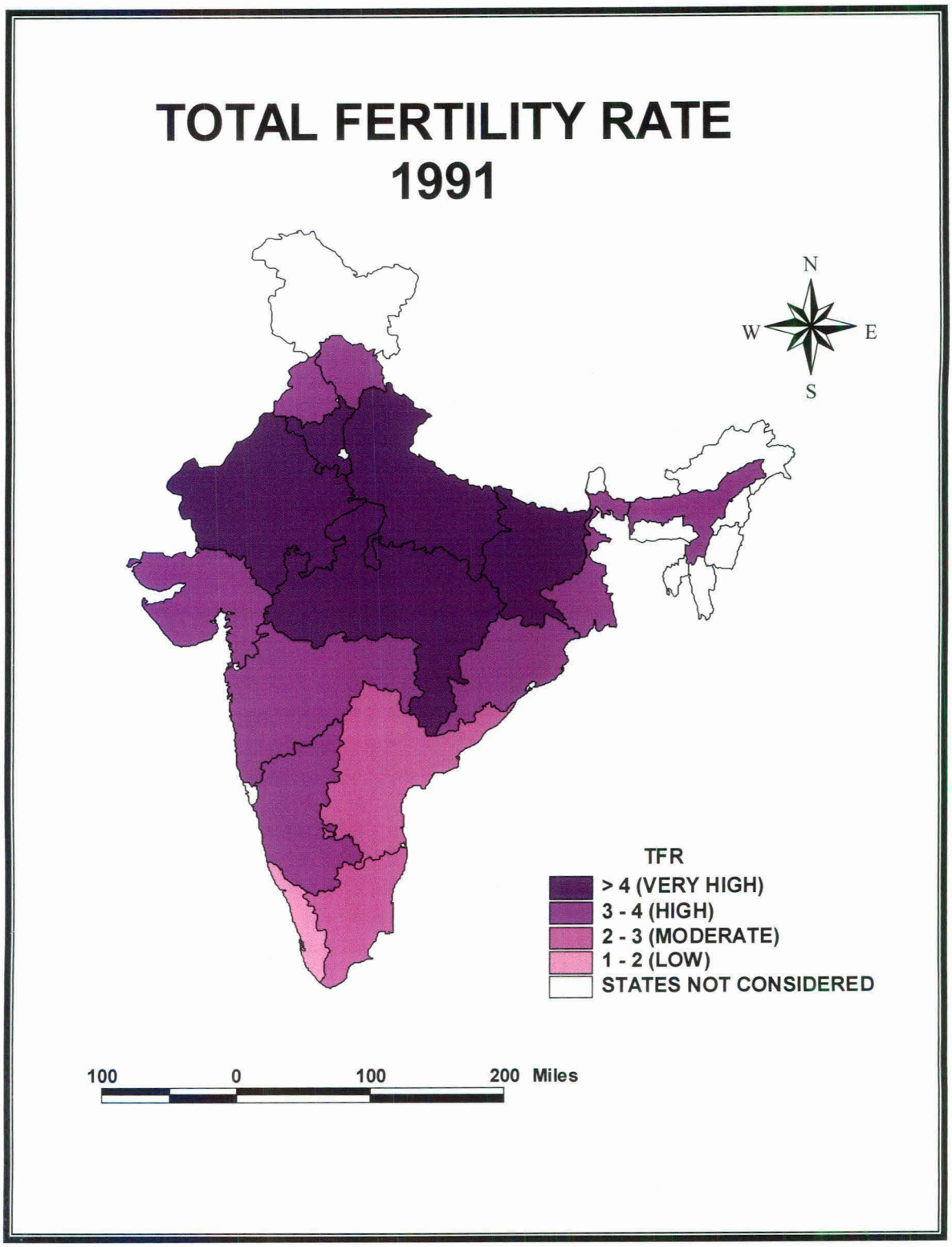
Map 2.1


TOTAL FERTILITY RATE
1971
N
W
E
S
N. A.
N. A.
N. A.
TFR
> 6
5 - 6
4 - 5
< 4
STATES NOT CONSIDERED
N. A. DATA NOT AVAILABLE
100
0
100
200 Miles

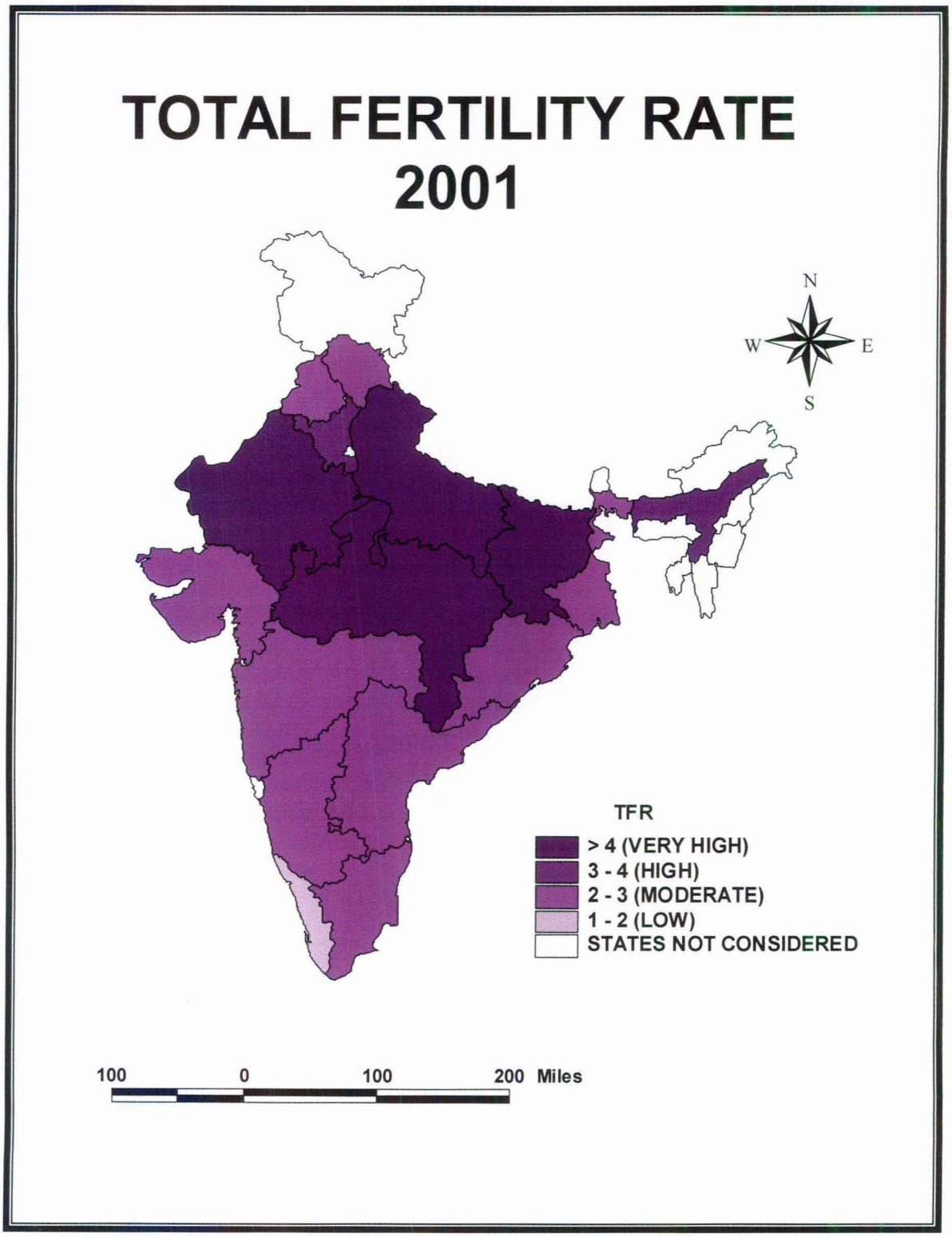
Map 2.2


TOTAL FERTILITY RATE
1981
N
W
E
S
TFR
> 5 (VERY HIGH)
4 - 5 (HIGH)
3 - 4 (MODERATE)
1 - 3 (LOW)
STATES NOT CONSIDERED
100
0
100
200 Miles

Map 2.3


TOTAL FERTILITY RATE
1991
N
W
E
S
TFR
> 4 (VERY HIGH)
3 - 4 (HIGH)
2 - 3 (MODERATE)
1 - 2 (LOW)
STATES NOT CONSIDERED
100
0
100
200 Miles

Map 2.4

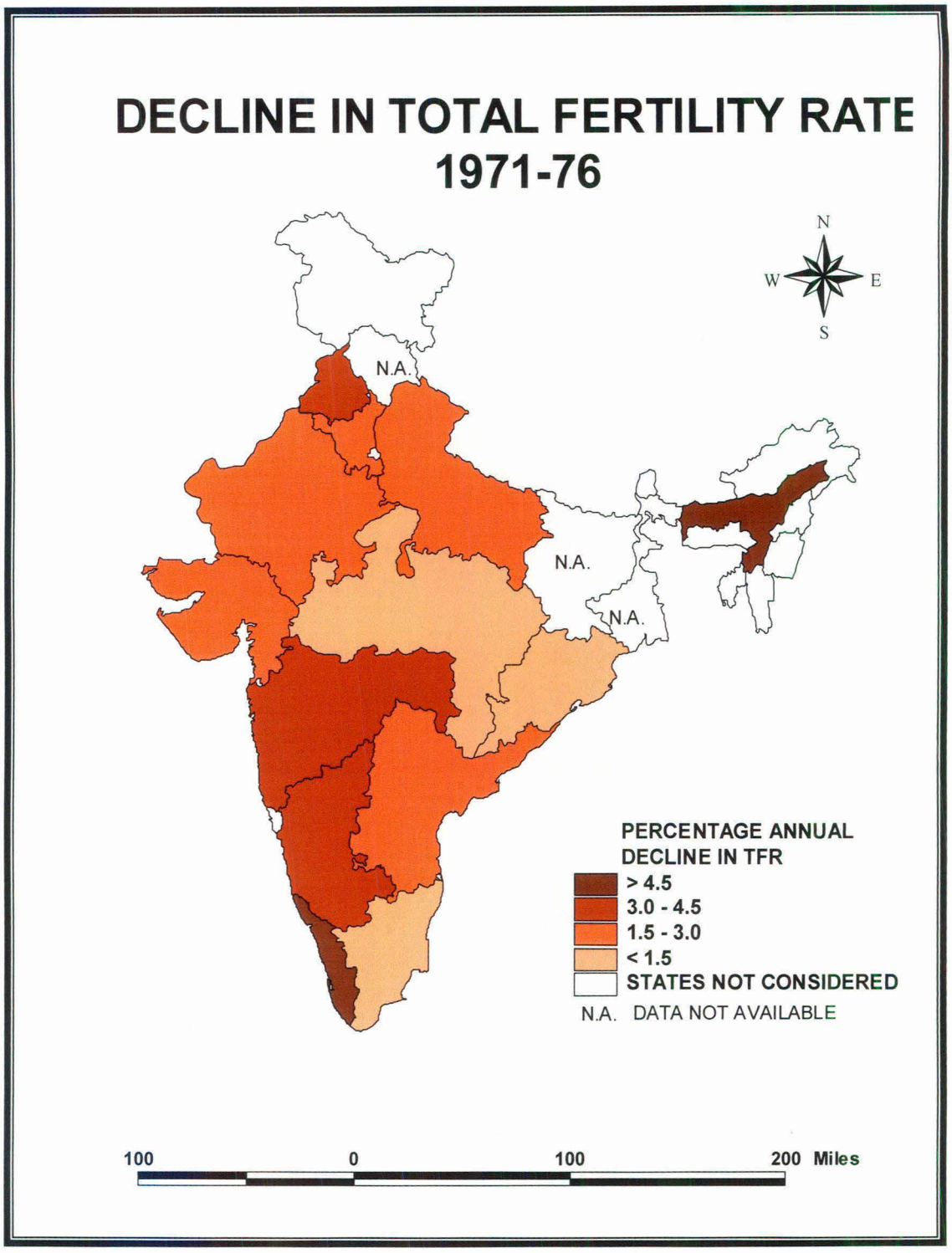

TOTAL FERTILITY RATE
2001
N
W
E
S
TFR
> 4 (VERY HIGH)
3 - 4 (HIGH)
2 - 3 (MODERATE)
1 - 2 (LOW)
STATES NOT CONSIDERED
100
0
100
200 Miles

During this period almost all the states have registered significant fertility decline. The Total Fertility Rate declined significantly in Andhra Pradesh during the late 1980s and early 1990s. The TFR of Andhra Pradesh is found to be less than national level estimates throughout this century. During the period 1971-81 decline in fertility was a bit slow, with a TFR of 4.7 and 4.3 in 1971 and 1976 respectively. The pace of decline in fertility accelerated, with an estimated TFR of 4 in 1981 to 3.7 in 1986 and to 2.3 in 2001. While comparing the TFR for various periods, it was observed the rate of decline in TFR was higher during 1986-96 as compared to about 1.5 percent per year during 1971-86. The decline rate has slowed down after 1996 and reached 1.6 percent per year in 2001.

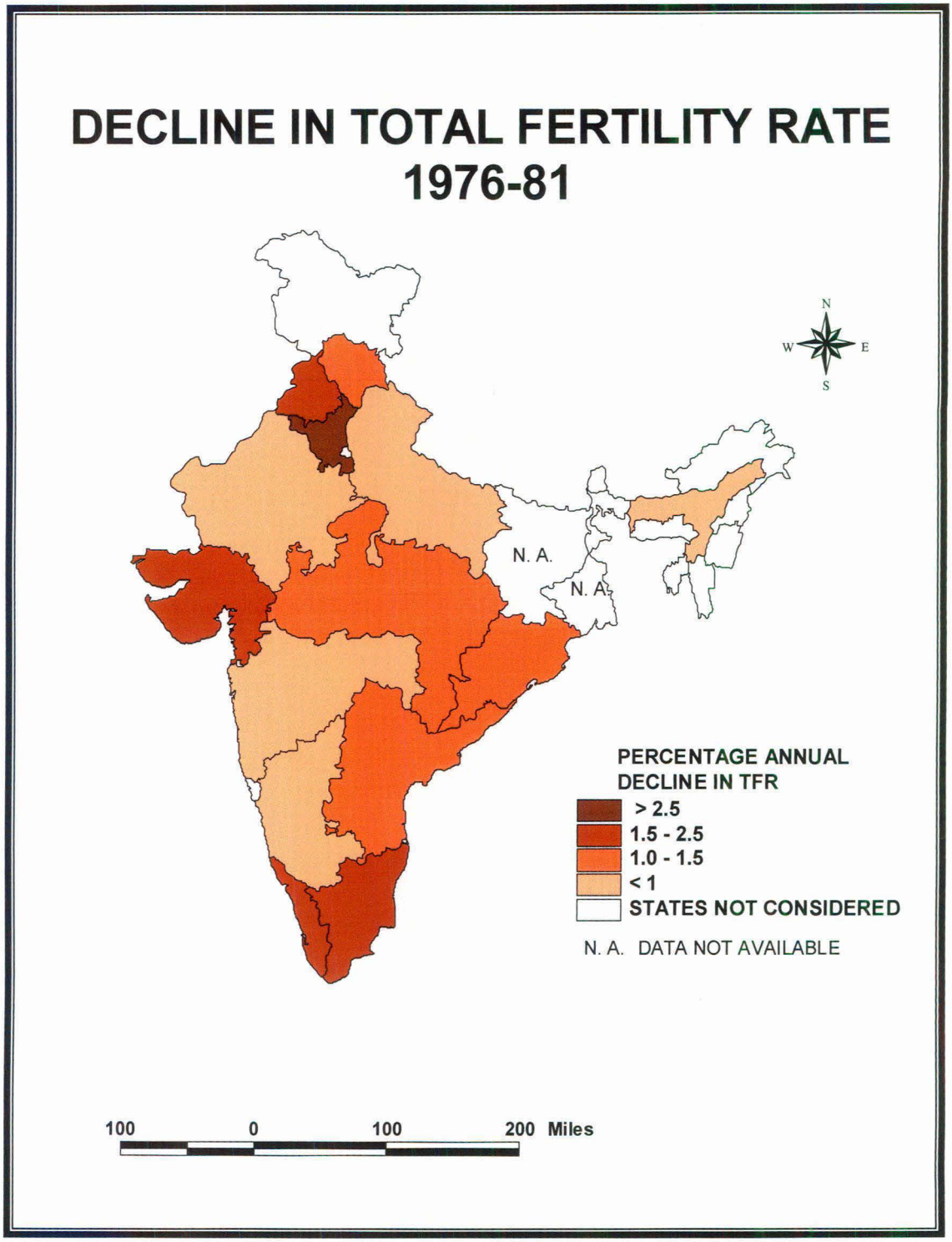
In Assam the TFR was above national average in1971 but 1976 onwards it came down significantly. The fertility rate has declined from 5.5 in 1971 to 3.1 in 2001, a decline of 3.1 percent per year during thirty year period. The percent annual decline was highest (4.73 percent per year) during 1971-76. The decline rate slowed down afterwards and reached naught during 1981-86. A surge in decline was witnessed during 1986-96, but again it slowed down to 0.63 percent per year during 1996-2001.

For Bihar the estimates of 1971 and 1976 are not available, thus the discussion is confined to two decades. There is not a substantial decline in Total Fertility Rate in Bihar during last two decades. The TFR has declined from 5.7 in1971 to 4.5 in 2001. The pace of decline in fertility has been very slow (about 1 percent per year) during

Map 2.5


DECLINE IN TOTAL FERTILITY RATE
1971-76
N
W
E
S
N.A.
N.A.
N.A.
PERCENTAGE ANNUAL DECLINE IN TFR
> 4.5
3.0 - 4.5
1.5 - 3.0
< 1.5
STATES NOT CONSIDERED
N.A. DATA NOT AVAILABLE
100
0
100
200 Miles

Map 2.6


DECLINE IN TOTAL FERTILITY RATE
1976-81
N
W
E
S
N. A.
N. A.
PERCENTAGE ANNUAL
DECLINE IN TFR
> 2.5
1.5 - 2.5
1.0 - 1.5
< 1
STATES NOT CONSIDERED
N. A. DATA NOT AVAILABLE
100
0
100
200 Miles

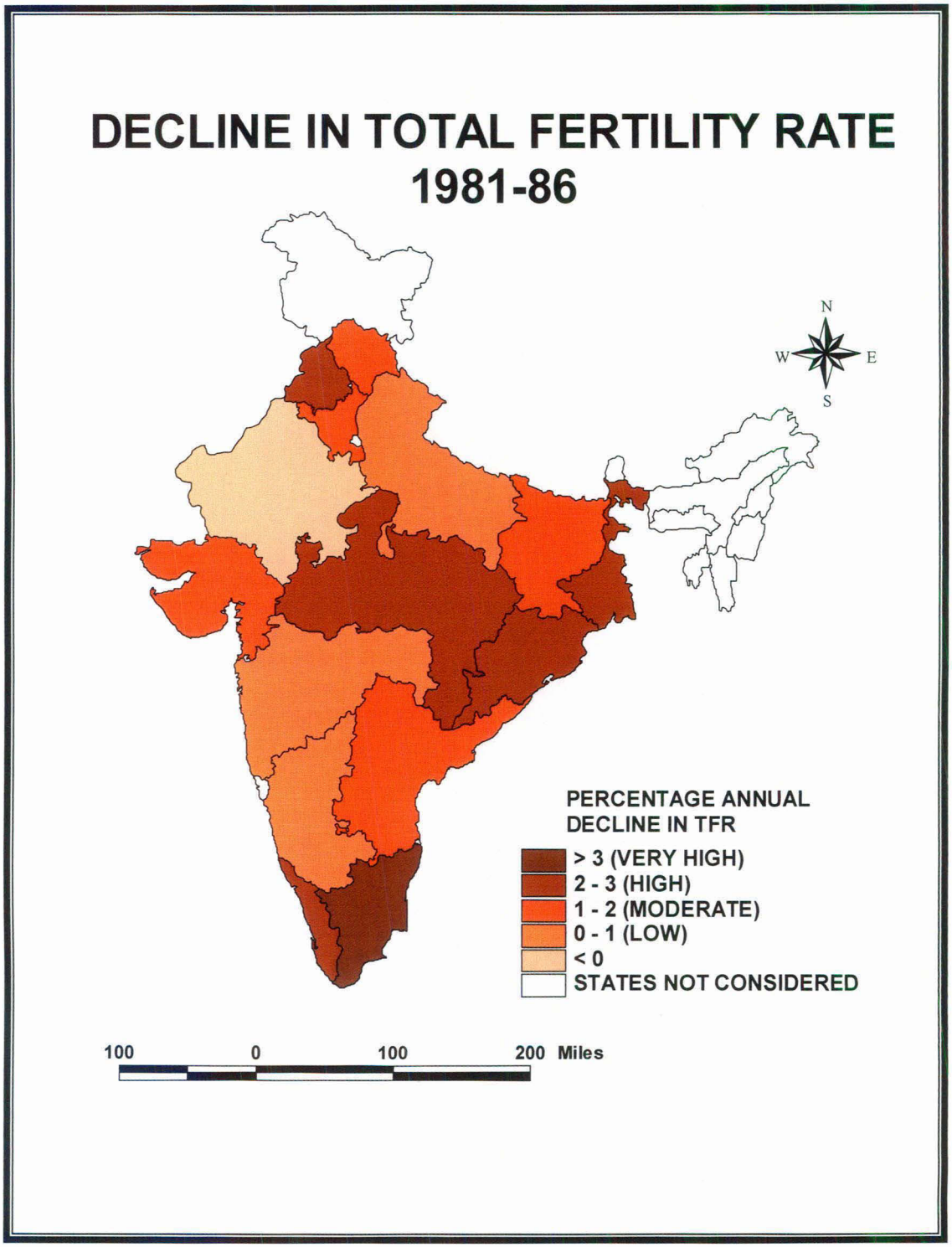
1981-86 and increased to 2.22 percent per year during 1986-91. The rate of decline was nil during 1996-2001.

The performance of Gujarat in fertility decline has been outstanding. In 1971 the TFR of the state was as high as 5.7 in 1971 but it declined to 4.3 in1981, further to 3.6 in 1991 and to 2.9 by 2001. During these three decades on an average the state has registered annual decline of 1.64 percent. The pace of decline in fertility was faster during 1971-76 (2.8 percent per year) compared to recent decades. The rate of decline became less than 1 during last five years.

The fertility transition in Haryana is witnessed by significant fall in Total Fertility Rates; which declined from 6.4 in 1971 to 5 by 1981 and further to 3.2 by 2001. The average annual decline during this period has been 1.67 percent. While comparing the TFR between various decades, it was observed that the rate of decline in the TFR is higher in recent years (2.93 percent per year during 1991-96) as compared to 1.88 during 1971-76 and 1.32 during 1981-86.

Himachal Pradesh is one of the few states in northern India which have a low fertility level. In 1976 TFR foe Himachal Pradesh was 4 which came down to 2.3 by 2001. In these twenty five years TFR has declined at a rate of 1.42 percent per year. The pace of decline has improved over a period of time except for past five years.

Map 2.7

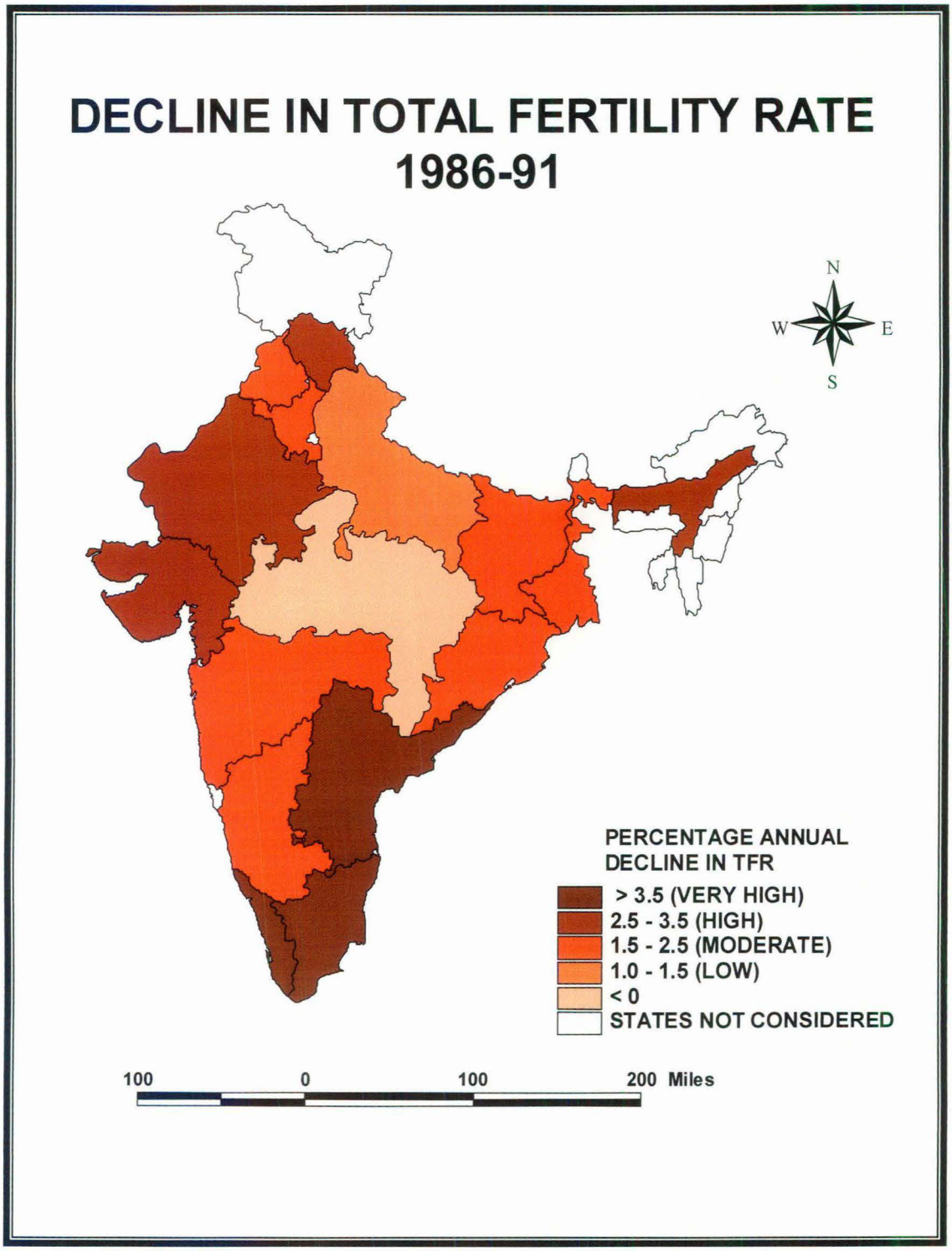

DECLINE IN TOTAL FERTILITY RATE
1981-86
N
W
E
S
PERCENTAGE ANNUAL
DECLINE IN TFR
> 3 (VERY HIGH)
2 - 3 (HIGH)
1 - 2 (MODERATE)
0 - 1 (LOW)
< 0
STATES NOT CONSIDERED
100 0 100 200 Miles

Karnataka has the highest TFR among southern states in 2001, notwithstanding the state of Karnataka has witnessed a significant decline in fertility rates. The TFR of Karnataka was 4.4 in 1971 which came down to 2.4 by 2001. The TFR declined 3.18percent per year during 1971-76, but this rapid pace could not been sustained decline was nil during 1981-86. After 1986 Karnataka again improved its performance in fertility decline as it registered 3.75 percent per year decline between 1991 and 1996.

Kerala has been the pioneer in fertility transition as it witnessed a tremendous decline in TFR from 4.1 in 1970s to 1.9 in 2001, a decline of 1.8 percent per year. Further, Kerala was the first state to achieve replacement level fertility at the beginning of the 1990s. At this stage many demographers in India and abroad thought that further decline would be unlikely. Against their predictions, Kerala's TFR declined further to 1.8 in 1996 and has registered a slight increase to 1.9 by 2001. In 1971 the TFR of Kerala was 4.4 which came down to 3.1 with a decline rate of 4.88 percent per year. The rate of decline of fertility although slowed down with the passage of time, it has always been well above the national average except last decade.

Madhya Pradesh, one of the 'BIMARU' states, has registered negligible decline in Total Fertility Rate, from 5.7 in 1971 to 4 in 2001. The rate of decline has also been slow, 0.99 percent per year. The trend in decline rate has never been consistent; it varied from 0.7 percent per year (1971-76) to 2.55 (1991-96).

Map 2.8


DECLINE IN TOTAL FERTILITY RATE
1986-91
N
W
E
S
PERCENTAGE ANNUAL
DECLINE IN TFR
> 3.5 (VERY HIGH)
2.5 - 3.5 (HIGH)
1.5 - 2.5 (MODERATE)
1.0 - 1.5 (LOW)
< 0
STATES NOT CONSIDERED
100
0
100
200 Miles

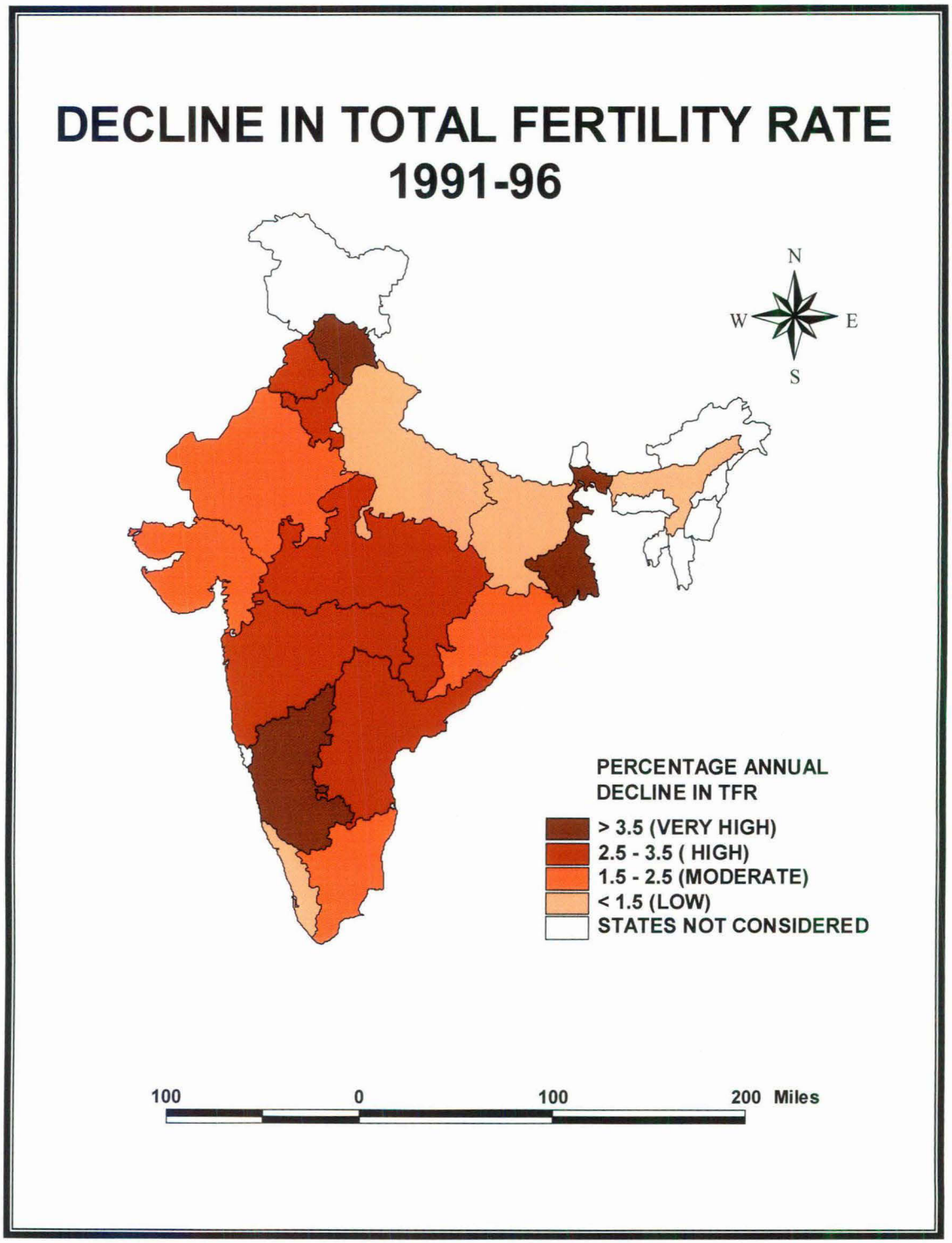
Levels of fertility in Maharashtra have always been lower than the national average. It declined from 4.5 in 1971 to 2.5 in 2001 with a rate of decline of 1.48 percent per year. The decline rate was highest during 1971-76 at 4 percent per year and lowest during 1981-86 (.56).

The performance of Orissa in fertility transition has been quite satisfactory. The TFR of the state has come down to 2.8 by 2001 from 4.8 in1971. The percent annual decline throughout this period has been 1.39. The pace of decline has been faster in recent years in comparison to 1970s and 1980s.

Punjab is the best performer in fertility transition among northern states. Its fertility has declined to 2.4 by 2001 from as high as 5.3 in 1971, with a decline rate of 1.82 percent per year. The decline rate has always hovered around 2 to 3 percent per year if we take percentage annual decline for five year periods into account.

Rajasthan is one of the high fertility rate states which have seen a very low decline in fertility rates. The TFR of Rajasthan has declined to 4.1 in 2001 from 6.3 in 1971, with a slow rate of 1.16 percent per year. The rate of decline was high (2.86 percent per year) in early 1970s but it slowed down and came to a halt during early 1980s. The decline in fertility picked up a good pace during early 1986-96 but once again it had slowed down.

Map 2.9

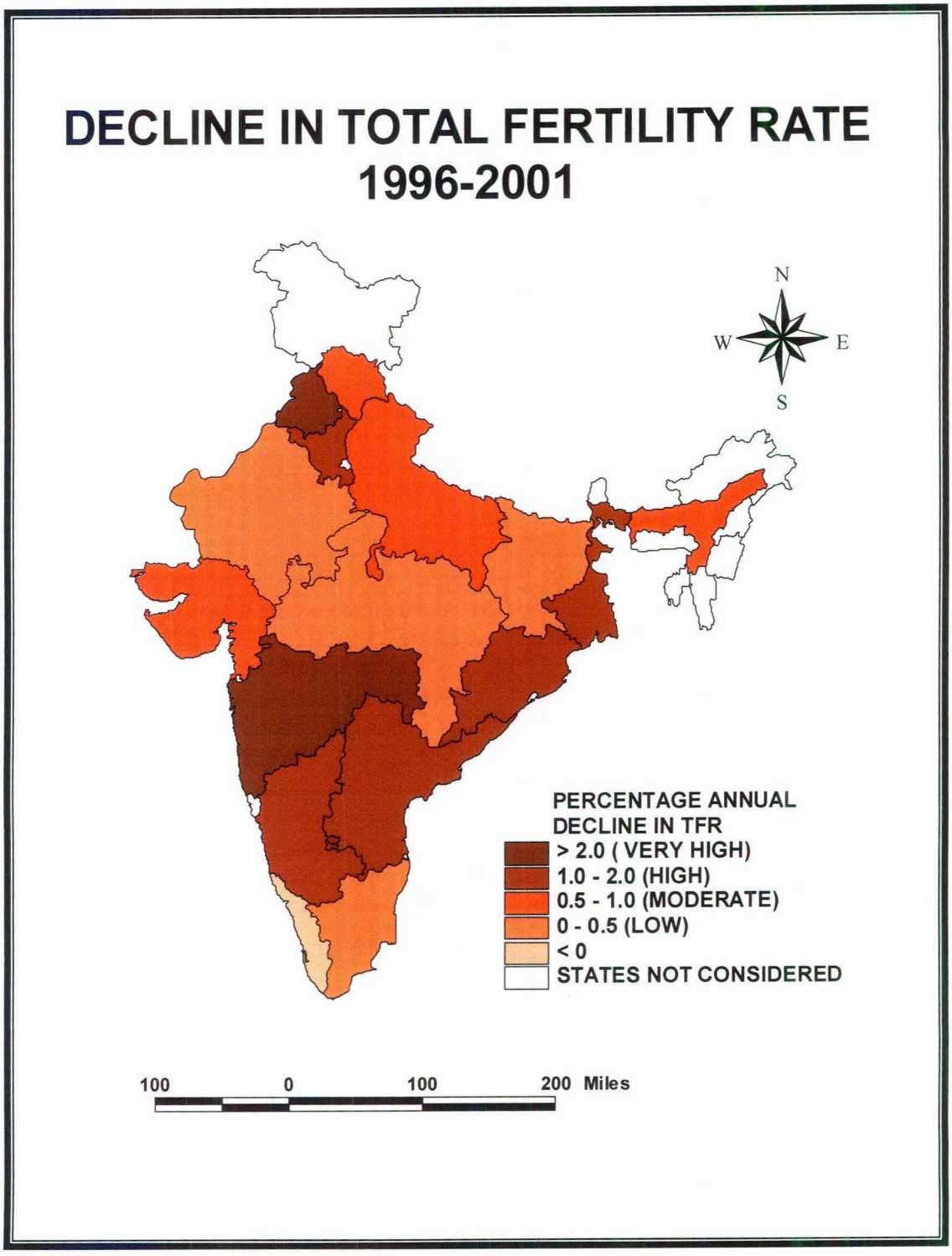

DECLINE IN TOTAL FERTILITY RATE
1991-96
N
W
E
S
PERCENTAGE ANNUAL
DECLINE IN TFR
> 3.5 (VERY HIGH)
2.5 - 3.5 (HIGH)
1.5 - 2.5 (MODERATE)
< 1.5 (LOW)
STATES NOT CONSIDERED
100
0
100
200 Miles

Tamil Nadu had the lowest fertility rate (3.9) in 1971 among Indian states and it declined to 2.1 by 2001, lowest fertility rate in the country after the state of Kerela. The decline rate shows a peculiar trend, it increased to 3.53 percent per year during 1981-86 from mere 1.03 percent per year during 1971-76 and again declined to 3.57 percent during 1986-91. The first half of last decade saw a decline of 1.74percent per year but in the second half the decline in TFR was nil. The average annual decline during these thirty years has been 1.54 percent per year.

Uttar Pradesh has always been the state with the highest TFR. The state TFR has come down from 6.7 in 1971, to 5.8 in 1981 and further to 4.7 in 2001. The rate of decline has been as low as 1 percent per year during the three decades. The pace of decline was higher during 1971-76 (2.09 percent per year) in comparison to last decade.

The reliable estimates of fertility for the state of West Bengal are available since 1981. The fertility levels have declined from a TFR of 4.2 in 1971 to 2.4 in 2001. The rate of decline in TFR hovered around 2.3 percent per year during 1980s which surged up to 4.24 during 1991-96. The percentage annual decline rate has again slowed down during 1996-2001.

Map 2.10


DECLINE IN TOTAL FERTILITY RATE
1996-2001
N
W
E
S
PERCENTAGE ANNUAL
DECLINE IN TFR
> 2.0 (VERY HIGH)
1.0 - 2.0 (HIGH)
0.5 - 1.0 (MODERATE)
0 - 0.5 (LOW)
< 0
STATES NOT CONSIDERED
100
0
100
200 Miles

Based on the above description a remarkably clear picture of the regional diversity in fertility levels and fertility transition has emerged. As far as levels of fertility is concerned: states in Northern India- Bihar, Madhya Pradesh, and Uttar Pradesh-have birth rates above the national average. Haryana showed no deviation from national average. On the other hand Southern states of Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu showed values well below national average. Only Punjab violated the North-South dichotomy. Among the Western states only Rajasthan had fertility levels well above national average whereas Gujarat and Maharashtra follow the southern pattern. Eastern states of Assam, Orissa and West Bengal have been close to national average.

The performance of states in fertility transition depicts that states in Northern India are far behind the states of south. On the basis of decline rates Punjab and Kerala are the pioneers in their respective regions with an average annual decline rate of 1.82 and 1.79 respectively during 1971-2001. On the other hand Uttar Pradesh with a decline rate of 1 percent per year and Karnataka with 1.52 percent per year stand last in their respective regions. It is interesting to note that the difference between the states with highest and lowest decline rate is much prominent in the Northern region as compared to the Southern states.

Figure 2.1: Fertility Transition in India and States, 1971-2001

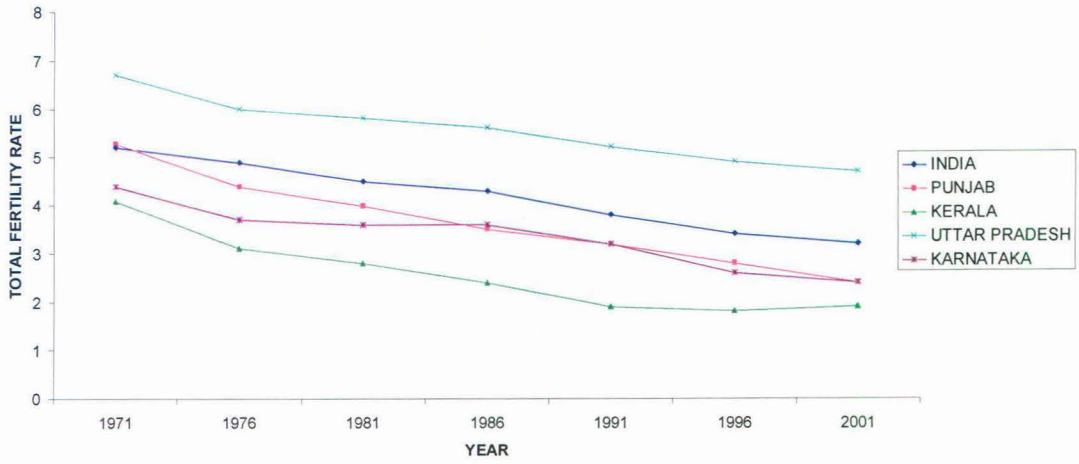
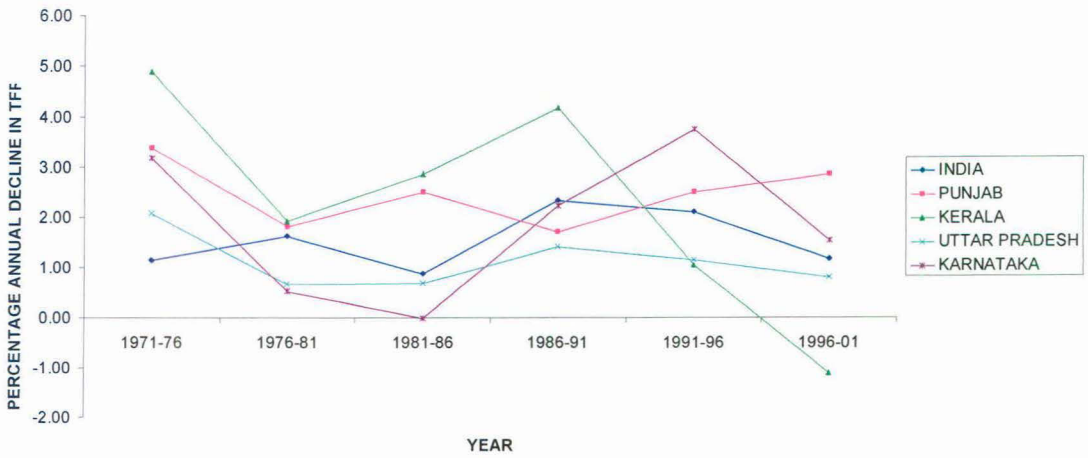


Figure 2.2: Decline in Total Fertility Rate, 1971-2001



2.3 AGE STRUCTURE:

Another factor which plays an important role in predicting demographic trends is the age composition of population. The age structure of a population refers to the number of people in different age-groups. The size of the various age groups does vary from one population to the other and also over the course of time.

The age structure of any population is most commonly studied with the help of a simple mathematical measure like the percent distribution and an equally simple measure like age and sex pyramid. Age and sex pyramids give a more detailed picture of age structure. The shape of the pyramid can indicate the history and the characteristics of the population portrayed.

Fertility, mortality and migration are responsible for determining the age structure of any population. Fertility levels directly affect Age structure and get affected in turn. Changes in birth rates are evident in population pyramids. Declining fertility is responsible for the shrinking of the base of the population pyramid. Further declining fertility levels cause an aging of the base as well as the apex of age pyramid and an increase in the proportion of adults, with a consequent high median age and an 'old population.' On the other hand Areas with a high proportion of young adults may be expected to have high birth rate figures.

Table 2.3: Age and Sex Structure of India and Selected States, 1971 and 2001

	INDIA				PUNJAB				KERALA				UTTAR PRADESH				KARNATAKA			
	1971		2001		1971		2001		1971		2001		1971		2001		1971		2001	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
0-4	15.9	16.4	9.3	9.8	14.5	15	9.1	8.3	15.1	14.4	9.1	8.3	15.9	16.6	12.3	12.7	16	16	9.4	9.3
5 - 9	14	14.2	12.4	13.1	13.7	13.8	11.2	10.5	13.5	13	8.4	7.6	14.3	13.7	15	14.9	13.8	14.5	10.8	10.7
10 -14	11.9	11.8	13.1	13.8	12.5	12.6	11.7	11.5	12.5	12.3	9.9	8.9	11.9	11.5	13.7	13.1	11.8	12.1	11.9	11.7
15-19	9.8	9.9	11	11.6	11	11	10.7	10.2	10.9	11.1	9.6	9.2	9.2	9.7	10.3	9	9.8	10.2	10.6	9.8
20-24	8.3	8.5	8.9	8.6	9.1	9.1	9.7	9.5	8.9	9.2	9.3	9.4	7.8	8.4	8	8.1	8.5	8.6	9.4	9
25-29	7.3	7.6	7.9	7.7	7.1	7.3	7.8	8.2	7.4	7.7	8.4	9.1	6.9	7.5	6.8	7.4	7.3	7.3	8.2	9.1
30-34	6.5	6.6	7.1	6.7	5.9	6.2	6.9	7.7	6.2	6.5	7.7	8.1	6.2	6.6	6.1	7	6.3	6.3	7.1	7.3
35-39	5.8	5.7	6.8	6.8	5.1	5.3	6.9	7.3	5.3	5.5	7.5	8	5.6	5.7	5.8	6	5.5	5.4	7.2	7.7
40-44	5	4.7	5.6	4.9	4.4	4.6	5.9	5.9	4.7	4.7	6.2	6.1	5	4.8	4.9	4.7	4.9	4.6	6.1	5.5
45-49	4.2	3.9	4.6	4.5	3.9	3.9	4.8	4.8	4.1	4	6.2	5.9	4.4	4	3.9	4.1	4.3	3.8	5.3	4.9
50-54	3.4	3.1	3.7	2.9	3.3	3.2	3.9	3.4	3.3	3.2	4.7	4.4	3.6	3.2	3.4	3	3.4	3	4.2	3.8
55-59	2.7	2.5	2.3	2.7	2.8	2.5	2.4	2.7	2.6	2.6	3.5	3.6	2.9	2.7	2.3	2.7	2.7	2.4	2.6	2.8
60-64	2	2	2.6	2.2	2.3	1.9	2.5	3	2	2.1	3.1	3.4	2.3	2.1	2.6	2.6	2.1	2	2.7	3
65-69	1.4	1.3	1.5	1.7	1.6	1.3	2.2	2.6	1.5	1.5	2.6	3.1	1.7	1.4	1.7	1.8	1.5	1.5	1.6	2
70+	1.8	1.8	3.2	3	2.8	2.3	4.3	4.4	2	2.2	3.8	4.9	2.3	2.1	3.2	2.9	2.1	2.3	2.9	3.4

SOURCE: India, Registrar General (1971 and 2001): Socio-Cultural tables c-14, India, New Delhi, Controller of Publications.

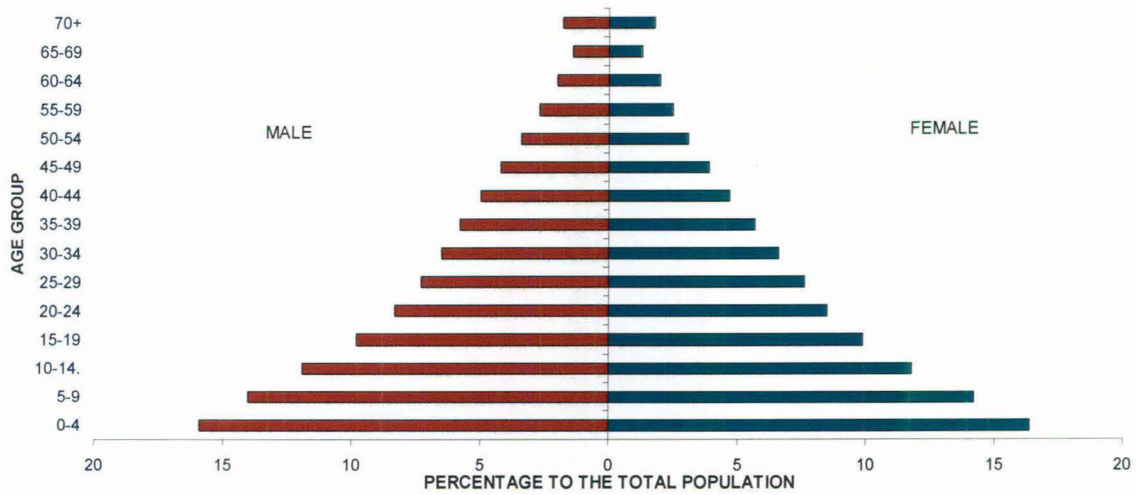
Based on age, Population is generally categorized into three broad groups, namely young, adult, and old. Usually population below 15 years of age is designated as young and that over 60 is old. The adult group (15 to 59 years of age) is called working age group.

Age structure can explain fertility transition. According to 1971 census more than 40percent of total population of India was young and only 5 percent of India's population was classed as 'old'. With the decline in fertility rates in 2001 less than 35 percent population was young.

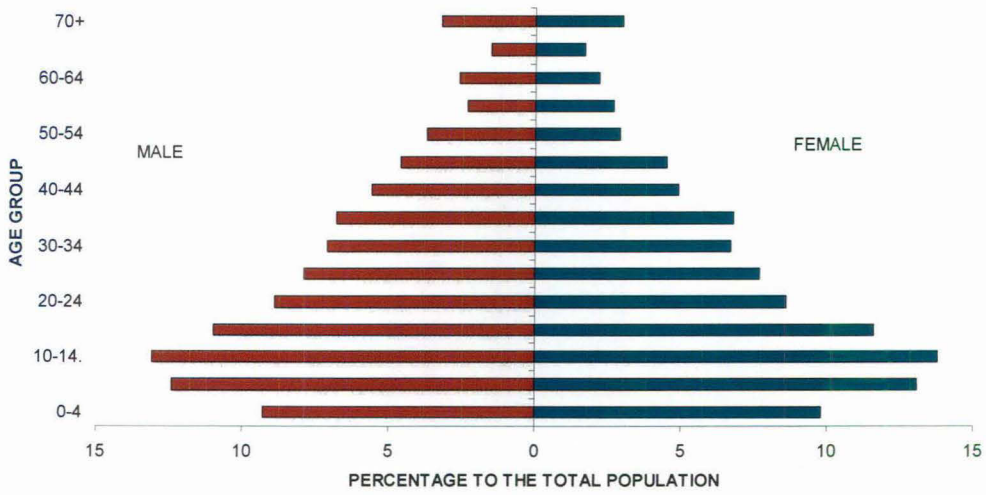
The impact of fertility decline in India can be appreciated by looking at age and sex pyramids for the periods 1971 and 2001.The age and sex pyramid of the Indian population for 1971 presents a very broad base tapering off towards the top; it is termed as expansive denoting an expanding population, with many children and a declining death rate. On the other hand in 2001 the broadest bar is of 10-14 age groups, which denotes the reduction in birth rate in recent past.

With accelerated decline in fertility in coming years, India is likely to improve its life expectancy at birth and increase in the share of its working age group of 15-65. The share of India's population in the age group of less than 15 years may experience a further decline and share of country's population in above 65 years of age would increase.

Figure 2.3: Age and Sex Structure of India, 1971 and 2001



1971

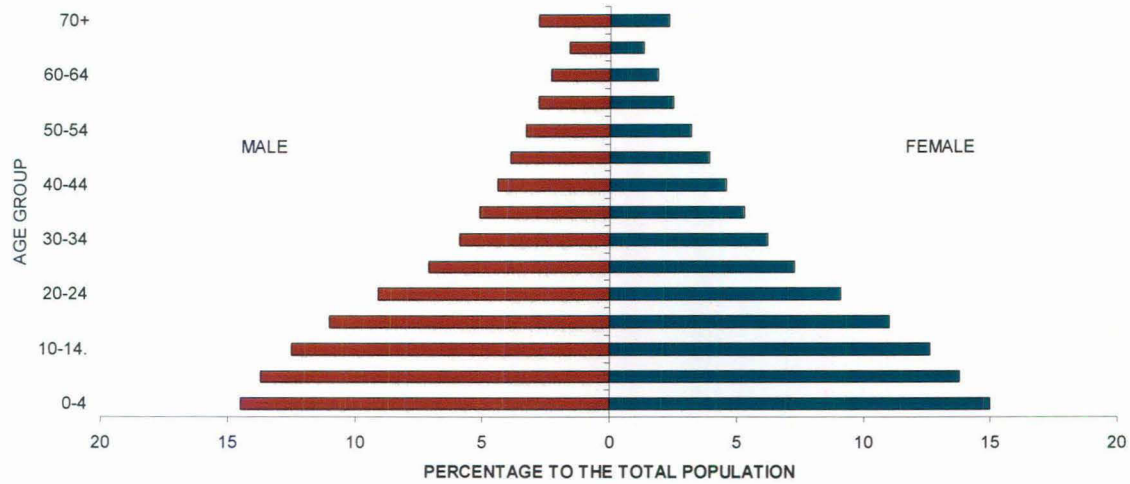


2001

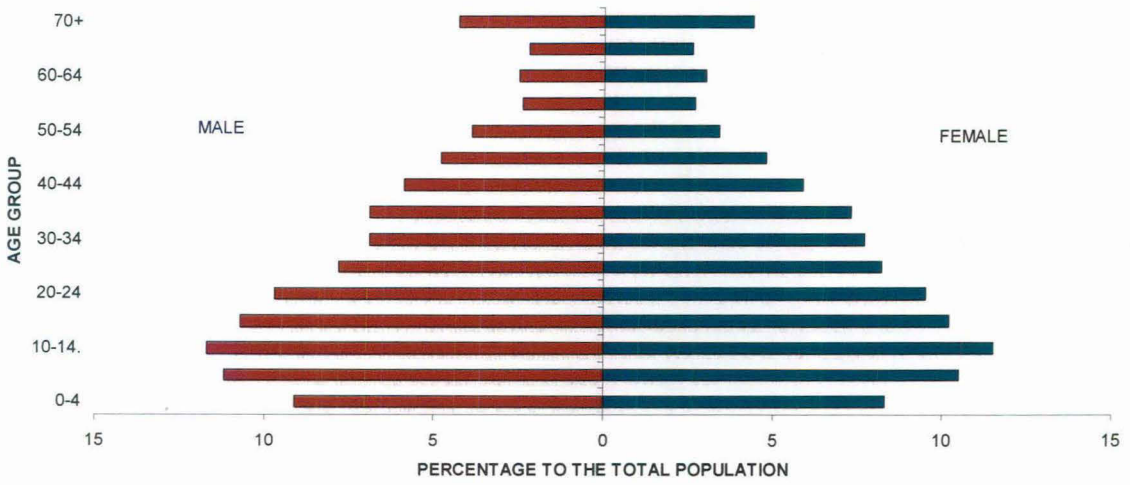
If comparisons between Northern and Southern states are made, one can notice that in 1971 more than 40 percent of Punjab's population was young which reduced to 32 percent in 2001 whereas, Kerala with the same proportion of young population as Punjab in 1971 has only 25 percent of population below 15 years of age. The difference in transition made by these two states can be understood with the help of age and sex pyramid for 1971 and 2001. In 1971 the age and sex pyramids for both the states depict an expanding population. In 2001 Punjab's age and sex pyramid illustrates the effect of reduction of birth rate in recent past on the other hand the shape of age and sex pyramid of Kerala resembles tall dome denoting a stable, slowly growing population with a decline in mortality and low birth rate.

While comparing Uttar Pradesh and Karnataka the North-South dichotomy becomes more evident. The proportion of young population in Uttar Pradesh has remained about 42 percent at both points of time but in Karnataka this proportion has decreased to 32 percent in 2001 as compared to 42 percent in 1971. The age and sex pyramids of both the states depict the difference. There is not much of change in age sex pyramid of Uttar Pradesh between 1971 and 2001; it has wide base and tapers to a pointed top. On the other hand age and sex pyramid of Karnataka shows a change from an expanding population to definite signs of declining birth rate.

Figure2.4: Age and Sex Structure of Punjab, 1971 and 2001

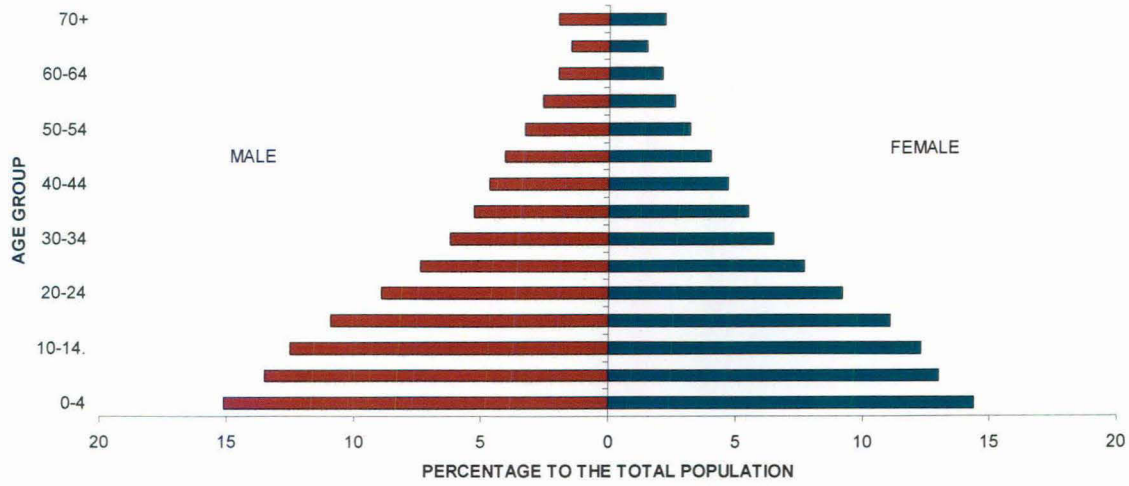


1971

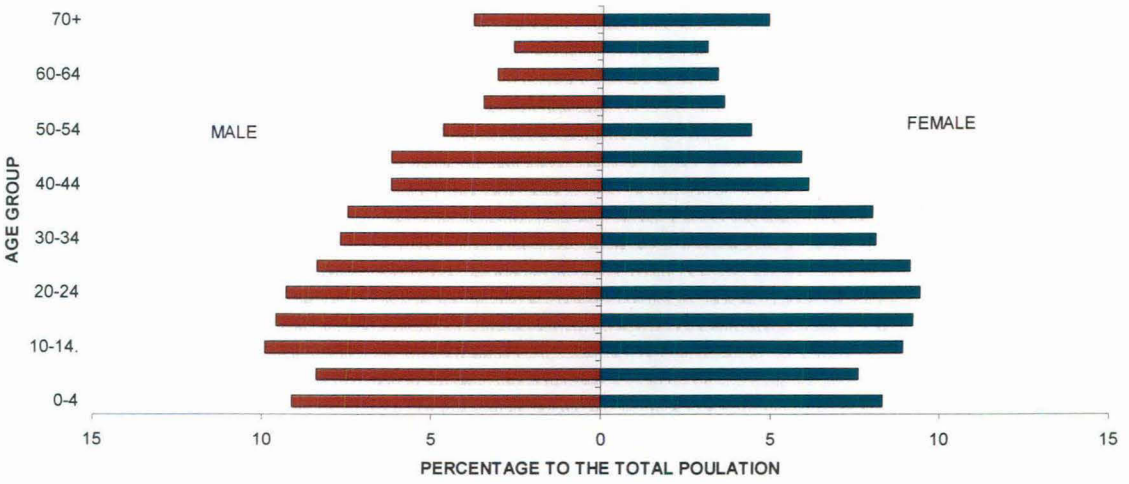


2001

Figure 2.5: Age and Sex Structure of Kerala, 1971 and 2001

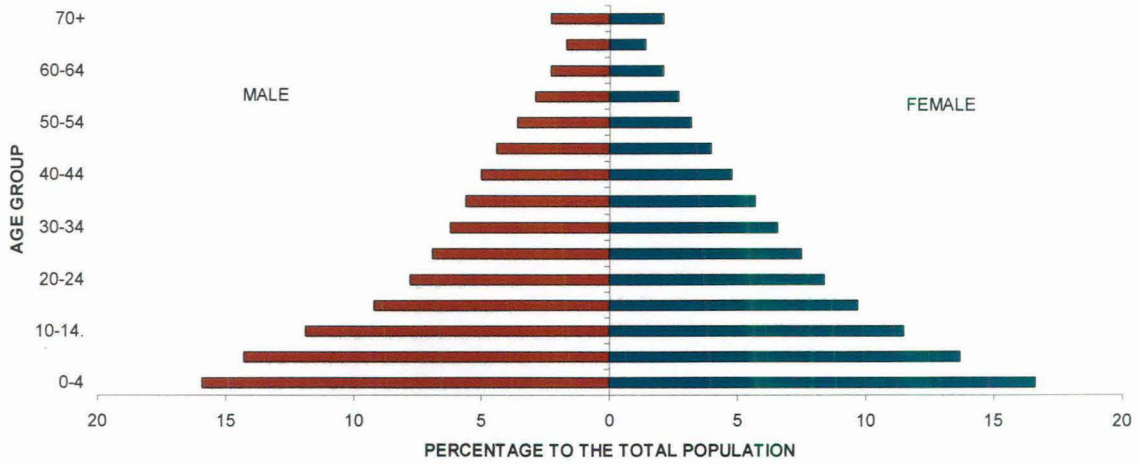


1971

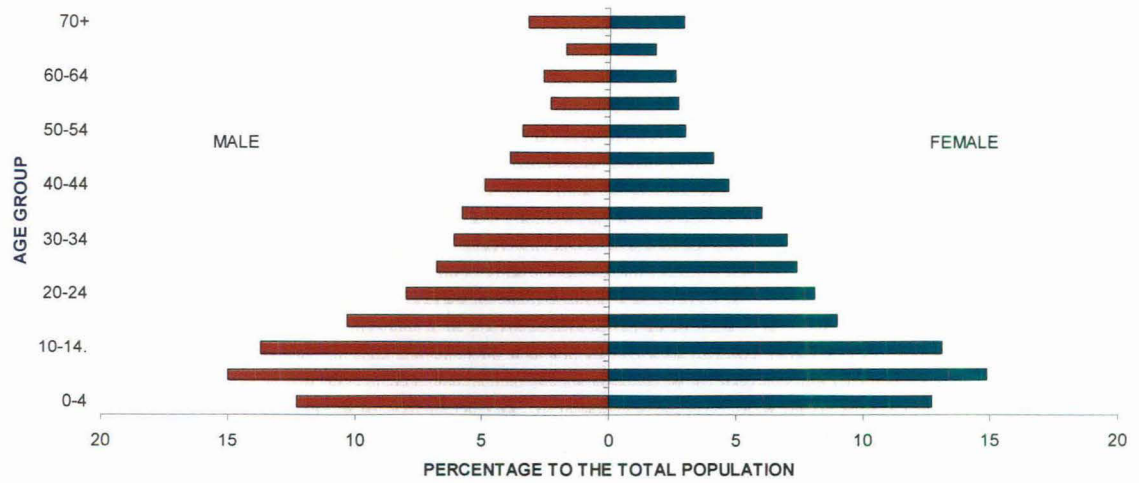


2001

Figure 2.6: Age and Sex Structure of Uttar Pradesh, 1971 and 2001

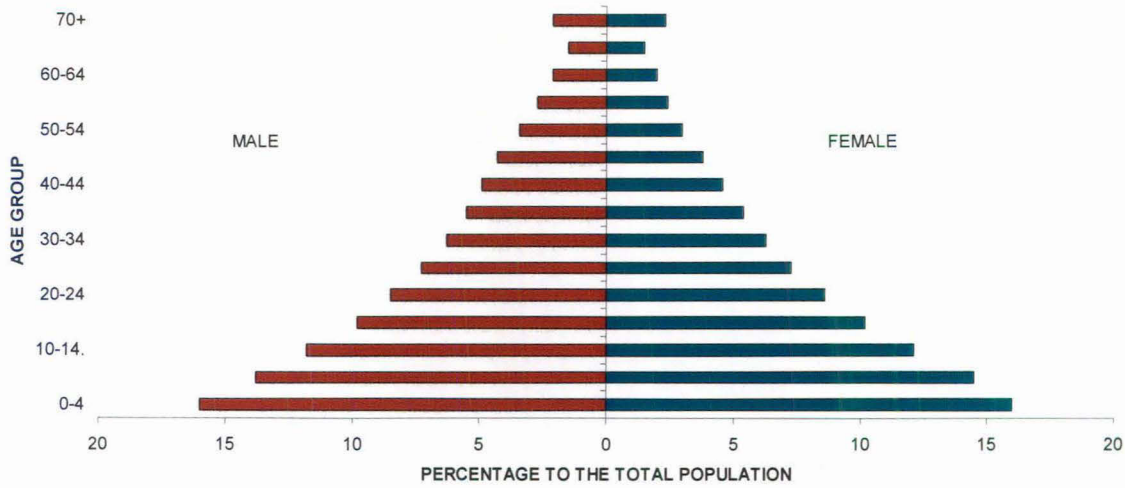


1971

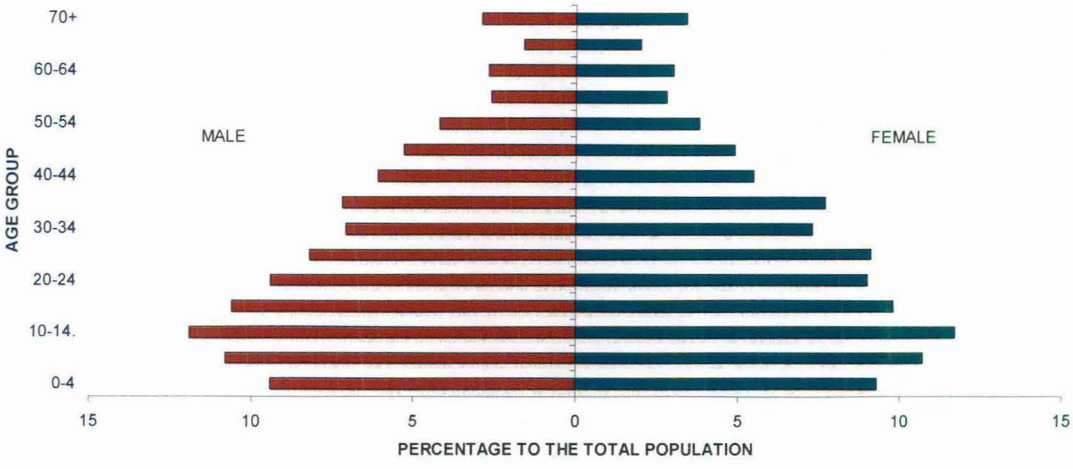


2001

Figure 2.7: Age and Sex Structure of Karnataka, 1971 and 2001



1971



2001

2.4 SUMMARY:

The above observations explain the general timing of the fertility transition and regional variations in transition as well. The North-South dichotomy in levels and trends of fertility transition is crystal clear. The south Indian states have low fertility rates and decline in TFR has been outstanding whereas the large and most populous northern states (BIMARU) states still have significantly high fertility rates. The contribution of BIMARU states in the fertility revolution of country is going to be much crucial in the years to come.

Extending the analysis to determinants of these differentials in the following chapters, an attempt would be made to understand the nuances of fertility transition in India.

CHAPTER 3

DETERMINANTS OF FERTILTIY TRANSITION

CHAPTER 3

DETERMINANTS OF FERTILTIY TRANSITION

3.1 INTRODUCTION:

A number of social scientists have tried to identify the determinants of fertility transition. Much of the controversy over the appropriate explanation of fertility change arises from assumptions that all fertility transitions follow a similar path and the same causal variables are present everywhere. The apparent uniformity of outcome covers diversity of individual country patterns- in the timing of onset of fertility decline, in the pace of change, and in economic and cultural circumstances. Explanations are similarly varied: initially cast in terms of responses to lower mortality and economic development; lately with greater attention to social influence and the source of ideational change.

Given these differences in interpretation of fertility transition and its aftermath, the assessment of factors behind fertility transition in India becomes necessary. There are a handful of competing, or perhaps complementary explanations. These include the spread of formal education and rise in adult literacy, modernization of economy, the impact of new ideas and aspirations, the family planning movement and improved survival.

Exploring structural, ideational and policy factors can provide a sophisticated understanding of contemporary fertility change in India.

3.2 FACTORS ASSOCIATED WITH FERTILITY TRANSITION:

In India, significant fertility changes have occurred during the last three decades accompanied by some social, economic and behavioural changes. The following analysis presents a picture of change in socio-economic conditions and their role in bringing fertility rate down in sixteen major states of India.

URBANIZATION

Urbanization is believed to reduce fertility because children are less likely to contribute to household production and are more difficult to supervise in an urban setting. In so far as fertility decline is in part a 'diffusion process,' it is also likely to proceed at a faster pace in urban areas, where people have greater exposure to mass media as well as wider opportunities to observe and discuss the lifestyles of other social groups.

FEMALE EDUCATION

Female education can be expected to reduce desired family size for a number of reasons, ranging from greater autonomy in defining fertility goals to enhanced receptiveness to modern social norms, reduced dependence on sons for social status and old age security, and the higher opportunity cost of time for educated women. In addition to reducing desired family size, female education is likely to affect the relationship between desired family size and planned number of births. One reasons for this is that female education reduces child mortality. Educated mothers thus need to plan fewer births in order to

achieve a desired family size. Female education may assist in achieving the planned number of births, especially by facilitating knowledge of and access to contraception and by enhancing women's bargaining power within the family.

MALE EDUCATION

In the existing Indian patriarchal society, male members are the ultimate decision-makers in the family including on reproductive choices. Thus education of male members is important in determining family size.

CULTURAL FACTORS

Cultural factors also affect fertility patterns in the Indian population. For instance, tribal populations have distinct kinship patterns and gender relations, including higher rates of female work force participation that may encourage lower fertility.

INCOME

The effect of income on fertility involves two basic issues. First, income effects are likely to be perceived as an economic burden or a productive asset. Higher incomes make children more affordable, but negative effects of income on fertility are also possible-for example, if parents substitute quality for quantity as income rises or if higher incomes are associated with a higher opportunity cost of time. On the other hand, children may be regarded as economic assets by some parents. Second, income effects are not independent of the source of additional income. For instance, if higher income reflects high adult

wage or high participation of women in labor force, the relationship between income and fertility is likely to be negative.

SON PREFERENCE

Son preference is one of the major factors associated with fertility transition. In India, the last rites of the deceased parents are to be performed by the son. Similarly, in the absence of age old homes, the parents in their old age are dependent upon their sons because there is a strong social prejudice against the parents living with their daughters. Thus, desire to have a son is strongest in Indian society. Desire for a specified number of sons often interferes with the transition towards small-family norms. On the other hand if sons and daughters are considered equally valuable few births are enough.

CHILD MORTALITY

If the probability of a newborn child reaching adulthood is low, parents tend to have more children to minimize the risk of ending up without any adult son or daughter. Thus, high child mortality leads to high fertility.

3.3 STATISTICAL ANALYSIS

VARIABLES:

The dependent variable analyzed here is state level Total Fertility Rate (TFR) available from Sample Registration System for 1981, 1991 and 2001.

Among explanatory variables urbanization is the share of the population residing in urban areas. The indicator of female education is female literacy computed as the per cent of literate females in age category of seven years and above and, similarly with male education. The shares of scheduled castes, scheduled tribes, and Muslims in the population are used as indicator of the social composition of different states. Poverty is measured by the headcount ratio: the proportion of population below the poverty line.

Gender bias in child survival is a good indicator of son preference. Hence, the ratio of female-to-male child mortality has been used as an index of son preference. Probability that a child will die before reaching fifth birthday has been used as an indicator of child mortality.

METHODOLOGY:

The following methodology has been applied in this chapter:

1. Karl Pearson's co-efficient: The strength of the linear association between two variables is quantified by the ***correlation coefficient***.

Given a set of observations (x_1, y_1), (x_2, y_2)... (x_n, y_n), the formula for computing the correlation coefficient is given by:

$$r = \frac{\Sigma XY - \frac{\Sigma X \Sigma Y}{N}}{\sqrt{\left(\Sigma X^2 - \frac{(\Sigma X)^2}{N}\right)\left(\Sigma Y^2 - \frac{(\Sigma Y)^2}{N}\right)}}$$

The correlation coefficient always takes a value between -1 and 1, with 1 or -1 indicating perfect correlation (all points would lie along a straight line in this case). A positive correlation indicates a positive association between the variables (increasing values in one variable correspond to increasing values in the other variable), while a negative correlation indicates a negative association between the variables (increasing values in one variable correspond to decreasing values in the other variable). A correlation value close to 0 indicates no association between the variables

2. Linear Regression:

The form of any linear relationship between a dependent variable 'y' and independent variable 'x' is given as:

$$Y = \acute{\alpha} + \beta x + U$$

Where the constant $\acute{\alpha}$ and β are the intercept and slope of the straight line and U is the error term. The basic objective of a regression analysis is to estimate the values of $\acute{\alpha}$ and β. The estimated least square form of this relationship is given by-

$$Y = a + bx$$

Where, *a=intercept*

b=slope of the line

Is an estimate of β and $a = y - bx$ is an estimate of $\acute{\alpha}$.

In multiple regression, more than one variable is used to predict the criterion. Predicted scores from multiple regression are linear combinations of the predictor variables. Therefore, the general form of a prediction equation from multiple regression is:

$Y=a + b_1 * X_1 + b_2 * X_2 + \ldots\ldots + bp * Xp$

Where Y is the predicted score,* X_1 is the score on the first predictor variable, *X_2 is the score on the second, etc. The Y intercept is a. The regression coefficients (b_1, b_2, etc.) are analogous to the slope in simple regression.

RESULTS:

Levels and trends of variables:

Table 3.2 indicates that fertility fell by 1.3 between 1981 and 2001. During the same period literacy increased, with female literacy achieving a larger improvement but from much lower base. In 2001, female literacy was 57.11 percent which is much lower than corresponding figure for men. Urbanization increased slowly between 1981 and 2001 from 21.09 percent to 26.29 percent. The percentage of scheduled castes and scheduled tribes to the total population has remained more or less the same during the two decades. The headcount index for poverty fell from 40.23 to 23 percent. The index of son preference shows virtually no change in the condition between 1981 and 2001.Child mortality registered a substantial drop from 34.36 o 17.60.

Table 3.1: Total Fertility Rate and other Variables, Major States 1981, 1991 and 2001

	TFR			FEMALE LITERACY			MALE LITERACY			POVERTY			URBANIZATION		
	1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001
ANDHRA PRADESH	4	2.9	2.3	20.52	32.7	51.2	39.13	55.1	70.9	28.91	22.19	15.77	23.25	26.89	27.1
ASSAM	4.1	3.4	3.1	N.A.	43	56	N.A.	61.9	71.9	40.47	40.86	36.09	N.A.	11.1	12.7
BIHAR	5.7	4.8	4.5	13.58	22	33.6	37.78	51.4	60.3	62.22	54.96	42.6	12.46	13.14	10.5
GUJARAT	4.3	3.4	2.9	32.31	48.6	58.6	54.53	73.1	80.5	32.97	24.21	14.07	31.08	34.49	37.4
HARYANA	5	4.1	3.2	22.23	40.5	56.3	47.78	69.1	40.5	21.37	25.05	8.74	21.96	24.43	29
HIMACHAL PRADESH	3.8	3.1	2.3	31.39	52.1	68.1	52.36	75.4	86	16.4	28.44	7.64	7.72	8.69	9.8
KARNATAKA	3.6	3.2	2.4	27.83	44.3	57.5	48.61	67.3	76.3	38.24	33.16	20.04	28.91	30.92	34
KERALA	2.8	1.9	1.9	64.48	86.2	87.9	74.03	93.6	94.2	40.42	25.43	12.72	18.78	26.39	26
MADHYA PRADESH	5.2	4.7	4	15.54	29.4	50.3	39.38	58.5	76.8	49.78	42.52	37.43	20.31	23.18	26.7
MAHARASHTRA	3.6	3.2	2.5	35.08	52.3	67.5	58.89	76.6	86.3	43.44	36.86	25.02	35.08	38.69	42.4
ORISSA	4.3	3.5	2.8	21.11	34.7	51	46.9	63.1	76	65.29	48.56	47.15	11.82	13.38	15
PUNJAB	4	3.2	2.4	34.14	50.4	63.6	46.59	65.7	75.6	16.18	11.77	6.16	27.72	29.55	34
RAJASTHAN	5.2	4.6	4.1	11.32	20.4	44.3	35.78	55	76.5	34.46	27.41	15.28	20.93	22.88	23.4
TAMILNADU	3.4	2.3	2.1	34.12	51.3	64.6	57.19	73.8	82.3	51.66	35.03	21.12	32.98	34.15	43.9
UTTAR PRADESH	5.8	5.2	4.7	14.42	24.4	43	38.89	54.8	70.2	47.07	40.85	31.15	18.01	19.84	20.8
WEST BENGAL	4.2	3.3	2.4	30.33	46.6	60.2	50.49	67.8	77.6	54.85	35.66	27.02	26.49	27.48	28

Continued..

	SCHEDULED CASTE			SCHEDULED TRIBES			MUSLIMS			SON PREFERENCE			CHILD MORTALITY		
	1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001
ANDHRA PRADESH	14.57	15.93	16.19	7.25	6.31	6.59	8.47	8.91	9.2	1.01	1.01	1.01	26.70	21.80	15.9
ASSAM	N.A.	7.4	6.85	N.A.	12.83	12.41	0.00	28.43	30.9	1.01	1.00	1.25	39.90	29.60	22.9
BIHAR	14.51	14.56	15.72	8.9	7.66	0.91	14.12	14.81	16.5	0.97	1.23	1.09	46.10	32.80	19.2
GUJARAT	7.15	7.41	7.09	19.13	14.92	14.76	8.53	8.73	9.1	1.01	1.30	1.13	40.40	29.20	19
HARYANA	19.17	19.75	19.35	0	0	0	4.05	4.64	5.8	1.21	1.27	1.21	30.40	24.10	18.5
HIMACHAL PRADESH	24.62	25.34	24.72	4.91	4.22	4.02	1.63	1.72	2	1.15	1.72	0.88	25.60	19.30	13
KARNATAKA	15.47	16.38	16.2	6.02	4.26	6.55	11.05	11.64	12.2	0.89	0.99	0.80	24.50	25.70	15.2
KERALA	10.02	9.92	9.81	1.24	1.1	1.14	21.25	23.33	24.7	0.79	0.84	0.94	10.80	6.10	3.3
MADHYA PRADESH	14.1	14.54	15.17	27.78	23	20.27	4.79	4.96	6.4	1.01	1.12	1.20	54.10	43.00	26.9
MAHARASHTRA	7.14	11.1	10.2	12.67	9.47	8.85	9.25	9.67	10.6	1.07	0.95	1.13	23.80	18.00	11
ORISSA	14.66	16.2	16.75	24.26	22.21	22.13	1.60	1.83	2.1	0.99	1.04	1.00	41.50	39.70	25.1
PUNJAB	26.87	28.31	2.85	0	0	0	1.00	1.18	1.6	1.16	0.94	1.36	23.50	21.90	15
RAJASTHAN	17.01	17.29	17.16	4.89	12.44	12.56	8.59	8.01	8.5	1.18	1.13	1.26	41.70	35.60	24.6
TAMILNADU	18.35	19.18	19	1.45	1.03	1.04	5.21	5.47	5.6	1.08	1.09	1.08	31.60	20.60	12
UTTAR PRADESH	21.16	21.04	21.15	0.24	0.21	0.06	15.93	17.33	18.5	1.24	1.23	1.20	55.90	41.30	26.8
WEST BENGAL	21.99	23.62	23.02	7.36	5.6	5.5	21.52	23.61	25.2	0.99	0.95	0.90	33.20	21.90	13.2

N.A. = Not Available

SOURCES: Registrar General of India, Ministry of Home Affairs, New Delhi, Sample Registration Bulletins, April, 1971 and October, 2001, for TFR and child mortality. Planning Commission, for poverty. The remaining variables are calculated from Census of India 1981, Social and Cultural Tables, part IV-A; Census of India, Series 1, paper 4 of 1984, "Household population by Religion of the head of the Household"; Census of India 1991, Social and Cultural Tables, part IV-B, Table C-3; Census of India 1991, Primary Census Abstract, General Population, Part II B(I)). Census of India 2001,General Population tables.

Table 3.2: Sample Means and Standard Deviations, 1981, 1991 and 2001

VARIABLE	1981	1991	2001
TFR	4.31	3.55	2.98
	(0.85)	(0.91)	(0.89)
FEMALE LITERACY	25.53	42.43	57.11
	(14.47)	(16.05)	(12.45)
MALE LITERACY	45.52	66.39	75.12
	(15.59)	(10.79)	(12.03)
POVERTY	40.23	33.31	23.00
	(14.89)	(10.89)	(12.82)
URBANIZATION	21.09	24.08	26.29
	(9.58)	(8.89)	(10.63)
SCHEDULED CASTE	16.45	16.75	15.08
	(5.80)	(6.07)	(6.16)
SCHEDULED TRIBES	8.41	7.83	7.30
	(8.87)	(7.49)	(7.27)
SON PREFERENCE	1.05	1.11	1.09
	(0.12)	(0.21)	(0.16)
CHILD MORTALITY	34.36	26.91	17.60
	(12.13)	(9.83)	(6.56)

NOTES: Means are unweighted.
Standard deviations in parentheses.

Correlation between variables:

The present section examines the results of the correlation analysis among the dependent and predictor variables. Such an analysis helps us to identify the relationship between dependent and predictor variables and also to notice the presence of common variance if any among the predictor variables.

The correlation matrix for the independent and dependent variables for 1981, 1991 and 2001 have been presented in tables 3.3 to 3.5.

In 1981, female literacy is highly negatively correlated (r=.815) to Total Fertility Rate. This was expected and explained by the fact that female education has a negative impact on fertility. Further child mortality is positively correlated (r=.783) to TFR, which confirms the fact that reduction in child mortality leads to rise in the confidence of child survival and therefore contributes in fall of the fertility rate. Other variables do not show any significant correlation with TFR, contrary to general belief that indicators of development and modernization are correlated to fertility levels. Among other variables, Female literacy shows a significant positive correlation with male literacy suggesting that in states where male literacy is high female literacy is also high. Female literacy has a strong negative correlation (r=.532) with poverty. Further female literacy has a negative correlation with child mortality suggesting that educated women are likely to be more knowledgeable about nutrition, hygiene and health care. In addition, basic education can be helping mothers to demand adequate attention to children's needs from others within the household, to take advantage of public health care services and generally to achieve

Table 3.3: Correlations between Variables, 1981

		TFR	FE_LIT	MA_LIT	POVERTY	URBAN	SC	ST	MUSLIM	SON_PRE	CHI_MOR
TFR	Pearson Correlation	1.000									
	Sig. (2-tailed)	.									
FE_LIT	Pearson Correlation	-.815**	1.000								
	Sig. (2-tailed)	.000	.								
MA_LIT	Pearson Correlation	-.472	.595*	1.000							
	Sig. (2-tailed)	.065	.015	.							
POVERTY	Pearson Correlation	.475	-.532*	-.094	1.000						
	Sig. (2-tailed)	.063	.034	.729	.						
URBAN	Pearson Correlation	-.413	.375	.205	-.396	1.000					
	Sig. (2-tailed)	.112	.152	.447	.129	.					
SC	Pearson Correlation	.162	-.246	-.190	.089	-.277	1.000				
	Sig. (2-tailed)	.550	.358	.482	.742	.299	.				
ST	Pearson Correlation	.130	-.212	.200	.484	-.119	-.152	1.000			
	Sig. (2-tailed)	.632	.430	.458	.057	.660	.575	.			
MUSLIM	Pearson Correlation	.091	.080	.079	.285	-.228	-.113	-.151	1.000		
	Sig. (2-tailed)	.737	.767	.770	.285	.396	.677	.578	.		
SON_PRE	Pearson Correlation	.489	-.314	-.344	.001	.079	-.478	.047	-.113	1.000	
	Sig. (2-tailed)	.055	.237	.191	.998	.770	.061	.862	.677	.	
CHI_MOR	Pearson Correlation	.783**	-.812**	-.441	.533*	-.386	.111	.533	-.126	.481	1.000
	Sig. (2-tailed)	.000	.000	.087	.034	.140	.682	.034	.643	.060	.

*** Correlation is significant at the 0.01 level (2-tailed).*

** Correlation is significant at the 0.05 level (2-tailed).*

Table 3.4: Correlations between Variables, 1991

		TFR	FE_LIT	MA_LIT	POVERTY	URBAN	SC	ST	MUSLIM	SON_PRE	CHI_MOR
TFR	Pearson Correlation	1.000									
	Sig. (2-tailed)	.									
FE_LIT	Pearson Correlation	-.712**	1.000								
	Sig. (2-tailed)	.002	.								
MA_LIT	Pearson Correlation	-.460	.894**	1.000							
	Sig. (2-tailed)	.073	.000	.							
POVERTY	Pearson Correlation	.215	-.168	-.049	1.000						
	Sig. (2-tailed)	.424	.533	.857	.						
URBAN	Pearson Correlation	-.260	.457	.601*	-.077	1.000					
	Sig. (2-tailed)	.331	.075	.014	.776	.					
SC	Pearson Correlation	.176	-.214	-.328	-.332	-.284	1.000				
	Sig. (2-tailed)	.529	.444	.233	.227	.306	.				
ST	Pearson Correlation	.158	-.259	-.160	.449	-.083	-.503	1.000			
	Sig. (2-tailed)	.573	.352	.568	.093	.767	.056	.			
MUSLIM	Pearson Correlation	.003	.398	.408	.358	.251	-.236	-.243	1.000		
	Sig. (2-tailed)	.992	.127	.116	.173	.348	.397	.384	.		
SON_PRE	Pearson Correlation	.505*	-.412	-.230	-.397	.013	.552*	-.299	-.404	1.000	
	Sig. (2-tailed)	.046	.112	.391	.128	.962	.033	.278	.121	.	
CHI_MOR	Pearson Correlation	.850**	-.751**	-.538*	.462	-.282	.034	.450	-.099	.345	1.000
	Sig. (2-tailed)	.000	.001	.031	.071	.290	.905	.092	.715	.191	.

*** Correlation is significant at the 0.01 level (2-tailed).*

** Correlation is significant at the 0.05 level (2-tailed).*

Table 3.5: Correlations between Variables, 2001

		TFR	FE_LIT	MA_LIT	POVERTY	URBAN	SC	ST	MUSLIM	SON_PRE	CHI_MOR
TFR	Pearson Correlation	1.000									
	Sig. (2-tailed)	.									
FE_LIT	Pearson Correlation	-.842**	1.000								
	Sig. (2-tailed)	.000	.								
MA_LIT	Pearson Correlation	-.764**	.957**	1.000							
	Sig. (2-tailed)	.001	.000	.							
POVERTY	Pearson Correlation	.437	-.426	-.369	1.000						
	Sig. (2-tailed)	.091	.100	.160	.						
URBAN	Pearson Correlation	-.358	.330	.363	-.444	1.000					
	Sig. (2-tailed)	.173	.212	.167	.085	.					
SC	Pearson Correlation	.098	-.138	-.157	-.287	-.106	1.000				
	Sig. (2-tailed)	.719	.609	.562	.280	.695	.				
ST	Pearson Correlation	.282	-.358	-.295	.453	-.217	-.472	1.000			
	Sig. (2-tailed)	.289	.174	.267	.078	.420	.065	.			
MUSLIM	Pearson Correlation	-.066	.205	.086	.258	-.115	-.418	-.137	1.000		
	Sig. (2-tailed)	.809	.447	.752	.334	.670	.107	.613	.		
SON_PRE	Pearson Correlation	.322	-.254	-.112	.044	-.457	.263	-.017	-.397	1.000	
	Sig. (2-tailed)	.224	.343	.681	.872	.075	.325	.951	.128	.	
CHI_MOR	Pearson Correlation	.831**	-.846**	-.784**	.537*	-.375	-.022	.605*	-.170	.207	1.000
	Sig. (2-tailed)	.000	.000	.000	.032	.152	.935	.013	.530	.441	.

*** Correlation is significant at the 0.01 level (2-tailed).*

** Correlation is significant at the 0.05 level (2-tailed).*

a more informed and effective pursuit of their aspirations (including the well being of children) in the family and society.

The variable poverty shows strong positive correlation with child mortality, which indicates that poor have less resources and knowledge about care and medication of child. No significant correlation has been found between other indicators of development and modernization and socio-cultural variables.

In 1991, the relationship between Total Fertility Rate (TFR) and indicators of development and modernization remains the same. TFR continues to be highly negatively correlated with female literacy and positively correlated with child mortality. In addition son preference shows a positive correlation with TFR, which suggests that son preference, pushes up fertility rate. There is a strong positive correlation (r=.894) between female literacy and male literacy in 1991 which is larger than in 1981. Female literacy is negatively correlated with child mortality. Urbanization shows a positive correlation with male literacy. This is due to high literacy rates in urban areas. Again there is strong negative correlation between male literacy and child mortality, which indicates that high male literacy, contributes to greater care of child. A positive correlation has been found between scheduled castes and son preference, but reasons are inexplicable.

For 2001, the correlation matrix shows more or less similar conditions as in 1981 and 1991. Both female literacy and male literacy show a strong negative correlation with

Total Fertility Rate (TFR). The coefficient value for female literacy is higher than the previous decades, which is due to increase in female literacy and decline in TFR. Further, positive correlation between male literacy and TFR indicates the role of males in decision making regarding family size. Again a strong positive correlation has been found between male literacy and female literacy. A negative correlation (r=-.846) between Female literacy and child mortality confirms that higher female literacy reduces child mortality. Further, male literacy also has a negative effect on child mortality, but the effect is smaller than that of female literacy. As expected, higher levels of poverty are associated with higher levels of child mortality. The correlation coefficient shows that a higher proportion of scheduled tribes in population are related to higher child mortality. This might be due to underdevelopment of scheduled tribes. But the precise basis of this statistical association requires further investigation.

Regression analysis:

Table 3.6 presents main results of Regression Analysis between Total Fertility Rate as dependent variable and explanatory variables for 1981, 1991 and 2001.

For 1981, we see that the coefficient of female literacy is negative and highly significant. The coefficient of the child mortality is significant and positive, conforming that child mortality enhances fertility. By contrast, we find no significant relationship between fertility indicators and general indicators of development and modernization such as the poverty index, male literacy. The poverty index has a negative sign, contrary to the notion that poverty is a cause of high fertility.

Table 3.6: Fertility in India: Main Results of the Regression Analysis

	1981	1991	2001
FEMALE LITERACY	-0.06*	-1.14*	-0.47*
	(-4.66)	(-5.12)	(-4.92)
MALE LITERACY	-0.33	0.73	0.16
	(-2.78)	(0.86)	(0.64)
POVERTY	-0.10	-0.10	0.06
	(-1.41)	(-1.41)	(0.21)
URBANIZATION	-0.19*	-0.06	-0.08
	(-4.71)	(-0.20)	(-0.38)
SCHEDULED CASTES	-0.19	0.01	0.15
	(-1.18)	(0.30)	(0.55)
SCHEDULED TRIBES	-0.13	-0.23	-0.20
	(1.83)	(-1.96)	(-1.95)
MUSLIM	0.19	0.22	0.15
	(0.85)	(0.85)	(0.71)
SON PREFENCE	0.21	0.04	0.33*
	(0.63)	(0.15)	(0.97)
CHILD MORTALITY	0.59*	0.64*	0.37*
	(2.74)	(3.18)	(2.67)
ADJUSTED R^2	0.79	0.62	0.71

** Significant at the 0.05 level*

NOTES: t-ratios in parentheses.

Urbanization shows a significant negative relation with TFR, conforming that in urban areas, people have greater exposure to mass-media as well as wider opportunities to observe and discuss the lifestyles of other social groups. We find no significant relation between fertility and caste and religion variables.

The estimates for 1991 depict that female literacy continues to be negative and highly significant. Moreover, its effect is even larger in 1991 than in 1981. This is indeed what one might expect, considering that the average level of education of a woman was higher in 1991 than in 1981. Again the coefficient of the child mortality is highly significant and positive and even larger than the figures for 1981. No significant relation has been found between fertility levels and indicators of development as well as social and religious variables.

In 2001, female literacy again shows a negative and highly significant relation with Total Fertility Rate. Son preference and child mortality are positively related with fertility levels, conforming that son preference and child mortality enhances fertility. The coefficients for male literacy, poverty, and urbanization show no significant relation with TFR. Among the caste and religion variables, no variable shows a significant relation with fertility levels.

FEMALE LITERACY AND FERTILITY DECLINE

These results yield a constant picture of the relation between female literacy and fertility. Female literacy is significantly associated with lower fertility, and the size of effect is also similar across the regressions. This effect is upheld even when we allow for other factors, such as male literacy, poverty, urbanization, caste, and religion and for unobserved influences on fertility.

The possibility remains that the observed association between fertility and female literacy reflects the joint influence of some unobserved, time varying variable. To illustrate, suppose states are moving at different paces (and for reasons unrelated to education) towards modern family norms that simultaneously places greater importance on small families and better education for children. This might generate a negative association between fertility and literacy across states, even in the absence of any direct casual link between the two. If this were the case, however, we would also expect to find a strong negative relationship between fertility and male literacy. The fact that we find no such association helps to dispel the hypothesis that the association between fertility and female literacy is driven by the unobserved, time varying variables; progression towards modern family norms, is likely to be correlated with both female and male literacy.

POVERTY AND FERTILITY DECLINE

It is worth noting that why we find no association between fertility and poverty. This finding contrasts with the common notion that children are typically seen as economic

assets in poor households and poverty therefore contributes to high fertility. Here, it is useful to distinguish between two senses in which parents might see children as economic assets in poor household. One is that children (particularly sons) provide age old security; the other is that they sometimes take part in productive work. The second interpretation might lead us to expect poverty to be an important cause of high fertility. There is little evidence, however, that the Indian parents see children as economic assets in that particular sense; rather, qualitative survey responses suggest that they tend to consider children as a short term economic burden, made worthwhile largely by the prospect of security in the old age. The latter motive for its part may or may not be closely related to income levels. For one thing, concern for old age security is partly a desire to maintain one's acquired living standard in old age, rather than some absolute level of living. For another what is at stake is not just income security, but also other material and psychological aspect of well being that are associated with being able to live with one's children at old age. These needs again may or may not decline as income rises. Even so, one would still expect the old age security motive to have more influence on fertility at low levels of income - for example, because of restricted access to credit and other mechanism alternative to children. But this relation need not be strong, and the implied negative association between fertility and income could easily be neutralized by positive income effects.

There is scope for further research on this issue, based for instance on various income proxies at the state level. Meanwhile, this study suggests that it would be unwise to rely on income effects to achieve reductions on fertility levels.

SON PREFERENCE AND FERTILITY DECLINE

The relationship between son preference and fertility is a complex issue. As stated above strong son preference leads to high fertility. The low status of women in society and the economic and other advantage of having male children are common causes of son preference and high fertility. Thus, a decline in son preference can lead to decline in fertility levels.

Further the effect of fertility decline on son preference and on gender bias in surviving children is the other face of the same coin. In societies characterized by a strong preference for sons, fertility decline has two opposing effects on discrimination against girls. Firstly, there are fewer births at higher parities where discrimination against girls is strongest, and this reduces discrimination (the parity effect). One major insight on this subject comes from Das Gupta's (1987) finding that, in rural Punjab, the female disadvantage in child survival is particularly pronounced among children of higher birth parity. From this 'parity effect' it can be concluded that fertility decline would generally be a factor in reducing gender bias in child survival.

In contrast to the foregoing discussion, parity specific discrimination becomes more pronounced and makes for increased discrimination (Das Gupta and Maribhat, 1997, p. 313). The parity effect is highly plausible, as female child mortality in India rises sharply with parity. There are several studies which explain this view. For instance, Das Gupta and Bhat (1997) confirm the spread of sex selective abortion. Sex selective abortion contributes to fertility decline and raises parity specific discrimination. On

the other hand, using fertility and mortality data from the Khanna re-study in Punjab, (Das Gupta, 1987), Dasgupta and Bhat suggest that parity-specific gender bias in child mortality is higher among women with lower fertility. This induces an overall negative association between fertility and gender bias. The sample is however small, and in the absence of statistical tests it is difficult to assess the significance of this pattern.

Contrary to the earlier studies on son preference and fertility decline, the results of the present study indicate that in India, the association between fertility and gender bias in child mortality is positive. But this is not in consonance with the explanations forwarded by other scholars.

The present study suggests that there are no grounds to believe in intensification of gender bias in India as a consequence of fertility decline. Indeed, virtually no change has occurred in the ratio of child mortality in India between 1981, 1991 and 2001, a period of rapid fertility decline. Sex selective abortion did spread, but that can be seen as a social problem in its own right (linked primarily with technological change) rather than as a consequence of fertility decline.

3.4 SUMMARY:

The findings of this chapter strengthen earlier evidence on the connection between various socio-economic, cultural variables and fertility. The strong effects of female literacy, child mortality and son preference contrast with the weak correlation

between the latter and various indicators of overall development and modernization such as male literacy, urbanization and even poverty. Our country is experiencing significant changes in various dimensions of development, such as agriculture, transportation, communication, and higher education and these changes might not have been captured by the variables used in this study. However, our regression analysis indicates that fertility decline is not only based on promotion of general level of economic development but also on improvements in specific conditions that favourably change couples' reproductive choices.

CHAPTER 4

FERTILTY TRANSITION: A COMPARATIVE ANALYSIS OF NORTHERN AND SOUTHERN STATES

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4.1 INTRODUCTION:

It has been observed that the levels and patterns of fertility vary considerably in various sub groups of the same population. India is a vast country with a great amount of diversity from region to region in terms of its geography, historical experience and resultant social, economic and cultural attributes. It is, therefore, obvious that the demographic behaviour will vary from region to another. On an average, the South India has been far ahead of the rest of the country with respect to fertility transition.

South India comprises four major states of India; Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. According to 2001 census the current growth rate of India is 1.9 percent per annum, the annual growth rate of south India is just 1.3 percent per annum. Kerala is the first state of India to reach growth rate below 1percent level, and Tamil Nadu is heading towards that. All four states of south India registered lower growth rates than the national average.

On the other hand the higher fertility zone, covering a large number of states such as Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh (BIMARU) is confined to north and central India.

Fertility decline in India began in the periphery along the coasts and in the extreme south, and spread progressively to encircle the region around the Ganges valley, the heart of traditional India where fertility has scarcely declined. The Hindi-speaking core region is characterized by high fertility, an entrenched patriarchal value system, economic underdevelopment and exclusion of women from education (Guilmoto, 2001, p. 730).

4.2 DETERMINANTS OF FERTILITY BEHAVIOUR:

AGE AT MARRIAGE

In Indian and most other societies, socially sanctioned child-bearing is limited only to married women. The female age at marriage marks the formal entry into sexual union and the reproductive life of a couple. The age at marriage determines the duration of time for which a woman would be exposed to the risk of pregnancy. Thus a rise in the age at marriage tends to lower down the levels of fertility.

EDUCATION OF WOMAN

Educational attainment of women is one of the indicators of modernization and the status of women in the society. The relationship between fertility and the educational attainment of the woman has been a negative one, in the sense that the higher the

educational level, the lower the family size. Further it has been observed that the curve tends to go up slightly at the highest educational level.

WORK STATUS

Women who work outside her households are more exposed and better informed about the availability of usages of various family planning programs. This allows her to choose the right maternal care practices. Moreover, an employed woman being economically independent has more decision making power regarding family size.

EXPOSURE TO MASS MEDIA

Media is one of the major sources of information about the various family planning methods. Exposure to mass media is associated with increase in awareness and knowledge of and attitude and intention to practice contraception.

AUTONOMY

NFHS-2 1998-99 defines women's autonomy as women's participation in household decision making, their freedom of movement and access to money that they can spend as they wish. Autonomy can affect fertility directly, or as an intervening variable that transmits or conditions the effects of other variables. First, women's position could lead to later age at marriage that affects fertility by shortening the reproductive span. Secondly, women's position would affect fertility through the motivation to have fewer children within marriage. Women's greater autonomy undermines patriarchal family structure, reduce son preference, and increase in the opportunity costs of

having children. Each of these changes provides motivation to limit fertility within family (Dyson and Moore, 1983).

EDUCATION OF HUSBAND

In the existing Indian patriarchal society, husband is the ultimate decision maker in the family including decision on reproductive choices. Thus education of husband is important factor affecting fertility transition. Further husband's education increases spousal communication and affects the contraceptive usages pattern.

SPOUSAL COMMUNICATION

It is important for couples to discuss among themselves about the reproductive choices, so that both the partners have a say regarding family planning. Couples with more interaction and communication are expected to perform better compared to those who have little and no communication.

STANDARD OF LIVING

The term standard of living is very elusive concept. It has both subjective and objective elements. Standard of living can be used as a proxy for economic status. General studies the past have highlighted the inverse relationship between the economic status of family and fertility. Each family attempts to maximize its well being which is a function of its consumption and of the number and quality of children, upon which depend the investments made on child in matters of health and

education. Thus, fertility is an adjustment of households to the changing living conditions, reflected by the price system. Economic progress acts as a stimulant in bringing down the fertility as it brings about an increase in relative cost of children.

CASTE

Caste, one of the most important social institutions in Hindu society, is a major underlying factor. The institution of caste being impregnable with inequality influences fertility behaviour. Apart from these direct impacts caste also affects the educational and economic status which determines the family size.

RELIGION

Fertility differentials by religion have been observed in developing as well as developed countries. The affect of religion on fertility is a matter of debate. At the aggregate level it appears that affiliation to a religion has an influence but it has been seen that religion effect on fertility is not constant across level of other socioeconomic factors (Alagrajan, 2003).

PLACE OF RESIDENCE

Numerous studies have been conducted on fertiltiy differentials according to rural-urban residence. In urban areas awareness about family planning methods, medical facilities and other infrastructure facilities are much better than the rural areas thus it has been found that the fertility of those residing in cities is lower than that of rural residents.

These determinants of fertility behaviour have direct and interactive effects on three preexisting conditions and changes therein:

MORTALITY LEVELS

The nature of mortality-fertility links was once a research priority. The dominant line of enquiry focused on reproductive physiology and behavioural responses to child loss (replacement) or the anticipation of future losses (insurance or hoarding). Mortality levels fall due to an increase in industrialization and urbanization rises in literacy and living standard, and the application of improved medical facilities. The main pathway through which mortality decline impinges on reproduction is explicitly economic; the pressure on families to having to rear "abnormally" large numbers of surviving children. Thus fall in mortality levels leads to decline in fertility (Yamada, 1985, p 365).

DESIRED NUMBER OF SURVIVING CHILDREN

Social and economic development and changing ideas and values determine the desired number of children. Declining desired family sizes is indeed one of the principal forces driving fertility transitions, but in reality levels of fertility sometimes deviate from stated preferences.

DESIRED SEX COMPOSITION OF SURVIVING CHILDREN

When stating a preference for a family of a particular size, a couple may have a specific sex composition in mind. In such cases parents may continue to have births after they have reached their desired number of children if their preferred sex composition has not been achieved. The existence of sex preferences therefore leads to higher fertility than would be the case in their absence, except in societies where parents do not control their fertility (Das, 1987, p. 517). But, the fertility effect of these preferences in a particular society is not easily estimated because it depends on the structure of parental preferences for the sex composition and size of their families, on the way parents reconcile conflicting preferences for sex composition and size, on the degree to which these preferences are implemented by the effective use of birth control, and on the extent of reliance on sex selective abortion.

The interactions among these factors are likely to influence fertility transitions. The most important interactions is between the preexisting number of surviving children that families can accommodate, the initiation of mortality decline, and their prior and subsequent use of controls on family size and composition. In pre-transitional populations as well as in those undergoing transitions, the nature of social systems influences the value of children to parents and different numbers of surviving children or sons and daughters. Thus, with the help of these factors and their interactions, here, is an attempt to understand that why the family planning takes a particular form at particular time in history (Mason, 1997, p. 450).

4.3 THE EMPIRICAL STUDY:

Data used in this chapter are from the National Family Health Survey 1992-93 and 1998-99, large surveys that covered various aspects of health, fertility and family planning in all the states of India.

As mentioned earlier on the basis of decline rates in fertility levels Punjab and Kerala are the pioneers among Northern and Southern states respectively with an average annual decline rate of 1.82 and 1.79 respectively during 1971-2001. On the other hand Uttar Pradesh with a decline rate of 1percent per year and Karnataka with 1.52 percent per year stand last in their respective regions. Therefore, Karnataka, Kerala, Punjab and Uttar Pradesh have been chosen for a detailed investigation and a comparative study of Northern and Southern states.

The National Family Health Survey-1 collected data from a nationally representative sample of 89,777 ever married women in the age group of 13-49 from 24 states and National Capital Territory of Delhi during 1992-93. For Punjab 2995, for Kerala 4332, for Uttar Pradesh 11,438, for Karnataka 4413 ever-married women were included in the survey.

The National Family Health Survey-2 carried out during November 1998 to March 1999 covers a representative sample of about 90,000 ever-married women in the age group of 15-49 years from 25 states of India. The survey for Punjab included 2796 and for Kerala 2884 ever married women. On the other hand for Uttar Pradesh 9292

and for Karnataka 4374 ever-married women in the age group of 15-49 years were surveyed in NFHS-2.

This chapter is based on three types of variables:

DEPENDENT VARIABLES:

Children Ever Born to ever married women of age 15-49 is dependent variable at individual level. Since 'Children ever born' is a discrete variable it has been converted into dichotomous form which can be considered as continuous. The groups are as follows:

1. Women with 'Children ever born' less than and equal to two,
2. Women with 'Children ever born' more than two.

These two categories have been formed because they correspond with Replacement level of fertility.

EXPLANATORY VARIABLES:

- **Age at marriage:**

  Less than or equal to 20 years

  21-25 years

  26 years and above

- **Education of woman:**

  Illiterate

  Primary school

  Middle school

High school or higher education

- **Work status:**

  Not earning cash for work

  Earning cash for work

- **Exposure to mass media:**[1]

  Low exposure to mass media

  Medium exposure to mass media

  High exposure to mass media

- **Autonomy:**[2]

  Low autonomy

  Medium autonomy

  High autonomy

- **Education of husband:**

  Illiterate

  Primary school

  Middle school

  High school or higher education

- **Spousal communication:**

  No

  Yes

[1] Refer Table 1 in Appendix.

2 Refer Table 2 in Appendix.

- **Standard of living**:[3]

  Low household standard of living

  Medium household standard of living

  High household standard of living

- **Caste:**

  Scheduled caste

  Scheduled tribes

  Other backward castes

  Other castes

- **Religion:**

  Hindu

  Muslim

  Christian

  Other religion

- **Place of residence:**

  Urban

  Rural

INTERVENING DEMOGRAPHIC VARIABLES:

- **Infant death**

  Never experienced infant death/deaths

  Experienced infant death/deaths

[3] Refer Table 3 in Appendix.

- **Desired number of surviving children**

  Less than and equal to two

  More than two

- **Desired sex composition of surviving children**

  Daughters more than and equal to sons

  More sons than daughters

METHODOLOGY:

A Multivariate logistic Regression analysis has been used to examine the relationship between each of the explanatory variables and dependent variable. This is done since the response variable is dichotomous and not normally distributed. In a logistic regression analysis, the relationship between dependent variable and explanatory variables is better understood as the influence of other variable are controlled.

In a logit regression model; a sigmoid curve is used to fit the observed points. Since the tails of the sigmoid curve level off before reaching $p = 0$ or $p = 1$, the impossible values of p ($p < 0$ and $p > 1$) observed in a probit model are avoided. The basic form of Logistic function is

$$p = 1/\ 1+e^{-Z} \qquad (1)$$

Where p is the estimated probability (here the probability of having more than 2 children ever born), Z is the explanatory variable and e is the base of the natural logarithm (e = 2.7183).

The explanatory variable has the largest effect on p when p = 0.5 and P becomes smaller in absolute magnitude as p approaches 0 or 1. The quantity p/1-p is called the odds and the quantity log (p/1-p) is called the logit of p. Simplifying equation (1) we get

$$\text{odds} = \frac{p}{1-p} = \frac{\textit{probability of presence of characteristic}}{\textit{probability of absence of characteristic}} \qquad (2)$$

$$\text{logit}(p) = \ln\left[\frac{p}{1-p}\right] \qquad (3)$$

The multivariate logistic function involving k predictor variables (x_1, x_2, x_3.....x_k) is given by

$$\text{logit}(p) = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + \ldots + b_k X_k$$

$$\text{odds} = \frac{p}{1-p} = e^{b0} \times e^{b1X1} \times e^{b2X2} \times e^{b3X3} \times \ldots \times e^{bkXk}$$

The coefficient b_1 represents the additive effect of 1 unit change in explanatory variable x_i on the log odds of the dependent variable.

The quantity eb^i is called the odds ratio, which represents the multiplicative effect on one unit change in the explanatory variable on the odds of dependent variable. The odds ratio is interpreted and not 'b' for it is more readily understandable.

PERCENTAGE DISTRIBUTION OF VARIABLES:

Independent variable:

Children ever born:

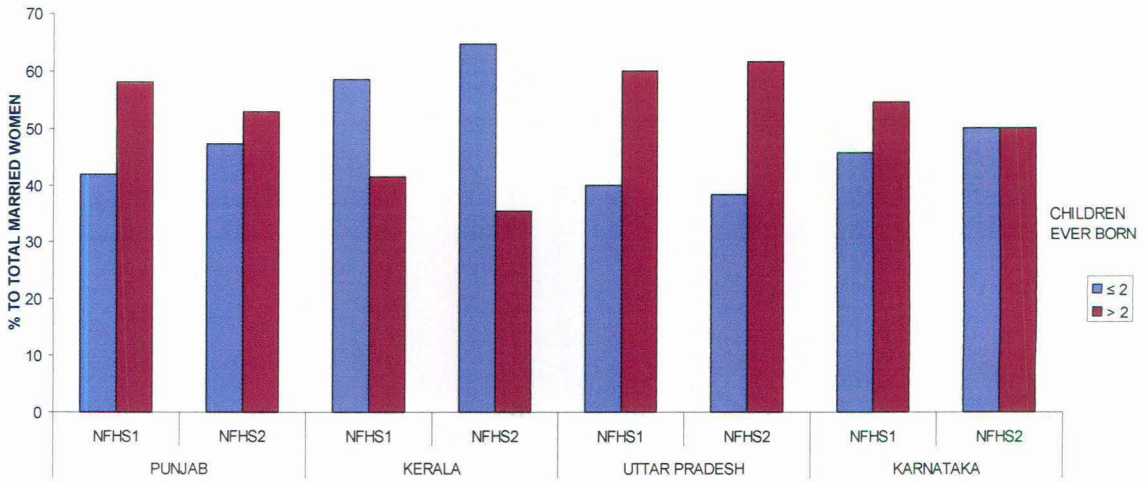
The percentage of ever married women according to children ever born in four states under study, NFHS-1 & NFHS-2 is given in table 4.1. In Punjab Percentage of ever-married women who have less than or equal to two children ever born has increased from 41.9 to 47.21 percent between the two surveys. Kerala had more than half of ever-married women with less than or equal to two children ever born in 1992-93, which increased to 64.67 percent in 1998-99.

Table 4.1: Percentage Distribution of Ever-married Women according to Children Ever Born, NFHS-1 and NFHS-2

CHILDREN EVER BORN	PUNJAB		KERALA		UTTAR PRADESH		KARNATAKA	
	NFHS1	NFHS2	NFHS1	NFHS2	NFHS1	NFHS2	NFHS1	NFHS2
LESS THAN OR EQUAL TO 2	41.90	47.21	58.56	64.67	40.01	38.36	45.52	50.02
MORE THAN 2	58.10	52.79	41.44	35.33	59.99	61.64	54.48	49.98

Uttar Pradesh, being an exception among these four states has registered a decline in percentage of ever-married women with less than or equal to two children ever born between the two surveys. Karnataka which has 45.52 percent ever-married women with less than or equal to two children ever born in NFHS-1, registered an increase to reach 50 percent of ever-married women with less than or equal to two children ever born.

Figure 4.1: Percentage Distribution of Ever-married Women according to Children Ever Born, NFHS-1 and NFHS-2



Intervening demographic variables:

Infant death

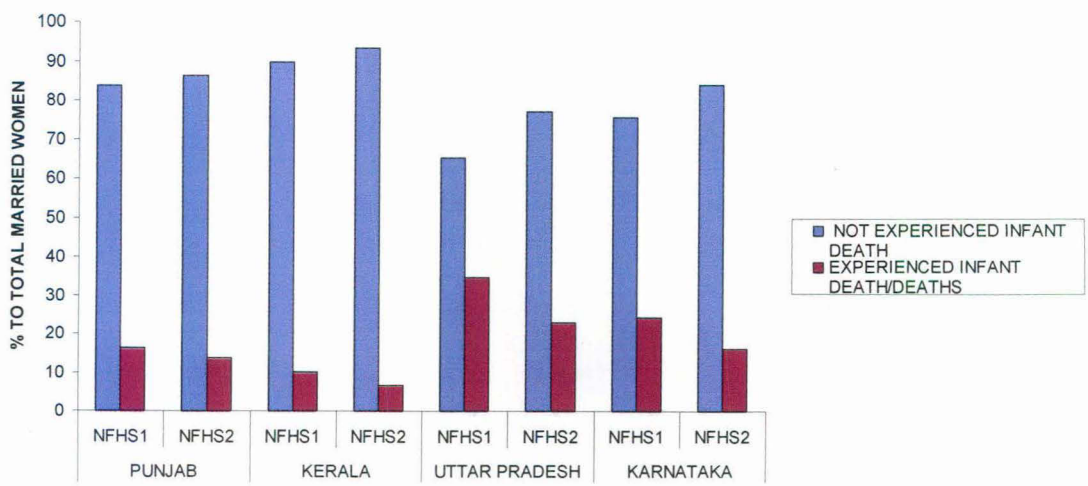
Table 4.2 presents the distribution of ever-married women according to infant deaths. Both Punjab and Kerala have very low percentage of women who have experienced infant deaths. On the other hand Uttar Pradesh and Karnataka have registered high percentage of ever-married women who have experienced infant deaths. All the states under study have registered fall in percentage of ever-married women who experienced infant deaths between the two surveys.

Table 4.2: Percentage Distribution of Ever-married Women according to Infant Deaths, NFHS-1 and NFHS-2

INFANT DEATHS	PUNJAB		KERALA		UTTAR PRADESH		KARNATAKA	
	NFHS1	NFHS2	NFHS1	NFHS2	NFHS1	NFHS2	NFHS1	NFHS2
NOT EXPERIENCED INFANT DEATH	83.71	86.41	89.87	93.48	65.30	77.23	75.82	83.95
EXPERIENCED INFANT DEATH/DEATHS	16.29	13.59	10.13	6.52	34.70	22.77	24.18	16.05

The fall is more pronounced in Karnataka and Uttar Pradesh than in Kerala and Punjab because the percentage of ever-married women who have experienced infant deaths in Kerala and Punjab was low in 1992-93. In Uttar Pradesh the percentage was quite high (22.77) according to the estimates of NFHS-II which explains the pathetic state of state in infant survival.

Figure 4.2: Percentage Distribution of Ever-married Women according to Infant Deaths, NFHS-1 and NFHS-2



Desired number of surviving children

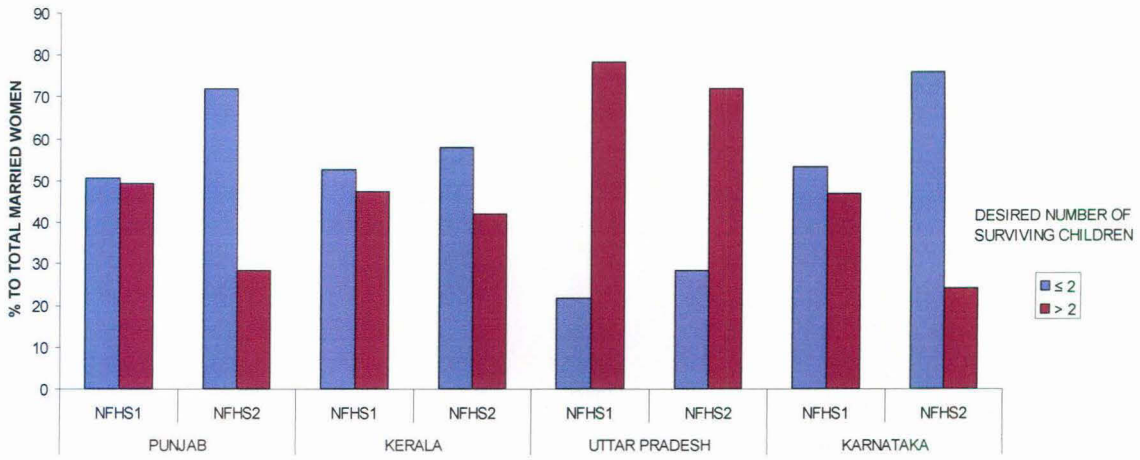
Table 4.2 shows percentage distribution of ever-married women according to desired number of surviving children for NFHS-1 and NFHS-2. Punjab which is ahead in fertility transition among northern states has registered a substantial increase in percentage of ever married women who desire less than or equal to two surviving children. The proportion has increased from 50.72 percent in 1992-93 to 71.78 percent in 1998-99. On the other hand Kerala, whose performance in the spheres of fertility transition has been substantially better than any other state of India, has registered a slight increase in percentage of ever married women who desire less than or equal to two surviving children. Kerala achieved the replacement level at the beginning of the 1990s. Kerala's TFR declined further to 1.7 by the year 1993 and has remained around this figure for last one decade.

Table 4.3: Percentage Distribution of Ever-married Women according to Desired Number of Surviving Children, NFHS-1 and NFHS-2

DESIRED NUMBER OF CHILDREN	PUNJAB		KERALA		UTTAR PRADESH		KARNATAKA	
	NFHS1	NFHS2	NFHS1	NFHS2	NFHS1	NFHS2	NFHS1	NFHS2
LESS THAN OR EQUAL TO 2	50.72	71.78	52.68	58.01	21.67	28.20	53.18	75.90
MORE THAN TWO	49.28	28.22	47.32	41.99	78.33	71.80	46.82	24.10

Uttar Pradesh and Karnataka are the states which lag behind in the process of fertility transition in their respective regions. In Uttar Pradesh only 21.67 percent ever-married women desired less than or equal to two surviving children in 1992-93, this increased to 28.20 percent by 1998-99. Such a low percentage of ever-married women desiring less

Figure 4.3: Percentage Distribution of Ever-married Women according to Desired Number of Surviving Children, NFHS-1 and NFHS-2



than or equal to two surviving children is an indicator of dismal performance of Uttar Pradesh in decline of fertility. In contrast, Karnataka has a high percentage (7.90 percent in 1998-99) of ever married women who desire less than or equal to two surviving children. Besides, Karnataka has registered a remarkable increase in percentage of ever married women who desire less than or equal to two surviving children. The increase is of 22.72 percentage points between 1992-93 and 1998-99. Although, Karnataka is laggard among the south Indian states with regard to fertility transition, it is much ahead of Uttar Pradesh, which ranks last among north Indian states.

Desired sex composition of surviving children

A strong son preference has been found to be invasive in Indian society, affecting both attitudes and behaviour with respect to children. The existence of a female

disadvantage in large parts of the country has been clearly identified, and the regional patterns are quite well known. Percentage distribution of ever-married women according to desired sex composition of surviving children, for Punjab, Kerala, Uttar Pradesh and Karnataka based on NFHS-1 and NFHS-2 data is presented in table 4.3.

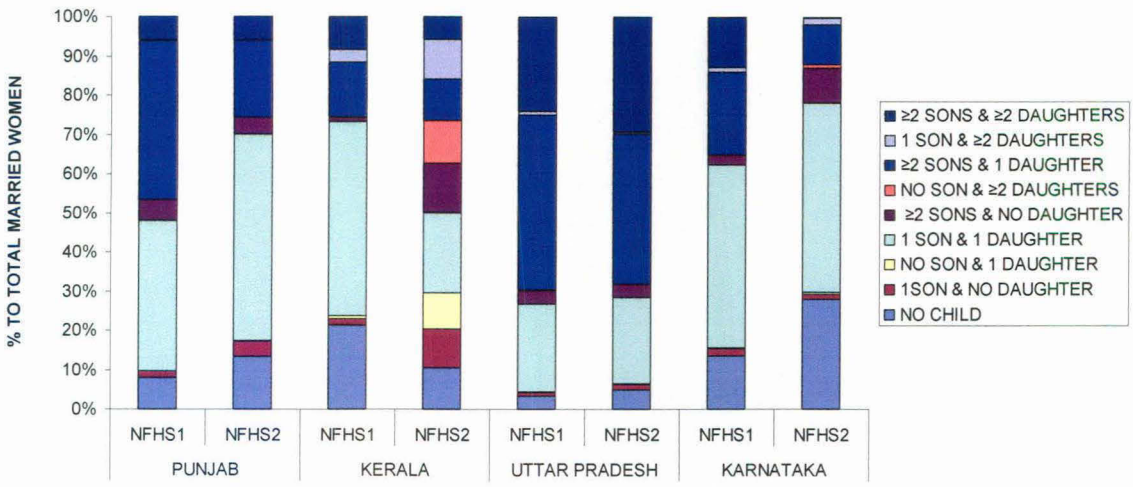
Table 4.4: Percentage Distribution of Ever-married Women according to Desired Sex Composition of Surviving Children, NFHS-1 and NFHS-2

DESIRED SEX COMPOSITION	PUNJAB		KERALA		UP		KARNATAKA	
	NFHS1	NFHS2	NFHS1	NFHS2	NFHS1	NFHS2	NFHS1	NFHS2
NO CHILD	7.94	13.47	21.33	10.51	3.21	5.04	13.54	27.96
1SON & NO DAUGHTER	1.60	3.72	1.80	9.95	1.09	1.42	1.92	1.42
NO SON & 1 DAUGHTER	0.03	0.25	0.73	9.22	0.14	0.15	0.37	0.46
1 SON & 1 DAUGHTER	38.42	52.65	49.52	20.39	22.38	21.97	46.50	48.31
≥2 SONS & NO DAUGHTER	5.45	4.33	0.94	12.73	3.34	3.07	2.55	8.92
NO SON & ≥2 DAUGHTERS	0.00	0.00	0.34	10.85	0.10	0.01	0.13	0.98
≥2 SONS & 1 DAUGHTER	40.33	19.63	13.78	10.61	44.82	38.69	21.02	10.13
1 SON & ≥2 DAUGHTERS	0.44	0.18	3.28	10.06	0.92	0.58	1.26	1.60
≥2 SONS & ≥2 DAUGHTERS	5.79	5.77	8.28	5.69	24.00	29.07	12.73	0.23

Between the two surveys Punjab has registered an increase in percentage of women (from 7.94 to 13.47 percent) who do not want any child. Again, Punjab has registered an increase in percentage of women who desire one son and one daughter. The percentage of women who desire more daughters than sons has been negligible in both the surveys. However the percentage of women who desire two or more sons and one daughter has declined from 40.33 percent to 19.63 percent between both the surveys. It is evident that although there is no weakening of son preference in Punjab, the state shows a definite sign of desire to have lesser children. Kerala, on the other hand, shows a decline in percentage of women who do not desire any child or those who want one son and one daughter. But there is an increase in percentage of women

who want one child. Further, there is a decline in percentage of women who desire one son and one daughter and there is an increase in percentage of women who desire more daughters than sons. In both the surveys it is clear that there is no strong son preference in Kerala.

Figure 4.4: Percentage Distribution of Ever-married Women according to Desired Sex Composition of Surviving Children, NFHS-1 and NFHS-2



In Uttar Pradesh there are a very low percentage of women who desire no child. There is hardly any change in percentage of women who desire one daughter and one son. It is striking to note that percentage of women who desire more daughters than sons is negligible in both the surveys. Karnataka has a different picture. It has registered an increase in percentage of women who don't want any child. A major chunk of women want one son and daughter as ideal sex composition in both the surveys. The percentage of women who want more daughters than sons is very less.

LOGISTIC REGRESSION ANALYSIS

The odds ratio and level of significance for women who have more than two children ever born by selected variables for Punjab, Kerala, Uttar Pradesh and Karnataka, NFHS-1& NFHS-2 is presented in table 4.5 and 4.6 respectively.

Age at marriage

Although the effect of age at marriage on levels of fertility has been proven time and again, in a vast country like India, there are significant variations in the degree of association between the two variables. According to the estimates of NFHS-1, in Kerala and Uttar Pradesh, with increase in age at marriage women are less likely to have more than two children ever born. For Punjab and Karnataka the results have come out to be significant only for woman whose age at marriage is 26 years and above and 21-25 years respectively. These results suggest that the probability of having more than two children decreases after a certain age at marriage.

The results of regression based on NFHS-2 have come significant for all the states under study except Punjab. The results confirm that with higher age at marriage women are less likely to have more than two children ever born.

Education of woman

There exists a negative relationship between education of women and fertility. Our results strengthen this view. Based on NFHS-1 estimates, in all the four states under study, the probability of having more than two children ever born to women decreases

with increase in the education level of women It is noteworthy that after a certain level of educational attainment (middle school and above) women are less likely to have more than two children ever born. It confirms the fact that a 'threshold' of education is required to bring changes in perception and choices related to fertility.

According to estimates of NFHS-2, in Kerala and Karnataka, women with educational attainment of middle school and above are less likely to have more than two children ever born in comparison to women who are illiterate. For Uttar Pradesh the results have come out to be significant only for women with higher education. This can be explained by the fact that with middle and higher education there is a reduction in desired family size and planned number of births. Since better maternal education reduces infant and child mortality (as discussed in the previous chapter), educated mothers plan fewer births and achieve the planned number of births, by facilitating knowledge and command of contraceptive method

Work status

In our study the effect of work status of women on fertility is not very clear and consistent. The results have come out to be significant only for Karnataka (NFHS-2) and suggest that women who earn cash for work are less likely to have more than two children ever born in comparison to women who do not earn cash for work. The study by Murthi, Guio and Dreze (1999) has also confirmed the negative effect of female work participation on fertility.

Table 4.5: Results of Logistic Regression Analysis for Children Ever Born, NFHS-1 (1992-93)

	Punjab	Kerala	Uttar Pradesh	Karnataka
Age at marriage				
Less than or equal to 20 years (Ref)				
21-25 years	0.60	0.41**	0.44**	0.51*
26 years and above	0.15*	0.14**	0.32**	0.82
Education of woman				
Illiterate (Ref)				
Primary school	0.59	1.09	1.20*	1.03
Middle school	0.77	0.46**	0.72**	0.61*
High school or higher education	0.12*	0.19**	0.48**	0.00
Work status				
Not earning cash for work (Ref)				
Earning cash for work	0.44	0.74	0.87	1.34
Exposure to mass media				
Low exposure to mass media (Ref)				
Medium exposure to mass media	0.76	0.92	1.15	0.89
High exposure to mass media	0.15	0.57**	0.69**	1.09
Education of husband				
Illiterate (Ref)				
Primary school	1.91	1.47*	1.13	3.80
Middle school	3.34**	0.95	0.82**	2.74
High school or higher education	1.93	0.72	1.02	4.05
Standard of living:				
Low standard of living (Ref)				
Medium standard of living	0.96	1.71	1.42*	2.07*
High standard of living	0.42	1.09	1.25	0.20
Religion:				
Hindu (Ref)				
Muslim	1.02	0.38*	1.93**	3.80
Christian	#	1.00	#	2.74
Other religion	2.03*	0.47	1.26**	4.05
Place of residence:				
Urban (Ref)				
Rural	0.59	0.76**	0.57**	1.31
Infant Deaths				
Never experienced infant death/deaths (Ref)				
Experienced infant death/deaths	1.43**	1.57**	1.46**	1.54**
Desired number of surviving children				
Less than and equal to two (Ref)				
More than two	1.59**	1.97**	1.39**	2.62**
Desired sex composition of children				
Daughters equal to or more than sons (Ref)				

More sons than daughters	0.54	0.95	1.27**	1.06
Constant	1.82	0.93	0.48	0.21
-2 Log likelihood	272.87	2855.63	9732.74	821.71
Nagelkerke R^2	0.40	0.42	0.35	0.29
N	2015	3996	10423	4103

Ref Reference category.
*** Significant at the 0.01 level of confidence.*
** Significant at the 0.05 level of confidence.*
 # Christian has been dropped from analysis in Punjab and Uttar Pradesh as the observations are too low.

Table 4.6: Results of Logistic Regression Analysis for Children Ever Born, NFHS-2 (1998-99)

	Punjab	Kerala	Uttar Pradesh	Karnataka
Age at marriage				
Less than or equal to 20 years				
21-25 years	0.46	0.53**	0.57**	0.39**
26 years and above	0.40	0.31**	0.28**	0.29**
Education of woman				
Illiterate (Ref)				
Primary school	1.81	0.77	0.91	0.84
Middle school	3.88	0.42**	0.79	0.53**
High school or higher education	4.58	0.20**	0.21**	0.13**
Work status				
Not earning cash for work (Ref)				
Earning cash for work	0.68	1.00	1.22	0.72**
Exposure to mass media				
Low exposure to mass media (Ref)				
Medium exposure to mass media	1.16	1.25*	1.23	1.07
High exposure to mass media	0.46	1.25	0.77	0.99
Autonomy				
Low autonomy				
Medium autonomy	1.68	1.02	1.10	1.25
High autonomy	2.86*	1.02	1.62*	0.86
Education of husband				
Illiterate (Ref)				
Primary school	0.91	1.27	1.11	1.23
Middle school	1.51	1.32	0.75	0.77
High school or higher education	0.14*	0.87	0.89	0.78
Spousal communication				
No (Ref)				
Yes	0.65	0.47**	1.36*	0.75
Standard of living:				
Low standard of living (Ref)				
Medium standard of living	1.17	1.66*	1.13	1.25*
High standard of living	0.84	1.77	2.47**	1.49*
Caste:				
Other castes (Ref)				
Scheduled caste	0.64	1.09	1.15	1.12
Scheduled tribes	##	.919	1.16	0.72
Other backward caste	0.39	1.09	0.91	0.71**
Religion:				
Hindu (Ref)				
Muslim	1.49	0.70**	0.93	1.78*
Christian	#	1.40*	#	0.32**
Other religion	0.46	0.03	0.18	0.77

Place of residence:				
Urban (Ref)				
Rural	**1.05**	**1.31***	**0.56***	**0.99**
Infant Deaths				
Never experienced infant death/deaths (Ref)				
Experienced infant death/deaths	**1.54****	**1.52****	**1.05****	**1.32****
Desired number of surviving children				
Less than and equal to two (Ref)				
More than two	**1.56****	**1.99****	**1.26***	**2.88****
Desired sex composition of children				
Daughters equal to or more than sons (Ref)				
More sons than daughters	**1.07**	**1.24**	**0.81**	**0.65***
Constant	**0.49**	**0.13**	**1.20**	**1.73**
-2 Log likelihood	**183.64**	**652.98**	**1590.17**	**1982.64**
Nagelkerke R^2	**0.56**	**0.44**	**0.34**	**0.23**
N	**2501**	**2664**	**7454**	**4114**

Ref Reference category.
*** Significant at the 0.01 level of confidence.*
** Significant at the 0.05 level of confidence.*
 # Christian has been dropped from analysis in Punjab and Uttar Pradesh as the observations are too low.
Scheduled tribes has been dropped from analysis in Punjab as the observations are too low.

Exposure to mass media

Exposure to mass media shows a significant effect on fertility only for Kerala and Uttar Pradesh according to NFHS-1 estimates. With higher exposure to mass media women are less likely to have more than two children ever born. Exposure to mass media enhances the knowledge and awareness regarding small family norms and family planning and thus leads to reduction in fertility.

On the other hand only significant result in NFHS-2 for Kerala suggests that women with medium exposure to mass media are more likely to have more than two children ever born in comparison to women with low exposure to mass media. The explanation of such needs further investigation.

Autonomy

In quite contrast to our general view that with greater autonomy fertility rate decreases the present study shows that in Punjab and Kerala (NFHS-2) women with high autonomy are more likely to have more than two children ever born in comparison to women with low autonomy. This sort of an impact of women's autonomy on fertility needs to be probed into more extensively.

Education of husband

The association between paternal education and fertility is mostly believed to be negative. In our analysis for NFHS-1 in Uttar Pradesh woman whose husband is middle school educated is less likely to have more than two children ever born in comparison to woman whose husband is illiterate. This finding is in contrast with the

results for Punjab and Uttar Pradesh, where with increase in husband's education the probability of having more than two children ever born to women also rises. This contrasting behaviour needs further investigation.

Our results for NFHS-2 have come significant only for Punjab, where a negative link between paternal education and fertility has been found. It is crystal clear from our analysis that many of the links between education and fertility are likely to be much weaker for male than female education.

Spousal communication

Discussion of matters related to family planning has a direct bearing upon fertility. According to NFHS-2 estimates, in Kerala women who discuss family planning with their partners are less likely to have more than two children ever born in comparison to women who do not discuss family planning with their partners. On the other hand, in Uttar Pradesh discussion of family planning with partner has a positive effect on fertility. This is probably due to the contrast in Total Fertility Rate which is lowest in Kerala and highest in Uttar Pradesh.

Standard of living

Inconsistent with our earlier explanation, standard of living shows a positive impact on fertility in all our results. In both the surveys the results suggest that with increase in standard of living women are more likely to have more than two children ever born. As discussed in the previous chapter the relationship between standard of living

and fertility is quite complex. Detailed research on the relationship between economic condition and fertility can provide explanations to such results.

Caste

Our results show that caste does not have any significant or consistent effect on fertility. Only women of Other Backward Castes in Karnataka are less likely to have more than two children ever born in comparison to Other Castes. In recent years Other Backward Castes have some advancement at economic and social front, which might have led to decline in fertility in comparison to other castes. In Punjab, the observations for Scheduled Tribes are too low.

Religion

Religion's influence on fertility is related to norms and values that seek to regulate behaviour connected to determinants of fertility. Our analysis show quite contrasting results. According to NFHS-1 Muslim women in Kerala are less likely to have more than two children ever born in comparison to Hindu women. In Uttar Pradesh the situation is reversed. This contrasting finding suggests that region effect is more pronounced than religion effect.

For NFHS-2, in Kerala again Muslim women are less likely and Christian women are more likely to have more than two children ever born in comparison to Hindu women. On the other hand, in Karnataka Muslim women are more likely and Christian women are less likely to have more than two children ever born in comparison to Hindu women. These results strengthen the view that the influence of

religion on fertility must be understood in specific social, political and economic contexts. In Punjab and Uttar Pradesh Christian has been dropped from the analysis because the observations are too low.

Place of residence

The effect of place of residence on fertility is not very consistent in our study. For NFHS-1 the estimates show that in Kerala and Karnataka women staying in rural areas are less likely to have more than two children ever born in comparison to women who stay in urban areas. This is in contrast to general view that fertility rates are higher in rural areas.

According to NFHS-2 estimates, in Kerala women staying in rural areas are more likely to have more than two children ever born in comparison to women in urban areas. On the other hand in Uttar Pradesh, women in rural areas are less likely to have more than two children ever born. The effect of place of residence on children ever born is not very clear.

Infant death

Infant deaths have a direct impact on fertility levels. According to our findings in all the four states under study women who have experienced infant death are more likely to have more than two children ever born in comparison to women who have not experienced infant death. Couples who experience infant deaths tend to have more births to compensate the present loss and in anticipation of future loss.

Desired number of surviving children

Couples desire a specific number of children and plan their fertility behaviour accordingly. Our results suggest that in all the four states under study for both the surveys with increase in desired number of surviving children the actual number of births also increases.

Desired sex composition of surviving children

Desired sex composition of surviving children provides information about gender preference. In our analysis the impact of desired sex composition of surviving children on fertility is neither significant nor consistent. According to NFHS-1 estimates, only in Uttar Pradesh women who desire more sons than daughters are more likely to have more than two children ever born in comparison to women who desire daughters more than or equal to sons. This result confirms our view that son preference leads to high fertility.

For NFHS-2, the results have come out to be significant only for Karnataka, where women who desire more sons than daughters are likely to have less than or equal to two children ever born in comparison to women who desire daughters less than or equal to sons. Such results call for further empirical investigations.

4.4 SUMMARY:

The comparative examination of fertility models of these states leads to the merging of diverse interpretative frameworks to explain the geographic and temporal variation of fertility. Age at marriage, female education, exposure to mass media, husband's education, spousal communication, infant deaths, ideal family size are major socio-cultural conditions that affect couples' attitudes and behavioural responses related to fertility. All the four states under study provide varied explanations of fertility transition: Punjab's fertility transition is a response to lower mortality and economic development. The results found Kerala are the because of major social, economic and political transformations. The poor performance of Uttar Pradesh is an outcome of the prevailing socio-economic conditions. Due to the winds of demographic change sweeping across the south Indian states Karnataka has come closer to replacement levels of fertility.

CHAPTER 5

SUMMARY AND CONCLUSION

CHAPTER 5

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5.1 SUMMARY:

Never before in history have there been such enormous changes in fertility behaviour in so many communities as took place in the twentieth century. India is one of those countries where Total Fertility Rates have declined substantially. On an average women in India now give birth to only 3.2 children as compared to about 5 children in early 1970s.

The study highlights a clear picture of the regional diversity in India. states in Northern India- Bihar, Madhya Pradesh, and Uttar Pradesh-have birth rates above the national average. Haryana showed no deviation from national average. On the other hand Southern states of Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu- showed birth rates well below the national average. Only Punjab is a departure from the north-south dichotomy. Among the Western states, only Rajasthan had fertility levels well above national average whereas Gujarat and Maharashtra follow the southern pattern. Eastern states of Assam, Orissa and West Bengal have been close to national average.

The basic explanations of fertility transition came from a descriptive analysis of levels and trends of selected social, economic, and health variables which indicated

the changing patterns in fertility across India. However, the amount of change in any of these variables is quite small, and by itself, can not be expected to cause independent and significant changes in family size values, the desire to space or limit children and the use of family planning methods. The strong effects of female literacy, child mortality and son preference contrast with the weak correlation between the latter and various indicators of overall development and modernization such as male literacy, urbanization and even poverty. Fertility decline is not just a byproduct of economic growth: it depends on improvements in specific conditions that are conducive to changed fertility goals and that helps couples to realize these goals.

Given the differences in levels and stages of fertility transition in states of India, the exploration of factors behind the transition in selected states revealed diversity of regional pattern in economic and socio-cultural environment.

The pioneering and atypical role of Punjab in the fertility decline in North India can be attributed to economic development caused by green revolution. In spite of strong son preference in Punjab, the decline in fertility rate points towards sex selective abortions.

The achievements of people of Kerala are the results of major social, economic and political transformations. They were possible because there was mass literacy;

because of enlightened social attitudes towards girls' and women's survival and education, and because of the policy interventions by the state.

Kerala is the only state of India where the socio-economic conditions were in place to absorb international advances in epidemiology and public health. The ratio of medical establishment to population is substantially higher in Kerala than the rest of India. In an area of mass literacy and where social and political consciousness are high people demand more health facilities, use the health system more and use it better.

In contemporary India it is worth mentioning that public action, and not policies of globalization and liberalization, was the locomotive of Kerala's progress.

Uttar Pradesh is a state which lags behind in social as well as economic development. Illiteracy, rigid caste system and patriarchal society are the main causes behind high fertility and slow rate of decline. The social failures of Uttar Pradesh are quite daunting but the potential rewards of action are correspondingly high, and the costs of continued inertia even higher.

Our study shows that Karnataka is gradually on its way to replacement level of fertility. Unlike what happened in Kerala, Karnataka experienced no remarkable change in social and economic development, no serious government interventions, no significant social and political movements which could influence the fertility behaviour and attitudes of the people. The recent efforts of the Karnataka state government on decentralized administration of education, health and family welfare

services under the *panchayati raj* system provide an opportunity for overall development. These efforts are apparent from the decline of Total Fertility Rates in Karnataka between NFHS-I and NFHS-II.

5.2 POLICIES AND PROGRAMMES:

Right from the beginning of the twentieth century, the health of mothers and children as well as the socioeconomic effects of rapid population growth has been a matter of concern for several Indian intellectuals and demographers. The first well known public advocacy of family limitation in India was made in 1916 by P. K. Wattal in his book, *The Population Problem in India,* who puts his argument in both health and socio-economic terms. Professor N.S. Padhke started the 'Birth Control League' in 1923 at Bombay, while G. D. Kulkarni formed a similar organization in Pune (visaria and Chari, 1998).

The Indian National Congress set up the National Planning Committee in 1935 under the chairmanship of Jawaharlal Nehru, which strongly supported the knowledge and practice of family planning. The second All-India Conference on Population and the First Family Hygiene Conference held at Bombay in 1938 considered the issue relating to differential fertility.

While the Indian leadership and intelligentsia appreciated the importance of limited family size, those early days were marked by one particular debate, namely, how the same was to be achieved.

Soon after independence, in March 1950, the government of India appointed the Planning Commission to formulate a plan for most effective and balanced utilization of natural resources for economic development. The Planning Commission recognized the need for a population policy. In 1952, India was the first country globally to launch a national programme, emphasizing fertility regulation to the extent necessary for reducing birth rate "to stabilize the population at a level consistent with the requirement of national economy". After 1952, sharp declines in death rates were, however, not accompanied by a similar drop in birth rates. Half a century after formulating the National Family Welfare Programme, India has;

- Reduced Crude Birth Rate (CBR) from 40.8 per thousand population (1951) to 25 per thousand population (2002).
- Reduced Total Fertility Rate (TFR) from 6.0 in1951 to 3.2 in 2002.
- Reduced Crude Death Rate (CDR) from 25 (1951) to 8.1 (2002).
- Quadrupled the Couple Protection Rate (CDR) from 10.4 percent (1971) to 48.2 percent (2002).
- Halved the Infant Mortality Rate (IMR) from 146 per 1000 live births (1951) to 63 per 1000 live births.
- Added 25 years to life expectancy from 37 years to 62 years.
- Achieved nearly universal awareness of the need for and methods of family planning.

Table 5.1: India's Demographic Progress

	1951	1981	1991	2002
CRUDE BIRTH RATE (PER 1,000 POPULATION)	40.8	33.9	29.5*	25
CRUDE DEATH RATE (PER 1,000 PPULATION)	25.1	12.5	9.8*	8.1
TOTAL FERTILITY RATE	6	4.5	3.6*	3.2
MATERNAL MORTALITY RATE (PER 1,00,000 LIVE BIRTHS	N.A.	N.A.	437	407
INFANT MORTALITY RATE	146	110	80	63
COUPLE PROTECTION RATE (PERCENT)	10.4	22.8	44.1	48.2
LIFE EXPECTANCY AT BIRTH YEARS (M)	37.2	54.1	60.6	63.87#
LIFE EXPECTANCY AT BIRTH YEARS (F)	36.2	54.7	61.7	66.91#

** Excludes Jammu and Kashmir*
 # Provisional
SOURCE: Sample Registration System, office of the registrar general, India.

5.3 SUGGESTIONS

In reflecting on the impact of India's population policy on fertility, one is struck by both its successes and failures. Although India's fertility level has declined since the 1970s, it has not declined as dramatically as the mortality rate. The reduced mortality rate has been easier to achieve in part because people tend to follow advice about behaviour changes required for better health but hesitate to accept advice relating to the adoption of contraception.

Even though the female sterilization has become the primary means of contraception in India people are afraid of surgery of any kind, they view even Intra Uterine Device (IUD) insertion as surgery. In addition, quite often the field workers and doctors at the primary health centers are not available during emergencies, and people do not find the programme reliable. The government still has not addressed this problem, which negatively impacts the acceptance of contraception.

Further, there are indications that the desired fertility is close to or below the replacement level in many parts of the country, including the areas where the actual fertility is still relatively high. This implies that for attaining or realizing the desired goals couples will have to practice reversible methods of contraception or lower the age of sterilization.

Another factor not fully explored in policy framework relates to pathways through which India can reach the demographic goal of attaining the Net Reproduction Rate

of unity as early as possible. It is argued that significant changes are required in socioeconomic conditions to achieve this goal. However, these changes have to operate through fertility inhibiting processes such as increase in mean age at marriage or in the proportion of women choosing permanent spinsterhood and in the control of marital fertility through the use of contraception or induced abortion. A countervailing fertility-enhancing factor would be reduction in duration of breastfeeding and the consequent shortening of postpartum amenorrhea. All these processes are not easily open to direct or indirect policy intervention. If there is some increase in the mean age at marriage and marriage continues to remain universal in India, questions might arise regarding the contraceptive prevalence level required to attain the net reproduction rate of one.

In order to promote the use of family planning, we have to address the issue of strong son preference with its roots in social mores. It contributes towards the raising of the desired fertility level and in turn leads to some unwanted births. Measures to weaken son preference include improving the status of women through education and employment. Though there are very few direct policy interventions to enhance women's autonomy, and improve their negotiating capacity within the household, there exists basic awareness programmes regarding issues sensitive to women's needs.

Equally important is lowering of infant and child mortality. Strong policy intervention on this front would not only enhance the credibility of the health personnel and the

government among the people, but also would raise the acceptance of family planning programme among those who are hesitant to do so. A lower infant and child mortality will help to reduce the desired fertility in so far as the couples try to replace deceased children.

The relevance of the study on the fertility transition in India lies in the fact that it raises concerns about certain important socio-demographic issues. It reveals the need to improve the present population policies in India. It brings to notice how factors such as gender preferences affect fertility positively or negatively or age at marriage helps in the decline of fertility. There exists further scope of research to prove how socio cultural factors like women's empowerment, women's education, autonomy, general awareness about family planning among both men and women affect fertility in India and in the long run help in bringing down fertility. States which have already reached the replacement level of fertility can be set as examples for those states lagging behind in fertility transition.

APPENDIX

APPENDIX

Table 1: Exposure to mass media

1. Reads newspaper	Yes-1
	No-0
2. Listens to radio at least once in a week	Yes-1
	No-0
3. Watches TV at least once in a week	Yes-1
	No-0

Index	Score
Low exposure to mass media	≤ 1
Medium exposure to mass media	2
High exposure to mass media	3

Table 2: Autonomy (NFHS-2)

1. Who decides on obtaining Health Care	Respondent-1
	Others-0
2. Permission needed to go to market	No-1
	Yes-0
3. Permission needed to visit relatives	No-1
	Yes-0

4. Allowed to have money	No-1
	Yes-0
Index	Score
Low autonomy	≤ 1
Medium autonomy	2
High autonomy	≥ 3

Table 3: Standard of living Index (NFHS-1)

1. Separate room for cooking	Yes-1
	No-0
2. Type of house	Pucca-1
	kachha-0
3. Source of lighting	Electricity-1
	Others-0
4. Fuel for cooking	LPG-1
	Others-0
5. Ownership of:	
a) Sewing machine	Yes-1
	No-0
b) Clock/watch	Yes-1
	No-0
c) Sofa set	Yes-1
	No-0

d) Fan	Yes-1
	No-0
e) Radio/Transistor	Yes-1
	No-0
f) Refrigerator	Yes-1
	No-0
g) Television	Yes-1
	No-0
h) VCR/VCP	Yes-1
	No-0
i) Bicycle	Yes-1
	No-0
j) Motorcycle/ Scooter	Yes-1
	No-0
k) Car	Yes-1
	No-0

Index	Score
Low household standard of living	0-5
Medium household standard of living	6-10
High household standard of living	11-15

REFERENCES

REFERENCES

BOOKS:

- Bulatao, R. A. and J. B. Casterline (eds.) (2001): Global Fertility Transition, Population Council, New York.
- Coale,J. A. and S. C. Watkins (eds.) (1986): The Decline of Fertility in Europe, Princeton University Press, Princeton.
- Chu, C. Y. Cyrus and Ronald Lee (eds.) (2000): Population and Economic Change in East Asia, Population Council, New York.
- Dreze J. and Amartya Sen (eds.) (1999): Indian Development Selected Regional perspectives, Oxford University Press, New Delhi.
- Guilmoto, C. Z. and S. Irudaya Rajan (eds.) (2005): Fertility Transition in South India, Sage Publications, New Delhi.
- Jain A. (ed.) (1998): Do Population Policies Matter? Population Council, New York.
- Mahadevan, K. (ed.) (1986): Fertility and Mortality: Theory, Methodology and Empirical Issues, Sage Publications, New Delhi.
- Repetto, R. (1979): Economic Equality and Fertility in Developing Countries, John Hopkins University Press, Baltimore.
- Sanderson, W. C. and Jee-Peng Tang (1995): Population in Asia, World Bank, Washington, D. C.

- Sen, R. (2003): We the Billion, A Social Psychological Perspective of India's Population, Sage Publications, New Delhi.
- Singh, J. P. (ed.) (1998): Studies in Social Demography, M D Publication, New Delhi.
- Singh S. N. et al. (eds.) (1989): Population Transition in India, B. R. Publishing Corporation, Delhi.
- Yadav H. L. and S. Sinha (2003): Fundamentals of Human Geography, NCERT, New Delhi.

ARTICLES:

- Adlakha, A. and D. Kirk (1974): "Vital Rates in India 1961-71 Estimated from 1971 Census Data", *Population Studies*, 28:3, pp. 381-400.
- Alagrajan, M. (2003): "An Analysis of Fertility Differential in Kerala State: A Test of the Interaction Hypothesis", *Population Research and Policy Review*, 22, pp. 557-74.
- Blake, J. (1968): "Are Babies Consumer Durables?" *Population Studies*, 22:2, pp. 2-25.
- Bhat, P. N. Mari and S. Irudya Rajan (1990): "Demographic Transition in Kerala Revisited", *Economic and Political Weekly,* 25:35 and 36, pp.1957-80.
- Bongaarts, J. (1978): "A Framework for Analyzing the Proximate Determinants of Fertility", *Population and Development Review*, 4:1, pp. 105-32.
- Bongaarts, J. (1993): "The Supply-Demand Framework for the Determinants of Fertility: An Alternative Implementation", *Population Studies,* 47:3, pp. 437-56.

- Bulatao, R. A. (1981): "Values and Disvalues of Children in Successive Childbearing Decisions", *Demography,* 18, pp. 1-25.
- Caldwell, J. C. (1997): "The Global Fertility Transition: The Need for a Unifying Theory", *Population and Development Review*, 23:4, pp. 803-12.
- Caldwell, J. C. (1976): "Toward a Restatement of Demographic Transition Theory", *Population and Development Review*, 2:3, pp. 321-66.
- Cleland, J. and C. Wilson (1987): "Demand Theories of the Fertility Transition: An Iconoclastic View", *Population Studies,* 41:3, pp. 5-30.
- Coale, A. J. (1992): "Age of Entry into Marriage and the Date of the Initiation of Voluntary Birth Control", *Demography*, 29:3, pp. 333-41.
- Das Gupta, M. (1987): "Selective Discrimination against Female Children in Rural Punjab", *Population and Development Review,* 13:1, pp. 77-100.
- Das Gupta, M. and P. N. Mari Baht (1997): "Intensified Gender bias in India: A Consequence of Fertility Decline", *Population Studies*, 51:3, pp. 307-15.
- Das, N. (1987): "Sex Preference and Fertility Behaviour: A Study of Recent Indian Data", *Demography,* 24:4, pp. 517-30.
- Davis, K. (1963): "Theory of Change and Response in Modern Demographic History", *Population Index*, 31:2, pp. 345-66.
- Davis, K., and J. Blake (1956): "Social Structure and Fertility: An Analytical Framework", *Economic Development and Cultural Change*, 4, pp. 211-35.
- Dreze, J. and M. Murthi (2001): "Fertility, Education, Development: Evidence from India", *Population and Development Review*, 27:1, pp. 33-64.

- Dyson, T. and M. Moore (1983): "On Kinship Structure, Female Autonomy, and Demographic Behaviour in India", *Population and Development Review*, 9, pp. 35-60.
- Easterline, R. A. (1975): "Economic Framework for Fertility Analysis", Studies in Family Planning, 6:3, pp. 54-6.
- Graff, H. J. (1979): "Literacy, education and fertility, past and present: A critical review", *Population and Development review,* 5:1, pp. 105-14.
- Guilmoto, C. Z. (2000): "The Geography of Fertility in India (1981-91)", in C. Z. Gulmoto and A. Vaguet (eds.), *Essays on Population and Space in India,* Pondichery: Institut francles de Pondichery, pp. 37-53.
- Guilmoto, C. Z. and S. Irudaya Rajan (2001): "Spatial Patterns of Fertility Transition in Indian Districts", *Population and Development Review*, 27:4, pp. 713-38.
- Hassan, M. I. and P. Daspattanayak (2004): "Demographic Transition in India: Some Policy Recommendations for the Demographically Vulnerable States", *Indian Journal of Regional Science*, 34:2, pp. 53-97.
- Hirshman, C. (2001): "Comment: Globalization and Theories of Fertility Decline", *Population and Development Review*, 27, pp.116-25.
- Hirshman, C. (1994): "Why Fertility Changes", *Annual Review of Sociology*, 20, pp. 203-33.
- James, K. S. and S. V. Subramanian (2003): "Towards A Demographic Transition", *Economic and Political Weekly*, 37:12, pp. 1219-29.

- Jain, Anurudh K. (1985): "The Impact of Development and Population Policy on Fertility in India", *Studies in Family Planning*, 16:4, pp. 181-98.
- Jain, A. K. and A. L. Adlakha (1982): "Preliminary Estimates of Fertility Decline in India during 1970s", *Population and Development Review,* 8:3, pp. 589-606.
- Kaa, D. J. Van De (1996): "Anchored Narratives: The Story and Findings of Half a Century of Research into the Determinants of Fertility", *Population Studies*, 50:2, pp. 389-432.
- Kabeer, Naila (2001): "Ideas, Economics and the Sociology of Supply: Explanations of Fertility decline in Bangladesh", *Journal of Development Studies*, 38:1, pp. 29-70.
- Kirk, D. (1996): "Demographic Transition Theory", *Population Studies,* 50:1, pp. 361-387.
- Knodel, John (1977): "Family Limitation and the Fertility Transition: Evidence from the Age Patterns of Fertility in Europe and Asia", *Population Studies,* 31:2, pp. 219-49.
- Malaker, C. R. (1997): "Population Growth in Developing Countries, 1950-2025", in A. Ahmad et al. (eds.), *Demographic Transition*, Rawat Publication, New Delhi, pp. 34-41.
- Mason, K. O. (1997): "Explaining Fertility Transitions", *Demography*, 34:4, pp. 443-54.
- Mauldin, W. C. and B. Berelson (1978): "Conditions of Fertility Decline in Developing Countries 1965-75", *Studies in Family Planning*, 9:5, pp. 90-147.

- Mosher, W. D. and G. E. Hendershot (1984): "Religion and Fertility: A Replication", Demography, 21:2, pp. 185-190.
- Murthi M. et al. (1999): "Mortality, Fertility and Gender Bias In India", in J. Dreze and A. Sen (eds.) *Indian Development Selected Regional perspectives*, Oxford University Press, New Delhi, pp. 357-406.
- Nair, P. R. G. (1974): "Decline in Birth Rate in Kerala: A Hypotheses about the Interrelationship between Demographic Variables, Health Service and Education", *Economic and Political Weekly*, 9:6, pp. 323-336.
- Rao, S. K. (1973): "On Reducing the Growth Rate of Population through declines in Mortality – A Note", *Centre for Economic Studies, Presidency College, Calcutta.*
- Rele, J. R. (1987): "Fertility Levels and Trends in India, 1951-81", *Population and Development Review*, 13:3, pp. 513-30.
- Rosen, B. C. and A. B. Simons (1971): "Industrialization, Family and Fertility: A Structural and Psychological Analysis of Brazilian Case", *Demography*, 8, pp. 49-69.
- Savitri, R. (1994): "Fertility Decline in Tamil Nadu: Some Issues", *Economic and Political Weekly*, 29:29, pp. 1850-52.
- Srinivasan, K. (1988): "Modernization, Contraception and Fertility Change in India", *International Family Planning Perspectives,* 14:3, pp. 94-102.
- Visaria, L. (1999): "Proximate Determinants of Fertility in India: An Exploration of NFHS Data", *Economic and Political Weekly*, 34:37, pp. 3013-3040.

- Visaria, P. and L. Visaria (1994): 'Demographic Transition: Accelerating Fertility Decline in 1980s", *Economic and Political Weekly*, 29:51&52, pp. 3281-92.
- Visaria, P. and V. Chari (1998): "India's Population Policy and Family Planning Program: Yesterday, Today and Tomorrow", in A. Jain (ed.), *Do Population Policies Matter?*, Population Council, New York, pp. 53-112.
- Williamson, J. B. (1970): "Subjective Efficacy and Ideal Family Size as Predictors of Favorability towards Birth Control", *Demography,* 7, pp. 329-39.
- Yamada, T. (1985): "Causal Relationship between Infant Mortality and Fertility in Developed and Less Developed Countries", *Southern Economic Journal,* 52:2, pp. 364-70.