

James, K S.: Fertility Decline in Andhra Pradesh: A Search for Alternative Hypotheses. Economic and Political Weekly of India. Feb 20-26, 1999 34(8).p.491-499.

Fertility Decline in Andhra Pradesh : A Search for Alternative Hypotheses

K.S. James

The Southern states in India, on the whole, are undergoing a fertility transition. Of these Kerala and Tamil Nadu have already attained a replacement level fertility. The dramatic fertility decline in Andhra Pradesh shows that the state will follow the other two soon. This paper attempts to depict the fertility decline in that state and to consider plausible explanations.

IT was once thought that fertility below a level could not be achieved without changes in the material conditions of the people. The classical demographic transition theory and other theories of fertility primarily attempted to capture the conditions necessary for a change in the reproductive behaviour of people. However, the recent revolution in family life" experienced in India in general, and the southern states in particular, is most spectacular and may not necessarily conform to the classical theories on fertility. Of these the decline in fertility in Kerala since 1960s and in Tamil Nadu more recently have been quite dramatic and have attracted wide discussion and debate in the development literature. Understandably, both these states have attained a replacement level of fertility within a short span of time without profound material development. This has steered attention to the search for new development variables that can explain the forces of change on the demographic front. By consensus, one of these is female education.

Of late, however there has been a striking decline in fertility in Andhra Pradesh, another southern state in India. Andhra Pradesh is one of the largest states in India and had a total population of around 66.5 million in 1991. The percentage decline in total fertility rate (TFR) between 1987-89 and 1992-94 was nearly 18 per cent in Andhra Pradesh, which is the third highest among the Indian states. According to the available Sample Registration System (SRS) data, the TFR for the state was 2.7 in 1994. The National Family Health Survey (NFHS) conducted in 1992, on the other hand, estimated a lower level of fertility for the state [National Family Health Survey 1995]. The NFHS estimate of total fertility rate was 2.6 for the period 1989-91. All these figures point to the important fact that the state has been experiencing a rapid fertility decline in recent years.

At the same time, it may be noted that Andhra Pradesh is experiencing this fertility transition unaccompanied by any suggestive improvement in 'social development'. Unlike in the case of Kerala and Tamil Nadu, the female literacy rate in the state is one of the lowest in the country. It is only 34.32 per cent, lower than the national average of 39.3 per cent [Census of India 1991]. The infant mortality rate is 63 per thousand live births as against 73 at the all-India level in 1994. The percentage of urban population in the state is almost in line with the all-India pattern (24.2 for Andhra Pradesh and 24.6 for all India). The per capita income at 1980-81 prices was Rs 1,888 for Andhra Pradesh and Rs 2,282 for all-India in 1994-95.

Nevertheless, the nature and extent of decline in fertility in Andhra Pradesh and the factors responsible for it are little investigated. The fast decline in fertility without any significant improvement in the conventional socio-economic variables still remains a mystery, although the fertility transition in Kerala and Tamil Nadu have received wide attention both at the national and the international levels.

This study, therefore, will attempt firstly to study the levels, trends and pattern in fertility both at the state and district level and secondly to investigate the factors behind the decline. Available secondary source of data will be utilised for understanding fertility change at the state as well as at the district level. The data are drawn mainly from the decadal census, the SRS and the NFHS.

I. Trends in Birth Rate

The decadal census and the SRS are the major sources of information on the fertility trends in the state. Table 1 gives the intercensal estimates of the crude birth rate in Andhra Pradesh since the 1950s. For comparison, data are also presented for two other southern states where replacement level fertility has already been achieved, along with data for all-India.

Table 1: Intercensal Estimates For Crude Birth Rate During Different Periods In Three Southern States

Period	AP	KER	TN	All Ind
1951-60	39.7	38.9	34.9	41.7
1961-71	39.2	37.5	36.8	41.2
1971-81	35.6	26.9	30.8	36.6
Percentage Decline				

1951-60 to 1971-81	10.3	30.8	11.7	12.2
1961-71 to 1971-81	13.5	19.3	17.9	12.5

Considering that major declines in fertility have not occurred in any state in India before 1950, it may be noted that the birth rate in Tamil Nadu had been lower than in Andhra Pradesh and in Kerala between 1951-60. It implies that fertility decline in Tamil Nadu had started from a much lower level of fertility as compared to other southern states [Rayappa and Prabhakara 1983] [Kishore 1994]. The decline in the birth rate between 1951-60 to 1971-81 was nearly equal in Andhra Pradesh and Tamil Nadu. Nonetheless, Andhra Pradesh recorded higher birth rates than Tamil Nadu in 1971-81, where the birth rate was low to begin with. Kerala, on the contrary, recorded the highest decline among these three states and by 1961-71, it even went below Tamil Nadu's level. However, during the period 1961-71 to 1971-81, the rate of decline in Tamil Nadu was slightly higher than in Andhra Pradesh and for all-India. On the whole, one can conclude that although the rates of decline in fertility in Andhra Pradesh and Tamil Nadu were not considerably different during 1951-81, the birth rate in Andhra Pradesh remained higher than in Tamil Nadu mainly because of the low initial level in the latter.

Annual data on the fertility rate are available from the SRS since 1970 to show explicitly the trends in these three southern states. The data on TFR for the three southern states and all-India since 1971 are presented in Table 2. In order to remove random fluctuations, a three-year moving average figure is presented in the table. The table also gives the rate of decline in TFR for different periods.

Table 2: Total Fertility Rate of Three Southern States and All India (Three Year moving Average)

Years	AP	KER	TN	All Ind	Years	AP	KER	TN	All Ind
1971-73	4.5	4.0	3.8	5.1	1985-87	3.7	2.3	2.7	4.2
1972-74	4.5	3.7	3.7	5.0	1986-88	3.6	2.2	2.6	4.1
1973-75	4.5	3.5	3.7	4.9	1987-89	3.3	2.1	2.5	4.0
1974-76	4.5	3.4	3.7	4.8	1988-90	3.2	2.0	2.4	3.9
1975-77	4.4	3.3	3.8	4.7	1989-91	3.1	1.9	2.3	3.8
1976-78	4.3	3.1	3.7	4.6	1990-92	3.0	1.8	2.2	3.7
1977-79	4.2	3.0	3.7	4.5	1991-93	2.8	1.7	2.2	3.6
1978-80	4.1	3.0	3.5	4.4	1992-94	2.7	1.7	2.1	3.5

1979-81	3.9	2.9	3.5	4.4	1993-95	2.7	1.7	2.1	3.5
1980-82	3.9	2.9	3.4	4.5	Rate of Decline (in Percentages)				
1981-83	3.9	2.8	3.3	4.5	1971-73 to 1979-81	1.73	3.86	0.83	1.98
1982-84	3.9	2.6	3.3	4.5	1980-82 to 1984-86	0.52	4.92	3.81	1.13
1983-85	3.9	2.5	3.1	4.4	1985-87 to 1989-91	4.94	4.79	3.58	2.68
1984-86	3.8	2.4	2.9	4.3	1990-92 to 1993-95	3.31	1.91	2.16	1.58

Note: Same as in Table 1

Source: Sample Registration System, Various Years.

Table 2 confirms the earlier statement that the initial level of fertility was lower in Tamil Nadu than in Andhra Pradesh and in Kerala. The difference in the between Andhra Pradesh and Tamil Nadu was nearly 0.7 births in 1971-73. There was a slow rate of decline in fertility both in Tamil Nadu and in Andhra Pradesh in the 1970s. However, the performance of Andhra Pradesh was superior to that of Tamil Nadu in the same period. This reduced the gap in the TFR between these two states to 0.4 births by 1979-81. Tamil Nadu has begun a course of rapid decline in fertility from the early 1980s. On the other hand, a stagnancy in the fertility rate is observed in Andhra Pradesh in the same period. This has again widened the gap in the TFR between these two states, roughly by one birth. The intensification of fertility decline in Andhra Pradesh started in the second half of the 1980s. Starting from the mid-1980s, the percentage decline in fertility has been sharper in Andhra Pradesh than in Tamil Nadu. On account of this, the expected number of births per woman has narrowed down to 0.6 by 1993-95. We must note, however, that Kerala recorded the higher rate of decline even in the 1970s.

An interesting aspect of fertility decline in Andhra Pradesh is the uniform rate of decline noted both in rural and urban areas. The decline in TFR between 1971-73 and 1993-95 was nearly 39 per cent in rural areas and 40 per cent in urban areas. The pace of decline in fertility in urban areas was higher in the 1970s and it widened the gap in TFR between rural and urban areas during 1974-76 to 1981-83. In all the other periods the difference in the number of children between rural and urban areas was less than one.

Fertility differentials are commonly observed not only with regard to the place of residence (rural or urban) but also for different socio-cultural groups.

Educational level, religion and caste group are the common variables with respect to which significant differences in fertility rate are noticed in India. The total fertility rate for groups, classified by these selected characteristics is presented in Table 3.

Table 3: Total Fertility Rate and Percentage of Currently Married Women Accepting Any Modern Method of Family Planning By Different Background Characteristics In Andhra Pradesh, 1989-91.

Characteristics	TFR	Per Cent of Acceptors	Per Cent of Women
Residence			
Urban	2.35	55.6	26.1
Rural	2.67	43.3	73.9
Education			
Illiterate	2.97	43.2	68.7
Literate, < middle complete	2.23	55.8	13.4
Middle School complete	2.23	54.6	7.6
High School and Above	1.84	50.1	10.4
Religion			
Hindu	2.59	46.5	88.0
Muslims	2.89	44.1	8.3
Christians	1.71	51.5	3.4
Caste/tribe			
Scheduled Caste	2.61	35.8	15.0
Scheduled Tribe	3.74	36.0	5.2
Other	2.52	49.8	79.8
Total	2.59	46.5	4276*

Note: *Total number of eligible women in NFHS.

Source: National Family Health Survey (1995)

Differential fertility is commonly noted for all the background characteristics in Andhra Pradesh. Across the different educational groups, the total fertility rate is lower among the literate with some educational background than among illiterate women. It may be noted in this context that around 69 per cent of the ever married women were illiterate in the state according to NFHS survey. Therefore, the considerable decline in fertility noted in the state would be the result of decline among the illiterate groups also, although the level of fertility among them is higher than among the literate group. The difference in fertility between Hindus and Muslims is narrow in the state. Christian, constituting 3.4 per cent of the eligible women in NFHS survey, however, record very low levels

of fertility. The highest level of fertility is observed among the scheduled tribe population. Scheduled castes, on the contrary, records a TFR almost in line with the entire state. Nearly 5 percent of the ever married women in NFHS survey belonged to the scheduled tribe communities.

There is a strong correlation between total fertility rate noted from background characteristics and the percentage of family planning acceptors in the state. Illiterate women have substantially lower levels of acceptance rate than women with some educational level. The rate of acceptance is almost similar between Muslims and Hindus. Interestingly, the acceptance rate of family planning between scheduled castes and scheduled tribe population is also similar although the fertility rate among them varied substantially.

On the whole, it may be concluded that although the fertility rate differs with various characteristics, the level of fertility is low among all these groups, except scheduled tribes. Hence, perfect homogenisation in fertility is still to take place in the state. However, the interesting observation is that the fertility rate among the Muslims is in line with the state level and close to that of the Hindus.

District-Wise Fertility Decline

Andhra Pradesh is divided into three regions primarily based on historical factors. There are significant differences among the three regions, coastal Andhra, Telangana and Rayalaseema in the levels of socio-economic development.

Andhra Pradesh was formed by amalgamating the Telugu-speaking areas of the Madras province under British India and the princely state of Hyderabad, which comprises the region of Telengana, one of the least developed regions at the time of independence. It is not that all the districts in one particular region are homogeneous in the levels of development. In the Andhra region of Madras province, there are less developed regions like Rayalaseema and north coastal Andhra compared to other coastal districts. Nonetheless, in most of the socio-economic characteristics, coastal Andhra fares better than the other two regions.

The estimates of district level, total fertility rates are available from 1981 Census [Census, 1981]. However, the corresponding rates based on 1991 Census are not yet published. [Bhat (1996)] has undertaken an indirect estimation of, district level TFR from the available, information on the population of age below seven years from 1991 and 1981 Censuses. Hence district level estimates of TFR is available for 1974-80 and 1984-90 period. For the latest years, [Balasubramanian and Satyasekhar (1998)] have estimated TFR from the available couple protection

rate at the district level. The different district level estimates along with female literacy rate and infant mortality rate (IMR) are presented in Table 4.

Table 4: Districtwise Total Fertility Rate, Female Literacy Rate And IMR For Different Periods

	1981	1974-80	1984-90	1995	Female Literacy Rate (7+) 1991	IMR 1991	Per Cent Decline in TFR 1981-95
Coastal Andhra							
Srikakulam	4.1	4.6	3.5	2.1	23.5	6.5	48.78
Vizianagaram	4.0	4.5	3.2	2.4	22.5	77	40.00
Visakhapatnam	4.0	4.1	2.9	2.3	34.6	54	42.50
East Godavari	3.8	4.2	3.2	2.1	42.3	48	44.74
West Godavari	3.9	3.9	2.9	1.9	47.0	43	51.28
Krishna	4.3	3.7	2.9	2.0	45.5	27	53.49
Guntur	4.1	3.7	2.7	2.1	35.9	30	48.78
Prakasam	4.6	4.4	3.0	2.2	27.1	41	52.17
Nellore	3.9	3.8	2.6	2.4	37.0	40	38.46
Royalaseema							
Kurnool	5.0	5.0	4.1	2.7	26.0	65	46.00
Anantapur	4.9	5.1	3.6	2.9	27.6	63	40.82
Cuddapah	4.5	4.2	-2.8	2.9	32.4	42	35.56
Chittoor	4.0	4.0	2.7	2.6	36.4	42	35.00
Telangana							
Rangareddy	4.8	5.1	4.0	2.6	36.9	44	45.83
Hyderabad	4.2	3.6	2.9	2.6	63.9	21	38.10
Nizamabad	4.1	4.2	3.2	2.9	21.4	35	29.27
Medak	4.6	4.8	3.9	3.3	19.3	43	28.26
Mahabubnagar	4.9	5.5	4.2	3.3	18.0	74	32.65
Nalgonda	4.5	4.9	3.6	2.5	24.9	50	44.44
Warangal	4.6	4.9	3.4	2.7	26.1	48	41.30
Khammam	4.7	4.9	3.5	2.4	30.5	41	48.94
Karimnagar	4.1	4.2	3.2	2.9	23.4	30	29.27
Adilabad	4.6	4.9	4.0	3.4	20.6	45	26.09
Andhra Pradesh	4.3	4.3	3.2	2.6	32.7	45	39.53

Note: Estimates of TFR for 1995 are based on the observed couple protection rate (CPR) in 1994 (one year lag) using the equation $TFR=4.94-0.00487* CPR$.

Source: 1981 TFR are taken from Census of India (1981). 1974-80 and 1984-90 TFR are from Bhat (1996) and 1995 TFR from Balasubramanian and Satyasekhar (1998). Literacy rate is from Census of India (1991) and IMR estimated from 1991 Census by Rajan and Mohanchandran.

Table 4 clearly brings out the fact that the state is characterised by, possibly, one of the highest levels of regional heterogeneity among Indian states. The TFR estimates vary between 1.9 in West Godavari district and 3.4 in Adilabad district in 1995. Fertility rates are generally higher in the Telengana region. Moreover, the rate of decline in fertility in few districts in this region is also comparatively poor. Districts like Medak and Adilabad recorded higher levels of fertility and also a low rate of decline in the 1980s. Incidentally, Adilabad and Medak are two of the poorest districts in the state.

In a nutshell, all these data indicate that while there are significant variations in the fertility rate among the regions in the state, a considerable amount of homogeneity is noted with regard to different socio-cultural backgrounds. The difference in the fertility level for different socio-cultural groups has been much lower than that noted among the regions. There has been a decline in all the districts, although the pace of decline is slow in a few districts in the Telengana region. In the coastal Andhra region, which is comparatively prosperous, fertility levels are lower. This is true even in the case of Srikakulam and Vizianagaram, the two poor districts in the case of north coastal Andhra. On the whole the poorest districts in Telengana region recorded a slower rate of decline and higher levels of fertility than in the other districts.

II. Factors Influencing Fertility Decline in Andhra Pradesh

The decline in fertility in any population, both historical and contemporary, has been attracting wide attention from researchers. Arguably, the decline in fertility is one of the important social and historical developments taking place [2].

Studies on the European countries have clearly brought out the fact that fertility decline could take place under a wide variety of social, economic and demographic conditions [Coale and Watkins 1986]. The onset of fertility decline had occurred with infant mortality as high as 221 in (Germany in 1890 and the percentage of literate as low as 40 per cent in Bulgaria in 1912 [Knodel and Walle 1979]). One of the crucial findings from the European fertility studies which has implications for developing countries is that decline in fertility can even occur in places with low levels of female literacy and high rates of infant mortality.

The discourse on fertility decline in India is mainly confined to two southern states in the country. The dramatic decline in fertility in Kerala in 1960s and more recently in Tamil Nadu has attracted the attention of scholars, both national and international. The experience of Kerala, on the whole, led to the understanding that even without significant improvement in the levels of industrialisation, urbanisation and material improvement in the standard of living of the people, fertility reduction could take place with social developments [3]. Female literacy came out as one of the strongest- variables explaining fertility decline in Kerala [Krishanan 1976] [Bhat and Rajan 1990]. Along with female literacy the health status of the people reflected in the low levels of infant mortality rate was also considered as a further possible explanation for fertility decline in the state in the above studies. Kerala's quick fertility decline also led to several other explanations like those referring to socio-economic like those referring to socio-economic improvement [Zachariah 1994] [Zachariah et al 1994], social justice in political and economic policies and development strategies reflected through land reforms and increased wages to agricultural labourers [Ratcliff 1978], poverty induced factors [Mencher 1980] [Basu 1986] and so on.

In general, however, female literacy and improved health facilities in the state are considered to be the most powerful among explanations.

The experience of Tamil Nadu, however, suggested that the decline in fertility could take place even with a much lower rate of female literacy and a higher rate of infant mortality than observed in Kerala. Although the female literacy rate in Tamil Nadu was much lower than Kerala, it was well above the national average. This comparison was true even in the case of infant mortality rate. A similar pattern was observed in some districts of Gujarat where the fertility rate has declined considerably even with lower level of female literacy than in Tamil Nadu and higher infant mortality rate [Visaria et al 1995]. All these confirm that it is nearly impossible to specify a threshold level of female literacy that would usher in a sharp decline in fertility [Visaria and Visaria 1994]. An analysis of the 1981 data by [Krishnaji and Krishan (1994)] showed that in the rural areas of Andhra Pradesh, female literacy, under five male mortality and ratio of male-female under five mortality did not have any relationship with children ever born or total marital fertility rate.

In the case of Tamil Nadu the explanatory factors varied from the implementation of vigorous family planning programme [Anthony 1992] [Srinivasan 1995] to the success of backward class movements in the state [Anandhi 1996] [Srinivasan et al 1991]. Further, Kishore (1994) argued that the exclusionary process - one that leaves the poor out of development in the state is the leading cause of decline in fertility in Tamil Nadu [4]. [Nagaraj (1997)] attributed the fertility decline in Tamil Nadu to the phenomenon of 'social

capillarity' where a large section of the population adopt family planning as a means for bridging the gap between increasing aspirations and expectations on the one hand, and the resources to meet these aspirations, on the other. The facilitators for the social capillarity phenomena are held to be: agrarian modernisation, strong rural-urban linkages, changing pattern of mobility, spread and reach of mass media and films, dilution of the progressive socio-cultural content within the Dravidian movement in the state and so on.

The onset of the electronic era has also persuaded the researchers to emphasise the importance of the media. It is argued that while in Kerala the print media played a crucial role, in Tamil Nadu, and to some extent in Andhra Pradesh, the access to electronic media was crucial in explaining fertility decline [Bhat 1996]. A similar explanation has been offered from the experience of several developing countries; 'social interaction' has been suggested as one of the powerful forces that accelerate the pace of fertility change in a society [Bongaarts and Watkins 1996]. There can be different channels of social interaction such as spatial proximity to urban centres, extensive media facility and so on.

From the above studies [5] and also from the experience of Andhra Pradesh it may be concluded that it is difficult to prescribe a threshold level of female literacy for fertility transition. However, replacing female literacy with mass media, it is thought, does not reveal much about the mechanism of fertility decline particularly in the rural context. This is not to ignore the fact that the exposure to mass media has considerably gone up even in the rural areas. For example, the NFHS data revealed that among ever-married women in the age group of 13-49 years, nearly 26 per cent watch television and 56 per cent listen to radio once a week, while 41 per cent visit the cinema at least one in a month in rural areas of Andhra Pradesh. Only 32 per cent were not exposed to any mass media in the rural areas of the state. An anthropological study carried out in a panchayat at the East Godavari district also indicated frequent visits to cinema (nearly once in a week) by the poor agricultural labour families in the area [Saavala 1997]. However, the important question is: how is it that poor agricultural labourers in rural areas who are at the bottom of the economic ladder and presumably struggle to meet both ends, could afford to go to the cinema and spend time in watching television? Does this indirectly indicate that the standard of living of the people in the rural areas of the state has gone up at least to some extent so that they can now afford to have some leisure and enjoy life? Without going into the process of change as such, considering mass media as the sole explanation for the fertility decline is unlikely to be useful.

This section, therefore, attempts to bring out the likely forces in the dramatic fertility decline in Andhra Pradesh. The emphasis here is not to test each of the above hypotheses in the case of Andhra Pradesh. However, the first part will

state briefly the importance of female literacy and health status in determining the fertility transition in the state. The changes that are occurring in the rural economy of the state are analysed in the second part. Thirdly, a statistical analysis is carried out to understand the factors responsible for fertility change in the state.

Importance of Female Literacy and Health Status

Table 4 clearly indicate that there is a poor correspondence between female literacy rate with total fertility rate among districts in Andhra Pradesh. In no district in the state except Hyderabad, which is a fully urbanised district has the female literacy rate crossed 50 per cent. In nearly half the districts the female literacy rate is even below 30 per cent. Very low levels of literacy are recorded particularly in the Telengana region. The female literacy in two districts in this region is below 20 per cent. Even in north coastal districts like Srikakulam and Vizianagram where the fertility rate is comparatively low the female literacy rate is only slightly more than 20 per cent.

This is also true in the case of infant mortality rate (Table 4). The north coastal districts and the districts in the Telengana region generally recorded a higher infant mortality rate than other districts. Some of the districts in the Telengana region like Adilabad, Medak and Rangareddy, which recorded highest rates of TFR do not have corresponding high levels of infant mortality rate. This again indicates that the fertility decline in the state is not in line with the decline in infant mortality rate,

Infant mortality rate, however, need not be the only indicator of the health status of the population. The probability of child survival will also depend on the proportion of children getting immunisation. This will, in fact, instill confidence among mother's about the child's survival chances. Further, this also indicates the availability of health facilities in the state. There are also other indicators like the antenatal care received by the pregnant women prior to delivery which would enhance the chances of survival of the child, particularly in the neonatal stages. Women who have received antenatal care would probably be more aware of family planning and the chances of their accepting family planning will also be higher.

The NFHS has collected information on antenatal care received by pregnant women in the four years prior to the survey. The information was collected from those women who had a live birth during the four years preceding the survey. The per cent distributions of live births during four years preceding the survey by source of antenatal care during pregnancy by background characteristics are given in Table 5.

Table 5: Per Cent Distribution of Live Births Four Years Preceding The Survey By Sources of Antenatal Care During Pregnancy By Selected Characteristics, Andhra Pradesh, 1992.

	ANC at Home from Health Worker	Doctor	Other Health Professional	No ANC
Residence				
Rural	24.8	55.3	4.3	14.1
Urban	5.3	81.6	3.1	6.6
Education				
Illiterate	25.0	53.0	4.0	16.4
Literate, middle complete	14.2	77.5	2.9	3.9
Middle School Complete	9.4	82.0	5.8	2.2
High School and above	3.5	90.5	1.0	1.0
Religion				
Hindu	20.5	60.6	4.3	12.4
Muslims	13.3	74.0	2.2	7.2
Christian	28.6	55.1	2.0	14.3
Caste/Tribe				
Scheduled Caste	24.1	56.1	5.4	11.5
Scheduled tribe	29.8	29.8	2.4	35.5
Other	18.3	65.7	3.9	10.4
Total	20.0	61.9	4.0	12.2

Note: ANC = antenatal care, ANC accepted from traditional health attendant and missing cases are omitted. Hence, the percentages will not add up to 100.

Source: National Family Health Survey, Andhra Pradesh, 1992.

An overwhelming percentage of mothers (86 percent) have accepted antenatal care and 62 percent have received it from a medical doctor in Andhra Pradesh. This is in fact a remarkable achievement. Even in the rural areas the percentage of women accepting antenatal care is fairly high. Differences are observed in the acceptance of antenatal services based on the level of education. Interestingly, however, nearly 80 per cent of mothers even among the illiterate groups have received antenatal care. The highest percentage of non-utilization of antenatal service is observed among the scheduled tribe population (35.5 percent).

The percentage of children accepting all the vaccinations within 12 months is relatively low (6.5 percent). However, the percentage of children not receiving

any vaccination is also not very high (21 percent). This implies that health facilities are available to most of the children in the state. However, many of them did not avail of the vaccination in time; nor have they undergone the full course of vaccinations. The availability of health facilities can instill confidence among the mothers on the survival chances of children.

The high incidence of antenatal care observed in the state definitely would have implications for the acceptance of the small family norm and family planning methods. More than half of the antenatal care even in the rural areas is provided by doctors outside home. In the hospital, women, may be encountering, a number of family planning acceptors and, this would encourage them also to accept the same. Proper information on the method of family planning could also be obtained from health professionals during the antenatal check up time.

In a nutshell, the role of female literacy and health status on fertility transition in Andhra Pradesh may not be as crucial as in the case of Kerala. However, significant changes are observed in the antenatal care of pregnant women in recent years. This would have played some role in the fertility decline in the state.

Role of Economic Factors

Although studies on fertility in India as a whole did not give much emphasis to the role of economic factors, it would be improper to ignore them altogether. Mainly two important changes are taking place in Andhra Pradesh, which have had an impact on the standard of living of the people. Firstly, there has been a considerable reduction in the population below the poverty line in the state over a period of time particularly in the 1980s. The second change, namely, the changes occurring in the labour market in the state, may be complementary to the first one. For the poor in the rural areas, the standard of living mainly depends upon the labour market conditions [Radhakrishana et al 1988].

The reduction in poverty in the state has been substantial over the last two decades and particularly from the 1980s [6]. The percentage of population below povertyline in Andhra Pradesh is the second lowest among major states in India after Punjab.

This arguably has been attained not by a substantial increase in the per capita income of the people but through generous subsidies provided by the government in raising the standard of living of the people. Table 6 gives the population below poverty line in the state for different periods.

Table 6: Percentage of Population Below Poverty Line, Andhra Pradesh

Year	Percentage Below Poverty Line		
	Rural	Urban	Total
1973-74	48.41	50.61	48.86
1977-78	38.11	43.55	39.31
1983	26.53	36.30	28.91
1987-88	20.92	40.11	25.86
1993-94	15.92	38.33	22.19

Rural poverty has declined dramatically and is now close to the Punjab figure of 11.95 per cent which is the lowest in India. The reduction in poverty in Andhra Pradesh has been attributed mainly to various poverty alleviation measures undertaken by the government. One of the important measures in tackling poverty has been the vigorous public distribution system (PDS) for food grains. The subsidised rice scheme at Rs. 2 per kilo has been in existence in the state since 1983 [Indrakant 1996]. The price was increased to Rs 3.50 in August 1996. This scheme is covering nearly 70 per cent of the population in the state [Radhakrishana et al 1997]. In the rural areas, the coverage is, as high as, 80 per cent of the total population. Another programme, which integrates supplementary nutrition with primary health care informal education is the Integrated Child Development Services (ICDS). It tries to help the pre-school children and pregnant mothers with supplementary nutrition through a network of anganwadi.

Andhra Pradesh is also spending a substantial amount of money on several other poverty alleviation programmes. The data on money spent on PDS and ICDS and also on all the poverty alleviation programmes (PAP) are presented in Table 7.

Table 7: Public Spending on Major Poverty Alleviation Programme in Three States, 1993-94 (Rupees in million)

	Andhra Pradesh	Karnataka	Uttar Pradesh
Food Subsidy	8273	2445	2153
Center	4193	1995	1653
State	4080	450	500
ICDS	625	393	336
Center	464	352	-
State	161	41	336
Major PAPs	13317	5235	12549
Center	7930 (59.5)	4144 (79.2)	9095 (72.5)
State	5387 (40.5)	1091 (20.8)	3454 (27.5)

Major PAPs (Per Capita Spending)	200.2	116.4	90.2
Centre	119.2	92.1	65.4
State	81.0	24.3	24.8

Notes: PAP = Poverty Alleviation Programme.

Percentage in Parentheses.

Source: Radhakrishna et al (1997).

Significant difference can be noted in the public spending on poverty alleviation programme between Andhra Pradesh and two other states. On a per capita basis, Andhra Pradesh spent almost double the money spent by Karnataka and Uttar Pradesh. The total money spent on food subsidy and ICDS are significantly higher in Andhra Pradesh. The state contribution in PAPs in the state is nearly 41 per cent, while it has been 21 per cent in Karnataka and 29 per cent in Uttar Pradesh.

All these indicate that the state was able to enhance the standard of living of the people by generous schemes. Studies conducted on the ICDS schemes report that the beneficiaries of the scheme in the state mainly belong to the economically and socially weaker sections of the rural society like scheduled caste and scheduled tribe population [Radhakrishna et al 1997].

The standard of living of the people in rural areas is also determined by the employment opportunities and the wage rate. As a majority of the poor in the rural areas have only their labour power to sell the number of days of employment and the wage rate ultimately determine their standard of living. Hence, the changes that are taking place in the labour market are crucial for the rural population. The nexus between poverty and unemployment was explicit in Andhra Pradesh, as shown by the data from the earlier rounds of the National Sample Survey Organisation (NSSO) [Parthasarathy and Jayashree 1995]. However, this relationship has weakened in the 1980s probably because of the public intervention programme in employment [Parthasarathy and Jayashree 1995]. The percentage of unemployed in the rural areas of the state for various years is presented in Table 8.

Table 8: Percentage Of Unemployed By Sex For Various Years. Andhra Pradesh, Rural (Current Daily Status)

Year	Male	Female	Total
1972-73	8.1	16.4	11.2
1983	7.9	10.5	10.0
1987-88	4.9	9.4	6.7
1993-94	5.9	7.0	6.3

Source: National Sample Survey Organisation, Various Years.

There is no doubt that there has been a significant reduction in the rural unemployment in the state particularly among females [7].

The female unemployment rate has declined consistently since 1972-73. The male rate has also come down to a low level by 1987-88, has registered a slight increase by 1993-94. However, this unemployment rate is higher than that recorded for all India, although the rate is declining at a faster rate in the state than in all-India. It may be recalled in this context that the state also has one of the highest female work participation rates among the major states in India in 1991. The male participation rate is also high in the state.

Not only has the unemployment rate come down but the wage rate of agricultural labourers has also shown a considerable increase in the 1980s [8]. The wage rate of agricultural labourers was Rs 5.9 and Rs 4.6 for males and females respectively in the state in 1980. This has gone up to Rs 23.9 Rs 17.8 for males and females by 1992. The real wage rate also indicated an increase from 0.9 to 1.4 among males and 0.6 to 1.1 among females between 1974-85 and 1987-88 at 1960-61 prices [Unni 1997]. However, [Parthasarathy (1996)] observed that during the 1990s the rising trend in real agricultural wages is not sustained. The wage rate of agricultural labourers varied considerably between the coastal districts and the dryland areas of Telengana districts in the first half of the 1980s. Thereafter, the gap has slowly narrowed to a considerable extent. The wage rate in coastal districts is Rs25.6 and Rs 18.2 for males and females respectively while in Telengana it was Rs 23.5 and Rs 17.6 for males and females in 1992. This indicates a homogenisation of agricultural wages in these two regions.

Another interesting development in the labour market is the migration of labour to high growth areas and urban centres particularly in the 1980s. It is also argued that the living, conditions of the rural labour households has gone up due to the remittances from these destinations [Krishnaiah 1997]. The homogenisation of the wage rate would also be the result of this migration of labourers.

All these suggest that substantial changes were occurring in the economic life of the rural people in the state in the 1980s. This would have been facilitated by several factors like the subsidised rice scheme for the poor, a large amount of

money set apart for poverty alleviation programmes by the state, increasing rate of work participation, particularly of females and higher wage rates. All these developments could have increased the real income of the rural households.

The important question, nevertheless, would be how far the rising living standards have influenced the familial decision making especially on the choice of the number of children. Could these factors have generated an environment of livelihood security, so that the role of children as a source of income security become less important?

Statistical Analysis

Finally, to test the validity of some of the above arguments a logit analysis is carried out using household level data from the NFHS. The dependent variable selected for the logit analysis is ever use of any modern contraception. The analysis is also done for coastal Andhra and other regions (Telengana and Rayalaseema) separately.

Several independent variables-are considered for the analysis. Age of the mother is included in the model as a squared term to account for any non-linear relationship between age and family planning acceptance. As family planning acceptance is also a function of number of male and female children ever born and dead, these are also entered into the equation. A square term is also introduced for all these variables. The number of children lost by the mother is the only health indicator in the model. Socio-cultural variables like literacy, of mother, literacy of father, caste-and community, are included as dummy variables. The effects of mass media are also sought to be captured by a dummy variable giving the exposure to any mass media, radio or television, in the past two weeks preceding the survey or visits to cinema in the past one month preceding the survey. Asset holding of the household would signify the economic standard of living of the household. Further, the work participation of women is included to know the effects of women's outside work on contraceptive use Type of residence will show the impact of rural or urban residence on fertility. Table 9 gives the results of logit analysis on ever use of modern contraception in different regions of Andhra Pradesh.

Table 9: Results of Logit Analysis on Ever Use of Modern of Contraception in Different Regions of Andhra Pradesh, 1992.

Variables	Coastal Andhra		Telengana and Rayalaseema		Total	
	B	SE	B	SE	B	SE
Age	.415**	.055	.418**	.049	.424**	.036
Age Squared	-.006**	.001	-.006**	.001	.006**	.001
Male Child Ever	1.620**	.132	1.518**	.117	1.493**	.085

Born						
Male Child Squared	-.188**	.031	-.200**	.024	-.194**	.018
Female Child Ever Born	1.734**	.130	1.109**	.108	1.317**	.082
Female Child Squared	-.268	.028	-.164**	.022	-.201**	.017
Male Child Dead	-.767**	.139	-.616**	.113	-.598**	.085
Female Child Dead	-.669**	.149	-.288*	.117	-.442**	.090
Literate Women	.316	.175	.716**	.155	.613**	.113
Literate Husband	.315	.152	.594**	.129	.452**	.096
Caste	.526**	.163	.642**	.137	.583**	.102
Muslim	-.536	.231	-.677**	.202	-.561**	.148
Media Exposure	.434*	.147	.141	.127	.327**	.094
Working Mother	.159	.143	.294*	.122	.184	.091
Asset Holding	.141**	.040	.087*	.033	.073*	.025
Type of Residence	.007	.160	.061	.145	.057	.104
(constant)	-10.783**	.902	-11.242**	.803	10.979**	.585
Goodness of Fit:	1949.837		2433.652		4230.945	
Number of Selected cases:	1899		2377		4276	
-2 Log Likelihood	2618.2184		2244.900		5912.2183	

Notes: ** significant at less than .001 level.

*Significant at less than .01 level

Literate women 1 = literate; 0 = illiterate.

Literate Husband 1 = literate; 0 = illiterate.

Muslim 1 = Muslims 0 = others.

Working Women 1 = working 0 - not working.

Caste 0 =SC and ST 1 = others.

Type of Residence 1 = Urban 0 = Rural.

Media exposure: 1 if exposed to radio or television two weeks prior to the survey or watch cinema one month preceding the survey; 0 if not exposed.

Asset holding: Number of assets owned by the household out of the total number enquired in the list of durable in the NFHS

The variables such as age male children born and died, female children born and died show, a significant relationship, with ever use of modern contraception. Surprisingly, neither literacy of mother or father show any significant relationship with family planning acceptance in the coastal and Andhra region. Instead mass media exposure and asset holdings become two important variable that determine family planning acceptance in this region. Mass media, however, is insignificant in the case of Telengana Rayalaseema region. In this region, work participation of women comes out as a strong variable that explains the use of contraception. Scheduled caste and scheduled tribe population seem to have lesser contraceptive use. Community (represented by the dummy 'Muslim') have significant impact on the contraceptive use only in the Telengana and Rayalaseema region.

On the whole, the logit carried out have indicated some very interesting patterns and also a certain inherent puzzle. Coastal Andhra region invariably shows that fertility decline is taking place even among the illiterate sections of the society. Whether mass media exposure is a substitute for literacy in this region is something which may need further probing. Another possible explanation for the fertility decline in the coastal Andhra may be in terms of the geographical diffusion, which is observed in the entire coastal belt. However, without explaining how, exactly diffusion has been taking place, citing it as a possible explanation for something, which has already happened (the fertility decline), is not very useful.

In the Telengana-Rayalaseema region, on the other hand, mass media do not play any crucial role. In this region, variables like work participation of women in outside work have a strong correlation with both children ever born and family planning acceptance. The inherent paradox cannot be resolved easily. However, it is thought that the outside work of women not only provides additional income to the poor household but also exposes them to some extent, to the world. Especially in a place like Telengana where the organisation of labour has a long and rich history of struggle and bringing about some changes, outside work of women possibly gives them better awareness than what mass media may provide. So work participation of women should not be taken as such but needs to be given emphasis in the context of a higher level of organisation of labour. [James (1997)] observed a similar experience in the case of agricultural labourers of Kerala. How ever, the reason as to why work participation is not important in coastal region while being important in Telengana Rayalaseema region in explaining the fertility variation needs further probing.

Conclusion

The southern states in India, on the whole, are undergoing a fertility transition. Of these Kerala and Tamil Nadu have already attained a replacement level fertility. The dramatic fertility decline in Andhra Pradesh shows that the state will follow the other two soon. This study has mainly attempted to depict the fertility decline in Andhra Pradesh and to bring out certain plausible explanations.

Fertility has been declining at a slow pace in Andhra Pradesh for at least two decades. However, a considerable decline in TFR is noted from the mid-1980s, after a stagnancy in the early 1980s. The neighbouring state Tamil Nadu, however, had a significant decline in fertility from the early 1980s onwards. The rate of decline as between Tamil Nadu and Andhra Pradesh was not widely different over the last two or three decades. However, the initial level of fertility in Tamil Nadu was much lower than in Andhra Pradesh and hence the magnitude of difference in total fertility rate still persists between these two states.

Another important aspect of fertility in Andhra Pradesh has been the similar pace of decline observed between rural and urban areas. The current fertility levels among different educational categories, religious groups and caste groups clearly indicate that fertility has substantially declined in all these groups. The difference in fertility between two prominent religious groups, Hindus and Muslims is negligible in the state. This is also observed in the case of family planning acceptance.

Spatial difference in fertility, however, still persist in the state, and the coastal districts and the Rayalaseema region have lower levels of fertility than the Telengana region. It may also be noted that the Telengana region, which was part of the old princely state of Hyderabad, was one of the least developed regions in the country. However, a fertility decline has occurred even in the Telengana region.

This study has also attempted to identify the factors responsible for the dramatic fertility decline in Andhra Pradesh. The discussion on the causes of fertility decline in India are mainly confined to the experience of Kerala and Tamil Nadu. Based on the experience of Kerala, female literacy and health status of the people are considered as two influential variables in reducing fertility, However, the impact of female literacy appears to be rather weak in Andhra Pradesh. On the other hand, a significant progress is noted in the antenatal care of pregnant women.

The decline in fertility in Andhra Pradesh would have intensified due to the striking changes that are taking place in the rural economy, particularly in the 1980s. The state government introduced a vigorous public distribution for food by which nearly 80 per cent of the people in rural areas are given rice at a very cheap rate. There are also other schemes like ICDS, in which government was pumping sufficiently large amounts of money to enhance the standard of living of the people. With all these developments the population below poverty line has declined dramatically in the state since the 1980s.

Along with the poverty reduction, significant changes are also taking place in the labour market in the rural areas. The unemployment rate has come down substantially and the agricultural labour wage rate has gone up even in dryland regions like telengana. Further there is also large scale migration of labour to urban centres and wetland regions where employment opportunities are higher.

All these changes, it is thought, would have helped to increase the standard of living of the rural people to some extent. However, whether the generous government intervention and increase in wage rate could create an environment of economic security whereby the role of children as economic security declined is a question which may need further probing. It is thought that some of these measures would have acted as a disincentive for having more children even in the rural context. To test the above argument a few regressions have been carried out at the district and the household level using NFHS data.

The household level analysis is carried out for coastal Andhra and Telengana Rayalaseema region separately. This brought out a few interesting finding coupled with some paradoxes. In the coastal Andhra region, variables like literacy of mother or father do not see to explain contraceptive use. The significant variables are: media exposure an asset holdings of the household. On the other hand, in the Telengana Rayalaseem region, mass media exposure and asset holdings were insignificant but literacy of women, work participation outside, home have emerged as significant variables in explaining family planning use.

Whether in the coastal Andhra region mass media and some of economic, prosperity could have replaced literacy levels of women in promoting fertility reduction cannot be conclusively shown. However, it seems that mass media have played a role in the fertility reduction in these, region. Why only in the Telengana-Rayalaseema region, does work participation of women come out as a significant fertility reducing variable? Although it is difficult to give a final answer to this question, it is thought that a region, which has rich history of labour organisation and struggle, outside work of women not only provides additional income to the poor household but also expose them, to some extent, to

the outside world and gives them a better awareness than possibly a medium like mass media.

Hence, in a nutshell, it is possible that the generous welfare measures undertaken by the government of Andhra Pradesh in poverty alleviation particularly in the 1980s have not only reduced poverty but also have had some impact on the fertility decisions of the people. This, along with the changes in the rural labour market labour organisation, and other related factors could have created a favourable climate for a decline in fertility, even with a low level of social development.

Notes

[A more detailed version of this paper was presented at a Workshop on 'South Indian Fertility, Transition in Comparative Perspective' at Centre for Development Studies (CDS), Trivandrum during April 6-8, 1998. This paper owes a great deal to N Krishnaji's inspiration and extensive comments. I have greatly benefited from the comments during the Workshops at CDS, Trivandrum and also from a seminar at Centre, for Economic and Social studies, Hyderabad. I also gratefully acknowledge the critical comments and suggestions made by C H Hanumantha Rao, P Venkatramaiah and Kanakalatha Mukund in an earlier version of this paper.]

1. David Levine considered transition from a regime of high fertility to another in which human reproduction is controlled as a family, revolution. David Levine (1987) *Reproducing Families: The Political Economy of English Population History*, Cambridge University Press, Cambridge, p1.
2. This argument is put forward by [Levine (1987)] based on the experience of England in the past century.
3. The demographic transition theory is that fertility decline basically occurred in places that moved from a traditional agrarian based economic system to a largely industrial, urban based one. See Notestien (1945).
4. This argument goes in line with Mencher's observation of poverty induced fertility transition among agricultural labourers of Kerala [Mencher 1980].
5. There are also other explanations on the fertility decline in India which are not considered here. See [Murthi et al (1995)], [Dharmalingam and Morgan (1996)].

6. The percentage of population below poverty line varies considering using different sources. The trend, however, is one of considerable decline irrespective of the source.
7. Current daily status is the most comprehensive measure as it combines chronic, seasonal and intermittent unemployment.
8. The increase in the agricultural real wage rate in the 1980s is observed even in other states in India [Unni 1997].

References

1. Anandhi, S (1996): 'Reproductive Bodies and Early 20th Century Tamil Nadu', paper presented at 26th Interdisciplinary Research, Methodology Workshop on Rethinking Indian Sexuality. Madras Institute of Development Research. Madras.
2. Antony. T V (1992): 'The Family Planning Programme: Lessons from Tamil Nadu's Experience', paper presented at the symposium on India's Development in the 1990s, Centre for Policy Research, New Delhi.
3. Balasubramanian, K and P Satyasekhar (1998): 'Population' in V Hanumantha Rao, N K Acharya and M C Swaminathan (eds), Andhra Pradesh at 50: A Data-Based Analysis, Data News Features, Hyderabad.
4. Basu, A M (1986): 'Birth Control by Assetless Workers in Kerala: The Possibility of a Poverty Induced Fertility Transition', Development and Change 17, No 2:265-88.
5. Bhat, P N M (1996): 'Contours of Fertility Decline in India: A District-Level Study Based on the 1991 Census', Discussion paper series No 13, UNDP Project, Centre for Development Studies. Trivandrum.
6. Bhat, Mari P N and S Irudaya Rajan (1990): 'Demographic Transition in Kerala Revisited', Economic and Political Weekly, 25, September 1-8, pp 1957-80.
7. Bongaarts, J and Susan Cotts Watkins (1996): 'Social Interaction and Contemporary Fertility Transition', Population and Development Review, Vol 22, No 4, pp 639-82.

8. Census of India (1981): Fertility in India: An Analysis of 1981 Census Data, Occasional Paper No 13 of 1988, Office of the Registrar General, New Delhi.
9. (1991):Final Population Totals: Brief Analysis of Primary Census Abstract, Paper 2 of 1992, Registrar General Of India, New Delhi.
10. Coale,A J and Susan Witkins (1986):The Decline of Fertility in Europe. Princeton University Press, Princeton.
11. Dharmalingam, A and S Philip Morgan (1996): 'women's Work, Autonomy and Birth Control: Evidence from Two South Indian Village', Population Studies, Vol 50, No 2, pp 187-201.
12. Government of India (1997): Estimates of Poverty, Government of India, New Delhi.
13. Indrakant, S (1996):'Public Distribution System: A Case Study of Andhra Pradesh', UNDP Research Project, Centre for Development Studies, Trivandrum.
14. James, K S (1997): 'Can Poverty Determine Fertility: Agricultural Labourers and Their Fertility Decisions' in K C Zachariah and S Irudaya Rajan(eds),Kerala's Demographic Transition: Determinants and Consequences, Sage Publication, New Delhi.
15. Kishore, Sunita (1994): 'Fertility Decline in Tamil Nadu, India' in Bertel Egro (ed), Understanding Reproductive Change: Kenya, Tamil Nadu, Punjab and Costa Rica, Lund University Press, Lund.
16. Knodel John and Etienne van de Walle (1979): 'Lessons from the Past: Policy Implications of Historical Fertility Studies', Population and Development Review, Vol 5, No 2, pp 217-46.
17. Krishnaiah, M (1997): 'Rural Migrant Labour System in Semi-Arid Areas:- A Study in Two Villages in Andhra Pradesh', The Indian Journal of Labour Economics, vol 40, no 1, pp 123-43.
18. Krishnaji, N and T N Krishnan (1994): 'Fertility Variations among Districts-1981: Some Preliminary Note', UNDP Research Project, Centre for Development Studies, Trivandrum.

19. Krishnan, T N (1976): 'Demographic Transition in Kerala: Facts and Factors'. *Economic and Political Weekly*, 11, No 31-33, August, pp 1203-24.
20. Levine, David (1987): *Reproducing Families: The Political Economy of English Population History*, Cambridge University Press, Cambridge.
21. Mencher, J P (1980): 'The Lessons and Nonlessons of Kerala: Agricultural Labourers and Poverty', *Economic and Political Weekly*, 15, No 41-43, pp 1781-1802.
22. Murthi, Mamta, Anne-Catherine Guio and Jean Dreze (1995): 'Mortality, Fertility, and Gender Bias in India: A District-Level Analysis', *Population and Development Review*, 21, No 4:745-82.
23. Nagaraj, K (1997): 'Fertility Decline in Tamil Nadu: Social Capillarity in Action?', Madras Institute of Development Research, Chennai, (unpublished manuscript).
24. National Family Health Survey (1995): *Andhra Pradesh, Population Research Centre, Andhra University, Visakhapatnwn and International Institute of Population Sciences, Bombay.*
25. Notestein, Frank W 'Population: The Long View' in Theodore Schiltz (ed), *Food for the World*, The University of Chicago Press, Chicago, pp 36-57.
26. Parthasarathy,G (1996):'Recent Trends in Wages and Employment of Agricultural Labourers', *Indian Journal of Agricultural Economics*, vol 15, nos 1 and 2, pp 145-67.
27. Parthasarathy, G and Jayashree Anand (1995): 'Employment and Unemployment in Andhra Pradesh: Trends and Dimensions', *Economic and Political Weekly*, Vol XXX, No 15, pp 811-821.
28. Raayappa, Hanumantha P and M Lingaraju (1996): 'Demographic Transition in South: A Regional Perspective', working paper, Institute of Economic and Social Change, Bangalore.
29. Raayappa, Hanuniantha P and N R Prbhakara (1983): 'Patterns of Population Growth in Southern States', *Economic and Political Weekly*, Vol 18, No 48, pp 2018-31.

30. Radhakrishna, R, S Sudhakar Reddy and Gautam Kumar Mitra (1988): 'Determinants of labour force Participation and Living Standards', Centre for Economic and Social Studies, Hyderabad, (unpublished manuscript).
31. Radhakrishna, R, K Subbarao, S Indrakant and C Ravi (1997): India's Public Distribution System: A National and International Perspectives, Poverty Reduction and Economic Management Network ' South Asia Country Department 2, The World Bank, Washington.
32. Rajan, S I and P Mohanachadran (1998): 'Infant and Child Mortality Estimates Based on 1991 Census', Centre for Development Studies, Trivandrum. (unpublished manuscript).
33. Ratcliffe, John (1978): 'Social Justice and Demographic Transition, Lessons from Kerala State', International Journal of Health Services 8, No 1:123-44.
34. Saavala, Minna (1997): 'Child As a Hope: Contextualising Fertility Decline in Rural South India', PhD Dissertation, CASA, University of Amsterdam.
35. Srinivasan, K (1995): Regulating Reproduction in India's Population: Efforts, Results and Recommendations. Sage Publication, New Delhi.
36. Srinivasan, K et al (1991): 'The Effect of Family Planning Components on Contraceptive Acceptance in Four Indian States'. International Family Planning Perspectives, No 1:14-24.
37. Unni, Jeemol (1997): 'Employment and Wages among Rural Labourers Some Recent Trends', Indian Journal of Agricultural Economics, Vol 52, No 1. pp 59-72.
38. Visaria, Pravin and Leela Visaria (1994): 'Demographic Transition: Accelerating Fertility Decline in 1980s'. Economic and Political Weekly, Vol XXIX, Nos 51 and 52, pp 3281-92.
39. Visaria, Pravin, Leela Visaria and Anrudh Jain (1995): Contraceptive Use and Fertility in India: A Case Study of Gujarat, Sage Publication, New Delhi.
40. Zachariah, K C (1994): The Anomaly of the Fertility Decline in India's Kerala State: A Field Investigation, Staff Working Paper No 700, Washington, DC, The World Bank.

41. Zachariah, K C, S Irudaya Rajan, P S Sarma, K Navancethan, P S G Nair and U S Mishra (1994): Demographic Transition in Kerala in the 1980s, Centre for Development Studies, Trivandrum.