

# CENTRE FOR DEVELOPMENT STUDIES

PRASANTHA NAGAR ROAD, ULLOOR  
TRIVANDRUM-695 011  
KERALA, INDIA





Working Paper No. 81

AGE OF MARRIAGE OF WOMEN AND POPULATION GROWTH

The Kerala Experience

Leela Gulati

Centre for Development Studies  
Ulloor, Trivandrum 695 011

February 1979

## AGE OF MARRIAGE OF WOMEN AND POPULATION GROWTH

### The Kerala Experience

Leela Culati



In Kerala increase in the age of marriage by itself did not bring down the number of children a woman had. It was the reduction in infant mortality, due partly to the shift in the age of marriage but largely to improvement in medical and public health facilities, which improved the child survival rate and this in turn seems to have influenced the number of children a woman wanted to have.

What Kerala really shows to the rest of India is the need to combine all these factors and, of course, female education. It also cautions us against relying only on raising the age of marriage to reduce the rate of growth of population because, going by Kerala's experience, higher age of marriage alone might well lead to higher rates of growth of population, at least in the immediate future.

### INTRODUCTION

The New Population Policy (NPP) announced by the Central Government proposes to raise the age of marriage for girls from 15 to 18 and for boys from 18 to 21. This is part of a series

of measures proposed to bring down the rate of population growth to 1.4 per cent by 1984. It is well known that population growth depends primarily on two factors, fertility and mortality, and fertility in its turn depends considerably on the age at which women marry. The higher the age of marriage the shorter is their reproductive period. So obviously, the main purpose of this upward revision of the female age of marriage is to reduce fertility by providing for a shorter reproductive period.

Given this objective, it would be instructive to look closely at Kerala's experience with the female age of marriage and its effect on fertility. Not only has the female age of marriage in Kerala been higher than the all India average in the last one hundred years or so, but the state has had the highest age of marriage in the country. As can be seen from Table 1, the mean age of marriage of women in Kerala was 17.13 for the decade 1901-10, when the corresponding all-India figure was 13.2; and now while the all-India mean age is close to 17 Kerala's age is close to 20.

#### SARDA ACT

The Child Marriage Restraint Act, also known as Sarda Act after its original mover, was the first piece of legislation on the minimum age of marriage for girls. It was passed on September 28, 1929, and fixed the minimum marriage age of girls

at 14 years. (This was raised to 15 in 1955.) In the 1920s the mean age of female marriage was 13.87 years. Today, the mean age of marriage of girls in India is 17.2 years and it is now proposed to raise it to 18 years. There is thus some similarity between what is now being proposed and what was proposed in 1929 since the current mean age of marriage for girls is not far below the minimum age proposed for enactment. However the major purpose of raising the minimum age of marriage of girls in 1929 was to prevent child marriages which were then quite common. At that period as many as 93 out of 1000 girls between the ages of 5 and 10 years, and 399 out of 1000 girls between the ages of 10 and 15 were married. The purpose of fixing, by legislation, the minimum age of marriage of females to 14 years was to combat two evils: (a) to prevent the evils of premature child birth and (b) to prevent the high incidence of child widowhood.<sup>1/</sup> According to the 1921 Census, there were 175 widows in every 1000 females; of these 148 were below 15.

#### MARUMAKATHAYAM SYSTEM

In Kerala, the age of marriage for girls has been comparatively higher without any legislation specifically designed for that purpose.<sup>2/</sup> This has come about mainly because of certain clearly identifiable social and cultural factors. It appears that unlike in the rest of India, in Kerala the pressure to

subscribed to the sastric law enjoining early and universal marriage was never very strong.<sup>3/</sup> Whereas in the rest of India, Brahmins practised universal pre-pubertal marriage for girls and enjoined it upon other castes through precept and practice, in Kerala, the Namboodiri Brahmins who (though comprising less than 1 per cent of the population) provided the intellectual and religious leadership to various lower order Hindu groups, did not practise either pre-pubertal or universal marriage.<sup>4/</sup> In fact, since only the eldest son among the Namboodiris was supposed to marry a Namboodiri girl, many Namboodiri girls remained unmarried for all their lives.<sup>5/</sup> So the question of pre-pubertal marriage for all their girls did not arise. Though pre-pubertal marriage was common among the Nairs and other Hindu groups in Kerala it is well known that such marriages were purely symbolic.<sup>6/</sup> Of the two marriage ceremonies which the girls underwent in Kerala, the first ceremony, namely Talikettu, was a pre-pubertal ceremony. This was merely a religious sacrament and was not immediately followed by cohabitation. The actual marriage, called the Sambandam, came later and was performed as a preliminary to real married life. For this later ceremony no age was specified.

The family organisation in Kerala also probably exercised a major influence on the female age of marriage. As is widely known, a substantial portion of the state's population follows the Marumakkathayam system of inheritance.<sup>7/</sup> Marumakkathayam is

descent through the female line. Under this system, succession is traced through females and property descends from mother to daughter.<sup>8/</sup> Also what is important to note is that marriage under this system did not call for change of residence for girls on their marriage. Thus even after the Sambandam ceremony girls stayed on in their own maternal houses. Naturally the concern with which the fact of a marriageable girl staying on with her own parents was viewed in the rest of the country was much less felt in Kerala, particularly among the Marumakkathayas. Also, the rules of divorce for women and of re-marriage in the event of widowhood were quite liberal.<sup>9/</sup>

These factors, namely the system of female inheritance, the right of female residence and the right to divorce and re-marry if widowed, gave to Marumakkathaya women a unique status unknown in the rest of India. This special status of women seems to have had an important impact not only on the age of marriage of women but also on the whole texture of the civil condition in the state. Not only was the female age of marriage among the group practising Marumakkathayam higher but the proportion of women remaining unmarried was also high, a situation virtually unknown in the rest of India. Since age was specified only for the pre-pubertal ritual but not for Sambandam, in many cases there was a tendency to postpone the marriage of girls.

Christianity came to the Malabar coast in the first century after Christ. It not only brought along with it Western ideas but

TABLE 1 : MEAN AGE OF MARRIAGE AND OTHER DEMOGRAPHIC CHARACTERISTICS OF KERALA

Decade	Mean Age of Marriage		Growth of Population India and Kerala		Birth Rate		Death Rate		Infant Mortality Rates		Literacy			
	India	Kerala	Per cent	Percentage Variation	India	Kerala	India	Kerala	India	Kerala	India	Kerala		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)		
1901-10	20.5	23.33	17.13	5.73	11.75	49.2	42.6	38.68	212	242	9.83	0.69	22	4
1911-20	20.5	23.87	17.35	-0.31	9.16	48.1	47.2	38.68	212	242	10.56	1.05	26	5
1921-30	18.4	23.31	17.80	11.01	21.85	46.4	36.3	33.76	176	210	12.21	1.81	32	12
1931-40	20.2	25.63	19.66	14.22	16.04	45.2	40.0	29.1	168	173	15.59	2.93	37	14
1941-50	19.8	25.69	19.35	13.31	22.82	39.9	39.8	27.4	148	153	24.95	7.92	50.0	31.5
1951-60	21.4	26.33	19.85	21.50	24.76	41.7	38.9	22.8	112	74	34.44	12.95	54.2	38.4
1961-70	22.2	17.2	-	24.66	26.29	38.8	31.9	9.24	122	61	39.51	18.44	66.5	53.9

Source: Columns 1, 3, 4, 5: "Fact Book on Population and Family Planning", Demographic Research Centre, Trivandrum, 1974; and "Towards Equality, Report of the Committee on the Status of Women in India, December, 1974.

Column 2: Registrar-General of India, Final Population Totals, Census of India Paper Number 1, 1962.

Column 6: Census of India, Paper I of 1971 Supplement, Provisional Population Totals.



also helped in the spread of education, especially female education.<sup>10/</sup> Female education made greater progress in Travancore and Cochin than elsewhere in India; this seemed to make a difference in their civil condition.<sup>11/</sup> It is also possible that the religious sanction that Christianity gave to celibacy had its impact on the female age of marriage. The relatively high proportion of the unmarried in Travancore and Cochin is attributed to the influence of Christianity. The influence of Islam was perhaps in the opposite direction since early marriage was quite common among the Muslims. Among the various religious groups in Kerala the Muslims have the highest proportion of early marriages.<sup>12/</sup> The Muslims were also least influenced by the Western education, with the result that the disparity between male and female education among the Muslims was very high.<sup>13/</sup>

Thus, it would appear that while among the non-Hindu groups in Kerala, education or its absence was an important factor explaining the female age of marriage, this cannot be said of the Hindu groups of Kerala for the earlier period. The fact of higher age of marriage for Hindu women in Kerala at the turn of the twentieth century can be directly related to the impact of factors other than education. In more recent years however the spread of education has possibly become an equally important factor for keeping the female age of marriage high even among the Hindu groups in the State. While education, including female education has spread quite fast, the hold of the Marumakkathayam system has for various



socio-economic reasons been weakening.

Even with literates comprising only 4 per cent of the female population in the area, the mean age of marriage for women was seventeen years in 1901. It cannot be overlooked however that when less than 1 per cent of the female population in the whole of India was found to be literate, in Kerala the proportion was four times higher. Also the spread of female education since then has been fast so that by 1971, 54 per cent of the females in Kerala were literate, with very little rural urban differences in literacy rates. This spread of education took place during the period when the influence of the matriarchal system had started weakening. A series of legislative measures were adopted in the early part of the twentieth century "to dispense with the evils of Marumakkathayam".<sup>14/</sup> These measures considerably weakened the system. The spread of female education during the period must have helped in making up for that weakening in so far as it concerned the tendency towards postponement of marriage. Indeed the spread of female education is possibly the strongest influence today on the age of marriage, in the state. Recent studies on various social groups in Kerala have shown a strong correlation between education and age of marriage. The practice of dowry which came along with the change from matriarchy to patriarchy, and which has now taken root even among the Nairs, Ezhavas and the Vellalas (other patriarchal groups, like the Brahmans, the Christians and the Muslims practised it all along), has also contributed to the postponement of female

marriage, and to the lengthening of the educational period. It is easy to see that high schools and colleges make a good waiting place for girls awaiting matrimony.

#### DECLINE IN DEATH RATE

It can be seen from Table 1 that the rate of growth of population, in Kerala has always been higher than the all India rate. This has happened in spite of the fact that the mean age of marriage was significantly higher in Kerala than the rest of India throughout the period, 1901-1971. It will be wrong, however, to jump to the conclusion that population growth and female age of marriage are positively correlated. Population growth depends as much on death rate as on birth rate, assuming that there is no migration inwards or outwards. In fact, it can be seen from the same Table that since 1941 the main factor responsible for the higher population growth in Kerala has been the relatively higher decline in death rate. Though the estimated birth rate in Kerala is also lower than the all-India rate, the difference is only marginal. Actually, if one took the former Travancore-Cochin parts of Kerala separately, the death rates there were significantly lower than the all-Kerala average. For 1951-60, while the death rate for the Travancore-Cochin area was about 12 per thousand, that for the Malabar area was 23 per thousand, giving an overall figure of 16.9 per thousand. Though high in

absolute terms, the death rate of 16.9 per thousand for Kerala as a whole was lower than the all-India death rate of 25 per thousand. Thus the higher than average population growth in Kerala was due to the relatively lower death rate.

But the fact that the birth rate in Kerala was not significantly lower than the all-India rate is noteworthy because it implies that the higher female age of marriage did not lead to a decline in birth rate. This phenomenon has however not gone unnoticed.<sup>15/</sup> In fact the National Sample Survey Report (No.76), based on 14th Round, showed that the marital fertility rate was higher in Kerala than rest of the states as well as India as a whole.<sup>16/</sup> It is difficult therefore to resist the temptation to draw the inference that in Kerala at least the higher age of marriage proved ineffective in lowering the state's birth rate. In fact, experts have all along been somewhat sceptical about the demographic effectiveness of raising the minimum age of marriage. Let us quote here an opinion expressed in the Indian context.

But the effect on fertility on the raising of age of marriage from 12 to 15 or even to 18, the age by which the vast majority of the rural women get married, is not likely to produce any significant effect on the fertility of the community. The period from age 18 to 45, the upper limit of reproductive age period, is sufficiently long to give a fertile woman six to eight live births unless methods for fertility control are attempted.<sup>17/</sup>

But such scepticism derives from the failure on the part of most experts to distinguish between the physical reproductive capacity of women and their desire to produce children. After all, if the women's desire to reproduce can be influenced significantly by the higher age of marriage, and this should be so when the decision to postpone marriage is voluntarily taken by the girls, it should make a considerable impact on their fertility.

#### DECLINE IN BIRTH RATE

The Sample Registration System (SRS) was introduced all over India in 1966, and reliable data about the birth and death rates for different parts of the country, are now available on a year-to-year basis. These data reveal some interesting developments over the past few years in Kerala, as should make experts sit up and re-evaluate their earlier scepticism.

During the five years 1968 to 1973, while the death rate declined by 1.7 points, from 10.4 to 8.7 deaths per thousand, birth rate declined by 4.4 points, from 34.3 to 29.9 births per thousand. So the natural rate of growth of population for the state fell from 23.9 to 21.2 per thousand.<sup>18/</sup> Going by the SRS figures, Kerala's death rate has now reached a level which is comparable with the death rates prevailing in the developed countries. So there is little scope for any further decline. From the point of view of population growth Kerala's growth

rate of population should decline hereafter more or less by the same points as its birth rate. And since, as noted above, the birth rate has started declining at the rate of one point every year, the population growth should also decline at the rate of one point every year.

This trend towards declining birth rate in Kerala is confirmed by corresponding fertility rates, which too have fallen. The fertility rate, in terms of the number of children born to a group of 1,000 women through their reproductive years, declined for rural Kerala from 4.3 in 1969 to 3.8 in 1973. The corresponding all-India rate for 1969 was 5.6.<sup>19/</sup> A recent study of the primary school enrolment showed that the annual rate of growth of enrolment in the first year of primary schools declined from about 4 per cent in the first half of the sixties to 1.6 per cent in the second half of the sixties. This again confirms the declining trend in birth rate disclosed by the SRS.

#### PUBLIC HEALTH FACILITIES

Can one attribute the recent decline in the birth rate, however delayed, to the continually rising age of marriage of women in Kerala? There is considerable force in the view that the rise in the marriage age need not by itself make much of an impact on fertility rates, because the span of reproduction period is still sufficiently long to give a fertile woman six to eight live births. But such a view seems to overemphasise the

TABLE 2: BIRTH AND DEATH RATES 1968-73

Year	Kerala		India	
	Births Per 1,000 Population	Deaths Per 1,000 Population	Births Per 1,000 Population	Deaths Per 1,000 Population
(1)	(2)	(3)	(4)	(5)
1968 (Rural)	34.3	10.4	39.0	16.8
1970 (Rural and Urban combined)	32.1	9.2	36.8	15.7
1971 "	31.6	9.1	36.9	14.9
1972 "	31.7	9.1	36.6	16.9
1973 (Rural)	29.9	8.7	34.6	15.5

Source: "Economic Review Kerala 1975", The State Planning Board, Government of Kerala, Trivandrum

immediate physical aspect. Also as was noted above, mortality rates have declined considerably in Kerala and have now reached a level comparable with those prevailing in the developed regions of the world. This decline in mortality itself must have been, to some extent at least, the result of the rising female age of marriage in the state. Higher age of marriage of girls naturally meant avoidance of pregnancies at an immature age and exposure to the risks of child birth. Thus the higher age of marriage alone could have brought about some lowering of both infant mortality rates and maternal mortality rates. Infant mortality in Kerala had fallen sharply during 1950-70 and was the lowest in India in 1971; also the female expectation of life at birth in Kerala was the highest (see Table 1).

While the lower than average rates of both maternal and infant mortality rates can be attributed to the rising age of marriage, this certainly could not have been accomplished without the supporting health and medical services which Kerala now offers. After all, until 1941-50, the infant mortality in Kerala was above the all-India average and this was so in spite of the higher than average female age of marriage. Kerala provides not only better but also much more dispersed medical and public health facilities as compared to other states.<sup>21/</sup> As a result of this there is not only a general decline in the death rate and infant mortality rate but in the expectation of life at birth for both males and females. Life expectancy has doubled in Kerala in the last forty years. The female life expectancy in Kerala is actually higher than male life expectancy, as in the developed countries. These levels have been attained only recently as the medical and health services have spread widely to all parts of the state.

With the decline in infant mortality in particular and mortality in general it is only natural that the prospect of child survivorship should have correspondingly improved. This has certain important implications. Recent studies in some other countries have shown that there exists an inverse relationship between child survivorship and fertility rates. In Bangladesh, it was found that mothers who lost a child had 0.5 children more on the average than mothers who did not lose a child.<sup>22/</sup> In Egypt, a study of a sample of women aged 45-47 showed that those who had



lost a child had more births and also a larger number of surviving children than those who had not lost a child.<sup>23/</sup> To the extent that rising female age of marriage contributes to improved child survival, particularly when it is combined with improvements in medical and public health services, it can be said to contribute to reduction in fertility rate. Improvement in female education also has its impact on the women's desire to reproduce and thereby on their fertility.

#### FEMALE EDUCATION

Let us go back now to the connection between female literacy and the age of marriage. We have seen above that though the higher than average age of marriage in Kerala was the outcome of the somewhat unique socio cultural forces prevailing there, in recent times education seems to have become the strongest factor to push up the age of marriage.<sup>24/</sup> Usually, when a positive statistical relationship is found between education and age of marriage, one tends immediately to infer that it is the higher level of literacy which leads to postponement of marriage. Implicit in it is the assumption that age of marriage is the dependant variable. But could not the sequence be somewhat different? It is possible that the higher age of marriage itself prompts people to keep their girls at



school and for longer periods. Historically, at least in Kerala, the higher age of marriage came first thanks to other factors, and the expansion of female education came much later. Once the girls were sent to schools and colleges, their education could certainly play its part in pushing up the age of marriage still further. It should thus have been the initial fact of the higher age of marriage which helped Kerala lead the rest of the country in the sphere of female education.

#### CONCLUSION

Thus what do we find in Kerala? A mere shift in the age of marriage, without female education, did not decrease the number of children a woman had. The higher age of marriage did perhaps create a favourable atmosphere for the spread of female education. It was however the reduction in infant mortality rates, due partly to shift in the age of marriage but largely to improvement in medical and public health facilities, which improved the child survivorship and this in turn seems to have influenced the number of children a woman wanted to have. Thus it is the high age of female marriage with a combination of all the above mentioned factors which seems to have at last brought down the birth rate in Kerala. A mere shift in the age of marriage, without a well dispersed medical and public health services as well as facilities for female education, could not have been much effective. What Kerala really shows to the rest of India is the need to combine all these factors. It also

cautions us against relying only on higher age of marriage to reduce the rate of growth of population, because going by Kerala's experience, higher age of marriage alone might well lead to higher rates of growth of population, at least in the immediate future. The postponement of marriage can be viewed as a device not only to reduce the reproduction span but also to increase the chances of child survivorship and to improve the level of female education; its usefulness as a demographic instrument therefore can be considerable. But unless postponement of female marriage is accompanied by a significant improvement in medical and public health facilities on the one hand and educational facilities on the other hand, raising the age of marriage alone may not secure the demographic results the New Population Policy, given its time perspective, is aiming at.

#### Notes

(I wish to thank M.F. Srinivas and K.M. Raj for their very helpful suggestions, but the responsibility for the views and opinions expressed is entirely mine.)

1. The All-India Census Report of 1921 put it as follows: "(1) It implies cohabitation at an immature age sometimes even before puberty and practically always immediately on the first sign of puberty resulting in grave physical effects upon the girl and in all the evils of premature child birth and (2) in the event of the husband dying the child-wife is in the case of the castes in which the remarriage of widows is prohibited left a widow for life". The 1931 All-India Census Report, while reviewing the

position immediately after the Sarda Act came into effect, emphasised the same aspect of early marriage thus: "Infant marriage naturally involves infant widowhood, a feature of no significance where remarriage is allowed but of serious importance where it is not." "Age and Marital Status", Census Centenary Monograph No.8, Census of India 1971, Chapters VI and VII, pp 130 and 153.

2. In the princely states of Baroda and Mysore, age of marriage had been the subject of legislation much earlier. The Infant Marriage Prevention Law of 1904 in Baroda fixed the minimum age of marriage for girls at 12. In Mysore a law dating back to 1894 prohibited the marriage of a girl under eight years of age.
3. T.M. Velu Pillai, (1940), "The Travancore State Manual", The Travancore State Manual", The Travancore Government Press, Trivandrum, Volume I, p 394. Also it has been contended that infant marriage was foreign to the earlier inhabitants of India and that it was introduced by the Aryans. See "Age and Marital Status", Chapter VII, p.120.
4. "Age and Marital Status", Chapter VI, p 155.
5. In this way the Namboodiri family was prevented from splitting into segments and was enabled to maintain its ancestral estate intact over many generations. Of course Namboodiris did practise polygamy also. Schneider, D M and Cough, Kathleen (1961), "Matrilineal Kinship", University of California Press, p320.
6. Wigram, Herbet (1900), "Malabar Law and Custom", Chapter II, p 34.
7. It is estimated that till 1951 less than half of the population in the regions now constituting Kerala followed the patriarchal system, known locally as the Makkathayam system. This included the Christians, Muslims and Hindu castes such as Brahmins, Kammals and Parayans. The rest of the population followed either Marumakkathayam system or a mixed system. G Surendranathan Nair, (1967), "Effects of Marumakkathayam on the Fertility Pattern of Kerala", The Demographic Research, Centre, Bureau of Economics and Statistics, Trivandrum.
8. Achutha Menon, (1911), "The Cochin State Manual", Chapter III, p 192.
9. "But among Nayars, a woman continues through life to belong to the family in which she is born and the sexual relation which she forms, or her so-called marriage, operates in law neither to give her the domicile of her husband nor to create a disability in her either to remarry or to put an end to her

- marriage at her pleasure during her first husband's life". Wigram, Herbert (1900), "Malabar Law and Custom", Chapter I, p 13.
10. "The Missionaries were the first to establish girls schools. The earliest effort was that of Mrs Mead in 1819 ... But the Missionaries were not merely content to establish schools. They tried to influence public opinion in the matter. They published pamphlets on the advantages of female education and exhorted people to send their girls to school." Nagam Aiya, 1906, "The Travancore State Manual", Volume II, p 474.
  11. "The increase in the number of the unmarried attended by a corresponding decline in the number of the married is mostly characteristic of such Malyali caste or communities as are advanced in English education". Census of India, 1931, Cochin, Chapter VI, p 96.
  12. "Till the early decades of the present century it was only normal that a majority of Muslim girls were married before they were twelve years old". A Sreedharan Menon, 1962, "Kerala District Gazetteers", Cannanore, Travancore Government Press, p 219.
  13. "The Muslims have always occupied the last place in literacy among the followers of different religions in the State ... The restrictions enjoined by the Furdah system must to a great extent account for the fact that there are but very few Muslim women able to read and write, and the disparity between the males and females in literacy is greatest among Muslims who have 230 literates in every 1000 males but only 41 literates in the same number of females, and for every 100 male literates among them there are but 17 female literates," Census of India, 1931 Cochin, p 195.
  14. A number of laws were passed in Travancore, Cochin and Malabar regions of the present-day Kerala, with a view to regulating marriage, succession and partition among the matriarchal groups and the thrust of these laws was such that led some observers to construe them as "providing for transition from matriarchy to patriarchy". L A Krishna Iyer, 1970, "Social History of Kerala", Volume II, p 86.
  15. "This higher age of marriage has however not resulted in the lessening of the fertility of the women in the state as compared with other regions in the country. While women in other states with younger age at marriage complete their reproductive life in the early 30s the Kerala women have high fertility even upto 40 years of age", C Chandrasekharan, "Population Growth in Kerala; Its Implications", Demographic Research Centre, Bureau of Economics and Statistics, Trivandrum 1965, p 43.

16. National Sample Survey, 1963, "Fertility and Mortality Rates in India (14th Round)", Number 76, Government of India.
17. K K Mathen, "The Impact of the Family Planning Movement on the Indian Population" in "Papers Contributed by Indian Authors to the World Population Conference", Belgrade, Yugoslavia, Office of the Registrar-General of India, 1965, p 289.
18. The results of these surveys are published regularly in the Sample Registration Bulletin issued by the Registrar General, India, Ministry of Home Affairs.
19. Sample Registration Report, Number 10, Bureau of Economics and Statistics, Kerala, 1975.
20. P R Copinathan Nair, 'Decline in Birth Rate in Kerala: A Hypothesis about the Inter-relationship between Demographic Variables, Health Services and Education', Economic and Political Weekly, Annual Number, February 1974.
21. Centre for Development Studies, 1975, "Poverty, Unemployment and Development Policy: A Case Study of Selected Issues with reference to Kerala", Volume I, Chapter XI.
22. Schultz, Paul T, 'Retrospective Evidence of a Decline in Fertility and Child Mortality in Central East Pakistan' Demography, August 1972.
23. S. Hassan, Influence of Child Mortality on Fertility, Paper presented at the Annual meeting of the Population Association of America, New York, April 1966.