A Comparative Study of Recent Fertility in Four Northern States (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) and Tamil Nadu

Dissertation Submitted to Jawaharlal Nehru University

in Partial Fulfilment of the Requirement

for the Award of the Degree of

Master of Philosophy

G. Thavasi Murugan

Centre for the Study of Regional Development
School of Social Sciences
Jawaharlal Nehru University
New Delhi – 110067
2012

जवाहरलाल नेहरू विश्वविद्यालय
JAWAHARLAL NEHRU UNIVERSITY
Centre for the Study of Regional Development
School of Social Sciences
New Delhi-110067

DECLARATION

I, **G. Thavasi Murugan**, hereby declare that the dissertation entitled **"A Comparative Study of Recent Fertility in Four Northern States (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) and Tamil Nadu"** submitted by me for the award of the degree of **Master of Philosophy** is my bonafied work and that it has not been submitted so far in part or in full, for any degree or diploma of this University or any other University.

G. Thavasi Murugan

CERTIFICATE

We Recommend that this dissertation be placed before the examiners for the evaluation.

Prof. P.M. Kulkarni
(Supervisor)

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

Prof. P.M. Kulkarni
(Chairperson)

Chairperson
Centre of the Study of Rej. Dev
School of Social Sciences
Jawaharlal Nehru University
New Delhi-110067

Tel.: 26704463, Gram : JAYENU Fax : 91-11-26742586, 26741504

Acknowledgement

It is my great pleasure to express my most sincere thanks to my supervisor Professor ***P.M. Kulkarni****, Center for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru, University, New Delhi, for his guidance and support. It was indeed a privilege to work with him. His great ideas and encouragement had been the constant source of inspiration behind my effort.*

I would like to express my gratitude to Dr. Bhaswati Das, our M.Phil coordinator, all my teachers and other faculty members for their invaluable suggestions and comments during the progress report presentation to improve the quality of the paper.

I take this opportunity to thank the JNU Library and Document Unit of CSRD for their kind cooperation and assistance. I would also like to mention my words of thanks to the staff of CSRD for providing excellent facilities and technical support.

I would extend my thanks to my senior scholars in shaping and refining my ideas with their comments and constructive criticism of my work. I have also thanks to all my friends for their support and assistance, and offered me a happy environment during monotonous moments and their smile made my painstaking work easy.

I am grateful to my family for their constant support even though they are far away. I am highly obliged to all who have supported me and guided me through this dissertation.

Ultimately and above all, I thank the Almighty and respected parents without whom blessings this was impossible.

G.Thavasi Murugan

Date: 26/07/2012

Content — Page No.

List of Tables

List of Map and Figures

CHAPTER I
INTRODUCTION

1.1. Introduction

Fertility, mortality and migration are the three major demographic events which affect the population size of an area through births, deaths and migration. In these three events fertility plays a very important role, and fertility depends on numerous socio-economic, cultural and other factors.

The term fertility embraces many different aspects of this capacity depending on the context. Fertility sometimes refers to the likelihood of being able to conceive (fecundity). It is often used as a measure of the numbers of babies being born in total or per capita in a given time (period measure). In the words of Lewis and Thompson *(Dasgupta, 2012, p. 65)*, "Fertility is generally used to indicate the actual reproductive performance of a woman or group of women".

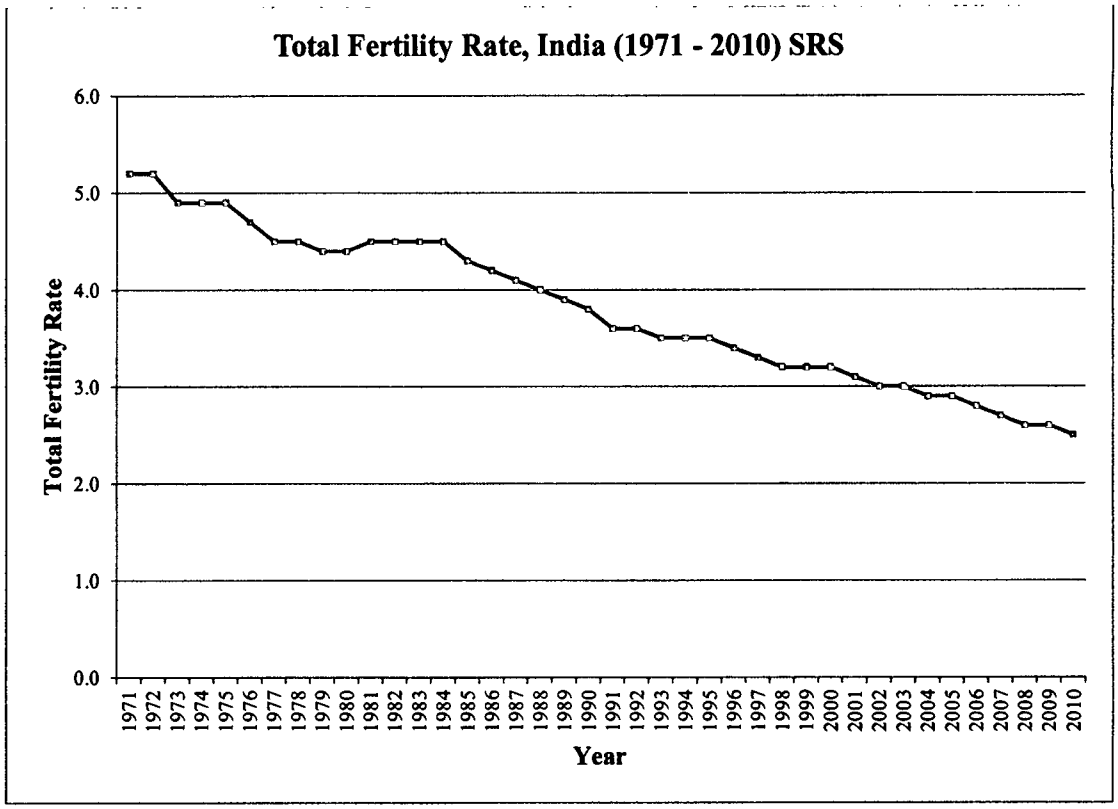
1.2. Fertility Trends in India

Trends in total fertility rate (TFR) for India since 1971 to 2010 have been shown in Figure 1.1, which are obtained from the Sample Registration System (SRS). The SRS with dual recording and verification gives fairly satisfactory results and enables an assessment of levels and trends. In this we can observe four nodal points where change has taken place. Until 1972 TFR of India remained high, i.e., above five births per woman. During the time periods of 1973 to 1988 and 1989 to 2003 TFR was in the range of 4 to 5 and 3 to 4 births per woman respectively. For dropping of TFR from 5 to 4 children per women and 4 to 3 children per women it took 16 years and 15 years respectively. The trend shows a clear decline of TFR from 1972 to 2010, i.e., in 38 years it declined by 2.7 births per woman in India, and TFR in the year 2010 is near to replacement level i.e. 2.5 children per woman.

The clear cut differences between northern and southern states of India in terms of fertility behaviour have been pointed out by many authors in demographic studies. A spatial picture of this north south divide is shown in the map (*Map 1.1*). The northern states especially Uttar Pradesh and Bihar are showing very high fertility rate (above 3.6 birth per woman) than other northern states, the situation in other northern states is also critical

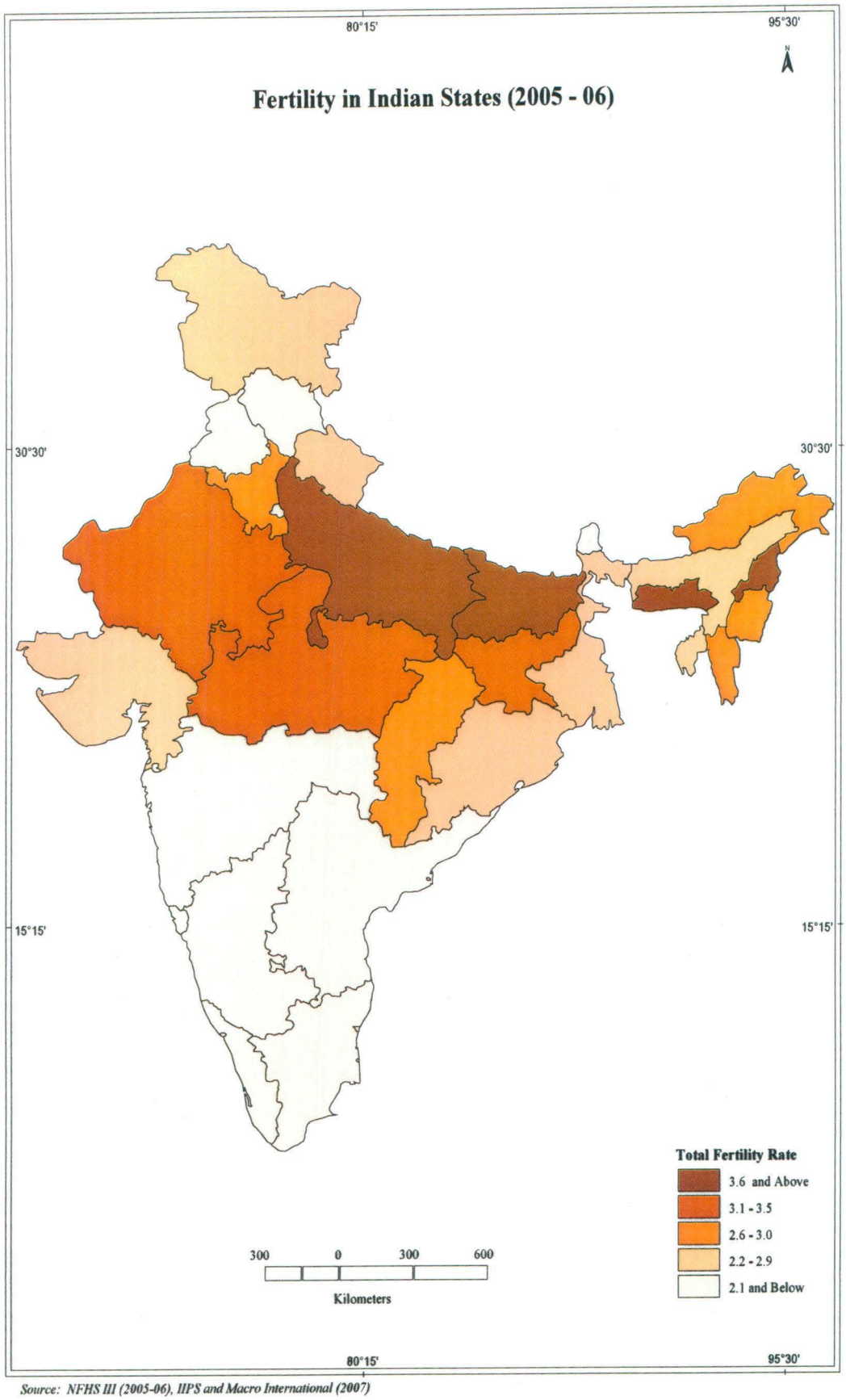
where the fertility rate is in high category, i.e., from 3.1 to 3.6 average births per women. On the other hand, the four southern states of India are showing lowest level of fertility, i.e., below replacement level (below 2.1 births per women) is prevailing. The two states from north, i.e., Punjab and Himachal Pradesh are the only states in north India whose fertility rate is below replacement level.

Figure 1.1



Source: Various SRS Reports, RGI: India, Registrar General (2010, 2011and 2012).

Map 1.1

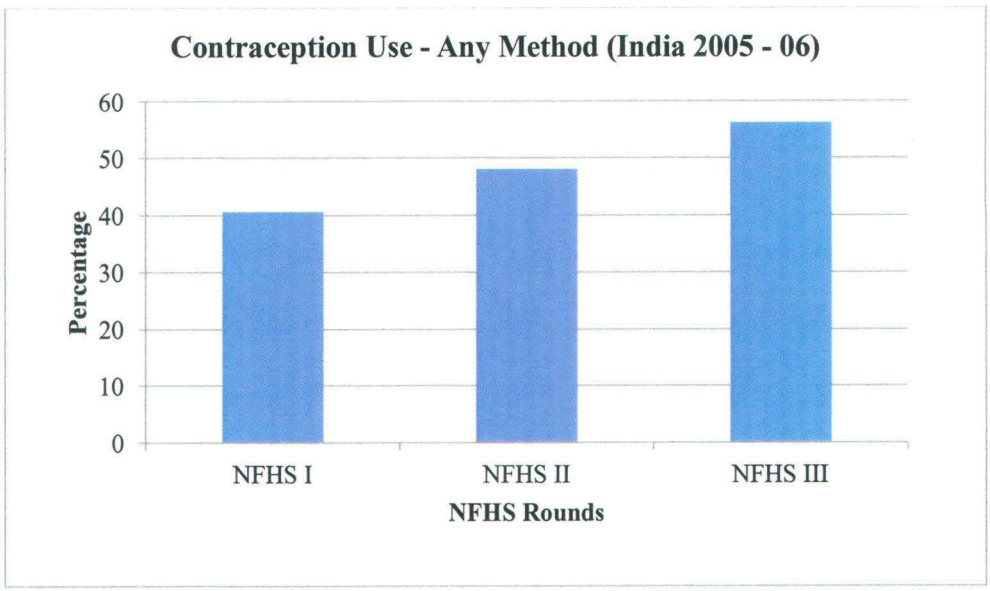


Source: NFHS III (2005-06), IIPS and Macro International (2007)

1.3. Contraceptive Use

India has a nationwide family planning programme since 1952. Contraception is promoted by the family planning programme to control family size and to achieve good quality reproductive health for women and health of children. Having fewer children and spacing them apart also gives the women a chance to improve own quality of life. This is achieved by increase in the use of contraception indisputably the main proximate determinant of fertility. So, effective contraception can be used to reduce and control fertility, as population will grow more rapidly without fertility control.

Figure 1.2

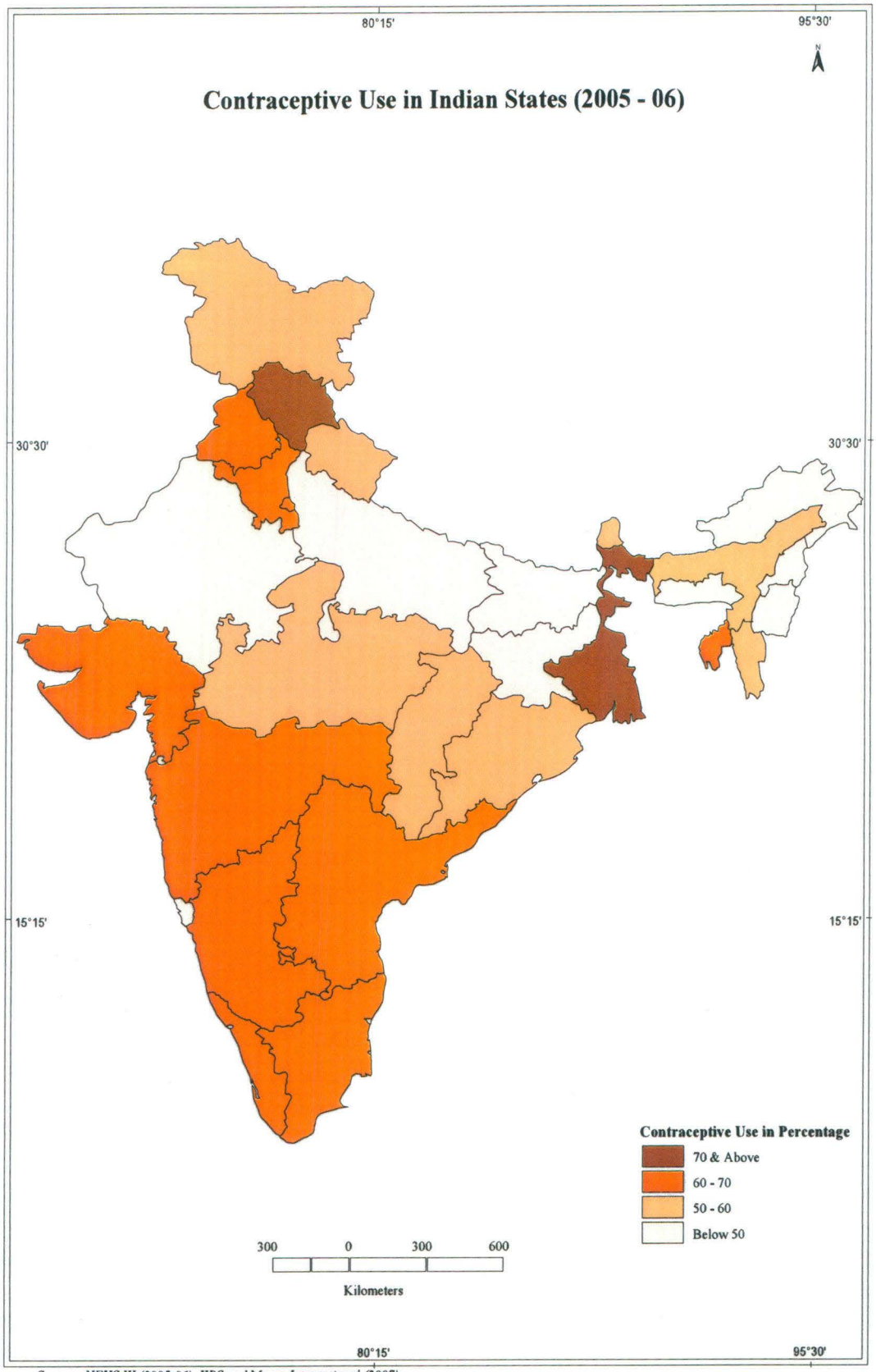


Source: NFHS III (2005-06) India Report, IIPS and Macro International (2007).

The contraceptive use in India by any method shows an increasing trend (see Figure 1.2) from the time period of 1992-93 (NFHS I) to 2005-06 (NFHS III). The actual use of the contraception in NFHS I, about near to 41% but it improved and achieved 15% more use in NFHS III. But the spatial variation in the use of contraception among Indian states is persisting. The positions in the use of contraception vary among by various reasons which we have understood from the review of literatures.

From Map 1.2 we can see the spatial differences in the use of contraception-any method. There are only two states which are showing above 70% of contraceptive use by any method, i.e., Himachal Pradesh and West Bengal. Traditional methods are widely used in these states.

Map 1.2



Source: NFHS III (2005-06), IIPS and Macro International (2007)

The southern states and only Punjab and Haryana from northern states are showing contraceptive use in the range of 60 to 70 percent. But the use of contraception in other northern states is below 50 percent except Madhya Pradesh which is in the range of 50 to 60 Percent. One of the reasons for high fertility rate prevailing in these northern states is the low use of contraception. However, the scenario of Madhya Pradesh is different because even with a good amount of use in contraception, this is not a low fertility state. The north-eastern states are also showing very low to moderate contraceptive use. The broad spatial difference which we can observe from the map is a clear cut north-south difference in the use of contraception. The same situation is prevailing in the east in terms of contraception use, with the exception of the state West Bengal which is showing very high use of contraception.

1.4. Purpose of the Study and Study Area

In this study an attempt has been made to examine the magnitude of influence of the various socio-economic and demographic determinants of fertility behaviour. It is hypothesised that fertility behaviour is an outcome of the complex interplay of social, economic, demographic and geographical situations. In this study two different societies have been chosen for an empirical analysis, which are different in their level of fertility behaviour as well as in terms of socio-economic, cultural and geographical settings. These two societies are four states from north India, i.e., Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh, and one state from south India, i.e., Tamil Nadu.

The main reason for taking these states is that these states collectively comprise about 42.69% *(according to 2011 Census Provisional Data)* of the population of the nation and any change in the demographic factors like fertility will affect the whole country in a dramatic way. So to know what are the factors which encouraged this high fertility behaviour in these northern states we need a standard state which can be compared. For this comparative study Tamil Nadu is taken as a standard one because it has achieved the replacement level of fertility and has shown a considerable decline in fertility in the last two decades along with consistent improvement on the fronts of social and economic spheres, which appears to be a suitable one for comparative analysis with these northern states.

Table 1.1: Demographic Characteristics of the Study Area.

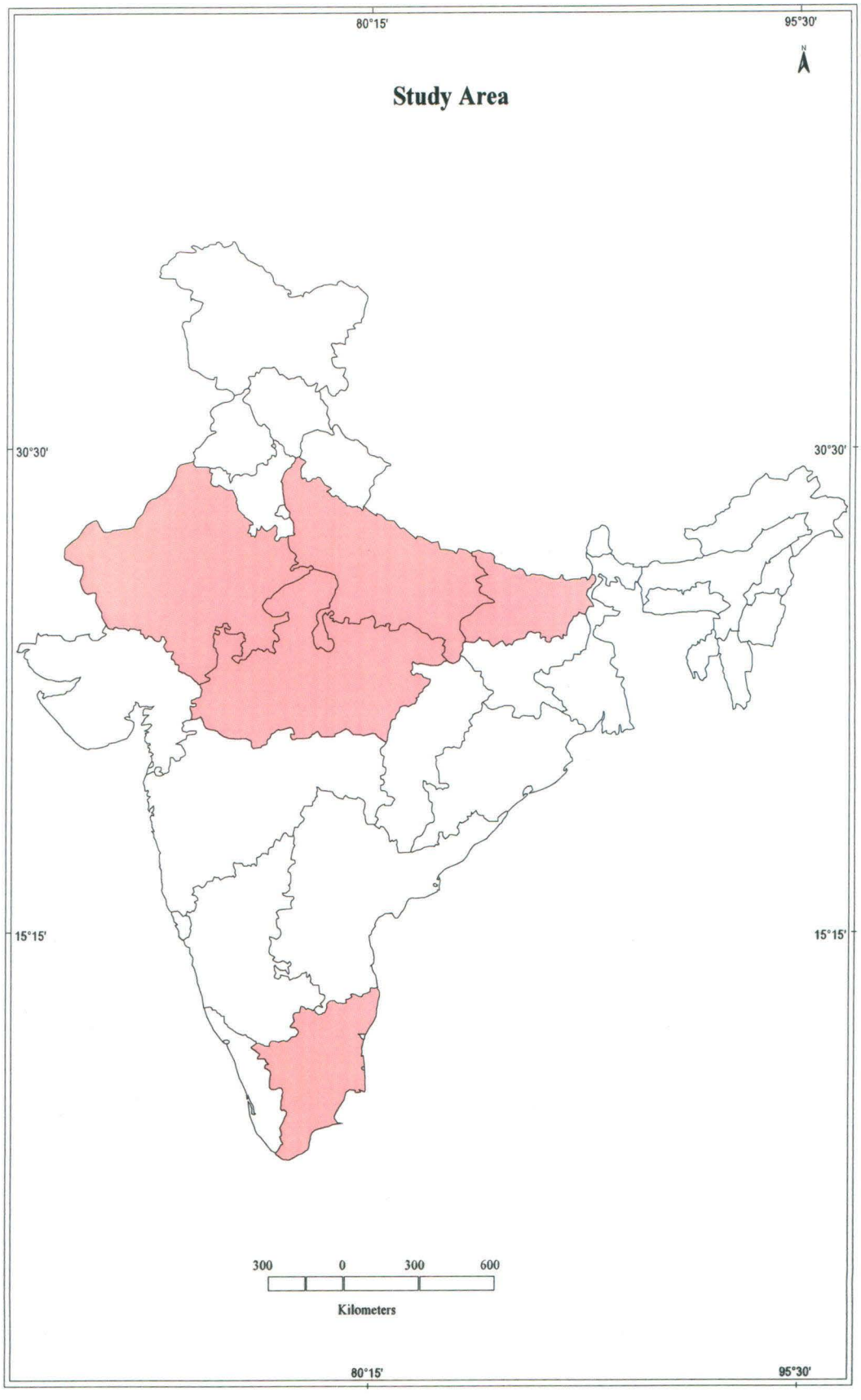
	Bihar	Madhya Pradesh	Rajasthan	Uttar Pradesh	Tamil Nadu	India
Population (2011)	103804637	72597565	68621012	199581477	72138958	1210193422
Share (in %) (2011)	8.58	6.00	5.67	16.49	5.96	-
Density/sq. Km (2011)	1102	236	201	828	555	382
Decadal Growth Percent (2001-2011)	25.07	20.30	21.44	20.09	15.60	17.64
TFR (2010)**	3.7	3.2	3.1	3.5	1.7	2.5
Life Expectancy Male* (2002-06)	62.2	58.1	61.5	60.3	65.0	62.6
Life Expectancy Female* (2002-06)	60.4	57.9	62.3	59.5	67.4	64.2
Literacy Total (2011)	63.82	70.63	67.06	69.72	80.33	74.04
Literacy Male (2011)	73.39	80.50	80.51	79.24	86.81	82.14
Literacy Female (2011)	53.33	60.00	52.66	59.24	73.86	65.46
Urban Population (in %) (2011)	11.30	27.63	24.89	22.28	48.45	31.16
Female Work Participation (2001)#	18.8	39	31.5	22.5	16.5	25.6

Source: *#Census of India 2001 CD's, Census of India 2011, Provisional Data. RGI, (NFHS III IIPS and Macro International 2007), *(National Health Profile 2009) and **(SRS India Registrar General (2011, 2012).*

Bihar:

The modern state of Bihar, which came into existence in 1956, is bounded by Nepal on the north, West Bengal on the east, Uttar Pradesh in the west and Jharkhand on the south. Bihar has 2.86% of the land area of India. In the 2001 census it ranked third in terms of population, after Uttar Pradesh and Maharashtra. Initially, Jharkhand was part of Bihar but is a separate state now.

Map 1.3


80°15'
95°30'
N
Study Area
30°30'
30°30'
15°15'
15°15'
300
0
300
600
Kilometers
80°15'
95°30'

Madhya Pradesh

Madhya Pradesh, as its name implies, is located at the geographic centre of India. It shares its border with five states, namely, Maharashtra, Gujarat, Rajasthan, Uttar Pradesh, Chhattisgarh (which was part of Madhya Pradesh earlier), Covering an area of 308,000 square kilometres with the population of 72.5 million, it has a large proportion of scheduled castes and tribes (15.4% and 19.9% respectively in 2001 Census), with 72% of the population living in rural areas.

Rajasthan

Rajasthan, physically the largest state in the Indian Union is situated in the North-west part of the country, and has 68.6 million (or 5.67 per cent) of the country's population. The population density is 201 persons per sq. km. (as against the national average of 382 in 2011 Census). The decadal increase in population of the state is 21.44 per cent (against 17.64 per cent for the country in 2011 Census), and the population of the state continues to grow at a rate much faster than the national rate.

Uttar Pradesh

Uttar Pradesh is the most populous state in the country. It is also the fourth largest state in geographical area covering 9.0 per cent of the country's geographical area. The decadal growth rate of the state is 20.09 (against 17.64% for the country) and the population of the state continues to grow at a much faster rate than the national rate.

Tamil Nadu

Tamil Nadu, the South Indian State of India nestles in the southernmost tip of peninsular India. Tamil Nadu has 3.96% of the land area of India. The State is bounded by Andhra Pradesh, Karnataka in the north and Kerala in the west. The waters of the Bay of Bengal and the Indian Ocean wash the coastal eastern and southern boundaries respectively. Tamil Nadu is the sixth most populous state in India.

1.5. Chapter Scheme

The study is divided into six chapters. The First chapter is an 'Introduction' to the study. The Second Chapter is a 'Review of Literature' on fertility behaviour and factors influencing it. The Third chapter on 'Objectives and Methodology' deals with objectives, research questions, and methodology. Trends in fertility in the study states are discussed in the Fourth chapter. The fifth chapter presents an analysis of fertility differences across states using the decomposition approach. An analysis of fertility behaviour at the individual level is carried out in chapter Six. At the end the chapter Seven presents the Conclusions.

CHAPTER II
REVIEW OF LITERATURE

There are various factors which influence fertility behaviour and each factor operates with different strength. Past research has identified these as: Age at Marriage, Female Education, Place of Residence, Wealth Index, Work Status of Women, Caste, Religion, Mass Media Exposure, Women's Empowerment, Desire for Children and Son Preference, Infant Mortality, etc. The above mentioned variables can be grouped into social, economic and demographic. This chapter briefly reviews literature in respect to the role of the above said variables in fertility behaviour and contraceptive use.

2.1. Theoretical Issues in Fertility Behaviour

There are a number of theories used to explain fertility behaviour. These have looked at fertility from different disciplinary and methodological perspectives. These include general socio-economic theories (identified with sociology and social demography), the psychosocial and microeconomics of fertility approaches (identified with psychology and economics respectively).

Davis and Blake (1956) have explained the way in which all non-psychological factors affect fertility in any society. They gave eleven intermediate variables, for three stages of child bearing, through which non-psychological factors affect fertility behaviour. All the eleven intermediate variables have either positive or negative effect on fertility.

Leibenstein (1957) in his ***'Economic Theory of Fertility'*** argued that whenever the growth of per-capita income takes place fertility will decline. His assumption is that families would balance utilities against disutilities, related to n^{th} child in order to determine whether a family wanted n^{th} child. He gave three types of utilities, that is, consumption, production and security utility and two types of disutilities, such as, direct cost for feeding a child and indirect cost as losing opportunities for better earning. He thought that utilities always decrease (except consumption utility) with higher birth order but disutilities do not give a clear image.

Becker (1960) strongly favoured the interlinkages between economic development and fertility reduction. By using Hicksian version of Micro Consumption Theory he explained

fertility and developed a demand theory as a pioneering work in this field. He says that children are like durable goods. In this regard he studied the American society to explore why richer families prefer small family size. He says that children are not inferior goods and as income rises, parents aspire to improve the quality of investment on existing children.

Further **Nambooodari (1972)** modified Becker's concept and said that decision regarding to family size is taken on the basis of past experience initially after having the first children. He further added that tastes also change during this gap between the present and next order children.

Davis (1963) in his ***'Theory of Change and Response'*** explained how the birth rates in developed countries have declined. He says that even before the experience of birth rate decline in the industrialised countries mortality rates had started declining, as a result of which the rates of natural increase had gone up. This take place in North-West Europe as well as in Japan. The danger of this demographic situation of stable increase was realised by people in industrialised countries and they responded quickly by postponing marriages, embracing conception, performing abortion and migrating outward.

In **Caldwell's (1976)** ***'Theory of Wealth Flows'*** he says that, either by economic or cultural forces the emotional nucleation of family take place, as a result fertility declines. At the heart of this theory is the idea that nucleation makes children as much more beneficiaries than the parents in family life, which Caldwell called as reversal of familial wealth flow.

According to **Dumont (Late 19th century)** an urge to rise in social scale brings down fertility. In the social scale a person who has small family has least burden so he will rise faster in the social ladder.

In an empirical study **Bongaarts (1978)** found that a major portion in the change in fertility levels could be explained by only four intermediate variables out of eleven intermediate variables listed by Davis and Blake. These variables are called proximate determinants of fertility, Nuptiality variable (age at marriage and proportion of non-marriages), amenorrhea due to following childbirth, induced abortion and contraceptive practice.

2.2. Regional Factor

We find that researchers generally use the term region to represent a broad geographical area based on prominent cultural differences. North and south India are two such examples. There is no agreement on where the north-south boundary may be drawn on the map of India and whether the north-south contrast is more prominent than the east-west divide. But the fact remains that fertility behaviours have clear geographical manifestations.

Although south India has had lower fertility levels historically, within south India there were two core areas namely the Travancore-Cochin region in Kerala and Kongu Nadu (Coimbatore Plateau) in Tamil Nadu where fertility declined first and diffused to other parts of south India. Thus, it is important to remember that fertility had declined both in the coastal as well as the inland areas initially.

Among the various socially rooted determinants of fertility the desire to have a son in a family has been quite significant. Although all societies in the world consider a family as complete at the attainment of a son, 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 of the major insights on this subject comes from **Dyson and Moore (1983)**, who sees the low status of women as a common cause of son preference and high fertility derive from a common root, i.e., the economic advantage of having male children.

In a study by **Roy et al. (2004)** indicators of women's empowerment found a regional divide, between Tamil Nadu and Uttar Pradesh. This divide is mainly because of socio-cultural variations in the level of empowerment. Education plays a major role in women's self esteem and favourable attitude towards girl's education and use of contraceptives across both cultures (Tamil Nadu and Uttar Pradesh). The two different societies which are prevailing in India are having the rural culture and urban culture. We can see, in rural areas the lifestyle is oriented more towards the community than family, while in urban areas the lifestyle is more individualistic and family oriented. This type of behaviour is more seen in Uttar Pradesh than Tamil Nadu.

A study by **Guilmoto and Irudayarajan (2005)** found a regional variation in fertility in India irrespective of religious affiliation, i.e., higher fertility in north than in the southern and western parts.

2.3. Education of Women

Female education can be expected to reduce desired family size for a number of reasons. First, education raises the opportunity cost of women's time and, generally, opens up greater opportunities for women that often conflict with repeated child-bearing. This may lead educated women to want fewer children. Second, in a country such as India where there is marked son preference, the education of women may reduce their dependence on sons for social recognition or support in old age. This too may lead to some reduction in desired family size, to the extent that large families are the consequence of a desire for an adequate number of surviving sons. Third, educated women may have higher aspirations for their children, combined with lower expectations of them in terms of labour services. This may also reduce desired family size, especially if there is a trade-off between the number of children and the time available for each child. Fourth, educated women may be more receptive to modern social norms and family planning campaigns.

According to **Oppang (1983)** the educated women may desire fewer children than less educated women. **Dreze and Murthi (2001)** in their study of fertility, education and development in India found strong relationship between women's education and fertility; that is female education has negative and highly significant effect on fertility.

Another study by **Kaur (2000)** says that education is the best contraceptive for having small families, so we have to root out illiteracy. Further **Islam and Nesa (2009)** find that education has great impact on women belonging to all economic groups. Higher educated women should be able to implement their fertility preferences due to their higher degree of autonomy in reproductive decision-making, better access and information about contraception. As the educated women are more likely to live in urban areas they may have lower fertility due to greater access of having family planning services and other modernization effects.

On the basis of his study **Singh (2002)** suggested that by improving women' education, women's autonomy in decision making, promoting employment opportunities for women and by spreading awareness of interspousal communication in family affairs reduction of fertility is achievable.

Pal and Makepeace (2003) found that parent's literacy, ownership of land in rural areas and that of television in urban areas significantly enhances use of some form of

contraception. In rural and urban areas women aged 35 and above are significantly using less contraception because of women's fecundity. The caste as factor in affecting contraceptive use is different for rural and urban women, i.e., ST women from rural areas have a lower use of contraception, while caste is insignificant for urban area in the study. The authors suggest that for the success of the family planning objective the spreading of contraceptives for limiting as well as for spacing of birth is done among women of all background in India.

Further **Arokiasamy et al. (2004)** say that positive educational externality is one of the main reasons of fertility decline in some southern states. According to **Sujatha and Reddy (2009)** education will affect fertility by bringing changes in the duration of breastfeeding, increasing age at marriage, increase in the practice of contraceptive, reduction in the preference for son and large numbers of children.

Gubhaju (2009) in his study captured the dynamic of wife and husband educational difference in the use of contraception. This article pointed out that once a country nears completion of its fertility transition, education does not play the same role as it did during the stage of high fertility. He found that wife's educational levels was important in influencing the type of methods used, but husband's education level was more influential in the use of male controlled methods. The contraception choice which the people got is limited especially in case of South Asian nations. The uneducated women are more likely to use sterilisation than the other methods and government programmes are also promoting sterilisation in rural areas where most of the women are uneducated.

On the basis of the study by **Arokiasamy (2009),** decline of fertility among illiterate women in India takes place because of the improved health and development conditions. In this study the increase in contraceptive prevalence rate among uneducated women has been larger and faster among educated women. This low fertility choice among uneducated women is guided by quantity-quality trade off, and maximization of benefits in the health and wellbeing for women and children.

2.4. Exposure to Mass Media

Exposure to mass media has considerable influence on contraceptive use. A study of NFHS data by **Ramesh et al. (1996)** revealed that regular exposure to electronic mass

media has a large effect on contraceptive use, even after controlling place of residence and education in India.

Retherford and Mishra (1997) noted that the mass media play an important role in spreading awareness about small family norms. The study found media exposure increases the acceptance of contraceptive use when women have general media exposure.

Barber and Axinn (2004) found that both premarital and lifetime exposure to mass media are associated with higher rates of permanent contraceptive use. Individuals exposed to mass media sources prefer smaller families, have weaker preferences for sons, and are more positive toward contraceptive use.

2.5. Religion of Women

A study by **Alagarajan and Kulkarni (1998)** found that the decline of fertility is not uniform for the three major religions i.e. Hindu, Muslim and Christian, after the considerable decline of third or higher order births in 1970's and 1980's in Kerala.

In a study about Muslim and non-Muslim fertility differences in women autonomy, **Morgan et al. (2002)** found that the religion plays a central role in fertility. Muslim women oppose some particular form of birth control, which automatically encourages higher risks of unwanted pregnancies which leads to larger family size among Muslim women than non-Muslim women.

In a study by **Dharmalingam et al. (2005),** among women with two or more children, Muslim women are much more likely to intend an additional child and also less likely to use contraception given an intention for no more children. The differences of Muslim-Hindu fertility are real and not due to differences in socioeconomic characteristics and either women's autonomy also. The Muslim-Hindu differences in fertility lie in discrimination against the minority group or in the role of demographic behaviour as markers of group identity.

According to **Bhagat and Praharaj (2005)** the Hindu-Muslim differential in fertility persists in India's demographic reality, but it is no more than one child. In their study they found that the practice of family planning is low among Muslims, but it is also important that they use more spacing traditional methods then Hindus. The authors were surprised to

find that there is a higher unmet need for family planning among the Muslims and they avail less services from government sources even in rural areas. As Muslims are more illiterate and poor, it is necessary to look why they utilise less services provided by the government.

A study by **Kulkarni and Alagarajan (2005)** found that education is the most commonly observed variable which influences fertility. But in the study the socio-economic factors do not seem to explain the religious differential in fertility. The contraceptive use is the prime factor which contributes to religious differentials in fertility among the four proximate determinants of fertility.

2.6. Caste

Members of the scheduled castes and scheduled tribes have distinctive social identities and face different forms of social and economic discrimination. This variable provides a rough indication of economic and social status. Unlike other indicators of economic well being, a woman caste remains constant from the beginning of her birth through the rest of time of her life. Therefore, expectation is that fertility would be higher in these social groups. *(Dixit, 2009)*

2.7. Standard of Living and Infrastructure Availability

Standard of living of the household indicates the economic condition and acts as a proxy variable for income when direct data on income is not available.

In a study by **Roy et al. (1999)** it was found that, unmet need for family planning was higher among households with low level of living standard. The negative relationship between standard of living and fertility is seen in their study areas, i.e., in Punjab, Kerala, Uttar Pradesh and Maharashtra. In Kerala the attitudes of couples towards family size have not at all been influenced by the living standard in this study. The uniform social development made them adopt small family size norm in this state as compared to other three states of the study.

According to **Savitri's (1994)** study fertility decline has taken place in Tamil Nadu without achieving high literacy rate and high status of women. The main reason behind this decline in fertility in Tamil Nadu is the availability of road facilities and low child

mortality. The better transportation facility which connects the rural and urban areas implies a quite strong linkage between them. The poverty effect also goes against the common belief that poor tend to have more children in Tamil Nadu. The female labour force participation in nonfarm activities has risen because of the good network of roads and efficient transportation facilities. Participation in nonfarm work activities naturally led them to have fewer children.

2.8. Women's Empowerment

According to **Mason (1987)** the extent to which women have autonomy from men's control in their day-to-day lives or are economically independent from male family members has been argued to affect their age at marriage, their desires for children, the costs of children, and the use of contraception which indirectly affect fertility.

A study by **Audinarayanan (1997)** conducted in Sulur town of Coimbatore district of Tamil Nadu, on 300 currently married couples both husband and wives (aged between 15 to 44 years wives) found the various dimensions of the status of women, i.e., consultation of women for their marriage, control over jewels bought from natal family, extent of segregated interaction, extent of restrictions imposed on women by husbands to do certain activities, extent of women's participation in decision making on household affairs have played a crucial role in influencing their children ever born.

Badar and Mansoor (2007) also showed that there is strong inverse relationship between women's empowerment and their fertility. The relationship between women empowerment and contraceptive use was positive. They concluded that women's empowerment provides multidimensional aspects of security which ultimately affect parity.

Further **Das and Tarai (2011)** observed that many of the background characteristics of women, like decision making do not influence the fertility behaviour significantly in the SC and ST communities. When the decision making of women was controlled, the one factor which influenced fertility behaviour is age of the respondent among SC and ST women, and exposure to mass media also influenced fertility behaviour of the ST women.

2.9. Desire for Children and Son Preference

Parent's concern about their security during old age is one of the strong motives for demanding own children. Since sons usually have the responsibility of caring for parents during their old age, parents may wish to have extra 'insurance' sons simply to guarantee that at least one will be able to meet their needs.

Since the desired number of children is related to the current number of living children of women, it is not unexpected to find that with increasing age the desired number of children increases, adjusting their preferences with their changing life situations. More than age, it is the number of living children that has a stronger influence on desired fertility.

One of the major insights come from **Dyson and Moore (1983)**, who see the low status of women in societies associated with son preference and high fertility. From another study by **Basu (1992)** we came to know that son preference and high fertility derive from a common root, i.e., the economic advantage of having male children.

According to **Yamada (1985)** fertility decline is a consequence of infant mortality rate decline which will occur due to an increase in per capita real income.

On the basis of their study **Ramesh et al. (1996)** found that number of living children is an important factor that influences intention to use contraception. The intention to use the contraception is determined by the number of living children till the level of two and three children, beyond which it increases. There are two reasons for this; firstly, as potential users reach their desired number of children, they tend to use contraception and thus do not show in the non user group and second, because older women have lower fecundity and thus do not feel the need to use contraception.

2.10. Child Survival

According to **Retherford and Ramesh (1996)** infant mortality is one of the important predictors of fertility. When infant mortality is low then more children will survive and women do not need as many births to achieve their wanted family size, so automatically the contraceptive use will increase and result in fertility decline.

Dwivedi and Rajaram (2004) observed that use of contraception is low in Uttar Pradesh and from this low proportion majority of the couples go for sterilisation. The study also pointed out that the couples who go for sterilisation already have an average of four children. Education of the wife has negative relationship with infant and child mortality. But infant and child mortality have positive relation with children ever born. The authors indicated that to lower fertility improving education of the women and ensuring that the children who are born will survive are essential. The improvement in educating women especially high school and above and utilization of facilities regarding infant/child survival may lead to lowering the fertility.

2.11. Age at Marriage

Marriage is universal in India and commencement of childbearing is socially acceptable only within the institution. Age at first marriage therefore, influences the period of time in which a woman is exposed to the risk of pregnancy during her reproductive years.

In a study by **Dommaraju (2008),** the women marrying early and having births at younger ages tend to have higher levels of child mortality and maternal mortality. And the delay in entry into motherhood for those marrying early could be due to physiological factors, low levels of coital frequency or combination of both. According to the author, the factors which promote late marriage are also the ones that encourage small family. The women marrying late have a shorter first birth interval than women marrying at a younger age. But second and higher birth intervals are longer among those marrying late compared with those marrying early.

Visaria (1999) found that the age at marriage in urban areas among Hindu women was higher than the Muslim women and because of modernisation and educational improvement in urban areas the family planning norms are also changed among Muslim women.

2.12. Contraception

In this section an attempt has been made to review some of the studies relating to contraceptive use and fertility behaviour. There are various factors influencing contraception adoption of the households; such as better physical amenities, mass media exposure, education, family's economic status and female age at marriage etc.

Urbanisation is often cited as an important factor that increases the level of contraceptive use. According to **Dreze and Murthi (2000)**, in urban areas children are less likely to contribute to household production. If we consider 'diffusion process' can cause fertility decline then urban areas have more potential due to the greater exposure to mass media and wider opportunities available to observe and discuss the lifestyles of other social groups. On the other hand, **Ramesh et al. (1996)** found that if education is controlled, urban-rural difference in contraceptive use is substantially reduced in India as a whole.

In **Dwivedi's (1992)** study of sixteen major states of India's 1987 data, he found that literacy contributes very much in motivating couples to accept sterilisation and had a direct negative effect on IUD use. He says that for strong and immediate effect on sterilisation acceptance we need further improvement in literacy in all states. According to **Gulati (1996)**, level of education attained by women has significant effect on contraceptive acceptance. He observed that female education beyond the middle school increases the use of contraception in the states studied.

According to **Basu (1992)** working women have higher opportunities to interact with outside world which exposes her to new ideas which could bring a change in her attitudes towards family size and the use of contraception. **Kanitkar and Murthi (1983)** came across a positive relationship between the standard of living and use of contraception in Rajasthan and Bihar.

In a study by **Kulkani and Alagarajan (2005)** it was found that contraceptive use is the main reason behind the difference of fertility among different religious community. The factors like, income, occupation, urbanisation, age at marriage and contraception are the one by which the population of all religion varies.

Patil et.al (2010) pointed out that the unmet need of contraception is one of the main reasons for the high fertility in tribal women of India. The contraceptive choice is conspicuously absent, and the quality of care is exceptionally poor within the programme. And to overcome these types of problems the author suggested to focus on improving information, education and communication activities which are the key to address the unmet needs for contraception along with easily accessible, convenient and good quality methods of family planning.

In the analysis by **Pathak et al. (1998),** sterilisation plays an important role in family planning programme, i.e., 76%. According to the authors relying entirely on sterilisation in declining fertility is unwise thing, because the sterilisation method is irreversible so it is acceptable only by those women who have already achieved their goals and do not want any more children in the future; this obviously leads to large families. To stop the unwanted fertility of the women who want children in the future, the temporary methods play an important role.

2.13. Programme and Policies

Increased contraceptive use is largely responsible for the observed decline in fertility. Use of effective contraceptive methods significantly reduces the reproductive years of a woman and thus it helps in reducing fertility. Sterilisation is the dominant method in the Indian family planning programme and women go for sterilisation only after completing their desired number of sons and daughters. Therefore, it happens that couples who were sterilized have a higher level of mean children ever born than those who had never adopted any contraceptive methods. But this scenario could be changed if women adopt spacing methods or go for early sterilisation. This variable also acts as a proxy measure of the government's efforts in the family planning programme.

In Tamil Nadu, the fifteen point programme that is largely based on the welfare of children, women's empowerment through education and health care etc. is considered the main source of fertility decline in the past. This is an integrated and quality oriented and women and children centred programme, aimed at population stabilization without relying heavily on contraceptive targets alone. It has to be seen as a model population policy for Indian nation. **(Ramasundaram, 1994).**

According to **Retherford and Ramesh (1996)** the three factors that influence fertility are infant mortality, age at marriage and contraceptive use, utilisation of maternal and child health services. This study shows that the most powerful predictors of total fertility and contraceptive prevalence are the percentage of women who receive antenatal care and the percentage of girls of age six to fourteen who are attending school. For Andhra Pradesh it is family welfare programme which brings fertility close to replacement level without much economic or social development.

In the case of Tamil Nadu, various explanations have been advanced to understand the demographic transition which includes strong political will, Dravidian movements, Social reforms, and influence of mass media, particularly films and above all, an efficient family planning programme. An optimal approach in the strategic balancing of 'top-down' and 'bottom-up' forces is believed to have played a crucial role in the successful fertility transition in Tamil Nadu, overcoming the cultural barriers imposed by low literacy level and low standard of living. **(Kulkarni et al, 2002).**

2.14. Research Gaps

The above studies mainly focussed on the trends, patterns and differentials on fertility. In various studies the authors have examined the socioeconomic factors influencing fertility and the reasons for variations across the country. But the above studies lack in focusing on the reasons for fertility differential prevail among the states of north itself, where we can see the similar conditions (socio-economic) are prevailing. We also need to know if the lower fertility in southern states, and in particular in Tamil Nadu, is because of more favourable socioeconomic conditions than in northern states, or if there are other factors, cultural or even intangible. Therefore this study is an attempt towards these directions.

CHAPTER III
OBJECTIVES AND METHODOLOGY

3.1. Introduction

This chapter deals with objectives, hypothesis, research questions, conceptual framework and methodology. It is divided into eight sections. In the first three sections objectives, hypothesis and research questions are discussed. Besides these, we describe the conceptual framework, methodologies and measurement of variables.

3.2. Objectives

The study is designed to see why fertility in the four states, Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh is higher than that in the southern state of Tamil Nadu. The specific objectives are:

1. To identify factors responsible for the difference in fertility in the four northern states on the one hand, and Tamil Nadu on the other.
2. To examine the various factors which influence contraceptive use and to analyse the differentials in contraceptive use among the selected various socio-economic and demographic groups.
3. To see whether the difference between the fertility in Tamil Nadu and the four north-central states is due to the differences in socioeconomic conditions or other factors.

3.3. Research Question

1. How significant the selected demographic and socioeconomic factors are in influencing the contraceptive use among women with two, three and four and above living children?
2. What are the reasons for high fertility prevalence in northern states (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) than Tamil Nadu?

CHAPTER III

OBJECTIVES AND METHODOLOGY

3.1. Introduction

This chapter deals with objectives, hypothesis, research questions, conceptual framework and methodology. It is divided into eight sections. In the first three sections objectives, hypothesis and research questions are discussed. Besides these, we describe the conceptual framework, methodologies and measurement of variables.

3.2. Objectives

The study is designed to see why fertility in the four states, Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh is higher than that in the southern state of Tamil Nadu. The specific objectives are:

1. To identify factors responsible for the difference in fertility in the four northern states on the one hand, and Tamil Nadu on the other.
2. To examine the various factors which influence contraceptive use and to analyse the differentials in contraceptive use among the selected various socio-economic and demographic groups.
3. To see whether the difference between the fertility in Tamil Nadu and the four north-central states is due to the differences in socioeconomic conditions or other factors.

3.3. Research Question

1. How significant the selected demographic and socioeconomic factors are in influencing the contraceptive use among women with two, three and four and above living children?
2. What are the reasons for high fertility prevalence in northern states (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) than Tamil Nadu?

3.4. Fertility Behaviour

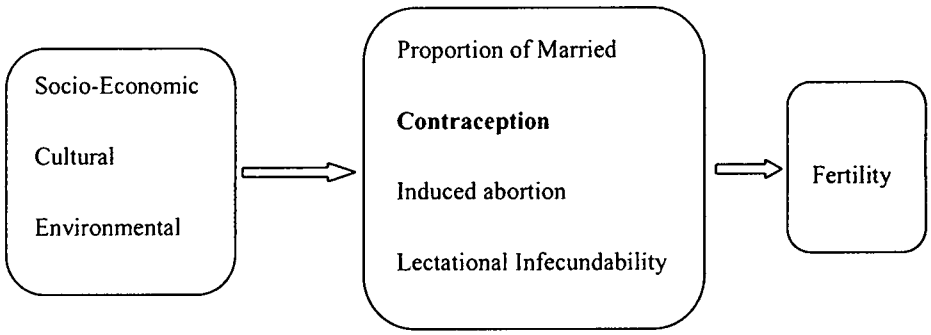
Fertility is one of the elements in population dynamics that significantly contributed to changing the population size and structure over time, and the level of fertility is closely associated with the levels of socio-economic development. There has been change from high fertility to low fertility where female education, widely available contraception, accessibility to health facilities are some of the responsible factors. The education, urbanisation, decline in mortality (especially infant and child mortality), health care facility availability, cultural differences and so on are all postulated to have a causal relationship with fertility decline. Contraception is the one of the main proximate determinants in determining the fertility, so it is clear that contraception can shape fertility behaviour in any region.

3.5. Conceptual Framework

Davis and Blake (1956) have developed a frame work of eleven intermediate variables only through which socio-economic and cultural factors affect fertility. But Bongaarts refined the Davis and Blake's intermediate variables and come out with a list of variables termed as proximate determinants of fertility which are the biological and behavioural factors through which social, economic and environmental variables affect fertility. The principal characteristic of proximate determinant is "its direct influence on fertility" **(Bongaarts and Potter, 1983)**. Bongaarts identified that the major variance in the fertility levels among societies is explained by four proximate determinants of regulated fertility, such as the proportion of females married, the prevalence of contraception, the incidence of induced abortion and the fertility inhibiting effect of breastfeeding.

The conceptual framework helps in understanding the interrelationship between indirect and direct variables. Contraception is one of the intermediate determinants. Based on Bongaarts' framework, this study will examine several factors which influence contraception, particularly the socio-economic, cultural, and demographic factors and then examine the effect on fertility rates in the study area i.e. (Bihar, Madhya Pradesh, Rajasthan, Tamil Nadu and Uttar Pradesh).

Figure 3.1: Framework of the Relationship among the Determinants of Fertility.



Source: Bongaarts' (1978), modification from Kingsley Davis and Judith Blake

3.6. Data Source

For describing Trends in fertility, data from the Sample Registration System (SRS) are used. The SRS has been providing estimates of demographic parameters for India and states regularly since 1971. The SRS is a system of sample registration introduced in India in the late 1960's, since the civil registration has not been functioning well and the coverage is poor. The SRS is based on duel registration and the quality of data in the years has been good.

This study will utilise secondary data from the National Family Health Survey **(NFHS- III 2005-06)**. NFHS used three questionnaires – a household questionnaire, a women's questionnaire and men's questionnaire. For the purpose of this study the data from the women's questionnaire are used.

The women's questionnaire was used to collect information from ever married women aged between 15 to 49 years. They were asked about: background characteristics like marital status, education, and media access; knowledge about family planning services; fertility preference and reproductive history; pre-natal care, delivery and postnatal-care; breastfeeding practices; immunisation and child illness; marriage and sexual activity; husband's occupation and husband's education; child mortality; sibling and maternal mortality; HIV/AIDS and other transmitted diseases.

The third NFHS (NFHS-3) was conducted between November 2005 and August 2006 in 29 states. NFHS-3 collected data on all women; 124,385 women aged 15-49 were interviewed and the individual response rate reached 94.5 percent. Compared to the two previous NFHS, the overall individual response rate was the lowest in the NFHS-3, yet the

data quality was the highest. The sample size varies across states between 1,647 women in Arunachal Pradesh (Northeast) and 12,183 in Uttar Pradesh (Central). The sample sizes the study states are, Bihar 3,818 women, Madhya Pradesh 6,427 women, Rajasthan 3,892 women, Tamil Nadu 5,919 women and Uttar Pradesh 12,183 women were done.

3.7. Methodology

3.7.1. *Decomposition Method*

The major reason to use decomposition method for this study is to identify the dominance of most influencing factor which is acting behind the phenomena of fertility differential among northern states and Tamil Nadu. Decomposition helps to know differences due to composition factors (like education, wealth and Place of residence) and other socio-cultural factors which prevail in the states of the study area.

The decomposition deals with finding the additive contributions of the effects of the differences in the compositional or rate factors in two populations to the difference in their overall rates. The subjects of standardization and decomposition are strictly linked and, logically, one cannot be treated independently of the other.

The procedure is described below:

Let,

TFR_o = TFR of standard state (Tamil Nadu in this case)

TFR_i = TFR of state i.

Further,

Let,

TFR_{ij} = TFR for education category j in the state i.

P_{oj} = Proportion of population in education category in standard state.

Then,

TFR of state i standardised for education = $\sum TFR_{ij} \times P_{oj}$

This would be the TFR of state i if it had the same educational composition of the standard state.

Then,

TFR_i – Standardised TFR_i = Effect of difference in composition by education.

And Standardised TFR_i – TFR_o = Effect of other factors.

The total difference in TFR, (TFR_i – TFR_o) is thus decomposed as:

(TFR_i – TFR_o) = (TFR_i – Standardised TFR_i) + (Standardised TFR_i – TFR_o)

= Effect of difference in educational composition + Effect of other factors

The same procedure has been followed for other background factors. Decomposition with place of residence and wealth index has been followed in the decomposition of TFR. And in the contraceptive use category the same method is used to obtain the decomposition results.

3.7.2. Binary Logistic Regression

Regression is an important technique to see the causal relationship between dependent variable and independent variables. Here I selected contraceptive use as dependent variable which is in dichotomous form as 'using contraception' and 'not using contraception' and various major socio-economic variables as independent variables such as female education, place of residence, wealth index, women work status, caste, religion and mass media exposure. Besides, state is used as a factor by creating a categorical variable (five categories, with Tamil Nadu as the reference).

Regression is useful for situations in which it enables us to predict the outcome based on values of a set of predictor variables. If the dependent or response variable is dichotomous (binary), such as presence or absence; success or failure; binary logistic regression is used. Logistic regression allows one to predict a discrete outcome, such as group membership, from a set of predictor variables that may be continuous, discrete, dichotomous, or a mix of any of these. There are two main uses of logistic regression: Firstly, to predict the group

membership, since logistic regression calculates the probability of success over the probability of failure. Logistic regression coefficients can be used to estimate odds ratios for each of the independent variables in the model. Secondly, logistic regression also provides knowledge of the relationships and strengths among the variables.

The basic form of logistic function is:

$$P = \frac{1}{1 + e^{-z}} \qquad (1)$$

Where P is the estimated probability (here the probability of using contraception), z is the explanatory variable and e is the base of the natural logarithm (e = 2.7183).

The quantity $\frac{p}{1-p}$ is called the odds and the quantity of $\log(\frac{p}{1-p})$ is called the logit of P. simplifying the equation (1) we get:

$$\text{Odd} = \frac{\text{P}}{1 - \text{P}} = \frac{\text{Probability of Presence of Characteristics}}{\text{Probability of Absence of Characteristics}} \qquad (2)$$

Logit (P) = $\ln [\frac{P}{1-P}]$

The Multivariate logistic function involving K predictor variables $x_1, x_2, x_3 \ldots\ldots x_n$ is given by:

Logit (P) = $b_0 + b_1x_1 + b_2x_2 + b_3x_3 + \ldots\ldots b_nx_n$

Odds = $\frac{P}{1-P} = e^{b0} \times e^{b_1x_1} \times e^{b_2x_2} \times e^{b_3x_3} \times \ldots\ldots e^{b_nx_n}$

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

If an explanatory variable is categorised, the ratio of odds for one category to the odds for a reference category measures the influence of the category relative to the reference category. If β_{kj} is the coefficient for category j of factor k, then $e^{\beta kj}$ is the odds ratio, ratio of odds for category j to the reference category for factor k.

3.7.3. Multiple Classification Analysis (MCA)

'Multiple classification analysis (MCA) is an appropriate technique to show how dependent variables are affected by various independent variables, it shows how predictor relates to independent variable and before and after adjusting for the effects of other independent variables and how all the independent variables considered together related to the dependent variables'. (Andrews et al, 1973, pp. 1)

Multiple classification analysis is a technique for examining the interrelationship between several predictor variables and a dependent variable with the context of an additive model (Retherford and Choe, 1993). The statistical method signifies that a coefficient should be assigned to each category of each predictor and dependent variable should be assigned to each category to each predictor and dependent variable should be treated as the sum of the coefficients assigned to categorise plus average for all classes plus an error term. Symbolically,

$$Y_{ijk} = \bar{Y} + a_i + b_j + \ldots + e_{ijk\ldots n}$$

Where,

Y_{ijk} = Score (on the dependent variable) of a particular individual variable which falls into the i^{th} category of predictor 'a', j^{th} category of predictor 'b', etc.

$\bar{Y}$ = Grand mean of dependent variable.

a_i = The effect of the membership in the i^{th} category of predictor 'a';

b_i = The effect of the membership in the j^{th} category of predictor 'b' (difference between y and the mean of all the j^{th} category of predictor b).

e_{ijk} = Error term of individual.

Through this technique we are not able to explain how each predictor variable is related to the dependent variable but also how well all the variables taken together explain variation in the dependent variable.

In the absence of the effect of other predictors the impact of a predictor variable on response variable is called unadjusted effect and the effect of a predictor variable controlling the effect of other predictor variables constant is called adjusted effect. In addition to adjusted and unadjusted effects, the eta (η) coefficient is the correlation ratio,

which shows how well a given predictor can explain the variation in the dependent variable; whole square (η^2) coefficient indicates the proportion of the variation explained by the predictor alone. These statistics are applicable to the unadjusted means. On the other hand, the beta (β) coefficient measures on the basis of the adjusted means, the ability of a given predictor to account for variation in the dependent variable where as the β^2 coefficient shows the proportion of the variation that is explained by the predictor, after taking into account the proportion explained by other predictors.

Further R^2 unadjusted is the actual proportion of variance in the dependent variable explained by using the obtained coefficients in the analysis. R^2 adjusted is an estimate of how much variance the predictors would explain if used in an additive model applied to different but comparable set of data cases.

Multiple classification analysis (MCA) is an appropriate one in this study because it needs dependent variable as quantitative variable, and the independent variable are categorical variables. The dependent variable (children ever born) of the study is in the form of quantitative one and other independent variables are categorical. Since the number of children ever born obviously depends on marital duration, it is necessary to control this variable while assessing the influences of other variables. Therefore, marital duration is used as a covariate in the MCA here.

3.8. Measurement of Variables

The variables selected for the study can broadly be categorised into two i.e. Response variable and Predictor variable. The measurement of response and predictor variables and the notations used to represent each of those variables are given below:

3.8.1. *Response Variable*

a) Current Contraception use by women, which is dichotomous in nature. It is categorised as

0 = Not Using any Contraception (by women or husband)

1 = Using any Method of Contraception (by women or husband)

b) Children Ever Born – Number of children ever born to a women.

3.8.2. *Predictor Variables*

Socioeconomic and demographic factors possibly influencing fertility behaviour are the predictor variables. These variables used here are:

1. **Caste of Women:** Women are categorised into four categories, such as Scheduled Caste (SC), Scheduled Tribe (ST), Other Backward Caste (OBC) and Others.

2. **Religion:** Women belonging to different religious groups are broadly categorised into four, Hindu, Muslim, Christian and Others. Because of the very few number of cases are belonging to all other religions except Hindu, Muslim and Christian, all these are clubbed into the category of 'Others'.

3. **Education:** The educational level of women and husbands are categorised in terms of their level of education as No Education, Primary School, Secondary School, and Higher.

4. **Place of Residence:** The place of residence of women is classified in terms rural and urban areas (Dichotomous).

5. **Wealth Index:** Since information on income is difficult to obtain in a survey, the NFHS has constructed an index called 'wealth index' based on ownership of assets by the household and housing conditions, and this is used as proxy. Each household asset is assigned a weight (factor score) generated through principal components analysis, and the resulting asset scores are standardized in relation to a normal distribution with a mean of zero and standard deviation of one. Individuals are ranked according to the score of the household in which they reside. The sample is then divided into quintiles i.e., five groups (Poorest, Poorer, Middle, Richer and Richest) with an equal number of individuals in each at the national level. The details are provided in the NFHS report. (IIPS and Macro International, 2007).

6. **Mass Media Exposure:** It is categorised into three i.e. High, Medium and Low. Women who either read the news paper, listen to radio or watch television almost every day are considered as highly exposed to mass media. The women who either read the news paper, listen to radio or watch television less than once a week or at least once a week are considered as partially exposed to mass media. And the women who are not at all either

reading news paper, listening radio or watching television are considered in the group of Low mass media exposure.

7. **State:** The principal factor of interest in the study is the effect of the state. In MCA, this is a categorical variable: five categories for the five states. In this analysis Tamil Nadu is treaded as the reference category.

8. **Marital Duration:** It refers to the gap (in completed years) between the dates of marriage to the date of Survey. This is used as a covariate in MCA.

9. **Work Status of Women:** Work status of women is categorised into four. Those who do not work are categorised as 'Not Working', those who are cultivators or engaged as agricultural labour are clubbed into 'Agricultural Employee', those who are skilled and unskilled manual workers are categorised as 'Manual Worker' and all other workers are clubbed as 'Other worker' Category.

CHAPTER IV

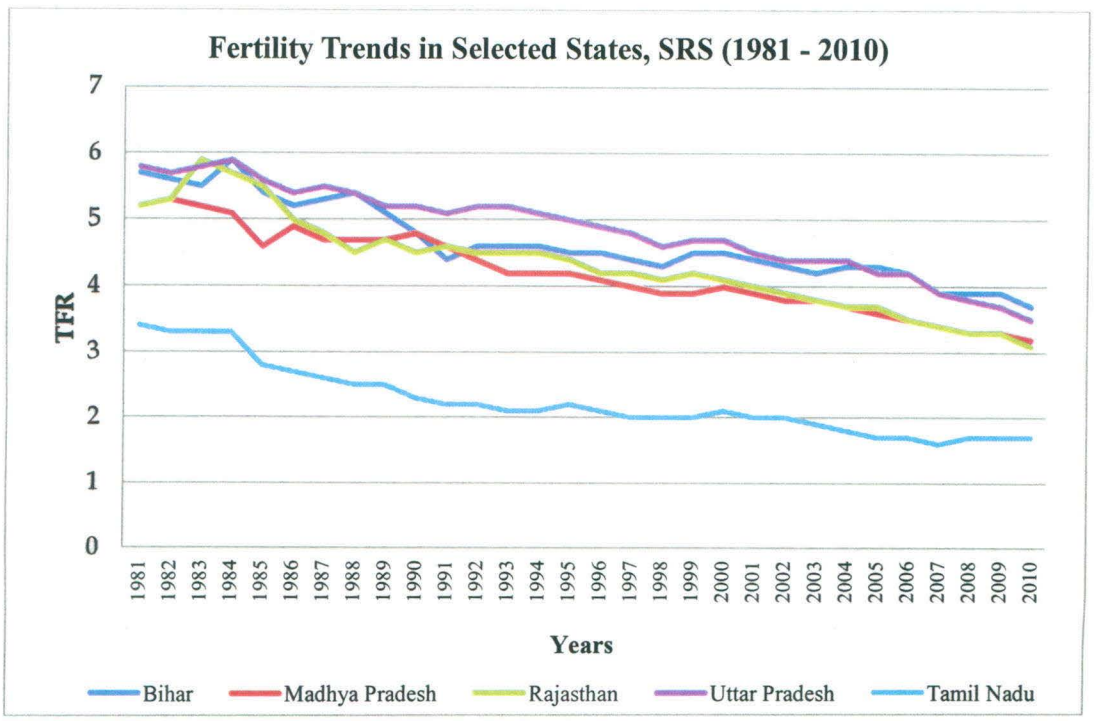
TRENDS IN FERTILITY

In this chapter we examined the trend in total fertility rate from the Sample Registration System (SRS) for the period of 1981 to 2010. An attempt has been made to analyse the fertility trend from past to present date for rural and urban areas separately.

4.1. Trends of fertility in selected states.

The trend analysis of total fertility rate helps to know the past, present as well as to predict the future scenario of fertility rate. The total fertility rate of selected states (Bihar, Madhya Pradesh, Rajasthan, Tamil Nadu and Uttar Pradesh) except Tamil Nadu was very high in eighties. The same level of total fertility also prevailed in India as a whole at that time. In the following figure 4.1 we can notice a fluctuating decline of fertility (TFR) from 1981 to 2010 in the selected states. Whereas the fertility gaps prevailing among four northern states are very narrow, but fertility gap between Tamil Nadu and these northern states is very wide.

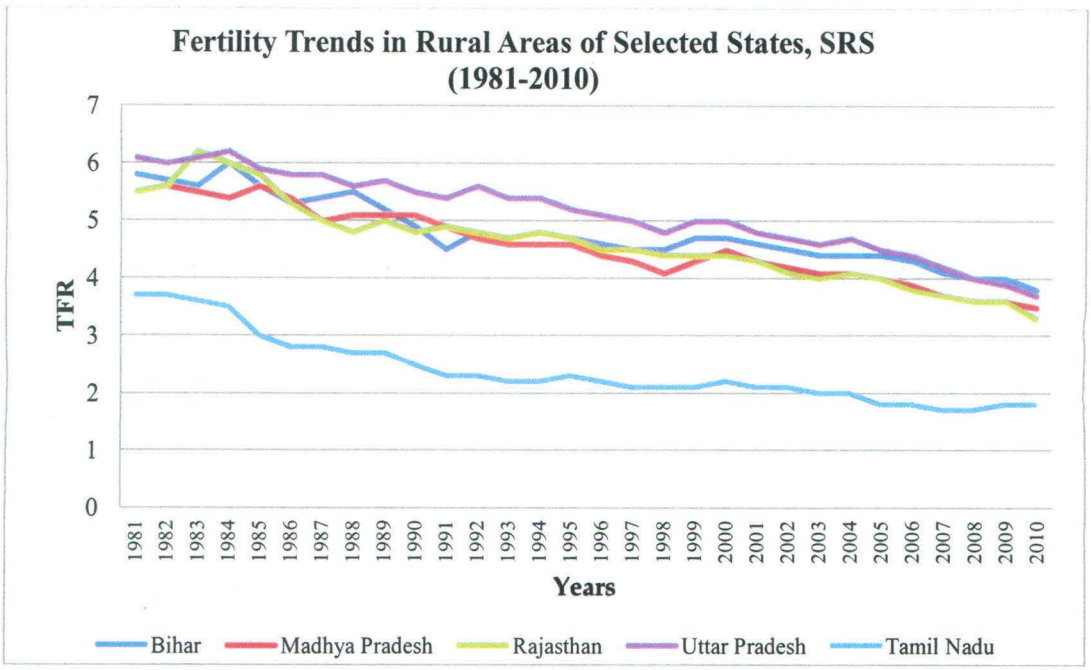
Figure 4.1



Source: SRS, Compendium 2007, RGI. India, Registrar General (2009, 2010 and 2011)

These northern states declined their fertility by 2 points of TFR from 1981 to 2010, in which the decline is very fast after 2000 in all these four northern states which is visible from the Figure 4.1. The same amount of fertility decline is seen in case of Tamil Nadu also, but earlier fertility of Tamil Nadu was already low as compared to all these four northern states so the average fertility decline in Tamil Nadu and the selected northern states remains same.

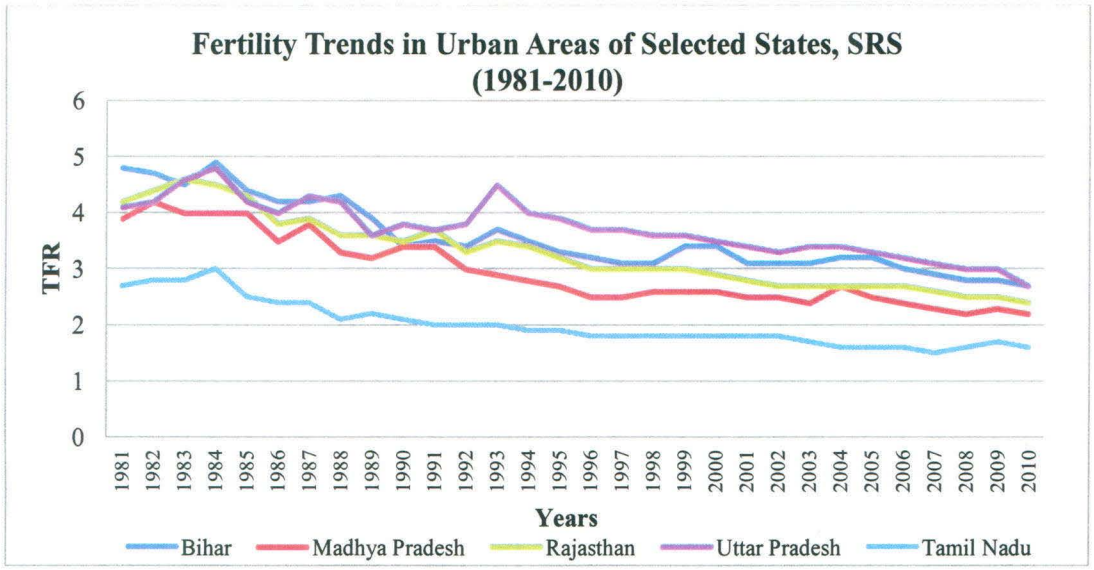
Figure 4.2



Source: SRS, Compendium 2007, RGI. India, Registrar General (2009, 2010 and 2011)

The fertility differences in rural and urban areas are shown in the figures 4.2 and 4.3 respectively. The fertility rate is fluctuating in rural areas of four northern states as compared to the urban areas. However, fertility difference between Tamil Nadu and these northern states is narrow in urban area and urban fertility started declining from 1995 itself. In the rural area of these northern states fertility came down faster from 2000 onwards, but the gap between the states of north in the study and Tamil Nadu is very wide, which indicates that the fertility difference among these states prevailed in rural areas. In urban areas the TFR of the four northern states came down very near to replacement level in 2010, whereas Tamil Nadu is showing TFR of below replacement level from the year 1992 onwards. The TFR in rural area of the four northern states remain higher than 3 in 2010, but Tamil Nadu rural TFR came below replacement level from 2002 onwards.

Figure 4.3

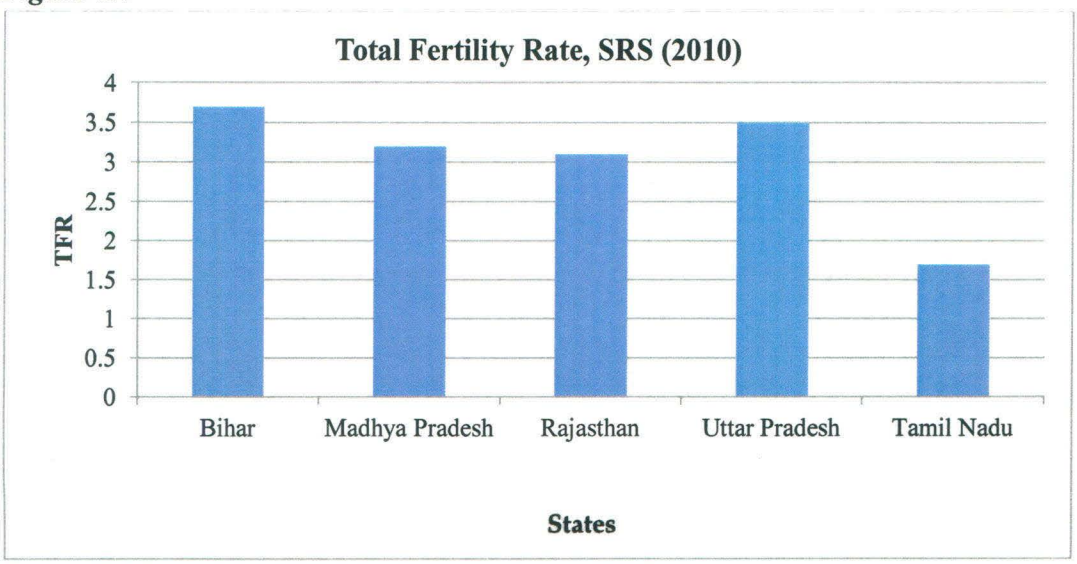


Source: SRS, Compendium 2007, RGI. India, Registrar General (2009, 2010 and 2011)

4.2. Fertility Differential: Present Scenario

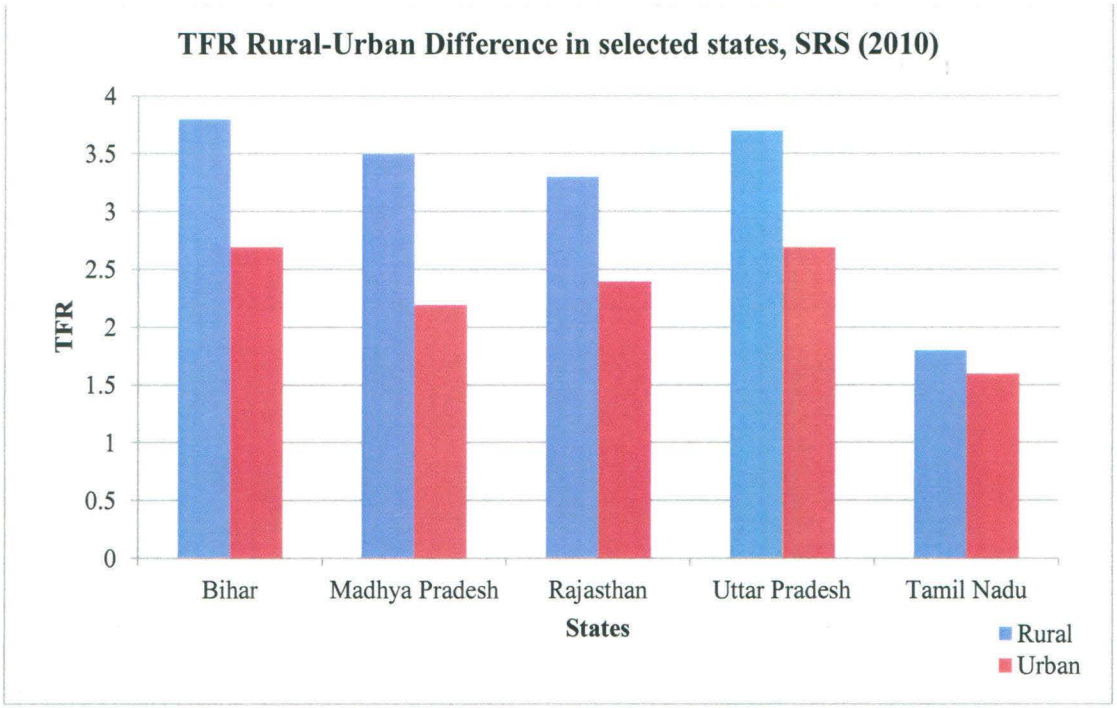
Fertility (TFR) differences among selected states of the study areas are shown in the figure 4.4. The fertility of Bihar is very high, which show TFR of more than 3.5 points than all other states (Figure 4.4). The fertility difference between rural and urban is very high among all these northern states but, Tamil Nadu is showing very low difference between rural and urban areas. It means the rural urban difference is one of the factors which affect the fertility rate in these northern states of India. Whereas the fertility difference among these northern states is around 1 child between rural to urban areas *(see figure 4.5).*

Figure 4.4



Source: *SRS, Report 2010, RGI. India, Registrar General (2012).*

Figure 4.5



Source: *SRS, Report 2010, RGI. India, Registrar General (2012).*

4.3. Conclusion

Fertility difference is prevailing in all these northern states and Tamil across time line, but fertility decline took place in the due course of time. The declines in fertility are same for all northern states and Tamil Nadu, i.e., 2 children from 1981 to 2010, whereas the Tamil Nadu from the past is having lower fertility than these northern states, so with the same amount of decrease in fertility also the northern states are showing higher fertility (TFR) rate than the state of Tamil Nadu. The rural urban difference is also prevailing among the northern states that is one child, but Tamil Nadu is showing less gap between rural urban, so the place of residence is one of the other factors which is shaping fertility in northern states.

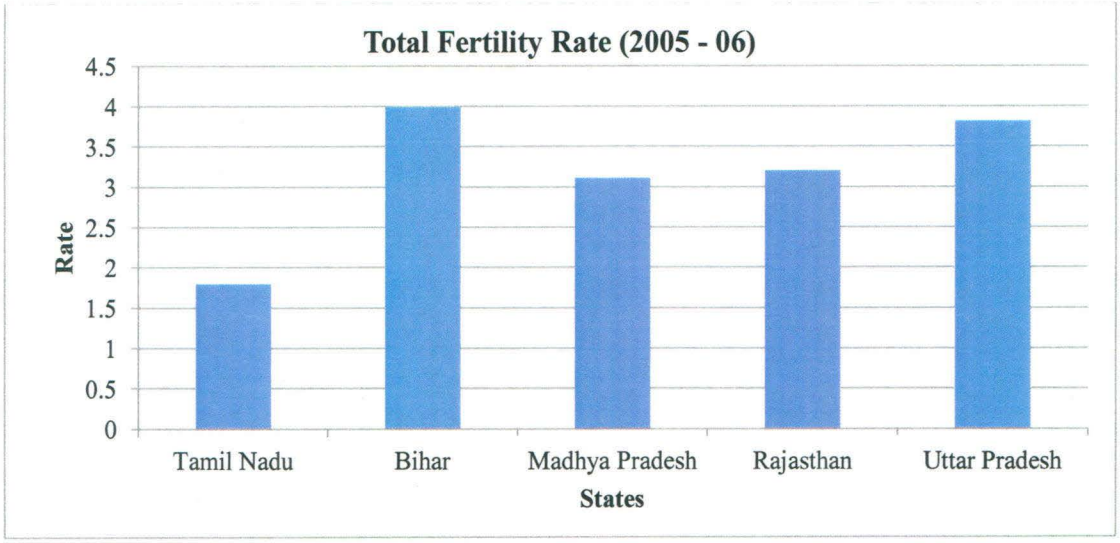
CHAPTER V

DECOMPOSITION ANALYSIS OF FERTILITY BEHAVIOUR

5.1. Introduction

The available literatures suggest that the principal causes of declining fertility are change in the demand for children as well as diffusion of new attitudes about birth control and greater accessibility to contraception provided by family planning programmes. In turn, these depend on socioeconomic factors. However, the critical question is how much fertility change in a particular state can be attributed to each of these broad explanatory factors. It is possible to quantify the role of key independent factors with the help of a decomposition analysis. Decomposition procedure permits us to delineate factors that may have contributed to observe difference in fertility as it gives the answer of the question that "how much of fertility differentials are attributable to differences in state's socioeconomic conditions?"

Figure 5.1: Total Fertility Rate of selected states.



Source: *NFHS III India Report, 2005-06, IIPS and Macro International (2007).*

Figure 5.1 show total fertility rate of the study area as given by the NFHS, in which Tamil Nadu (1.8) shows a very low fertility compared to all the northern states. Here Bihar is experiencing high fertility (with TFR 4) than all other northern states, where as there is not much difference prevailing between these northern states. Among all northern states only Madhya Pradesh has relatively lower fertility, but its TFR is above critical level of 3.

5.2. Decomposition of Total Fertility Rate

As we can see, the actual fertility rate of the four northern states is very high as compared to the actual fertility of Tamil Nadu. To know whether the education, wealth and place of residence factors contribute to this wide difference of Fertility between them we used decomposition method, with each of the four states standardised to the composition of Tamil Nadu.

Table 5.1: Decomposition of TFR by Education.

State	Actual TFR	Standardised TFR (By T.N Education)	Tamil Nadu TFR	Difference	
				Due to Education Factor	Due to Other Factors
Bihar	4.00	3.30	1.80	0.70 (31.8)	1.50 (68.2)
Rajasthan	3.21	2.61	1.80	0.60 (42.6)	0.81 (57.4)
Uttar Pradesh	3.82	3.30	1.80	0.52 (25.7)	1.50 (74.3)
Madhya Pradesh	3.12	2.78	1.80	0.34 (25.8)	0.98 (74.2)

Figures in brackets are in percentage.

The decomposition shows that while the TFR in Bihar is 4.00, it would have been 3.30 if Bihar had the same educational composition as Tamil Nadu, that is proportions in each category in Bihar were hypothetically the same as in Tamil Nadu (Table 5.1). Thus, TFR in Bihar is higher by 0.70 points (4.00 – 3.30) than Tamil Nadu due to the unfavourable educational conditions in Bihar. But TFR in Tamil Nadu is 1.80. The difference of 1.5 points (3.30 – 1.80) is attributable to influence of other factors. Thus, of the total difference of 2.2 points in TFR between Bihar and Tamil Nadu (4.00 – 1.80), only 0.7 or 31.8 percent is because of the poorer education conditions. But the remaining 1.5 points (or 68.2 percent) is because of other differences between Bihar and Tamil Nadu. Clearly, the high (higher than Tamil Nadu) fertility in Bihar is only partly due to the education factor. Results for other states (Table 5.1) are similar with minor variations.

The highest difference due to educational factor is 42.6% and lowest of 25.7%, in Rajasthan and Uttar Pradesh respectively.

Table 5.2: Decomposition of TFR by Wealth Index.

State	Actual TFR	Standardised TFR (By T.N Wealth Index)	Tamil Nadu TFR	Difference	
				Due to Wealth index Factor	Due to Other Factors
Bihar	4.00	3.41	1.80	0.59 (26.8)	1.61 (73.2)
Rajasthan	3.21	3.03	1.80	0.18 (12.8)	1.23 (87.2)
Uttar Pradesh	3.82	3.52	1.80	0.30 (14.9)	1.72 (85.1)
Madhya Pradesh	3.12	2.78	1.80	0.34 (25.8)	0.98 (74.2)

Figures in brackets are in percentage.

The decomposition shows that while the TFR in Bihar is 4.00, it would have been 3.41 if Bihar had the same wealth composition as Tamil Nadu that is proportions in each category in Bihar were hypothetically the same as in Tamil Nadu (Table 5.2). Thus, TFR in Bihar is higher by 0.59 points (4.00 – 3.41) than Tamil Nadu due to the unfavourable wealth conditions in Bihar. But TFR in Tamil Nadu is 1.80. The difference of 1.61 points (3.41 – 1.80) is attributable to influence of other factors. Thus, of the total difference of 2.2 points in TFR between Bihar and Tamil Nadu (4.00 – 1.80), only 0.59 or 26.8 percent is because of the poorer wealth conditions. But the remaining 1.61 points (or 73.2 percent) is because of other differences between Bihar and Tamil Nadu. Clearly, the high (higher than Tamil Nadu) fertility in Bihar is only partly due to the wealth factor. Results for other states (Table 5.2) are similar with minor variations.

The highest difference due to wealth index factor is 26.8% in Bihar and lowest of 12.8% in Rajasthan.

Table 5.3: Decomposition of TFR by Place of Residence.

State	Actual TFR	Standardised (By T.N Residence)	Tamil Nadu TFR	Difference	
				Due to Place of Residence Factor	Due to Other Factors
Bihar	4.00	4.05	1.80	- 0.05 (-2.3)	2.24 (102.3)
Rajasthan	3.21	2.94	1.80	0.27 (19.3)	1.13 (80.7)
Uttar Pradesh	3.82	3.56	1.80	0.26 (12.9)	1.75 (87.1)
Madhya Pradesh	3.12	2.98	1.80	0.14 (10.7)	1.17 (89.3)

Figures in brackets are in percentage.

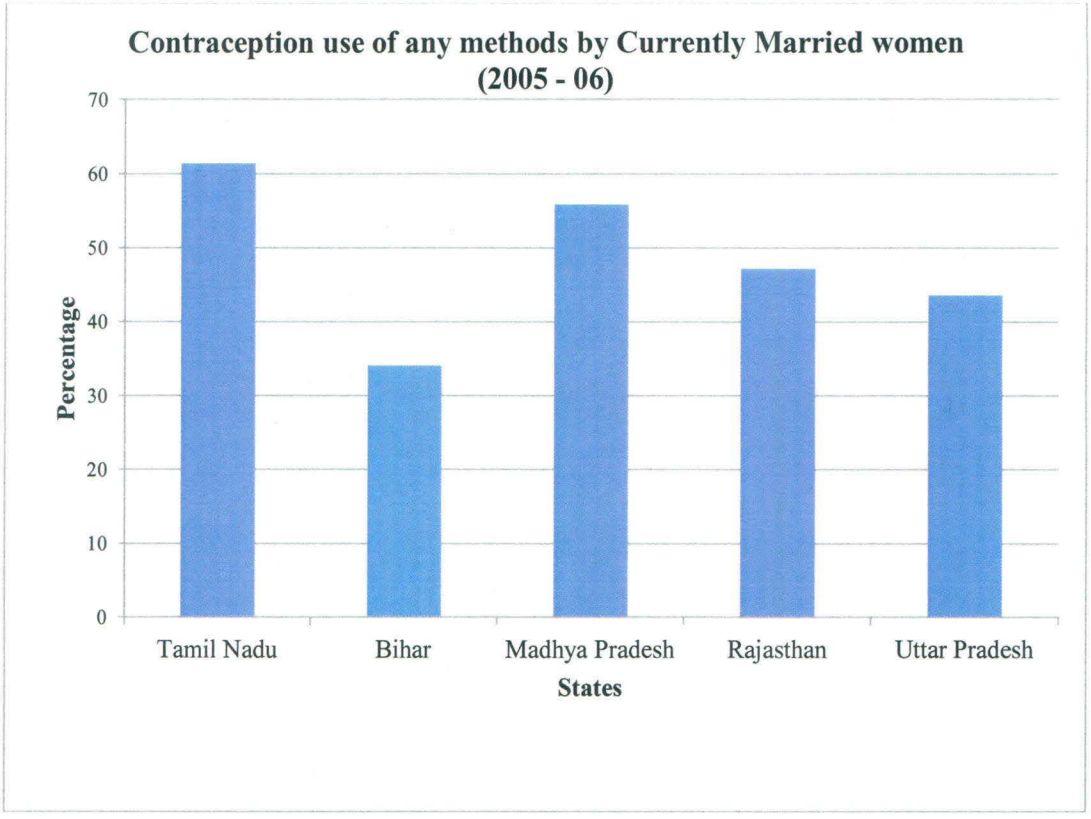
The decomposition shows that while the TFR in Bihar is 4.00, it would have been 4.05 if Bihar had the same rural-urban composition as Tamil Nadu that is proportions in each category in Bihar were hypothetically the same as in Tamil Nadu (Table 5.3). Thus, TFR in Bihar is higher by 0.05 points (4.00 – 4.05) than Tamil Nadu due to lower urbanisation in Bihar. But TFR in Tamil Nadu is 1.80. The difference of 2.24 points (4.00 – 1.80) is attributable to influence of other factors. Thus, of the total difference of 2.2 points in TFR between Bihar and Tamil Nadu (4.00 – 1.80), only 0.05 or -2.3 percent is because of the poorer education conditions. But the remaining 2.24 points (or 102.3 percent) is because of other differences between Bihar and Tamil Nadu. Clearly, the high (higher than Tamil Nadu) fertility in Bihar is only partly due to the wealth factor. Results for other states (Table 5.3) are similar with minor variations.

The highest difference due to place of residence factor is 20.1% in Rajasthan and lowest of 4.2% in Bihar. Overall we can say that lower urbanisation in the northern states has been a major factor in keeping fertility high.

5.3. Decomposition of Contraceptive Prevalence

As we can see, the Total Marital contraceptive use of the northern states is very low as compare to the actual contraceptive prevalence of Tamil Nadu. To know whether the education, wealth and place of residence factors mainly contributed to this wide difference between them we used decomposition method, with each of four states standardised to the composition of Tamil Nadu.

Figure 5.2:



Source: NFHS III India Report, 2005-06.

The contraceptive prevalence is shown on Figure 4.2, in which Tamil Nadu is dominating on contraceptive use with more than 61 percent in all states from the study. From northern states only Madhya Pradesh has above 50 percent of contraceptive use as compared to all others where as all other states are showing below 50 percent use of contraception. The lowest use of contraception (35 percent) is observed in Bihar and the other two states contraceptive use, i.e., Rajasthan and Uttar Pradesh are 47.2 and 43.6 percent respectively.

Table 5.4: Decomposition of Contraceptive use among Married Women by Education.

State	Actual	Standardised for T.N Education	T.N Actual Contraception Use	Difference	
				Due to Education Factor	Due to Other Factors
Bihar	34.10	39.24	61.40	5.14	22.16
				(18.8)	(81.2)
Rajasthan	47.20	50.55	61.40	3.35	10.85
				(23.6)	(76.4)
Uttar Pradesh	43.60	45.49	61.40	1.89	15.91
				(10.6)	(89.4)
Madhya Pradesh	55.90	55.21	61.40	-0.69	6.19
				(-12.5)	(112.5)

Figures in brackets are in percentage.

The decomposition shows that while the contraceptive use among married women in Bihar is 34.10, it would have been 39.24 if Bihar had the same educational composition as Tamil Nadu that is proportions in each category in Bihar were hypothetically the same as in Tamil Nadu (Table 5.4). Thus, contraceptive use in Bihar is higher by 5.14 points (61.40–34.10) than Tamil Nadu due to the unfavourable educational conditions in Bihar. But contraceptive use in Tamil Nadu is 61.40. The difference of 22.16 points (61.4– 39.24) is attributable to influence of other factors. Thus, of the total difference of 27.3 points in TFR between Bihar and Tamil Nadu (61.40 – 34.10), only 5.14 or 18.8 percent is because of the poorer education conditions. But the remaining 22.16 points (or 81.2 percent) is because of other differences between Bihar and Tamil Nadu. Clearly, the high (higher than Tamil Nadu) fertility in Bihar is only partly due to the education factor. Results for other states (Table 5.4) are similar with minor variations.

The educational factor is not affecting at all in the use of contraception use in Madhya Pradesh, instead the use of contraception is higher than that the educational level. The highest difference due to educational factor is 23.6% in Rajasthan and lowest of -12.5% in Madhya Pradesh. The contribution of other state factors to the difference in contraceptive prevalence is the highest in Madhya Pradesh more than 100% and the lowest of 76.4% in Rajasthan.

Table 5.5: Decomposition of Contraceptive use among Married Women by Wealth Index.

State	Actual	Standardised for T.N Wealth Index	T.N Actual Contraception Use	Difference	
				Due to Wealth Index Factor	Due to other Factors
Bihar	34.10	41.87	61.40	7.77	19.53
				(28.5)	(71.5)
Rajasthan	47.20	49.4	61.40	2.20	12.00
				(15.5)	(84.5)
Uttar Pradesh	43.60	46.64	61.40	3.04	14.76
				(17.1)	(82.9)
Madhya Pradesh	55.90	59.65	61.40	3.75	1.75
				(68.2)	(31.8)

Figures in brackets are in percentage.

The decomposition shows that while the contraceptive use among married women in Bihar is 34.10, it would have been 41.87 if Bihar had the same wealth composition as Tamil Nadu, that is proportions in each category in Bihar were hypothetically the same as in Tamil Nadu (Table 5.5). Thus, TFR in Bihar is higher by 7.77 points (61.4 – 34.1) than Tamil Nadu due to the unfavourable wealth conditions in Bihar. But TFR in Tamil Nadu is 61.40. The difference of 19.53 points (61.40 – 41.87) is attributable to influence of other factors. Thus, of the total difference of 27.32 points in TFR between Bihar and Tamil Nadu (61.34 – 34.02), only 7.77 or 28.5 percent is because of the poorer wealth conditions. But the remaining 19.53 points (or 71.5 percent) is because of other differences between Bihar and Tamil Nadu. Clearly, the high (higher than Tamil Nadu) fertility in Bihar is only partly due to the wealth factor. Results for other states (Table 5.5) are similar with minor variations.

The highest difference in married women due to wealth index factor is 68.2% in Madhya Pradesh and lowest of 15.5% in Rajasthan. The contribution of other state factors to the difference in contraceptive prevalence is the highest in Rajasthan 82.9% and the lowest 29.7% in Madhya Pradesh.

Table 5.6: Decomposition of Contraceptive use among Married Women with Place of Residence.

State	Actual	Standardised for T.N Place of Residence	T.N Actual Contraception Use	Difference	
				Due to Place of Residence Factor	Due to other Factors
Bihar	34.10	40.35	61.40	6.25	21.05
				(22.9)	(77.1)
Rajasthan	47.20	52.24	61.40	5.04	9.16
				(35.5)	(64.5)
Uttar Pradesh	43.60	47.43	61.40	3.83	13.97
				(21.5)	(78.5)
Madhya Pradesh	55.90	57.36	61.40	1.46	4.04
				(26.5)	(73.5)

Figures in brackets are in percentage.

The decomposition shows that while the contraceptive use among married women in Bihar is 34.10, it would have been 40.35 if Bihar had the same urban composition as Tamil Nadu, that is proportions in each category in Bihar were hypothetically the same as in Tamil Nadu (Table 5.6). Thus, contraceptive use in Bihar is higher by 6.25 points (61.40 – 34.10) than Tamil Nadu due to the unfavourable Urban conditions in Bihar. But TFR in Tamil Nadu is 61.40. The difference of 21.05 points (61.40 – 40.35) is attributable to influence of other factors. Thus, of the total difference of 27.3 points in contraceptive between Bihar and Tamil Nadu (61.40 – 34.10), only 6.25 or 22.9 percent is because of the poorer education conditions. But the remaining 21.05 points (or 77.1 percent) is because of other differences between Bihar and Tamil Nadu. Clearly, the high (higher than Tamil Nadu) fertility in Bihar is only partly due to the place of residence factor. Results for other states (Table 5.6) are similar with minor variations.

The highest difference due to place of residence factor is 35.5% in Rajasthan and lowest of 21.5%, in Uttar Pradesh.

5.5. Conclusion:

In this chapter we decomposed the fertility (Total Fertility Rate and Total Marital Fertility Rate) by education, wealth and place of residence of northern states with Tamil Nadu as standard state. This study concludes as difference in fertility due to education, wealth and place of residence is observed to be relatively low and other state factors are found dominating in these four northern states. The education, wealth and place of residence are not the main factors keeping fertility higher in these northern states. There are some other states factors are responsible for large difference in fertility between these northern states and Tamil Nadu. Contraceptive use is the main proximate determinant of fertility decline so we also decomposed contraceptive use of four northern states with Tamil Nadu, where we find similar results. The main reason for this difference in the use of contraception is mainly because of other state-specific characteristics.

CHAPTER VI

CONTRACEPTIVE USE AND FERTILITY BEHAVIOUR: INDIVIDUAL LEVEL ANALYSIS

6.1. Differentials in Contraceptive Prevalence

In reducing fertility contraceptive prevalence rate plays a major role. Generally contraceptive behaviour depends on socioeconomic and demographic characteristics at the individual as well as community level. Number of living children a woman has is obviously highly affected by the use of contraception. To study the gross effect of background characteristics on contraceptive use of currently married women of aged 15-49 present using contraception with two, three and four and above living children are presented by various relevant socioeconomic and demographic factors (Table 6.1 to 6.3). Contraceptive use refers to use by the woman or her husband and ascertained by the survey date in the NFHS – 3 which was conducted during 2005-06.

Education is one of most important factors which affect contraceptive use. The difference in the use of contraception among illiterate women and higher educated women for two living children is around 25 percentage points in Tamil Nadu, but in Bihar due to education 70 percentage point gap is seen in these two categories. The other states are showing currently married women with two living children in contraceptive use between 30 to 45 percent difference among the illiterate and higher educated women (Table 6.1). With increase in number of living children, i.e., three and four and above the education is not influencing much because the illiterate women's use of contraception and women with higher education contraceptive use difference is goes down (Table 6.2 and 6.3).

The urban and rural difference in the use of contraception is very low in Tamil Nadu, i.e., 4 and one percent for women with two and three living children respectively. Whereas the currently married women with 4 and above children the rural women are showing higher use of contraception then the urban women in Tamil Nadu, it can be because of having higher number of children, so they didn't want any additional child that's why the use of contraception among rural women increases. But in the northern states there is wide rural-urban gap in use of contraception (See Table 6.1 to 6.3).

Table 6.1: ***Percentage of currently married women with two living children, age 15-49 using any contraception method, by demographic and socio-economic characteristics, 2005-06.***

Background Characteristics	Tamil Nadu	Bihar	Madhya Pradesh	Rajasthan	Uttar Pradesh
Female Education					
No education	76.8	25.9	61.3	48.8	51.8
Primary	80.8	48.9	71.4	68.9	63.1
Secondary	85.1	69.0	83	82.1	82.2
Higher	90.4	95.7	91.3	93.8	91.4
Place of Residence					
Urban	84.9	73.1	78.2	86.4	84.4
Rural	80.8	39.5	69.3	49.7	58.0
Wealth Index					
Poorest	71.2	17.6	56.5	34.8	40.0
Poorer	79.3	28.4	68.2	41.5	58.0
Middle	77.2	54.6	74.1	53.4	61.0
Richer	86.3	57.7	79.5	64.3	76.5
Richest	90.4	88.3	90.0	91.0	87.8
Work Status					
Not Working	83.1	49.0	69.3	64.9	67.5
Agricultural Employee	80.2	23.7	73.4	56.5	52.8
Manual Worker	86.2	30.2	70.7	59.6	80.2
Other Worker	82.7	90.8	91.8	90.6	85.6
Caste					
Others	96.1	59.3	82.5	79.1	78.7
SCs	71.8	17.2	65.9	43.8	53.9
STs	85.0	50.0	58.1	57.1	77.8
OBCs	84.7	45.2	73.1	60.7	62.5
Religion					
Hindu	82.6	48.4	71.7	64.1	67.3
Muslim	82.1	22.0	69.1	50.5	56.6
Christian	85.7		100	100	100
Others	-	100	94.3	100	100
Mass Media Exposure					
High	82.5	100	97.4	94.7	94.7
Partial	86.3	71.5	91.4	88.3	86.6
Low	81.0	39.9	67.7	59.4	60.7

N (Total Number of Sample) = 8143
Source: Computed from National Family Welfare Survey (III) 2005-06 Individual women data.

In wealth index, from poorest to richest category the use of contraception goes on increasing for all states, whereas the gap in contraception use among poorest to richest goes on decreasing with increase in number of living children. In case of working status and contraception use except Madhya Pradesh all other states of study area are showing higher percentage contraceptive use among non-working women as compared to agricultural employee and manual workers. Except Tamil Nadu all other states are showing higher use of contraceptive use among other caste category women in three and four and above living children.

Women with high exposure to mass media in Tamil Nadu are showing lower use of contraception than partial and low exposed women in mass media with two and three living children. However, the use of contraception is high in case of women with high exposure to media.

Table 6.2: ***Percentage of currently married women with three living children, age 15-49 using any contraception method, by demographic and socio-economic characteristics, 2005-06.***

Background Characteristics	Tamil Nadu	Bihar	Madhya Pradesh	Rajasthan	Uttar Pradesh
Female Education					
No education	86.0	47.1	77.6	66.3	60.5
Primary	88.3	63.8	80.9	81.6	75.8
Secondary	87.6	84.0	86.9	92.6	85.7
Higher	83.3	96.2	100	100	92.0
Place of Residence					
Urban	87.7	76.0	86.9	90.1	79.9
Rural	86.9	55.0	78.2	65.6	65.6
Wealth Index					
Poorest	83.2	36.8	73.7	48.8	54.9
Poorer	87.8	48.1	76.3	68.8	64.1
Middle	88.1	72.7	84.2	71.6	69.6
Richer	87.5	69.3	88.6	78.8	79.8
Richest	86.4	90.3	93.5	91.8	85.7
Work Status					
Not Working	85.0	64.6	80.0	76.0	72.2
Agricultural Employee	88.0	42.1	79.3	67.9	61.5
Manual Worker	86.7	66.7	81.4	64.8	63.3
Other Worker	95.7	79.5	89.7	95.9	82.5
Caste					
Others	66.7	68.3	87.5	83.6	77.0
SCs	91.9	47.9	77.0	73.6	67.9
STs	85.7	-	70.7	61.0	66.7
OBCs	87.3	58.1	83.6	71.2	66.4
Religion					
Hindu	87.8	61.5	80.0	72.4	71.8
Muslim	83.3	33.5	82.4	69.3	54.4
Christian	80.3	-	100	100	100
Others	-	100	90.2	100	100
Mass Media Exposure					
High	75.0	100	93.8	100	82.2
Partial	85.6	85.5	93.5	95.4	89.7
Low	88.2	55.7	79.0	70.7	66.4

N (Total Number of Sample) = 7600

Source: Computed from National Family Welfare Survey (III) 2005-06 Individual women data.

Table 6.3: ***Percentage of currently married women with four and above living children, age 15-49 using any contraception method, by demographic and socio-economic characteristics, 2005-06.***

Background Characteristics	Tamil Nadu	Bihar	Madhya Pradesh	Rajasthan	Uttar Pradesh
Female Education					
No education	68.5	53.2	69.5	59.9	65.8
Primary	77.3	76.3	81.4	83.7	83.2
Secondary	79.4	80.1	83.4	90.7	84.9
Higher	-	100	100	100	79.2
Place of Residence					
Urban	71.7	71.2	80.2	85.5	75.9
Rural	75.0	55.8	70.4	58.2	67.7
Wealth Index					
Poorest	60.2	46.0	64.2	42.1	61.8
Poorer	79.5	54.3	75.2	63.5	65.9
Middle	76.5	62.3	79.5	68.0	71.6
Richer	71.4	79.4	82.0	75.5	79.6
Richest	83.3	82.1	85.0	89.6	84.4
Work Status					
Not Working	75.6	60.5	73.6	63.9	68.9
Agricultural Employee	69.4	54.2	69.5	62.3	67.7
Manual Worker	69.2	55.1	72.9	60.4	79.0
Other Worker	87.5	61.0	91.9	87.3	80.4
Caste					
Others	73.2	50.3	81.0	64.3	71.1
SCs	83.3	49.2	72.5	71.3	69.9
STs	74.1	57.1	65.8	53.5	77.8
OBCs	73.9	62.7	73.8	63.7	68.4
Religion					
Hindu	72.5	62.5	71.4	65.0	72.4
Muslim	77.8	40.4	81.1	57.5	58.3
Christian	82.5	-	89.5	-	100
Others	-	-	89.5	-	87.5
Mass Media Exposure					
High	100	100	100	100	100
Partial	78.9	81.2	85.1	92.9	91.2
Low	71.9	56.7	71.8	62.9	68.1

N (Total Number of Sample) = 12227

Source: Computed from National Family Welfare Survey (III) 2005-06 Individual women data.

6.2. Determinants of Contraceptive use

Contraception is the most dominant determinant of fertility and contraceptive use mainly depends on number of living children at two, three and four and above where we find a large contraception difference. In general we find low contraceptive use among women with one living child or no child and hence differentials at this family size are small. Therefore, the analysis is done for women with two, three or more living children. Further analysis is carried out at each family size separately to see where differences arise. To study the net effect of different background variables in the contraceptive use by number of living children after controlling for other relevant socioeconomic and demographic variables, logistic regression analysis has been carried out. The three panels of logistic regression analysis have been performed, first column panel gives the odds ratios for those with two living children, the second column panel gives the odds ratios for those with three living children and the third column panel gives the same for those with four and above living children.

The dependent variable (contraceptive use) is dichotomous, logistic regression is adopted to understand the effects on contraceptive use. All the explanatory or independent variables are categorised, where one category (first category) is taken as reference category (see Table 6.4) and the regression coefficients are used to give the odds ratios, that is, ratio of odds for a specific category to the reference category.

Table: 6.4: Details of variables:

Explanatory Variables	**Reference Categories**
Women's Education	No Education
Caste	Others
Religion	Hindu
Place of Residence	Urban
Wealth Index	Poorest
Work Status	Not Working
Mass Media Exposure	Highly
States	Tamil Nadu

Table 6.5: Odd Ratios of Contraceptive Use by Currently Married Women with Two, Three and Four and Above Living Children by Background Characteristics in selected States, based on Binary Logistic Analysis.

Background Characteristics	Two Living Children (N = 5935)	Three Living Children (N = 4946)	Four and Above living Children (N = 6940)
Female Education			
No education®	1	1	1
Primary	1.356***	1.404***	1.763***
Secondary	1.802***	1.983***	1.609***
Higher	2.287***	3.773***	1.215***
Place of Residence			
Urban®	1	1	1
Rural	0.796**	0.855*	0.83**
Wealth Index			
Poorest®	1	1	1
Poorer	1.648***	1.379***	1.427***
Middle	2.023***	1.973***	1.892***
Richer	2.775***	2.184***	2.574***
Richest	5.467***	3.159***	3.472***
Women Work Status			
Not Working®	1	1	1
Agricultural Employee	1.517***	1.022	1.15**
Manual Worker	1.749***	1.076	1.405***
Other Worker	1.762***	1.935***	1.637***
Caste			
Others®	1	1	1
SCs	0.491***	0.836*	1.061
STs	0.949	0.636***	0.958
OBCs	0.805**	0.79**	1.113*
Religion			
Hindu®	1	1	1
Muslim	0.559***	0.448***	0.513***
Christian	1.097	0.491**	1.266
Others	2.695**	1.421	1.698
Mass Media Exposure			
High®	1	1	1
Partial	1.231	2.374**	0.012
Low	0.949	1.885**	0.008
States			
Tamil Nadu®	1	1	1
Bihar	0.259***	0.263***	0.909
Madhya Pradesh	0.749**	0.868	1.638***
Rajasthan	0.406***	0.475***	1.004
Uttar Pradesh	0.604***	0.411***	1.464**

*Pseudo R^2 for two living children = 0.141, three living children = 0.139 and four and above living children =0.141. Notes: *P < 0.1, **P < 0.05, ***P < 0.001, ® = Reference category,*

Source: Computed from National Family Welfare Survey (III) 2005-06 Women Data File

Table 6.5 exhibits the results of binary logistic regression for contraception use with two living children, three living children and four and above living children in three panels respectively. In all panels the first category of each predictor variables are treated as reference category.

For female education the result shows that with increasing education, the probability of contraception use is increasing. The odds for primary, secondary and higher education is more than one implying that they are more likely to use contraception as compared to reference category with all variable controlled. This pattern is similar for three living children and four and above living children.

On the other hand in place of residence urban area is treated as reference category and odds for rural area is lower than one, implying that rural area is less likely to use contraception as compared to urban area in all panels. In wealth index the probability of using contraception is increasing with increasing wealth status. The pattern is similar for all panels.

In women's work status, not working women are treated as reference category in all panels. In the first panel the odds for agricultural employee; manual worker and other worker are more than one implying that they are more likely to use contraception as compared to not working women. In second panel of women's work status women engaged in other work are more likely to use contraception as compared to not working women. Panel three again shows the similar pattern of result as like panel one.

In caste, others category is treated as reference category. In the first panel, the odds ratio for SCs and OBCs are lower than one implying that they are less likely to use contraception as compared to those women who belongs to others category of social group. On the other hand in second panel SCs, STs and OBCs are less likely to use contraception than that of others category whereas in third panel only OBCs category is showing significance and less likely to use contraception as compared to others category.

In the religion Hindu is treated as reference category in all panels. The result indicates that Muslims are less likely to use contraception as compared to Hindu in all panels. In the second panel, Christians are less likely to use contraception than that of Hindus. On the other hand, in first panel, others category of religion shows the value of odds is more than one implying that they are more likely to use contraception as compared to Hindus. In

mass media exposure, women belonging to partial and low media exposure are more likely to use contraception as their odds are more than one with three living children.

Finally in the states Tamil Nadu is treated as reference category since it is taken as a standard state and the odds ratios for the specific state to the odds for Tamil Nadu. In the panel with two living children, the odds for Bihar, Rajasthan, Madhya Pradesh and Uttar Pradesh are much lower than one, implying that these states have lower tendency to use contraception as compared to Tamil Nadu after controlling other independent variables. The pattern is similar with three living children in the second panel. On the other hand, in the third panel, the odds for Madhya Pradesh and Uttar Pradesh are higher than one, implying that they have higher tendency to use contraception as compared to Tamil Nadu with four and above living children.

6.3. Multiple Classification Analysis of Children Ever Born

The Multiple Classification Analysis (MCA) results give the information on the mean number of Children Ever Born (CEB) to women in this study in two forms, i.e., unadjusted and adjusted. The result shows the category of mean and the eta (ή) value. This eta value is a common correlation ratio associated with the set of unadjusted category effect. This eta ($ή^2$) indicates the proportion of variance as explained by a given predictor variable (all categories combined). In this table beta (β) is a partial correlation ratio, associated with the adjusted categories effect for each independent variable. These beta (β) values can be treated as standardised partial regression coefficients. MCA finally provides a multiple 'R' value; which is a multiple correlation between the dependent variable and all factors and the covariates. The analysis in this study is restricted to currently married women only. Taking currently married women in this study for the reason that the marital status effectively controls the variation in birth histories and in the use of contraception. And marital duration has been included as a covariate in this study.

The unadjusted mean by place of residence shows significant differences, i.e., 2.77 mean children to urban women and 3.35 mean children to rural women. The adjusted mean of urban women shows slightly higher mean children to urban women than rural women, i.e., 3.17 and 3.05 respectively. The unadjusted means reveals that the educational level of women has a significant negative influence on their fertility, i.e., higher the educational level lower the number of children. The average number of CEB to those women who

have been categorised as illiterate, primary, secondary and higher are found to be 3.88, 2.79, 2.20 and 1.65 respectively. After controlling other predictor variables and covariates, the differences by women's educational level narrow down, with the adjusted mean being 3.28, 2.94, 2.94, and 2.83 in the respective categories.

Wealth index has a substantial negative effect on the number of children ever born (CEB). The unadjusted values show that those women who have been categorized as poorest, poorer, middle, richer and richest in the wealth index are found to have 3.77, 3.52, 3.15, 2.91 and 2.37 mean number of CEB respectively. After controlling the effect of other predictors, wealth index shows a negative effect on mean number of CEB, same as unadjusted, but the gaps are now narrow. With the increase in wealth index women tend to have lesser number of children of better quality. With respect to work status of women, the unadjusted means reveals that, higher average number of children is found among those women who are engaged in agricultural and unskilled manual workers (3.7 and 3.3 respectively) than the not working and service category women 2.84 and 2.82 respectively. But after controlling the predictors, the work status of women shows minor differences.

The caste factor has a substantial effect on the number of children ever born to women. Where, the unadjusted value shows that the general caste women have less number of children (2.85) than the SC and ST category, i.e., 3.32 and 3.67 respectively. After the adjustment of all predictors and covariates, the gap pattern persists. The result reveals that, religion has a substantial effect on the number of CEB. The unadjusted values show that the Hindu women have less number of children (3.02) than those who belong to Muslim religion (3.8). After making adjustments for all variables and covariates used in the model, the explanatory power of religion in determining the Children ever born is more or less constant and very high. Thus the religion effect persists ever after other factors are controlled.

The unadjusted means show that the women's exposure to mass media has a significant negative effect on their fertility, that is those who are highly exposed mass media show lower mean (1.89) than those who are lower exposed to mass media (3.36). But such effect becomes negligible after controlling the other predictors

Table 6.6: Multiple Classification Analysis of Children Ever Born of Selected Study Area, NFHS III.

Background Variables	Unadjusted Deviations	Eta	Deviations Adjusted for Factors and Covariates	Unadjusted Mean	Beta	Mean Adjusted for Factors and Covariates
Place of Residence						
Urban	-0.328	0.128	0.056	2.77	0.022	3.15
Rural	0.246		-0.042	3.34		3.06
Female Education						
No education	0.784		0.176	3.88		3.27
Primary	-0.319	0.380	-0.170	2.79	0.081	2.93
Secondary	-0.901		-0.171	2.20		2.93
Higher	-1.447		-0.247	1.65		2.85
Wealth Index						
Poorest	0.675		0.394	3.77		3.49
Poorer	0.426	0.227	0.235	3.52	0.139	3.33
Middle	0.033		0.063	3.13		3.16
Richer	-0.193		-0.079	2.90		3.02
Richest	-0.724		-0.474	2.37		2.62
Work Status						
Not Working	-0.257		0.009	2.84		3.11
Agricultural Employee	0.647	0.175	0.032	3.74	0.021	3.13
Unskilled Manual Worker	0.194		-0.003	3.29		3.09
Service	-0.305		-0.152	2.79		2.94
Caste						
Others	-0.255		-0.199	2.84		2.90
SC	0.226	0.094	0.162	3.32	0.060	3.26
ST	0.574		0.265	3.67		3.36
OBC	-0.039		-0.006	3.06		3.09

Religion						
Hindu	-0.078		-0.086	3.02		3.01
Muslim	0.676	0.130	0.572	3.77	0.102	3.67
Christian	-0.873		0.177	2.22		3.27
Others	-0.836		-0.362	2.26		2.73
Mass Media Exposure						
High	-1.205	0.229	-0.113	1.89	0.011	2.98
Partial	-0.970		-0.006	2.13		3.09
Low	0.251		0.007	3.35		3.10
States						
Tamil Nadu	-0.919		-0.781	2.13		2.32
Bihar	0.259	0.217	0.177	3.35	0.195	3.27
Madhya Pradesh	-0.150		-0.180	2.95		2.92
Rajasthan	0.091		0.015	3.19		3.11
Uttar Pradesh	0.421		0.424	3.52		3.52

N (Total Number of Sample) = 25379 (For Detailed Frequencies See Appendix 2), R^2 (Coefficient of Determination) = 0.492, R (Multiple Correlation Coefficient) = 0.701, Grand Mean = 4.918
Source: Computed from NFHS III (2005-06) Women Data File.

Women from the states of the study shows average number of children ever born in the unadjusted category are 2.13, 3.35, 2.95, 3.19 and 3.52 in Tamil Nadu, Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh respectively. After controlling the effect of other predictors, the states are showing fairly the same means number of children, i.e., 2.32, 3.27, 2.92, 3.11 and 3.52 in Tamil Nadu, Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh respectively. This shows that the higher than Tamil Nadu fertility in the northern states is primarily due to state level factors and is not much explained by differences in socioeconomic conditions. Only a small portion of the gaps is attributable to socioeconomic factors. This is consistent with the results of the decomposition analysis.

6.4. Conclusion

Contraception increase is the main proximate determinant of fertility decline. The use of contraception mainly depends on number of living children, so in the study we examined the currently married women with a given number of living children. The use of contraception in overall study increases with the number of living children increase. The logistic regression result of the analysis shows education plays a major role in the use of contraception in all the panels of living children in the study. There is difference in the use of contraception among the different categories of working women, whereas from agricultural employees are showing low use of contraception than manual workers and these two are showing lower use of contraception than other workers. The wealth index shows a positive relationship with contraceptive use, when we see the mass media exposure the mass media exposure shows a positive relation, that is with increase of exposure of mass media leads to higher use of contraception in all the states. The gap between the uses of contraception among all category of mass media exposure goes on decreasing with increasing number of living children. The difference in the use of contraception is also visible among the states, we can see that in overall socioeconomic condition of the four northern states are much similar but in the use of contraception Madhya Pradesh is higher than the other three states which is an noticeable one, but it remains lower than Tamil Nadu in contraception use were Tamil Nadu is taken as reference category.

In the analysis the higher mean children ever born (CEB) was found among women in lower education group (i.e., higher the educational level lower the number of children), Scheduled Caste (SC) and Scheduled Tribe (ST), lower living standard, Women engaged in agricultural activities, lower mass media exposure, women in rural area and Muslim women. After controlling the effect of other predictors, educational level, mass media exposure and wealth index shows a negative effect on mean number of CEB, same as unadjusted. With the increase in educational level, mass media exposure and wealth index women tend to have lesser number of children of better quality.

Higher mean CEB is found among rural women than the urban women but this difference almost disappears when other predictors are controlled. After controlling all factors agricultural employee women are showing higher number of CEB.

The religion factor has a substantial effect on the number of children ever born to women. After making adjustments for all variables and covariates used in the model, the explanatory power of religion in determining the Children ever born is more or less constant and very high. Thus the religion effect persists ever after other factors are controlled.

After controlling the effect of other predictors, the states are showing fairly the same means number of children. This shows that the higher than Tamil Nadu fertility in the northern states is primarily due to state level factors and is not much explained by differences in socioeconomic conditions. Only a small portion of the gaps is attributable to socioeconomic factors.

CHAPTER VII

CONCLUSIONS

Fertility behaviour in India, as anywhere else, is governed by the prevailing social and economic conditions as well as cultural and religious traditions as there are a number of groups belonging to different economic strata, different social groups with different religious view towards fertility and finally vast regional differences are existing. With a significant variation in the determinants of fertility behaviour there exists a considerable range of variation in the fertility levels from one region to another. Moreover this variation can be understand by North-South divide, which reflect the dominance of patriarchal value system, low level of economic development, predominance of *Brahminical* influence and exclusion of women from education and societies in Hindi speaking belt like Uttar Pradesh, Madhya Pradesh, Bihar and Rajasthan. On the other hand, in south India, the state Tamil Nadu got the pioneer position not only in low level of fertility but in other demographic settings as well.

Available literature also suggests that fertility behaviour is an outcome of the complex interplay of social, economic, demographic and geographical situations. Data from Sample Registration System suggest that, though the fertility has declined in the four northern states from 1981 to 2010 but it is still high as compared to Tamil Nadu. It has been observed that the pattern and trends of fertility in selected northern states are considerably shaped by urban-rural differences, socio-economic status in terms of educational attainment, empowerment, wealth status, religion, caste etc.

From the decomposition analysis we know that differences education, wealth and place of residence do not explained much of the gap between the fertility in the four northern states and Tamil Nadu. Some other state factors are the main reason for large difference in fertility between these northern states and Tamil Nadu. Contraceptive prevalence is the main proximate determinant of fertility decline so we also decomposed contraceptive use of four northern states with Tamil Nadu, where we find that differences in the use of contraception is not explained by differences in education, wealth and place of residence to a large extent. The main reason for this difference in the use of contraception must be because of other state-specific characteristics.

Contraception use is the main proximate determinant of fertility decline. The use of contraception mainly depends on number of living children, so in the study we examined the contraceptive use among currently married women with a given number of living children. The use of contraception in overall study area increases as the number of living children increase. Although the decomposition analysis shows that state factor is highly dominated in shaping fertility decline in Tamil Nadu as compared to four northern states but in these four states the use of contraception is relatively low as results of logistic regression shows. The result indicates that education plays a powerful role in the use of contraception which is very low in four northern states. There is difference in the use of contraception among the different categories of working women, whereas agricultural workers show low use of contraception than manual worker and these two are showing lower use of contraception than other workers.

The wealth index shows a positive relationship with contraceptive use, when we see the mass media exposure the mass media exposure shows a positive relation that with increase of exposure of mass media leads to higher use of contraception in all the states. The gap between the uses of contraception among all category of mass media exposure goes on decreasing with increasing number of living children. The difference in the use of contraception is also visible among the states, we can see that in overall socioeconomic condition of the four northern states are much similar but in the use of contraception in Madhya Pradesh is higher than the other three states which is noticeable one.

In order to know that what are the factors causing higher fertility in the northern states as compared to Tamil Nadu, Multiple Classification Analysis (MCA) is carried out. In the analysis the higher mean children ever born (CEB) was found among women in lower education group (i.e., higher the educational level lower the number of children), Scheduled Caste (SC) and Scheduled Tribe (ST), lower living standard, Women engaged in agricultural activities, lower mass media exposure, women in rural area and Muslim women. After controlling the effect of other predictors, educational level, mass media exposure and wealth index shows a negative effect on mean number of CEB, same as unadjusted. With the increase in educational level, mass media exposure and wealth index women tend to have lesser number of children of better quality.

Higher mean CEB is found among rural women than the urban women but this difference is almost disappears when other predictors are controlled. After controlling all factors agricultural employee women are showing higher number of CEB.

The caste factor has a substantial effect on the number of children ever born to women. After the adjustment of all predictors and covariates, the gap narrows but persists. After making adjustments for all variables and covariates used in the model, the explanatory power of religion in determining the Children ever born is more or less constant and very high. Thus the religion effect persists ever after other factors are controlled.

After controlling the effect of other predictors, the states are showing fairly the same means number of children. This shows that the higher than Tamil Nadu fertility in the northern states is primarily due to certain other state level factors and is not much explained by differences in socioeconomic conditions. Only a small portion of the gap is attributable to socioeconomic factors.

As conclusion we can say that in selected northern states, although the social-economic setting is not too much favourable in order to decline fertility, but high fertility can be frequently explained in terms of pronatalist pressures such as desire for sons and a demand for children as a source of labour and old age security. This situation still exists in these states because of the absence of education, awareness and strong motivation to change behaviour. Earlier literature suggests that education, place of residence and income plays a key role in shaping fertility of any region as data suggested by the northern states. But in case of Tamil Nadu, although they have some impact in determining the fertility, but it is not too much relevant for the state, as decomposition analysis suggest.

Dominance of social movements, effective family planning services and efficient use of contraception plays an important role in shaping the low level of fertility in Tamil Nadu. As result, Tamil Nadu occupies a unique position in the country for having achieved replacement-level fertility without reaching high level of literacy or low level of infant mortality. It is because of the presence of state's underlying factors such as strong motivation to change behaviour, greater role for women in the societies, and most importantly effective implementation of family planning programmes. So policy makers must document such policies which promote the awareness toward adopting the family planning services through social engineering.

BIBLIOGRAPHY

Alagarajan, M., (2003): "An Analysis of Fertility Differentials in Kerala State: A Test of Interaction Hypothesis". *Population Research and Policy Review, Vol. 22, pp. 557-57.*

Alagarajan, M., and Kulkarni, P.M., (2008): "Religious Differentials in Fertility in India: Is There a Convergence". *Economic and Political Weekly, 29 November 2008.*

Alagarajan, M. and Kulkani, P.M., (1998): "Fertility Differentials by Religion in Kerla State – A Period Parity Progression Ratio Analysis", *Demography India, Vol.27, No. 1, pp. 213-28.*

Andrews, F.M., et al., (1975): "Multiple Classification Analysis, A Report on a Computer for Multiple Regression Using Categorical Predictors", Ann Arbor: *The Institute for social Research, The University of Michigan.*

Arnold, F., (1987): "The Effect of Sex Preference on Fertility and Family Planning: Empirical Evidence", *Population Bulletin of United Nation, Vol. 4, pp. 44-45.*

Arokiasamy, P., (2009): "Fertility Decline in India: Contributions by Uneducated Women Using Contraception". *Economic and Political Weekly, Vol. 54, No. 30, pp. 55-64.*

Arokiasamy, P., McNay, K., and Robert, H.C., (2004): "Female Education and Fertility Decline: Recent Developments in the Relationship". *Economic Political Weekly, October9, 2004, pp. 4491-95.*

Arora, G., (1990): "Social Structure and Fertility – A Study of Population Dynamics in Haryana", *National Book Organisation, New Delhi.*

Audinarayana, N., (1997): "Effect of Status of Women on fertility in an Urban Setting of Tamil Nadu", *Indian Journal of Social Work, Vol. 58, No. 4, pp. 542-56.*

Badar, S., Mansoor, S., et al. (2007): "Women Empowerment and Fertility Behaviour". *Professional Medical Journal, Vol. 14, No. 2, pp. 295-99.*

Barber, J.S., and Axinn, W.G., (2004): "New Ideas and Fertility Limitation: The Role of Mass Media", *Journal of Marriage and Family, Vol. 66, pp. 1180-1200.*

Basu, Alaka M., (1992): "Culture, the Status of Women and Demography Behaviour: Illustrated With the Case of India". *England: Oxford Clarendon Press.*

Basu, Alka (1992): "Cultural Influences on the Timing of First Birth in India: Large Differences that Add to Little Differences". *Population Studies, Vol. 47, pp. 85-95.*

Becker, G.S., (1960): "An Economic Analysis of Fertility", Demographic and Economic Change in Developed Countries, *National Bureau of Economic Research.*

Bhagat, R.B., and Praharaj, P., (2005): "Hindu-Muslim Fertility Differentials". *Economic and Political Weekly, Special Article, January 29, 2005.*

Bhat, P.N.M., and Irudya Rajan, S., (1990): "Demographic Transition in Kerala Revisited", *Economic and Political Weekly, Vol. 25, pp. 1957-80.*

Bhat, P.N.M., and Francis, Z.A.J., (2003): "Fertility Decline and Gender Bias in North India", *Demography, Vol. 40, No. 4, pp. 637-57.*

Bongaarts, J., (1978): "A Frame Work for Analysing the Proximate Determinants of Fertility". *Population & Development Review, Vol. 4, No. 1, pp. 105-132.*

Bongaarts, J., and Potter, G., (1983): "Fertility, Biology and Behaviour: An Analysis of the Proximate Determinants", *published by Academic Press.*

Caldwell, J.C., (1976): "Towards a Restatement of Demography Transition Theory", *Population and Development Review, Vol. 2, No. 3, pp. 321-66.*

Coale, A.J., (1992): "Age of Entry into Marriage and Date of the Initiation of Voluntary Birth Control", *Demography, Vol. 29, No. 3, pp. 333-41.*

Das, B., and Tarai, D., (2011): "Decision Making and Fertility Behaviour: A Comparative Analysis of Scheduled Caste and Scheduled Tribe Women in Odisha". *Social Change, Vol. 41, No. 2, pp. 233-249.*

Dasgupta, S., (eds.) (2012): "Social Demography", *Dorling Publication (India).*

Davis, K., (1963): "Theory of Change and Response in Modern Demographic History". *Population Index, Vol. 31, No.2, pp. 345-66.*

Davis, K., and Blake, J., (1956): "Social Structure and Fertility: An Analytical Frame Work". *Economic Development and Cultural Change, 4, pp. 211-35.*

Dharmalingam, A., and Morgan, S.P. (2004): "Pervasive Muslim-Hindu Fertility Difference in India". *Demography, Vol. 41, No. 3, pp. 529-545.*

Dharmalingam, A., and Morgan, S.P., (1996): "Women's Work, Autonomy and Birth Control Evidence from Two South Indian Villages". *Population Studies, Vol. 50, No. 2, pp. 187–201.*

Dharmalingam, A., Navaneetham, K., and Morgan, S.P., (2005): "Muslim-Hindu Fertility Differences: Evidence from National Family Health Survey-II". *Economic and Political Weekly, Special Article, January 29, 2005.*

Dixit, P., (2009): "Fertility Change and its Determinants in India: A Decomposition Analysis", *Demography India, Vol. 38, No. 2, pp. 187-207.*

Dommaraju, P., (2008): "Marriage Age and Fertility Dynamics in India". *Demographic and Health research, Working Paper No. 52.*

Dreze, J., and Amartya Sen, (eds.) (1999): "Indian Development Selected Regional Perspectives". *Oxford University, New Delhi.*

Dreze, J., and Murthi, M., (2000): "Fertility, Education and Development. Houghton Street, London: *Suntory and Toyota International Centres for Economics and Related Disciplines London School of Economics and Political Science.*

Dreze, J., and Murthi, M., (2001): "Fertility, Education, Development: Evidence from India". *Population and Development Review, Vol. 27, No. 1, pp. 39-64.*

Dweivedi, L.K., (2006): "Contraceptive Use in India: A Multivariate Decomposition and Related Simulation Analysis". *Demography India, Vol. 35, No. 2, pp. 291-302.*

Dwivedi, S.N., (1992): "Contribution of Some Socio-Economic Variables towards Explaining the Level of Adoption of Various Family Planning Devices in India during 1987". *Demography India, Vol. 21, No. 2, pp. 239-45.*

Dwivedi, S.N., and Rajaram, S., (2004): "Some Factors Associated with Number of Children Ever Born in Uttar Pradesh: A Comparative Results Under Multiple Regression Analysis and Multilevel Analysis". *Indian Journal of Community Medicine, Vol. 29, No.2, pp. 72-76.*

Dyson, T., and Moore, M., (1983): "On Kinship Structure, Female Autonomy, and Demographic Behaviour in India", *Population & Development Review, Vol. 9, pp. 35-60.*

Gubhaju, B., (2009): "The Influence of Wives and Husbands Education Levels on Contraceptive Method Choice in Nepal, 1996 – 2006". *International Perspectives on Sexual Reproductive Health, Vol. 35, No. 4, pp. 176-85.*

Guilmoto, C.Z., and Irudhaya Rajan, S., (eds.) (2005): "Fertility Transition in South India". *Sage Publication, New Delhi.*

Guilmoto, C.Z. and Irudhaya Rajan, S., (2001): "Spatial Pattern of Fertility Transition in Indian Districts", *Population and development Review*, Vol. 27, No. 4, pp. 713-38.

Gulati, S.C., (1996): "Contraceptive Methods Use and Choice in Kerala and Uttar Pradesh: Multinomial Logit Analysis of NFHS Data". *Demography India, Vol. 25, No. 2, pp. 205-20.*

Islam, S., and Nesa, N.K., (2009): "Fertility Transition in Bangladesh: The Role of Education". *Proc. Pakistan Academy Science, Vol. 46, No. 4, pp. 195-201.*

Iyer, S., (2002): "Religion and the Decision to use Contraception in India". *Journal for the Scientific Study of Religion, Vol. 41, No. 4, pp. 711-722.*

James, K.S., and Subramanian, S.V., (2003): "Towards a Demographic Transition". *Economic and Political Weekly, Vol. 37, No. 12, pp. 1219-1229.*

Jejeebhoy, S.J., and Sathar, Z.A., (2001): "Women's Autonomy in India and Pakistan: The Influence of Religion", *Population and Development Review, Vol. 27, No. 4, pp. 687-712.*

Jejeebhoy and Shireen J., (1995): "Women's education, autonomy and reproductive behaviour: Experience from development countries". *Clarendon Press-Oxford, International Studies in Demography.*

Kanithkar, T., and Murthi, B.N., (1983): "Factor Associated with Contraception in Bihar and Rajasthan: Findings from Recent Sample Surveys". Dynamics of Population and Family Welfare. *Himalaya Publishing House, Delhi.*

Kaur, H., (2000): "Impact of Income and Education on Fertility". *The Journal of Family Welfare, Vol. 46, No. 1, pp. 70-76.*

Kishore, S., (2004): "Women's Empowerment in India and its States: Evidences from NFHS", *Economic and Political Weekly, Vol. 39, No. 7, pp. 694-712.*

Kulkarni, P.M., and Alagarajan, M., (2005): "Population Growth, Fertility and Religion in India". *Economic and Political Weekly, 29 January 2005.*

Kulkarni, P.M., Krishnamoorthy, S., and Audinarayanana, N., (2002): "Review of Research of Fertility in Tamil Nadu". *Demography India, Vol. 31, No. 2, pp. 17-36.*

Kulkarni, M.S., et al. (2005): "Identifying the Predictors of Fertility and Contraceptive Use: NFHS II Data Analysis of 25 Indian States", *Journal of Family Welfare, Vol. 51, No. 1, pp. 67-70.*

Kulkarni, P.M., et al. (2002): "Review of Research on Fertility in Tamil Nadu", *Demography India, Vol. 31, No. 1, pp. 17-36.*

Lahiri, S., (1983): "Preference for Son's and Ideal Family", *The Indian Journal of Social Work, Vol. 34, pp.323-336.*

Leibenstein, H.M., (1957): "Economic Backwardness and Economic Growth", *John Wiley, New York.*

Manson, K.O., (1997): "Explaining Fertility Transitions". *Demography, Vol. 34, No. 4, pp. 443-54.*

Mason, K.O., (1987): "The Impact of Women's Social Position on Fertility in Developing Countries". *Sociological Forum, Vol. 2, No. 4, pp. 718-45.*

McNay, K., Arokiasamy, P., and Cassen, R.H., (2003): "Why Are Uneducated Women in India Using Contraception? A Multilevel Analysis". *Population Studies, Vol. 5, No. 1, pp. 21-40.*

Morgan, S.P., et al. (2002): "Muslim and Non-Muslim Differences in Female Autonomy and Fertility: Evidences from Four Asian Countries", *Population and Development Review, Vol. 28, No. 3, pp. 515-37.*

Mosher, W.D., and Hendershot, G.E., (1984): "Religion and Fertility: A Replication", *Demography, Vol. 21, No. 2, pp. 185-90.*

Nakkeeran, N., (2003): "Women's Work, Status and Fertility; Land, Caste and Gender in South Indian Village". *Economic and Political Weekly, 13 September 2003, pp. 3931-39.*

Namboodori, N.K., (1972): "Some Observations on the Economic Framework for Fertility Analysis", *Population Studies, Vol. 26, No. 2, pp.185-206.*

Nath, D.C., and Deka, A.K., (2004): "The Importance of Son in a Traditional Society: How Elderly Parents See it?". *Demography India, Vol. 33, No. 1, pp. 33-46.*

National Family Health Survey (NFHS), 2005-2006, International Institute for Population Sciences (IIPS), Mumbai.

Oppong, C., (1983): "Women's roles, opportunity costs, and fertility". In: R. A. Bulatao and R. Lee (eds.), Determinants of Fertility in Developing Countries. *New York: Academic Press. pp. 547-89.*

Pachauri, S., (2004): "Expanding Contraceptive Choice in India: Issues and Evidences". *The Journal of Family Welfare, Vol. 50, Special Issue 2004.*

Pal, S., and Makepeace, G., (2003): "Current Contraceptive Use in India: Has the Role of Women's Education Been Overemphasised?". *The European Journal of Development Research, Vol. 15, No. 1, pp. 149-69.*

Pathak, K.B., Feeney, G., and Luther, N.Y., (1998): "Accelerating India's Fertility Decline: The Role of Temporary Contraceptive Methods". *NFHS Bulletin No. 9, IIPS.*

Patil, S.S., Rashid, A.K., and Narayan, K.K., (2010): "Unmet Need for Contraception in Married Women in a Tribal Area of India", *Malaysian Journal of Public Health Medicine, Vol. 10, No. 2, pp. 44-51.*

Peters, D.H., (2002): "The Role of Oversight in the Health Sector: The Example of Sexual & Reproductive Health Services in India". *Reproductive Health Matters, Vol. 10, No. 20, pp. 82-94.*

Petrucci, C.J., (2009): "A Primer for Social Worker Researchers on How to Conduct a Multinomial Logistic Regression". *Journal of Social Service Research, Vol. 35, No. 2, pp. 193-205.*

Ramasundaram, S., (1994): "Dr. Jayalalitha 15-Point Programme in Tamil Nadu: A Model Population Policy for India", *Social Change, Vol. 24, No. 3 & 4, pp. 81-85.*

Ramesh, B.M., Gulati, S.C., and Retherford, R.D., (1996): "Contraceptive Use in India, 1992-93". *NFHS Subject Report No. 2 Mumbai: IIPS and Honolulu: East-West Centre.*

Registrar General, India. 2009. '*Compendium of India's Fertility and Mortality Indicators 1971-2007 based on SRS*', New Delhi: Registrar General of India.

Registrar General, India. 2009. '*Report No.1 of 2009, Sample Registration System Statistical Report 2008*', New Delhi: Registrar General of India.

Registrar General, India. 2011. '*Report No.1 of 2011, Sample Registration System Statistical Report 2009*', New Delhi: Registrar General of India.

Registrar General, India. 2012. '*Report No.1 of 2012, Sample Registration System Statistical Report 2010*', New Delhi: Registrar General of India.

Registrar General of India (RGI), 1992, Sample Registration System, Statistical Report 1991. Office of the Registrar General, Ministry of Health and Family Welfare, Government of India, New Delhi.

Rele, J.R., (1987): "Fertility Levels and Trends in India 1951-1981", *Population and Development Review", Vol. 13, No. 3, pp. 513-30.*

Repetto, R., (1979): "Economic Equality and Fertility in Developing Countries". *John Hopkins University Press, Baltimore.*

Retherfoed, R.D., and Mishra, V., (1997): "Media Exposure Increases Contraceptive Use". *NFHS Bulletin No. 7, IIPS.*

Retherford, R.D., and Ramesh, B.M., (1996): "Fertility and Contraceptive Use in Tamil Nadu, Andhra Pradesh and Uttar Pradesh". *NFHS Bulletin No. 3, IIPS.*

Retherford, R.D., and Choe, M.K., (1993): "Statistical Models for Causal Analysis", *John Wiley & Son, INC, New York.*

Roy, T.K., and Niranjan, S., (2004): "Indicators of Women's Empowerment in India". *Asia Pacific Population Journal, Vol. 19, No. 3, pp. 23-38.*

Roy, T.K., Jayachandran, V., and Banerjee, S.K., (1999): "Economic Condition and Fertility: Is There a Relationship?", *Economic and Political Weekly, Vol. 34, No. 42/43, pp. 3041-46.*

Roy, et al. (2004): "Indicators of Women's Empowerment in India", *Asia-Pacific Population Journal, Vol. 19, No. 3, pp. 23-38.*

Saavala, M., (1999): "Understanding the Prevalence of Female Sterilisation in Rural South India". *Studies in Family Planning, Vol. 30, No. 4, pp.288-301.*

Savitri, R., (1994): "Fertility Rate Decline in Tamil Nadu: Some Issues". *Economic and Political Weekly, Vol. 29, No. 29, pp. 1850-52.*

Shekhar, C., And Ram, F., (2006): "Timings to Initiate Contraceptive Use and its Overlap with Postpartum Insusceptibility among Indian Women". *Demography, Vol. 35, No. 1, pp. 111-28.*

Singh, K.K., et al. (2002): "Impact of Education and Autonomy on Fertility of Women in Eastern Uttar Pradesh", *Demography India, Vol. 31, No. 2.*

Sohail, A., and Rossem, R.V., (2002): "Impact of mass media campaigns: The female condom in Tanzania". *International Family Planning Perspectives, Vol. 28, No.3, pp. 151-58.*

Srinivasan, K., (1988): "Modernisation, Contraception and Fertility Change in India", *International Family Planning Perspective, Vol. 14, No. 3, pp. 94-102.*

Steele, F., Diamond, I., and Wang, D., (1996): "The Determinants of the Contraceptive Use in China: A Multilevel Multinomial Discrete Hazards Modelling Approach". *Demography, Vol. 33, No. 1, pp. 12-23.*

Sujatha, D.S., and Reddy, G.B., (2009): "Women's Education, Autonomy and Fertility Behaviour". *Asia-Pacific Journal of Social Sciences, Vol. 1, No. 1, pp. 35-50.*

Sulaja, S., (2005): "Son Preference in the Southern States of India: An Analysis", *Health and Population Perspective and Issues, Vol. 28, No. 3, pp. 122-31.*

Visaria, L., (1999): "Proximate Determinants of Fertility in India: An Exploration of NFHS Data". *Economic and Political Weekly, Vol. 34, No. 37, pp. 3033-40.*

Yamada, T., (1985): "Casual Relationship between Infant Mortality and Fertility in Developed and Less Developed Countries". *Southern Economic Journal, Vol. 52, No. 2, pp. 364-70.*

Zavier, F., and Padmadas, S.S., (2000): "Use of Spacing Method before Sterilisation among Couples in Kerala, India". *International Family Planning Perspectives, Vol. 26, No. 1, pp. 29-35.*