EFFECT OF FEMALE LITERACY/EDUCATION ON FERTILITY A STUDY OF KERALA, KARNATAKA, PUNJAB & RAJASTHAN–1981.

Dissertation submitted to the Jawaharlal Nehru University
in fulfilment of the requirements
for the award of the Degree of

MASTER OF PHILOSOPHY

By

K. A. SURESH KUMAR

CENTRE FOR THE STUDY OF REGIONAL DEVELOPMENT
SCHOOL OF SOCIAL SCIENCES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI-110067

1992

जवाहरलाल नेहरू विश्वविद्यालय
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI - 110067

CENTRE FOR THE STUDY OF REGIONAL DEVELOPMENT,
SCHOOL OF SOCIAL SCIENCES.

C E R T I F I C A T E

This is to certify that the dissertation entitled: "EFFECT OF FEMALE LITERACY/EDUCATION ON FERTILITY. A STUDY OF KERALA, KARNATAKA, PUNJAB AND RAJASTHAN, 1981" submitted by Mr. K.A. SURESH KUMAR in partial fulfilment for the award of the degree of Master of Philosophy (M.Phil) of this University, is a bonafide work to the best of our knowledge and may be placed before the examiners for evaluation.

21.7.92

(PROF. K.S. SIVASWAMI)
CHAIRPERSON
21.7.92

(DR.MURALIDHAR VEMURI)
SUPERVISOR

GRAM : JAYENU TEL. : 667676, 667557 TELEX : 031-73167 JNU IN

TO MY

AMMA AND APPA

CONTENTS

ACKNOWLEDGEMENT

It is with a deep sense of gratitude I acknowledge that during my research work, I was always encouraged and motivated by the critical and constructive suggestions of my supervisor, Dr. Murali Dhar Vemuri, who spent most of his summer vacation with me in correcting this work with patience and sincerity.

The debt that I owe to him is very profound that just thanks and gratitude cannot express them even partially.

I am thankful to Sathiyander and Shish who extended me all help when I requested for computerising the data for my study.

I would also like to extend my thanks to my friend Ranjit Chakaraborty, Selvarajan and also to other friends who helped me during my studies. Here I would like to mention about my brother K.A Dhanaraj K.A Ramsh Kumar and my sister K.A. Prabha for their continious encouragement and support to me throughout my studies.

Lastly, I extend my thanks to the library staffs of Jawaharlal Nehru University, National Institute of Health and Family Welfare, and Nehru Memorial Library.

[K.A. Suresh Kumar]

LIST OF TABLES

CHAPTER 1

INTRODUCTION:

The study of human fertility occupies a central position in the study of population. Human fertility is responsible for biological replacement and for the maintenance of human society. Any society replienishes itself through the process of human fertility. Thus in population dynamics, fertility is a positive force, through which the population expands, counteracting the force of attrition caused by mortality.[1]

It is increasingly realised that the "problematic factor"[2] in the population growth of developing countries is the fertility rate. The growth rate of several countries [for eg: India, China, Pakistan & Sri Lanka] at present depends on the level of fertility and mortality and are not much affected by migration. In the developing countries mortality has declined considerably, and is expected to decline further. Birth rate in those countries however has not declined correspondingly, with the result that these countries are experiencing a rapid population growth which, in the opinion of development experts, is a threat to programme of social and economic development.

As the rate of population growth could be brought down by a decline in birth rate,it was soon realised that all efforts at

---

1. Bhende,A.Kanitkar,T [1985] Principles of Population Studies, Himalaya punlishing house, Bombay. p. 205.

2. Freedman, R. The Sociology of Human fertility: A Trend Report and Bibliography, Oxford: Brasil Balckwell [1963].

bringing down fertility rate would be successful only if development scientists were equiped with an adequate knowledge of fertility behavior in the context of social, cultural, economic and political settings. It has been observed that the fertility behavior varies considerably in various subgroups of the same population, these subgroups may be based on socio economic status, occupation, income, size of land holding, caste, race, etc.

It is extremely difficult to attribute the change in the fertility behaviour to one single factor, there being a whole complex of factors intricately meshed together that affect the motivation of couple in limiting the size of their famlies. Throughout the past decade interest has been growing both in understanding the socio economic forces that causes fertility to fall during the process of economic development. Among the factors most commonly emphasized as important and one which is tractable to policy manipulation is "education".[3]

Education, particularly of women is known to have a strong depressant effect on fertility. In many situation there is an apparently inverse relationship between level of educational attainment of women and their fertility. According to Mc Greevy and Birdsall [1974][4] "the inverse relationship of education to

---

3. Cochrane, Susan H. 1979. Fertility and Education: what We Really Know? Baltimore: Jojn's hopkins University Press.

4. Mc Greevy, W.P, and Nancy Birdsall. The Policy Releiance of Recept Social Reseaarch on Fertility. Washington, D-C: Interdisclplinary Common Nications Program; Smith & Onian Institute, 1974.

completed family size is of the most clear cut relations found in the literature." Similarly, Cochrane [1979][5] found that "female literacy has a strong negative effect on fertility". Simon [1974][6] explains that "an increase in income causes an increase in education. And parental education in LDC's reduces fertility, this much is clear from both cross-national and intracountry cross-sections". Such a consenses on the relation between two variables is extremely rare in the social sciences.

Educated women generally tend to marry later than illiterate women. Furthermore educated women, once married are more likely to enroll their children in school. School attendance tends to reduce the labour value of children and therefore to increase the motivation to have a lesser number of children. Educated women also tend to be more knowledgeable about matters of health and hygiene, so more number of their children survive, thereby reducing the number of births required to attain, the couple's desired family size. And educated women are more likely to have interests out side the immediate family that compete with children for time and attention. Educated women also tend to be more knowledgeable about the family planning and are therefore more likely to make use of family planning services.

It is also possible to pointout the other reasons of education especially of women, It provides opportunities for personal

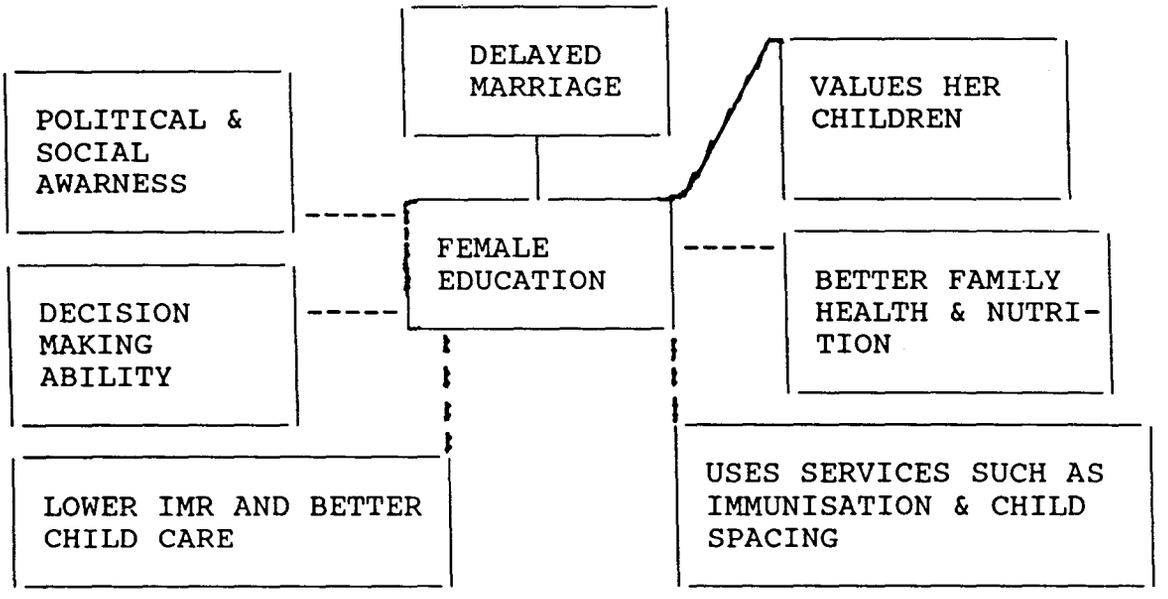
---

5. Cochrane, Susan H. 1979, Fertility & Education:- What do we really know?, John Hop Skins University Press.Baltimore

6. Simon, Julian. The Effect of Income on Fertility. Chapel Hill: North Carolina Population Center, 1974.

advancement and awareness of social mobility, the freedom from tradition, developing rationalism. Education meets some of the basic psychological needs of women, such as freedom from the close familial roles, a desire to acquire knowledge. The following figure can be helpful in understanding the relationship between female education and their development.

FIGURE-1-1



In India, the female literacy rates* [percentage of females of all ages who are literate, are based on the census question on literacy, which asks whether the person enumerated can read and write with understanding in any language,] in various census from 1901 onwards show an increase for both males and females [Table-1-1]. The rates were very low till 1931. In 1941, there was a sudden jump in literacy rates from 9.5 percent to 16.1 percent,

* In this chapter we have considered persons of all ages for claculating the literacy rate. An effective literacy rate can be calculated by using only female whoare either 5+ or 7+. Since we are presenting literacy rate from 1901 we have used all females.

but it remained almost at the same level [16.7] in 1951. Since then there is a monotonic increase of 7 to 8 percent points in each of the decades. The increase in female literacy rates has been higher as compared to males leading to considerable decline in male-female disparities. From this table it is also clear that as female literacy increases there is a gradual decrease in the birth rates and a rapid fall in the death rates.

TABLE-[I-I]
LITERACY, BIRTH AND DEATH RATE IN INDIA. 1901-1991.

CENSUS YEARS	LITERACY RATE [PERCENT]			BIRTH RATE	DEATH RATE
	MALE	FEMALE	TOTAL		
1901	5.51	0.69	5.35	48	48
1911	10.56	1.69	9.92	49	43
1921	12.21	1.81	7.16	49	49
1931	15.59	2.93	9.50	47	37
1941	24.90	7.30	16.10	45	33
1951	25.95	7.93	16.67	43	31
1961	34.44	12.95	24.02	44	26
1971	39.45	18.72	29.46	42	20
1981	46.89	24.72	36.23	33.9	15
1991	52.68	32.52	42.49	30.5*	10.2

*1989.

Source [1] Mukherjee, S.B. The age Distribution of the Indian Population : A Reconstruction for the States and Teritories, Honolulu, East West Centre, 1976; p.221.

[2] Census of India 1981, occasional papers, No. 40 of 1988. Report of the expert committee on population projections, New Delhi. Office of the Registrar General India, Demographic division, 1988, D.117

[3] Registrar general India, sample Registration Bulletin, Vol. XXIV, # 1, June 1990.

In the present study, the main objective is to examine the relationship between educational attainment of women and their fertility. In India, there are many studies using female literacy as one of the variables. For example, "Effect of Female Literacy On Fertility In India" by O.P Sharma and R.D. Retherford[7] [1990] and "Female Literacy and fertility" by V.P. Jauvali[8] [1971] [1978], But the relationship between female education and fertility has not been examined in detail using district level data. In this study , we are interested in selecting four states, two from northern states and two from southern states, having high and low fertility.

In order to select the states let us first examine Total Fertility Rate [TFR], for all the major states in India from the following table [1-2]

---

7. Sharma, O.P., and Robert D. Retherford: Effect Of Female Literacy on Fertility in India. Occasional Paper No 106 1990. Office Of The Registrar General And Census Commissioner, India. 1990

8. Jauvli. Female Literacy & Fertility. Demography India. Vol VIII, No 122, 1971.

TABLE:- 1-2

TFR AND FEMALE LITERACY/EDUCATIONAL LEVEL FOR MAJOR STATES IN INDIA 1981.

STATES	TFR	FEMALE LITERACY RATE	% OF FEMALE EDUCATED UPTO.		
			PRIMARY.	MATRICULATE.	GRADUATION.
1. ANDHRAPRADESH	4.3	20.39	7.78	1.65	0.43
2. BIHAR	5.2	13.62	2.94	1.15	0.19
3. GUJARAT	4.7	32.30	8.53	3.53	0.71
4. HARYANA	5.4	22.27	6.93	2.05	0.79
5. KARNATAKA	4.7	27.71	9.18	2.80	0.49
6. KERALA	3.3	65.73	21.91	5.67	0.99
7. MADHYAPRADESH	5.3	15.53	4.26	0.59	0.57
8. MAHARASHTRA	4.3	34.79	10.30	2.81	0.62
9. ORISSA	4.3	21.12	5.62	0.80	0.19
10. PUNJAB	3.2	33.69	11.65	4.13	1.38
11. RAJASTHAN	6.1	11.42	3.21	0.64	0.35
12. TAMILNADU	3.9	34.79	12.53	4.58	0.63
13. UTTARPRADESH	5.9	14.04	4.73	1.11	0.65
14. WESTBENGAL	4.3	30.25	11.39	2.14	0.95
INDIA	3.6	24.82	8.64	2.40	0.63

Source [i] Census of India, 1991 Occasional Paper # 13 of 1988, Fertility in India Registrar General and Census Commissioner, India, New Delhi 1991.

[ii]. Government of India, Ministry of Human Resource Development, Selected Educatioinal Statistics 1986-87, New Delhi 1988.

From the table, among the northern states we have selected Punjab as the low fertility state [TFR = 3.2], Rajasthan as high fertility state [TFR = 6.1] and among the southern states we have Kerala as low fertility state [TFR = 3.3] and Karnataka as high fertility state [TFR = 4.7] according to 1981 census. We have made this distinction between the northern and southern states as there appears to be significant differences in the fertility behaviour of the regions[9]. Hence in our study, we analyse the effect of female education on fertility in these four states, using the district as the unit of observation. We have organised our study as follows. A review of past literature on the same subject is presented in chapter II. The third chapter deals with the conceptual framework, hypothesis and the methodology of the study, used for examining the hypothesis. In chapter IV we have presented the factors influencing female literacy/ education for 1981 for the two northern and for the two southern states. The last chapter consists of the findings and conclusions of the study.

---

9. Dyson and Moore," On Kinship Structure, Female Autonomy and Demographic behaviour in India. 1983. Population Development Review Vol.9. No.1. 1983

CHAPTER-II

A REVIEW OF LITERATURE

This chapter reviews the previous studies that have been conducted on female education and their fertility. We find that a large number of studies have been conducted in this subject in developing as well as developed countries apart from India.

The 'Mysore population Studies'[1] which was conducted by the United Nations (1961) found that in Bangalore city, women with high school and college education were found to have a smaller family size than the women with lower educational attainment.

The 16th round of N.S.S. (1960-61)[2] also brought out a clear cut relationship between educational attainment of married urban women and her fertilty. It was observed in this study that the average family size was 6.10,6.32,6.25 and 4.25,for the illiterate, below primary, primary completed, upto secondary and secondary completed women respectively.

J.R.Rele and Tara Kanitkar[3] conducted a study in

1. United Nations, The Mysore population Studies, New York: 1961, p.p 122-123.
2. National Sample Survey Sixteenth Round, 1960-61, No. 116, Tables with Notes on Family Planning, Delhi: The Cabinet Secretariat, Government of India, 1967.p.22.
3. J.R. Rele and Tarakanitkar, Residence Background and Fertility In Greater Bombay. population studies, Vol-28, No. 2, 1974.

Metropolitan city of Greater Bombay found that a strong negative relationship between educational attainment of currently married women and their fertilty.

O.P. Sharma and R.D Retherford[4] found that there in a strong negative relationship between educated women and their fertility. In their study they found that, districts with low female literacy rate of 20 percent had a total fertility rate 5.2 children per women, and an increase of 10 percent in female literacy reduces, the total fertility rate by slightly less than one-half child per women and they also found that districts with high female literacy rate the T.F.R is about 2.3 children per women. It is interesting to note that the author did not contribute the whole effect of reduction in fertility to female literacy, but that half of its effect was primarily due to reduction in child mortality. In their study the increase in female literacy generates a decrease in child mortality rate, which inturn decrease the total fertility rate.

Katherine and George[5] while studying the

---

4. Ibid, p. 26.

5. Katherine, L.Bourne, George M.Walker, "The Differential Effect of Mothers Education on Mortality of Boys and Girls in India", population studies, A Journal of Demography. 45[2],1991.P.203.

differential effect of mothers education on mortality of boys and girls in India , confirms the association between mothers education and child mortality and also shows that in India, mothers education has an even greater effect on survival of her daughter than it does on that of her sons. Here it is clearly evident that due to the survival of her children, her fertility declines indirectly, but the authors did not give much attention for the decline in fertility. They used the 1981 census data of India, while presented for the first time infant and child mortality estimates classifed by states, sex of children, educational level of mother for the 14 major states. The study covered 93 percent of the India's population.

A study by V.P.Javali[6], entitled 'Female Literacy and Fertility' attempted to examine the possible impact of educational attainment of women on their fertility behavior in India. The author included eighteen states and four union teritories for the study which is based on the data of 1971. The author states that female literacy and crude birth rate are inversely related, this relationship was significant for rural areas and was not significant in urban areas because the factors other than literacy among female play an important role in determining crude birth rate.

---

6. V.P.Javali, "Female Literacy and Fertility", Demography India,vol,No.122, 1978.

O.P. Sharma and R.D. Retherford[7] in their study' Recent Literacy Trends in India', while using the variables literacy ratio among females aged 15+years, percentage of urban population,percentage of females employed, percentage of SC/ST population, Infant mortality rate, sex ratio, mean age at marriage, contraceptive use rates, crude birth rate and total fertility rate found that female literacy is strongly and negatively associated with Infant mortality, Crude birth rate & total fertility rate. In their concluding part they suggests that the steady improvement in female literacy is contributing substantially to both mortality and fertility decline.

While analysing the family planning adoption with selected secio economic characteristics at district level, K.G. Jolly[8] states that the long term performance is clearly related to different socioeconomic characteristics. There is a positive relationship between literacy rate and adoption of family planning, that is,higher the level of literacy higher the family planning adoption rate. The Chi-square

---

7. O.P. Sharma, and Robert .D.Retherford, 1987" Recent Literacy Trends in India. "Occasional paper No-1 of 1987," Office of the Registrar General, New Delhi, India.

8. K.G. Jolly "Relation of family planning adoption with selected socio-economic characteristics of district level," Demography India, Vol II, No.1 and 2, 1978.

test results shows that the relationship is significant. There is a similar relationship between the proportion of urban population and the family planning adoption rate.

A study by R.P. Singh and J. Richard[9] entitled "Socio-economic and Demographic Correlates of age at marriage" states that, to increase the age at marriage of females action programmes to increase women's education and jobs for women should be provided. They collected data from both rural and urban areas of North Arcot districts of Tamilnadu. While analysing the correlate they used the variables, age at marriage, education, occupation etc. In their study the auther found that, the highest proportion of age at marriage for husbands who belongs to rural and urban areas was influenced by their wife's educational and occupational level. From this study it is evident that female education should be given much importance to increase their age at marriages so that there will be a reduction in their fertility.

According to the Bangladesh fertility survey [BFS][10] conducted in 1975 shows that the higher the

---

9. R.P singh and J.Richard,"Socio-economic and Demographic Correlates of Age at Marriage," Demography India, Vol.18, No.182, 1989.

10. Government of Bangladesh," The Bangladesh Fertility Survey' 1975, Ministry of health and population control, Dhaka. 1978.

educational level leads to higher the age at marriage and as a result there will be a reduction in the fertility. The B.F.S. data shows that the mean age at marriage were 12.8 years, 13.6 years and 14.7 years respectively among women with no education, women with primary education, and women with education beyond primary level. As a result of increase in education there will be a decline in their fertility.

Various National and village level studies carried out in Bangladesh reveal empirical support to the relationship between education and use of contraception and as a consequence the reduction in fertility. According to the Contraceptive Prevalance Survey of Bangladesh[11] shows that the contraceptive use rates were 16 percent, 20.96 percent, and 42.07 percent respectively among women with no Schooing, women with primary schooing, and women educated beyond primary level. The over all use rate for the country as a whole was 19.1 percent which is exactly the same rate prevailng among women who did not complete their primary level education. Thus it is evident from the survey that unless education is raised beyond the primary level the impact of education on contraception will not be pronounced and there will not be a considerable reduction in fertility.

11. Bangladesh contracentive prevalence survey 1978, The second there year plan of Bangladesh, planning commission, Dhaka 1980.

M.M.Hug and Rokeyakatum[12], estimated the impact on fertility of increasing female education. They have found that the likely rate of decline in fertility as a measure by the mean number of children born to women as they move from one educational level to the next higher educational level. They have found out the proportional reduction in fertility corresponding to different educational level. In this study they suggest that all the female children would have to be provided education beyond the secondary school level, and then there will be a drastic reduction in the fertility. The authors also state that it involves a enormous financial requirement on the part of the government and it is clearly an impossibility.

A recent village study called"Age at Marriage and Fertility in a rural Bangladesh" carried out by Barkat-e-khuda[13] shows a positive relationship between female age at marriage and their educational level. In this study the mean age at marriage was 14.6 years , 16.8 years and 18.2 years respectively for women with no schooling, primary schooling, and education beyond primary level. The author states that, any increase in

---

12. M.M.Hug and Rokeyakatum, "Fertility Impact of Female education in Bangladesh", The fertility impact of development Inputs, planning commission, Dhaka, Government of Bangladesh 1985.

13. Barkat-e-Khuda,"Age at Marriage and Fertility in a rural Bangladesh", Asian profile, Hongkong 1985 .

age at marriage leads to a decline in the proportion of women currently married in a population, and as a result of this there will be a decline in fertility. The age at marriage is raised by increase in educational level and consequently the fertility will decline.

Bashir Ahmed[14] in his study states that husbands and wife's education can help lower the preceived market cost as well as the psychological cost of using contraceptives. Therefore, it can be assumed that the higher the husband's or wife's education, then higher contraceptive use , and there will be a reduction in fertility.

While analysing the impact of development programmes on fertility in Bangladesh, Barkat-e-khuda, Sushil Hawaldar and Sarah P.Harbison,[15] State that the development projects such as agricultural projects, educational assistance are likely to affect the socio-economic structure which eventually affects fertility. They have attempted a quantification of major development input on contraceptive prevalence and fertility in Bangladesh. It appears from the analysis

---

14. Bashir Ahmed,"Determinants of contraceptive use in rural Bangladesh"Demography India, vol 24, No.3 1987.

15. Barker-e-Khuda,Sushil Hawaldar and Sarah P.Harbison, ,"The impact of development programme on fertility in Bangladesh" Demography India, vol 17, No.1, 1988.p.1-18.

that the contraceptive use effect of female education is about four times greater than that of agricultural modernization. In addition, the other benifical effects of education such as increased age at marriage, greater exposure to media, favorable change in attitudes toward small families, are expected to reduce fertility further.

S.A.Ather[16] while evaluating the school scholarship programme in Chandpur district of Bangladesh states that the proportion of young girls remaining single was higher among the scholarship recipient who remained in school than among those who were not in school. The young girls who remained in school also married later. The majority of unmarried scholarship recipient were in favour of delayed marriage[20-22] age group, while the majority of girls not in school were in favor of earlier marriages [16-18], 93 percent of the scholarship recipients, both married and unmarried believed in family planning. Girls who had stayed in school longer were also more likely to be contraceptive users and to prefer small family size. Thus it appear from this study that provision of scholarship money to female students increases their enrollment in secondary schools, raises female age at marriage, increases contraceptive useage, and there by helps to depress fertility.

16. S.A.Ather, " young women fertility, "Demography India vol.17, No.A,1988.

A study by William Larvely and Ronold Freedman[17] entitlled "The origin of Chinese fertility decline" states that education appears to be associated with early adoption of family control, and they are stating that urbanization is also plays an equal role in this regard, like higher the proportion of educated women are associated with larger cities and then the fertility of that cities are expected to be less.

While analysing the educational attainment and occupational structure of china's minority women and their relations to population development, Yang Yixing,[18] suggests that education is a stepping stone to change the occupational structure and has a grater impact on the number of children born to each women and on her use of contraceptives. The higher the level of educational level of women is, the higher the contraception rate will be and fewer children will be born, so that population growth can be more effectively controlled. It is also evident from Yang Yixing study that lower educational level results in poor knowledge

---

17. Willian Larvely and Ronold Freedman, "The Origin of Chinese fertility decline, "Population Research Quarterly, vol 4, No.1,1987.

18. Yang Yixing," A Brief Analysis on educational Attainment and Occupational Structure of China's Minority women and their Relations to Population Development," Population Research Quarterly, VOL 4, NO.1, 1987.

about child bearing and contraception which brings about more diffculties in contraceptive uses. The author while analysing the educational level and occupational structure of women in their reproductive ages, shows that most of the women with a college education only give birth to one children and a very few of them give birth to two children but none give birth to three children. In their study as the educational level decreases there in a gradual increase in the number of children born to them.

Susan[19] in her study on Thailand, states that in 1960-1970 literacy and number of children ever born for married women over 30 years were significantly and positively related, but at the same time for younger married women, the results were not significant.

Ben-porath[20], observed different relations for male and female education in Israel, he found that female education was inversely and significantly related to fertility, but interestingly he found that male education was inversely related in only one out of four cases. The hypothesis for positive relationship between

---

19. Susan Hill cochrane, "The determinants of children ever born in cross regional data on Thailand", spring 1978 processed. Fertility and education, what do we really know?, world Bank staff occasional paper, No.26.1979.

20. Ben-Porath, Voram. "Economic Analysis for fertility in Israel. Points and counterpoint". Journal of political Economy, vol.18(March/April],P.202-233.

male education and fertility in that the educational status of males is positively related to income status of male, and that income status could be positively related to fertility. In this manner he states that male education might be positively related to fertility.

Hanna, Rizk[21] in his study found that female education is negatively associated with their fertility. The author studied the women in Jordan of 30-34 age group, and found that illiterate women have an average of 6.4 children, while those with primary school education have an average of 5.9 children. For secondary school graduates, the average was 4 children and for university degree holders only 2.7 children. The author also found a dramatic correlation between educational level and attitude towards family planning. In this study women were asked about their opinion about family planning, of those who disapproved 80 percent were illiterates, 16 percent had received primary education, and 3 percent had attended primary school, and 0.6% percent had attended secondary school. No university women disapproved of family planning.

Safilos- Roths child[22] observes that the

21. Rizk, Hanna, "Trends in fertility and family planning in Jordan," Studies in family planning Vol. 8 [April 1977], p.91-99.

22. Safilos-Rothschild, "sociological factors affecting fertility in Urban Greece: A preliminary report." Journal of marriage and the Family, Vol 31 [August 1969], p.p. 595-606.

educational impact on fertility is negative for all countries but the impact was not uniform in educational hierarchy. The association becomes effective at a different point of educational continium.

Stycos[23] reports on simple correlation between literacy and child women ratio for eleven Latin American countries and found the correlation to be generally inverse. While examining his results, he felt that two factors needed to be considered, general level of education and the extent of urbanization of a country. He found that if the process of urbanization is held constant, the educational development will also raise according to that and the relation between education and fertility remain high in those countries [Argentina, Chile and Costarica]. In Bolivia, Honduras, and Panama, however the correlation shows higher fertility associated with higher education even in the urban areas that is positive correlation between the variables.

Friedlander and others[24] found that, fertility was lower in more illiterate countries. In their study

---

23. Stycos, J.Mayone. Human fertility in Latin America. Ithaca: cornell university press, 1968.

24. Friedlander, Stanley, and Morris Silver; A quantitative study of the Determinants of fertility Behavior". Demography, Vol 4, No 1 [1967].

they considered developed and developing countries as well. But they found a strong inverse relationship between education and fertility when the developed and developing countries are grouped together. The authors also found that the countries at the middle level of development had significantly inverse association.

Jhon and Rodriguz[25] noted the effect of parental education on marital fertility in developing countries. They collected data from 38 of the 41 successfully completed developing country surveys conducted under the auspices of the world fertility survay. The authors observed that most commonly a monotonic decline is observed in total or marital fertility with increasing parental education. They have documented the variation in the relationship between marital fertility and education of husband and of wifes in the wide range of societies that participated in the world fertility survey [WFS] conducted between 1974-82. the primary respondents in WFS where women of reproductive age. In their study it is found that in Latin American and the Arab states of North Africa and Western Asia, the wife's education is strongly associated with fertility behaviour Women educated upto secondary school level

25. John Cleland and German Rodriguz, " The effect of parental education on Marital Fertility in developing countries'" Population Studies, A Journal of Demography, 1988, p. 419.

typically bear 2, 3 or 4 children fewer on an average than women who have held no schooling.

In Asia, the effect of women's education on fertility limitation and the level of child bearing are less pronounced than in Latin America and the Arab regions. Ignoring Nepal, where the number of educated women is small, the difference between the marital fertility of women of varying educational level ranges from 0.7 to 2.8 births. Moreover, difference in the degree of fertility control between women with no schooling and those with a few years of primary school tend to be small. In both Asia and Africa, appreciable decline in traditional birth-spacing restrains are found as education increases. In Africa, fertility control is virtually absent among couples where the wife is uneducated or has had incomplete Primary schooling, but rises there after. The net result is that the highest marital fertility is usually found among women with a little schooling, but the lowest fertility is almost always recorded by the small number with secondary education. In this study China & India were not included.

These reviews suggests that these is apparently an inverse relationship between fertility and female education. Therefore, based on the above reviews, our study focusses attention on the effect of female

literacy/education on fertility in two southern and two northen states of India. In the next chapter we have framed a conceptual framework for analysing effect of female literacy/education on fertility through proximate variables.

CHAPTER-III

A CONCEPTUAL FRAMEWORK FOR ANALYSING THE EFFECT OF FEMALE LITERACY/EDUCATION ON FERTILITY.

In this chapter an attempt has been made to trace the impact of female education on fertility.To improve the understanding of the causes of fertility variation, it is necessary to analyze the mechanism through which female education influences fertility. An mentioned in the last chapter the relationship between female literacy/education is examined through proximate variables. The proximate determinants of fertility are the biological and behavioral factors through which social, economic, and environmental variables affect fertility.

An analytical framework that has been very influential in fertility studies is the one formulated by Davis and Blake[1956][1], which identifies and classifies a set of "intermediate variables" through which socital changes have their impact on fertility. In this scheme the intermediation variables are placed immediately before fertility. Intermediate variables is an exhaustive classification in the sense that any change in fertility must be affected through changes in one or more of these intermediate variables, but it is not a mutually exclusive set in that

1. Kingsley Davis and Judith Blake, "Social Structure and Fertility. An Analytic Framework", Economic Development and Social Change, Vol. 4, No. 3, April 1956, pp 211-235.

the intermediate variables are not independent of each other.

The eleven intermediate variable were classified into three categories, [i] factors affecting exposure to intercourse[inter course variables; [ii] factors affecting exposure to conception [conception variable]; and [iii] factors affecting gestation and successful parturition. The detailed list of intermediate variables is given below.

I. Factors affecting exposure to intercourse ["Intercourse Variables"}

A. Those governing the formation and dissolution of unions in the reproductive period.

1. Age of entry into sexual unions.
2. Permanent celibacy: proportion of women never entering sexual unions.
3. Amount of reproductive period spent after or between unions.
   a. When unions are broken by divorce, separation, or desertion.
   b. When union are broken by death of husband.

B. Those governing the exposure to intercourse within union.

4. Voluntary absatinence.
5. Involuntary abstinence [From Impotence, illness, unavoidable but temporary separations]
6. Coital frequency [excluding periods of abstinence]

II. Factors affecting exposure to conception ["conception variables"]

7. Fecundity or infecundity, as affected by involuntary causes.

8. Use or non use of contraception.

   a. By mechanical or chemical means.

   b. By other means.

9. Fecundity or infecundity as affected by voluntary causes [Sterilization, subincision, medical treatment, etc.]

III. Factors affecting gestation and successful parturition ["gestation variables"]

10. Fetal mortality from involuntary causes.

11. Fetal mortality from voluntary causes.

This classification assists in identifying the appropriate intermediate variables for explaining any observed fertility change in a society. sociological elaboration of the model have attempted to include the effects of norms about family size and about the intermediate variables themselves on each of these intermediate variables.

In recent times a major contribution in this regard has been made by Bongarts [1978][2]. Who has tried to quantitatively assess the effects on fertility of some of

---

3. Bongarts, J and H. Nelgado (1979) "Select of Natritional status on Fertility in Rural Guatemala," in "Patterns and Determinants of Natural Fertility," H. Leridon and J. Menken eds., Oridina, Liege.

the key intermediate variables. In seeking an explanation for the observed differentials in fertility among various population in both developed and developing countries, Bongarts found that a major portion of the variability in the fertility level in the population can be Explained by only four out of eleven intermediate variables, proposed by Davis and Blake.

These were found to be nuptiality variables, age at marriage and proportion of non-marriage, period of lactation following child birth, incidence of total wastage, and prevalence of contraceptive practice [Bongarts, 1978]. Two population with same level of contraceptive use of modern methods of family planning can have sub stantially different fertility levels when the levels of the other three proximate variables, namely lacation , foetal wastage, and nuptiality are different.

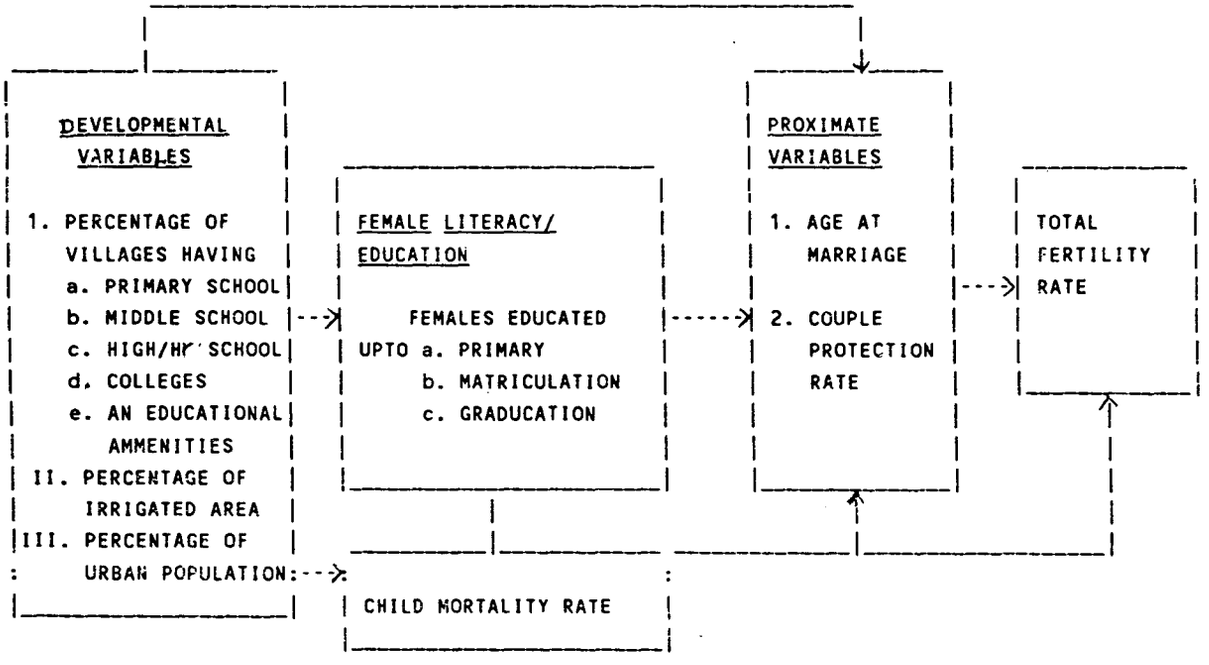
In our framework we analyse the relationship between female education and fertility through the proximate variables, the conceptual framework is presented in figure [3-1]. As the conceptual framework shows that developmental variables influence female literacy/education, aproximate variables and child mortality. Female literacy/education generally tends to be high in those areas which have larger percentage of educational facilities. In those areas which have higher urban popuplation it can be expected that there will be a higher percentage of literate females and educated females. Another variables that may

influence female literacy/education is percentage of irrigated area. Developmental variable also influence proximate variables directly and indirectly through female literacy/education.

We shall now discuss the relationship between female literacy/education and proximate variables. In our study we have considered only two proximate variables, that is age at marriage and couple protection rate, the other two proximate variables infecundity and abortion are not considered because of lack of data.

A CONCEPTUAL FRAMEWORK FOR ANALYSING THE EFFECT OF FEMALE LITERACY/EDUCATION ON FERTILITY.

[FIGURE-3.1]



The relationship between literacy/education and age at marriage has been widely discussed. This may be because of a strong negative association with fertility. the female age at

marriage is affected primarily by the wifes education. Although males education may affect male's age at marriage, the latter is much less important to fertility than female age at a marriage. Where there are fixed differences between the age of brides and grooms, male education would increase male's age at marriage and thus increase wifes age at marrige, but this is very uncertain. Thus the effect of male's education on wife's age at marriage is hypothesized to be unknown.

Education may affect Females age at marriage in several ways. Education in general raises wage rates and increases access to better jobs, making market work more attractive. Therefore, women desire to work for some time before marriage, thus postponing it, this effect of education would apply throughout all levels of education, but because certificates or degrees are used as screening devices in hiring, this effect may not be equally strong for each level of education.

Education may also narrow the range of potential marriage partners and may thus increase the waiting time involved in finding the right suitor. This effect may operate at all levels of education, but the impact may be concentrated at the levels of secondary or degree levels. Education beyond primary level may conflict directly with early marriage since married women are generally not enrolled in schools in our country.

There are basically two ways in which a population can control its fertility. First, the number of years of exposure to childbearing can be limited delaying marriage. Delayed

marriages have reduced the duration of the actual childbearing years to less than the potential maximum in all known human societies. Second, deliberate control of marital fertility can be exerted, either through the use of contraception or by resorting induced abortion.

Age at first marriage indentifies the onset of exposure to the risk of socially sanctioned childbearing, and as such, it is a principal determenant of the number of birth a women will have. The biological supply of children and demand for children determine whether there is a potential demand for fertility regulation. However, the actual, and particularly the effective, use of contraception depends on several other factors. Atitudes toward fertility regulation, knowledge of birth control methods, access to the means of fertility regulation, and communication between husband and wife about family size, goals are essential for effective fertility regulation.

Contraceptive use should increase with education for several reasons. First, the more educated appear to have greater natural fertility and generally higher rates of survival for their children. Second, ideal and desired family size tend to be inversely related to education. Third, the more educated have better attitudes toward and knowledge of contraception. Fourth more educated people tend to be more rational in their behavior; that is if they do not want more children, they will do something to prevent more births.

Another link that has been shown in figure 3-1. is between literacy/education and child mortality. We consider child mortality rather than infant mortality rate because data on child mortality is readily available. Education would seems to increase the health of parents and children through better knowledge of hygiene, nutrition, and adequate food supplies. Educations effect through infant and child mortality in more complex. It is obvious that education will lead to better occupation and increase in income and may improve purchasing power leading to qualitative and quantitative improvement in child care, reducation in risk of infection, timely and appropriate adoption of modern medical services. Therefore, better education of parents is also associated with lower infant, and child mortality.

Based on the conceptual frame work and the review of literature we have framed our hypothesis which is given below.

1. Fertility is inversely related with female literacy/education. In those districts which have a higher level of female literacy or higher level of females educated upto primary/matriculation/graduation tend to have lower fertility rate.

2. In those districts where the female literacy or the level of female educated upto primary/ matriculation/graduation is high, the higher will

be their age at marriage and lower the fertility rate.

3. In those districts where couple protection rate is high then there will be low fertility rate. Here fertility is inversely related with couple protection rate.

4. Fertility and child mortality is positively related. In those districts which have a low child mortality rate, tend to have low fertility rate.

5. Fertility is inversely related with the developmental variables. In those districts which have a higher percentage of villages having primary school/ middle school/ Higher secondary school/college/an educational amenities tend to have lower fertility rate.

6. Those districts which is having high percentage of irrigated area will be having low fertility rate.

7. Those districts which is having high percentage of urban population will be having lower fertility rate.

METHODOLOGY:

To find out relationship between the dependent and independent variables we have used the correlation technique which gives us the direction and strength of the relationship between the variables. We have also used the step-wise multiple regression analysis because the correlation analysis explains only the relationship between the two variables at one time, but our step-wise regression procedure helps in observing the effect of adding independent variable in a systematic way.

After inputting the data In the stepwise rgression the computer firs selects the independent variable that explains the greatest variation in the dependent variables. Then the computer performs successive regression analysis by adding one or more variable to each run depending on the variation explained in the dependent variable. The variable added is the one that offers the greatest additional reduction of the unexplained variation. The programme continues until all variables in the set have been included, or until none of the remaining variables can make a significant reduction in the explained variation. Multiple regression analysis describes the relationship between the dependent and independent variables, generally a multiple regression equation consists of more than one independent variables.

The equation will be,

$$Y + a + b1\ x1 + b2\ x2 + b3\ x3 + \ldots\ldots\ bn\ xn.$$

Where

Y = dependent variable.

a = intercept term.

x1,x2,....xn = independent variables.

b1,b2...bn = coefficient of independent variable.

In the above equation, the coefficients b1,b2,bn measure the degree of variation in the dependent variable associated with variation in each independent variables that is, b1 = y/x1, holding all other independent variables constant. In addition we also know the coefficient of determination, R^{-2} which measures the proportion of variation in the dependent variable associated with variation in the independent variables. The value of R^{-2} may range from 0 to 1. A value of 0 indicates that there is no relationship between the dependent and any of the independent variables. A value of 1 indicates that all the variation in dependent variable is explained by simultaneous variations in the independent variables. So if the value of R^{-2} is high, we say that there is high correlation between the dependent and independent variables and vice versa. We have also used F-test and t-test. To find out the significance F-statistics provides a measure of the ratio of explained variation [in the independent variable] to unexplained variation. To test whether overall equation is significant, we compare the value of F-

statistics with critical F-value. If the value for the F-statistic exceeds the critical F-value, We can say that the regression is statistically significant at the specified confidence level. But this test does not imply that all the variables are significant. To know this, the individual variables are tested by means of the t-test. The t-test requires only that we compare the t-test ratio with the critical t-value for our desired level of significance. If the t-test ratio is greater than the t-value from the table, we say that the variables is significant at a particular level of significant.

Variables, measurement and source of data

In this study, in all fifteen variables which comprise fourteen independent and one dependent variable have been used. The following table gives the variables for which data has been compiled. We have grouped independent variables into four categories, according to the nature of the variables. These categories are (i) Developmental variables, (ii) Female literacy/education variables; (iii) Child mortality and (IV) proximate variables. And the only dependent variable is Total fertility rate.

Table 3-1

Variables used in the study

Type of variables	Description of variables	Measurement of variables
Developmental variables	1. percentage of villages having primary schools.	No of primary school / Total no of all schools. x 100
	2. percentage of villages having middle school	No of middle schools / Total no of all schools. x 100
	3. percentage of villages having High/Hr schools	No of high/hr schools / Total no of all schools x 100
	4. percentage of villages having colleges	No of colleges / Total no of all the colleges x 100
	5. percentage of villages having an educational amenities	No of school/colleges / Total no of educational institutions x 100
	6. percentage of irrigated area	Gross irrigated area / Total cropped area x 100
	7. percentage of urban population	Urban population / Total population x 100
Female literacy/ education variables	8. Female literacy	No of female literates / Total female population x 100
	9. percentage of females educated upto primary level	No of females educated upto primary level / Total female population x 100

Type of variables	Description of variables	Measurement of variables
	10. percentage of females educated upto matriculation level	No of females educated upto matriculation ---------- x 100 Total female population
	11. percentage of females educated upto graduation	No of females educated upto graduation ---------- x 100 Total female population
Mortality	12. Child mortality rate	No of deaths before age two. ---------- x1000 Total live births
Proximate variables	13. Mean age at marriage	This based on the census question that asks age at first marriage, if women has ever been married
	14. Couple protection rate	The norms used by the states for the calculation of C.P.R. could be varying depending upon the data locally compiled
Dependent variable	15. Total fertility rate	Sum of age specific fertility rate ---------- x 5 1000

Table 3-2

Sources of data. 1981.

Variables	Sources
1. Percentage of villages having primary schools	District census hand book of 1981 for. (i) Kerala (ii) Karnataka (iii) Punjab (iv) Rajasthan
2. Percentage of villages having middle school	-do-
3. Percentage of villages having high/hr school	-do-
4. Percentage of villages having college	-do-
5. Percentage of villages having college an educational amenities	-do-
6. Percentage of irrigated area	Statistical Abstract.Central Statistical organisation, Department of statistics, Ministry of planning. 1981
7. Percentage of urban population	District census hand book of 1981 for Kerala, Karnataka, Punjab and Rajasthan.
8. Female literacy rate	Socio cultural tables
9. Females educated upto primary level	-do-
10. Females educated upto matriculation level	-do-
11. Females educated upto graduation level	-do-

Variables	Sources
12.Child mortality rate	(i) Office of the Registrar General, India, 1988 Fertility and Child Mortality estimates of Kerala, Occasional paper # 2 of 1988. New Delhi.
	(ii) Office of the Registrar General, India, 1987 Fertility and Child Mortality estimates of Karnataka Occasional paper # 11 of 1987. New Delhi.
	(iii) Office of the Registrar General, India, 1988 Fertility and Child Mortality estimates of Punjab, Occasional paper # 10 of 1988. New Delhi.
	(iv) Office of the Registrar General, India, 1987 Fertility and Child Mortality estimates of Rajasthan, Occasional paper # 5 of 1987. New Delhi.
13. Mean age at marriage	(i) Office of the Registrar General, India, 1988 Fertility and Child Mortality estimates of Kerala, Occasional paper # 2 of 1988. New Delhi.
	(ii) Office of the Registrar General, India, 1987 Fertility and Child Mortality estimates of Karnataka Occasional paper # 11 of 1987. New Delhi.

Variables	Sources
	(iii) Office of the Registrar General, India, 1988 Fertility and Child Mortality estimates of Punjab, Occasional paper # 10 of 1988. New Delhi.
	(iv) Office of the Registrar General, India, 1987 Fertility and Child Mortality estimates of Rajasthan, Occasional paper # 5 of 1987. New Delhi.
14. Couple protection rate	District-wise couple protection rate as on 31st March 1984. Ministery of Health and family welfare, Government of India.
15. T.F.R.	(i) Office of the Registrar General, India, 1988 Fertility and Child Mortality estimates of Kerala, Occasional paper # 2 of 1988. New Delhi.
	(ii) Office of the Registrar General, India, 1987 Fertility and Child Mortality estimates of Karnataka Occasional paper # 11 of 1987. New Delhi.
	(iii) Office of the Registrar General, India, 1988 Fertility and Child Mortality estimates of Punjab, Occasional paper # 10 of 1988. New Delhi.
	(iv) Office of the Registrar General, India, 1987 Fertility and Child Mortality estimates of Rajasthan, Occasional paper # 5 of 1987. New Delhi.

The whole study has been carried out on the basis of secondary data, but to know the indepth of what factors determine fertility reduction, it is necessary to use the primary seurces of data, where we can have more information. In this study the district is taken as the unit of analysis. In the next chapter we discuss about the analysis of effect of female literacy/education on fertility.

CHAPTER-4

AN ANALYSIS OF EFFECT OF FEMALE LITERACY/EDUCATION ON FERTILITY

In this chapter, first of all, we have discussed the inter-district variations among the variables for the states of Kerala, Karnataka, Punjab and Rajasthan. Secondly, the result of correlation analysis have been presented. Here we have studied the relationship within the independent variables and correlation between dependent and independent variables. Thirdly, to determine the influence of one independent variables on the dependent variable holding all other variables constant. We have presented the multiple regression analysis. The regression analysis for each state consist of four selections. The four selections are given below.

I. TFR = a+b.FLR + c.MAM + d.CMR + e.PURBAN + f.AMEN + g.PIA + h.CPR.

II. TFR = a + b. FPRIM + c. MAM + d.CMR + e.PURBAN + f.PSCH + g.PIA + h.CPR.

III. TFR = a + b. FMET + c. MAM + d. CMR + e.PURBAN + f.HSCH + g.PIA + h.CPR.

IV. TFR = a + b.FGRAD + c.MAM + d.CMR + e.PURBAN + f. COLL + g. PIA + h.CPR.

These selections differ in respect of the educational variables and the corresponding edducational amenities variables. In the first selection we consider female literacy rate and

percentage of villages having an educational amenities. In the second selection these variables are replaced by females educated upto primary level and percentage of villages having primary schools. The third and fourth selections consist of females educated upto matriculation level, percentage of villages having high schools, females educated upto graduation and percentage of villages having colleges respectively. We have considered this selections because we want to determine whether the changes in the level of education influence fertility. More over we have also considered the possibility of multicollinearity among the independent variables. At the end of this chapter we have summed up all the results of regression analysis for all the four states.

In this chapter we have studied all these variables for which we have data, so that the influence of education on fertility can be meaningfully broughtout, where data was difficult to obtain we have left out that variables. For example, in Kerala data for percentage of irrigated area is not available, so we leftout that variable in this state. We have made comparision between Kerala and Punjab on the one hand and Karnataka and Rajasthan on the other. All the results of the four states have been presented in the following order. I. Kerala; 2. Karnataka; 3. Punjab; and 4. Rajasthan.

1 KERALA

(a) INTER-DISTRICT VARIATIONS

The coefficient of variation for the variables for the state of Kerala is given in the following table No, [4-1]. The district-wise estimates of variables are given in appendix.

Table 4.1.

MEAN AND COEFFICIENT OF VARIATION OF THE VARIABLES IN KERALA.

Variables.	Mean	Co-efficient of Variation.
Dependent Variable.		
TFR	3.40	24.56
Explanatory Variable.		
FLR	64.81	14.12
FPRIM	21.81	9.29
FMET	5.67	42.18
FGRAD	0.98	63.58
MAM	19.10	4.39
CMR	55.66	29.72
PURBAN	15.70	73.64
PSCH	80.08	2.12
MSCH	71.21	49.06
HSCH	50.43	57.26
COLL	4.99	80.26
AMEN	81.58	46.79
PIA	N.A.	N.A.
CPR	40.88	41.27

EXPANSION OF ABBREVIATED TERMS

TFR = Total Fertility Rate.

FLR = Female Litevancy Rate.

FPRIM = Percentage of Females Education upto Primary Level.

FMET = Percentage of Females Educated upto Matriculation.

FGRAD = Percentage of Females Educated upto Graduation.

MAM = Mean Age at Marriage.

CMR = Child Mortality Rate.

PURBAN = Percentage of Urban Population.

PSCH = Percentage of Villlages having Primary School.

MSCH = Percentage of Villages having Middle School.

HSCH = Percentage of Villages having High School.

COLL = Percentage of Villages having College.

AMEN = Percentage of Villages having an Educational Amenities.

PIA = Persentage of Irrigated Area.

CPR = Couple Protections Rate.

The table 4.1 reveals that the dependent variable, total fertility rate, has a variation of 24.56 percent. The appendix shows that this variable ranges from 2.5 children per women to 5 children per women in Trivandrum and Mallappuram districts of Kerala in 1981.

Among the explanatory variables, the variable percentage of villages having college shows a high coefficient of variation which is 80.26 percent. This variable ranges from 0 to 11.2 percent in Wayanad, Kottayam and Alleppey districts.

The percentage of urban population also has a high coefficient of variation which is 73.64 percent ranging from 4.6 percent to 39.60 percent in Idukki and Eranakulam districts respectively. The variable percentage of female educated upto graduation also shows a some what high variation ranges from 0.30 to 2 percent in Malappuram and Trivandrum districts.

Among the expalnatary variable, the variable percentage of villages having primary school shows a low coefficient of variation followed by mean age at marriage. The variable percentage of villages having primary school ranges from 91.33 percent in Palghat and 100 percent in Malappuram, Eranakulam and Quilon districts of Kerala. The next low coefficient variation of the variable mean age at marriage ranges from 17.80 percent to 20 percent in Malappuram and Eranakulam districts.

(b) CORRELATION ANALYSIS.

In order to understand how the dependent and independent variables covary with each other, the Zero-order coefficient are calculated. The matrix which represent the Zero order correlation coefficient are given in the Table 4.2.

From the Zero-order correlation matrix, two relations can be established.

[i]. Correlation within the independent variables.

[ii]. Correlation between dependent and independent variables.

The relations which are mentioned above are discussed separately.

(i). correlation within the independent variables.

The correlation within the independent variables as observed from the correlation matrix, by and large falls in line in the expected direction. Here let us discuss only the highly correlated independent variables.

In Kerala among all the independent variables, The highest coefficient of correlation has been found between the percentage of villages having an educational amenities, and the percentage of villages having primary school. The coefficient value is 0.9967. It is statistically significant at 1 percent level. It means that in a district where the villages having an educational amenities is high, there at least a primary school will be there. In fact it is a positive correlation.

The coefficient of correlation between percentage of villages having matriculation school and percentage of villages having primary school is 0.9814. It is also statistically significant at 1 percent level. It means that higher the percentage of villages having middle school and higher will be the primary school. In the same manner, the variables percentage of villages having matriculation and high school are correlated with percentage of villages having an educational amenities. Here this variables also statistically significant at 1 percent level. The coefficient of correlation between percentage of villages having college and percentage of villages having high school is positively correlated as we have expected. The coefficient value is .8777. It is significant at 1 percent level.

We have the positive correlation between percentage of villages having high school and percentage of villages having matriculation School. The correlation value is .8508. It is statistically significant at 1 percent level. The variables percentage of villages having high school and percentage of villages having primary school are correlated in the same way and it is also statistically significant at 1 percent level.

The variable female literacy rate and female educated upto matriculation is positively correlated. The correlation of coefficient value is .9268 and it is statistically significant at 1 percent level. The relationship states that in a district where the female literacy is high female educated upto matriculation is also high. The coefficient of correlation between female educated upto matriculation and mean age at marriage is .9265. It is

statistically significant at 1 percent level. This relationship reflects our hypothesis, which means that females those who are educated upto matriculation their age at marriage will also be high.

There is a negative correlation between child mortality rate and female literary rate. The coefficient value is - .8697. It means that if the female literacy is high then the child mortality will be low and it is statistically significant at 1 percent level. The variable couple protection rate and child mortality rate is negatively correlated, the value of coefficient is -.8814. If the child mortality rate is less then there will be high couple protection rate. This is statistically significant at 1 percent level.

The variable couple protection rate is positively associated with the variables female educated upto primary, female educated upto matriculation, female educated upto graduation and mean age at marriage. This correlation is fall in the expected direction. The variable percentage of urban population is positively associated with female literacy rate, female educated upto primary level, female educated upto matriculation, females educated upto graduation and also with mean age at marriage. This relationship is similar to our expectation. The variable percentage of villages having primary school is positively correlated with female literacy, female educated upto primary, female educated upto matriculation, female educated upto graduation and with mean age at marriage. But it is negatively

associated with child mortality rate. And this relationship is as we have expected. Similarly the variables percentage of villages having matriculation school, high school and colleges are correlated in the same way as mentioned above. But these are not stastically significant at 1 percent level.

II. Correlation between dependent and independent variables. Kerala.

Among all the independent variables, the highest coefficient of correlation has been found for the variable mean age at marriage with total fertility rate. In fact the mean age at marriage is negatively correlated with total fertility rate. The value of correlation coefficient is -0.9058. It is statistically significant at 1 percent level. It means that females of higher mean age at marriage have low number of children. The variable female educated upto matriculation is negatively and highly correlated with total fertility rate. The value of coefficient is -0.9028. It is statistically significant at 1 percent level. It means that those females who are educated upto matriculation have lesser number of children.

The variable couple protection rate is again negatively correlation with the total fertility rate -0.8824 and is statistically significant at 1 percent level. We can say that, therefore, the districts where the couple protection rate is high the total fertility rate will be low.

The variable female literacy rate is negatively correlated

with the total fertility rate. The coefficient value is -0.8606. The negative sign shows that the higher the female literacy rate the lower the total fertility rate and it is statistically significant at 1 percent level.

The variable female educated upto graduation is negatively correlated with the total fertility rate. The coefficient -0.8608 and is statistically significant at 1 percent level. It means districts with higher the female educated upto graduation there will be lower the total fertility rate. The coefficient of correlation between child mortality rate and total fertility rate is 0.7384. It seems that the positive relationship indicates that in a district where child mortality is high, the total fertility rates will also be high. The positive relationship brings out a clear cut conclusion.

The variable percentage of villages having college is negatively correlated with total fertility rate -0.6788. It means that, if a village has a college in that particular area the educational level of that area is expected to be high therefore we can expect lower fertility. This value is statistically significance at 0.1 percent level. The variables, percentage of villages having primary school, matriculation school, high school and percentage of villages having an educational amenities are negatively correlated with total fertility rate.

The variable percent urban population is negatively associated with total fertility rate. The coefficient of

TABLE NO: [4-2]

ZERO ORDER CORRELATION MAT RIX:KERALA

	TFR	FLR	FPRIM	FMET	FGRAD	MAM	CMR	PURBAN	P.SCH	M.SCH	HSCH	COLL	AMEN	GIA	CPR.
TFR	1.0000														
FLR	-.8606	1.0000													
F.PRIM	-.2680	.5755	1.0000												
F.MET	-.9028	.9268	.2916	1.0000											
F.GRAD	-.8.603	.7967	.2283	.8932	1.0000										
M.A.M.	-.9058	.8094	.0734	.9265	.8677	1.0000									
C.M.R.	+.7384	-.8697	-.5404	-.7829	-.7701	.6111	1.0000								
PURBAN	-.4152	.3206	.1484	.2661	.4450	.2151	-.5775	1.0000							
P.SCH	-.2140	.3910	.3852	.2793	.3845	.0558	.7520	.5478	1.0000						
M.SCH	-.1767	.3894	.4551	.2457	.3484	.0110	-7344	.4558	.9314	1.0000					
HISCH	-.5360	.6970	.3646	.6339	.6877	.4783	-.8590	.4478	.8399	.8508	1.0000				
COLL	-.6788	.7424	.3840	.6884	.7525	.6291	-.8072	.2519	.6045	6487	.8777	1.0000			
AMEA	-.2235	.3879	.3583	.2849	.3760	.0638	.7511	.5484	.9967	.9653	.8221	.5814	1.0000		
GIA	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	
C.P.R.	-.8324	.8543	.3482	.8217	.8217	.7490	-.8814	.4749	.5184	.5228	.7779	.8763	.5130	.0000	1.0000

TFR FLR FPRIM FMET FGRAD MAM CMR PURBAN PSCH MSCH HSCH COLL AMEN GIA CPR.

correlation is -0.4152. It means that districts with higher percentage of urban population have lower fertility rate. Negative association has been found between the variable female educated upto primary level and total fertility rate. We have obtained this negative relationship as we expected. Due to the non availability of data of percentage of irrigated area we couldn't get the relationship of this variable with fertility for Kerala state.

In general, the relationship with the dependent variable, as we observed from the correlation matrix, in table 4-2 by and large fall in line in the expected direction.

(c) REGRESSION ANALYSIS:

From the regression results from Table 4.3 - selection I, it has been found that the value of R^{-2} is highest in the step 4. The value of R^{-2} is 0.8965. The regression equation from this step is follows:-

TFR= 13.6691 - 0.4870 MAM - 0.0265 CPR -0.0105 PURBAN
[- 2.756] [- 2.532] [-1.214]

- 0.0034 AMEN
[- 1.098]

R^{-2} = .8965 F= 24.88580

From the above regression equation, we find that 89.6 percent of the variation in the total fertility rate has been explained by the independent variables. The overall goodness of fit indicated by F - value is statistically significant at 1 percent level.

From the t - value in the brackets, we find that the variable mean age at marriage is statistically significant at 1 percent level. The regression coefficient is -0.4870. Which means, that if we increase means age of marriage by 1 unit, then T.F.R. decreases by 0.48 units holding all other variables constant. The variable couple protection rate is statistically significant at 5 percent level, and it is in the expected direction. It explains that if we increase the couple protection rate by one unit point, then the total fertility rate is

decreases by .02 points. The variables percent urban population and percentage of villages having an educational amenities are statistically significant only at 30 percent level. Among these two variables percent urban population has a higher regression coefficient, explaining that, if we increase percent urban population' by one unit then the total fertility rate decreases by.01 unit. Similarly if percentage of villages having an educational amenities increases by 1 unit, then the T.F.R. decreases by .003 units.

To find out the influence of female literacy rate on T.F.R. we have to take the step 4 in the same selection. In step 4 Female literacy enters as an important variable that explains total fertility rate, with the inclusion of Female literacy the R^{-2} decreases to 88.8 percent and female literacy is statistically significant at 50 percent level. Thus in Kerala female literacy does not have an important influence. A reason for this may be low coefficient of variation for female literacy as literacy is fairly uniform at the state.

Table No. 4.3

MULTIPLE REGRESSION ANALYSIS-KERALA.

DEPENDENT VARIABLE T.F.R. [1981] KERAL , SELECTION - I

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUES	R^{-2}	F-VALUES
MAM	20.67138	-.90343	.13366	-6.759	.80246	45.6859
MAM	14.98027	-.55627	.14609.	-3.808.	.89640	48.5873
CPR		-.02328	.00733	-3.173		
MAM	15.57146.	-.5888	.15232	-3.866	.89391	31.8952.
CPR		-.0196	.00849	-2.311		
PURBAN		-.0073	.00832	-0.888		
MAM	13.6691	-.48705	.17671	-2.756	.89656	24.8355
CPR		-.02650	.01046	-2.532		
PURBAN		-.01059	.00871	-1.214		
AMEN		-.00349	.00318	1.098		
MAM	12.9952	-.41179	.21315	-1.932	.88833	18.5008
CPR		-.02287	.01206	-1.897		
PURBAN		-.01166	.009187	-1.269		
AMENE		-.00410	.003421	1.201		
FLR		-.01458	.02096	-.696		
MAM	15.30901	-.41824	.22960	-1.822	.87097	13.3747.
CPR		-.02525	.01405	-1.798		
PURBAN		-.01405	.01127	-1.246		
AMEN		-.001362	.00725	0.188		
FLR		-.02947	.04072	- .724		
CMR		-.01557	.03549	- .439		

Selection II.

From the results of Table [4.4,] selection-II it has been found that the value of $R^{-2}$is highest in step 5. The value of $R^{-2}$is 0.9030. The regression equation from this step is as follows.

$$TFR = 14.8885 - \underset{[-2.832]}{0.5040\ MAM} - \underset{[-2.275]}{0.0245\ CPR} - \underset{[-1.436]}{0.0122\ PURBAN}$$

$$- \underset{[1.411]}{0.0045\ PSCH} - \underset{[-1.069]}{0.0468\ FPRIM}$$

$R^{-2} = 0.9030$ $F = 21.5021.$

From the above aggression equation, we find that 90.3 percent of variation in total fertility rate has been explained by the independent variables. The overall goodness of fit indicated by F- value as 21.5021, and it is statistically significant at 1 percent level.

From the t-value in the brackets, We find that only the variable mean age at marriage is statistically significant at 2 percent level, explaining, that if we increase ' Mean age at marriage by one unit then the total fertility rate is decreases by 0.50 units. The variable C.P.R. is statistically significant at 5 percent level. the explains that if the C.P.R. increases by one unit, then the 'T.F.R.' is decreases by only .02 units.

We find that the variables percent urban population, and percent of female educated upto primary level are statistically significant only at 20 percent level. Among these two variables

percentage of urban population' has a higher regression coefficient, explaining that, if we increase percent urban population by one percent then the T.F.R. decreases by .01 units. Similarly if percent primary school increases by one unit, then the TFR decreases only by .004 units. The variables percentage of female educated upto primary level is also statistically significant only at 30 percent level and is in expected direction. Here again female education is not important and the reason may be very much similar to that in the case to female literacy rate.

TABLE No. 4-4

MULTIPLE REGRESSION ANALYSIS

DEPENDENT VARIABLE T.F.R. [1981] KERALA, SELECTION -- II

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUES	R^{-2}	F-VALUES
MAM	20.67138	-.90343	.13366	-6.759	.80246	45.685
MAM	14.98027	-.55627	.14609	-3.808	.89640	48.587
CPR		-.02328	.00733	-3.173		
MAM	15.57146.	-.58888	.15232	-3.866	.89391	31.895
CPR		-.01962	.00849	-2.311		
PURBAN		-.00739	.00832	-0.888		
MAM	13.29736	-.46661	.17624	-2.648	.90113	26.064
CPR		-.02780	.01046	-2.658		
PURBAN		-.01092	.00850	-1.284		
PSCH		-.00404	.003217	1.259		
MAM	14.88859	-.50407	.17797	-2.832	.90309	21.502
CPR		-.02456	.01079	-2.275		
PURBAN		-.01222	.008511	-1.436		
PSCH		-.00454	.00321	+1.411		
FPRIM		-.04682	.04382	-1.069		
MAM	18.05308	-.59159	.28382	-2.084	.88764	15.4
CPR		-.02725	.01329	-2.051		
PURBAN		-.01386	.00996	-1.391		
PSCH		-.002115	.00676	+ .313		
FPRIM		-.06979	.07243	- .964		
CMR		-.01185	.02834	- .418		

SELECTION III.

From the result of selection-III, Table (4-5) it has been found that the value of R^{-2} is highest in step 4. The value of R^{-2} is .9188. The regression equation from this step is as follows.

$$\begin{array}{lcccc} TFR = 12.5974 & - 0.5316\ MAM & - 0.0316\ CPR & + 0.0076\ HSCH & \\ & [-3.889] & [-3.215] & [1.861] & \\ & & -0.0085\ PURBAN & & \\ & & [-1.173] & & \end{array}$$

$R^{-2} = 0.9188$ $\qquad$ $F = 32.1503.$

From the above regression equation we find that 91.8 percent of variation in T.F.R. has been explained by the independent variables. The overall goodness of fit indicated by f - value is 32.1503 and it is statistically significant at one percent level.

From the t-values in the brackets, we find that the variables, mean age at marriage and couple protection rate are statistically significant at 1 percent level. Among these variable mean ages at marriage has a higher regression coefficient, explaninig that, if we increase mean age at marriage by one unit, then the T.F.R. decreases by .53 units. Similarly if C.P.R. increases by one unit then the T.F.R. decreases by .031 units.

The variable percent urban population is in the expected direction and is statistically significant only at 10 percent level. explaining that if we increase the percentage of urban

population increases by one percentage point, then the T.F.R. decreases only by .008 points. The positive influence of percentage of villages having high school on TFR is quite opposite to our hypothesis and we are not sure why the regression coefficient for percent of villages is having high school is positive.

Table No. 4-5

MULTIPLE REGRESSION ANALYSIS. KERALA

DEPENDENT VARIABLE - T.F.R (1981), SELECTION - III

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUES	R^{-2}	F-VALUES
M.A.M.	20.67138	0-.90343	.13366	-6.759	.80246	45.68596
MAM	14.98027	-0.55627	0.14609.	-3.808.	.89640	48.58732
CPR		-.02328	.00733	-3.173		
MAM	13.97043	-.49721	.13663	-3.639	.91507	40.50420
CPR		-.03522	.00959	-3.672		
HSCH		-.007225	.004186	1.726		
MAM	14.59742	-.53160	.13671	-3.889	.91888	32.15031
CPR		-.03167	.009549	-3.215		
HSCH		+.007642	.004107	1.861		
PURBAN		-.008567	.007303	-1.173		
MAM	11.07566	-.32581	.25219	-1.292	.91825	25.71107
CPR		-.02969	.01009	-2.941		
HSCH		+.009185	.004417	2.079		
PURBAN		-.009486	.007392	-1.283		
FMET		-.09756	.10031	- .973		
MAM	10.74477	-.28593	.32945	- .868	.90284	18.03537
CPR		-.03098	.01247	-2.484		
HSHC		-.008587	.005532	1.552		
PURBAN		-.01062	.0095734	-1.109		
FMET		-.11797	.14349	- .822		
CMR		-.003863	.01758	- .220		

SELECTION IV.

The results of selection 4 are presented in table [4-6] the value of R^{-2} is highest in step 3. The value of R^{-2} is 0.920. The regression equation is as follows,

$$\text{T.F.R.} = 14.8584 - \underset{[-4.178]}{0.5349}\ \text{MAM} - \underset{[-3.777]}{0.0391}\ \text{CPR} - \underset{[1.949]}{0.07189}\ \text{COLL}.$$

$R^{-2} = .9209$ $\qquad$ $F = 43.74.$

We have find that from the above regression equation, 92 percent of variation in T.F.R. has been explained by the independent variables. The overall goodness of fit indicated by F-value as 43.74 is statistically significant at one percent level.

From the t-values in the brakets, we find that the variables mean age at marriage and C.P.R. are statistically significant at 1 percent level. Among these two variables mean age at marriage has got higher regression coefficient, explaining that if we increase mean age at marriage by one year then the T.F.R decreases by .53 unit. Similarly if CPR increases by 1 unit then the T.F.R decreases by .039 units. The regression coefficient of the variable percentage of villages having college is not in the expected direction, and it is quite opposite to our hypothesis. Therefore, from the above analysis it shows that mean age at marriage has been found to exercise the largest negative influence on T.F.R.

Table (4-6)

MULTIPLE REGRESSION ANALYSIS - KERALA.

DEPENDENT VARIABLE T.F.R.(1981)

SELECTION - IV

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUES	R^{-2}	F-VALUES
MAM	20.67138	-.90343	.13366	-6.759	.80246	45.68596
MAM	14.98027	-.55627	.14609.	-3.808.	.89640	48.58732
CPR		-.02328	.007337	-3.173		
MAM	14.85841	-.53497	.12803	-4.178	.92098	43.73429
CPR		-.03919	.01038	-3.777		
COLL		+.07189	.03688	+1.949		
MAM	15.00960	-.54410	.14296	-3.806	.91028	28.90008
CPR		-.03743	.01378	-2.716		
COLL		+.06798	.04335	+1.568		
PURBAN		-.001807	.008439	- .214		
MAM	15.14727	-.54407	.15419	-3.529	.89563	19.87808
CPR		-.03814	.01579	-2.415		
COLL		+.06570	.04984	1.318		
PURBAN		-.0024411	.01029	0.237		
CMR		-.001590	.01207	-0.132		

MULTICOLLINEARITY.

SELECTION-I

In Kerala, selection I, III and IV has the problem of multicollinearity. This is evident when we looked at the correlation coefficient of variables in those respective selections. As mentioned in the section on correlation analysis, mean age at marriage and couple protection rate are highly correlated and the value of correlation coefficient is 0.7490. So we removed the variable couple protection rate and also it is correlated to a higher level with percentage of villages having educational amenities. The results of the modified, regression results are given in table (4-7).

It has been found that the value of R^{-2} is highest in the step 2. The value of R^{-2} is 0.8427. The regression equation from this step is as follows.

$$TFR = 19.9867 - \underset{[-\ 6.992]}{0.8538\ MAM} - \underset{[-\ 1.889]}{0.0167\ PURBAN}$$

$R^{-2}=0.8427$ $F=30.4690$

From the above regression equation, we find that 84.4 percent of the variation in total fertility rate has been explained by the independent variables. The overall goodness of fit indicated by the F-value is statistically significant at 1 percent level.

From the values in the brackets we find that the variable mean age at marriage is statistically significant at 1 percent level. The regression coefficient is -0.8538 which means that if we increase the mean age at marriage by 1 year then the TFR decreases by .85 units holding all the other variables constant In the same equation the varible percentage of urban population is statistically significant at 9 percent level, and the regression coefficient for this variable is -0.0167.

Table (4.7) MULTIPLE REGRESSION ANALYSIS

SELECTION - I

KERALA

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUE	R^2	F-VALUE
MAM	20.6713	-0.9034	0.1336	-6.759	.8024	45.6859
MAM	19.9867	-0.8538	0.1221	-6.992	.8427	30.4690
PURBAN		-0.0167	0.0088	-1.887		
MAM	20.1221	-0.8572	0.1285	-6.670	.8265	18.4755
PURBAN		-0.0142	.0111	-1.281		
AMEN		-0.0013	0.0033	-0.403		

SELECTION-III

When we looked at the correlation coefficient we found that there was no serious problem in selection II. But in selection III we have multicollinarity among the independent variables. As mentioned in the selection on correlation analysis mean age at marriage and couple protection rates are highly corretated (0.7490). So are removed the vasiable couple protection rate.

From the modified regression results from table (4-8), it has been found that the value of R^{-2} is highest in the step 2. The value of R^{-2} is 0.8427. The regression equation from this step is as follows.

$$TFR = 19.9867 - 0.8538\ MAM \underset{[-6.992]}{} - 0.0167\ PURBAN \underset{[-1.887]}{}$$

$R^{-2} = 0.8427.$ F=30.4690.

From the above regression equation we find that 84.27 percent of the variation in the total fertility rate has been explained by the independent variables. The overall goodness of fit indicated by the F-value is statistically significant at 1 percent level.

From the t-values in the brackets we find that the variable. mean age at marriage in statistically significant at 1 percent level the regression coefficient for this variable is -0.8538. The negative sign indicates that if we increase mean age at marriage by 1 year then the T.F.R. decreases by .85 units holding all other variable constant. This influence is in agreement with our hypothesis.

In the same equation, we find that the variable percentage of urban population is negatively influencing total fertility rate. The value of regsession coefficient -0.0167 and it is statistically significant only at 9 percent level.

TABLE No. 4-8

MULTIPLE REGRESSION ANALYSIS

DEPENDENT VARIABLE T.F.R.

SELECTION - III

KERALA

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUE	R^2	F-VALUE
MAM	20.6713	-0.9034	0.1336	-6.759	0.8024	45.6859
MAM	19.9867	-0.8538	.1221	-6.992	.8427	30.4690
PURBAN		-0.0167	.0088	-1.887		
MAM	19.7515	-0.8395	0.1435	-5.847	.8241	18.1894
PURBAN		-0.0157	0.0102	-1.542		
HSCH		-0.0010	0.0045	-0.227		

SELECTION-IV

As mentioned in the section on correlation analysis among the independent variables we find a high correlation between age at marriage and couple protection rate (0.7490). So we removed the variable couple protection rate to avoid multicollinearity, and a regression analysis for the rest of the variables was performed in selection IV.

The regression result from table(4-9) Shows that the value of R^{2-} is highest in the step 2. The value of R^{2-} is 0.8045. The regression result from this step is as follows.

$$TFR = 18.6973 - 0.7902\ MAM - 0.0376\ COLL$$
$$[-4.620] \quad [-1.052]$$

$R^{-2}=0.8045$ $\qquad$ $F=23.6374$

From the above regression equation we find that 80.45 percent of the variation has been explained by the independent variables. The over all goodness of fit indicated by the F-value is statistically significant at 1 percent level.

The t-value in the brackets shows that the variable mean age at marriage is statistically significant at 1 percent level. The regression coefficient is -0.7902, which means that if we increase mean age at marriage by 1 year then the T.F.R. decreases by .79 units holding all the other variables constant. Eventhrough the second variable percentage of villages having college is in the expected direction, it is statistically significant only at 32 percent level.

Table (4-9)

MULITIPLE REGRESSION ANALYSIS

SELECTION-IV

KERALA

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUE	R^2	F-VALUE
MAM	20.6713	-0.9034	0.1336	-6.759	0.8024	45.6859
MAM	18.6973	-0.7902	0.1710	-4.620	0.8045	23.6374
COLL		-0.0376	0.0358	-1.052		

2. KARNATAKA

(a) INTER-DISTRICT VARIATIONS

The following table shows the coefficient of variation for the variables for the state of Karnataka. The districtwise estimates of variables are given in Appendix

Table - (5.1)

COEFFICIENT OF VARIATION OF VARIABLE IN KARNATKA 1981.

Variables	Mean	Coefficient of variation
Dependent variable		
1. T.F.R	4.68	7.57
Independent variable		
1. FLR	27.12	37.37
2. FPRIM	9.18	39.65
3. FMET	2.80	55.44
4. FGRAD	0.49	92.86
5. MAM	17.01	5.95
6. CMR	101.73	16.37
7. PURBAN	24.47	46.22
8. PSCH	63.03	15.96
9. MSCH	29.82	59.66
10. H.SCH	4.64	64.79
11. COLL	0.07	235.50
12. AMEN	83.27	14.16
13. PIA	19.20	63.71
14. CPR	30.33	18.12

The table 5.1 shows the dependent variable, T.F.R has a variation of 7.57 percent. The appendix shows that this variation ranges from 3.8 children per women to 5.2 children per women in Kodagu and Raichur districts of Karnataka in 1981.

Among the explanatory variables, the variable percentage of villages having college shows a high coefficient of variation which is 235.50. This variable ranges from 0 to 0.69. We find that this variable has a zero value in almost all the districts except Dharwad, Uttarkannad and Kodagu districts of Karnataka. The percentage of female educated upto graduation also has a high coefficient of variation which is 92.86 percent ranging from 0.12 percent to 2.13 percent in Raichur and Bangalore districts respectively. The variable percentage of villages having high school also shows a high coefficient of variation and it ranges from 1.56 percent to 11 percent in Kolar and Kodagu districts respectively. The Variable percentage of irrigated area also shows somewhat high coefficient of variation which is 63.71 percent ranging from 3.09 percent and 48.34 percent in Kodagu and Shimoga districts respectively.

Among the explanatory variables, the variable mean age at marriage shows a low coefficient of variation which is 5.95 ranging from 15.70 to 19.20 in Bidar and Kodagu districts of Karnataka in 1981. The second lowest coefficient of variation is for the variable percentage of villages having an educational ammenities which is 14.16 percent ranging from 61.05 percent to 97.28 percent in Kolar and Dakshinkannad districts of Karnataka in 1981.

(b) CORRELATION ANALYSIS

We have presented the zero-order correlation coefficient matrix for the state of Karnataka in Table (5.2).

(i) Correlation within the independent variables.

The correlation within the independent variables as observed from the correlation matrix, by and large falls in the expected directions. From the matrix let us only concentrate on the highly correlated variables. In Karnataka, among all the independent variables the highest correlation coefficient has been found between the variable female literacy rate and female educated upto primary level the coefficient value is .09703 and it is statistically significant at 1 percent level. These results are not surprising as female educated upto primary level includes female literates. The correlation coefficient between female educated upto graduation and female educated upto matriculation is 0.9038 and is statistically significant at one percent level. This relationship is also not surprising as female educated upto graduation includes female educated upto matriculation. The correlation between female literacy rate and female educated upto matriculation represents the same as above and it is statistically significant at 1 percent level. The coefficient value is 0.8946.

The positive relationship has been found between the variable mean are at marriage and female literacy rate, mean age at marriage and female educated upto primary level and mean age at marriage and female educated upto matriculation. The value of

coefficient is 0.8776, 0.8765, and 0.7352 respectively and all these are statistically significant at 1 percent level. The variable child mortality rate is negatively associated with female literacy rate, female educated upto primary level, females educated upto graduation. The value of coefficient is -0.7341, -0.7180, 0.6989 and -0.5668, respectively. It means that as the female education increases then the child mortality decreases. This relationship suits well with our hypothesis. All these four relationships are statistically significant at one percent level.

The correlation coefficent between child mertation rate and mean age at marriage is -0.6250 and it is statistically significant at 1 percent level. It means that higher the age at marriage, lower will be the child mortality rate. The variable percentage of urban population is positively associated with female educated upto matriculation and female education upto graduation and the coefficient value is 0.5852 and 0.7988 respectively. These values are statistically significant at 1 percent level. It means that higher the percentage of urban population, higher will be the percentage of female educated upto matriculation and percentage of female educted upto graduation.

We have find that the variable percentage of villages having primary school is negatively associated with female literacy rate; female educated upto primary level; female educated upto matriculation; and female educated upto graduation. The coefficient values are -0.6694; -0.7081; -0.4725 and -0.1584 respectively. The negative sign shows that higher the percentage

of villages having primary school, the lower will be the female literacy rate, female educated upto primary level, and female educted upto matriculation, and female educated upto graduation. This result is different from our hypothesis.

The correlation coefficient between percentage of villages having primary school and mean age at marriage is -0.7130 and is statistically significant at 1 percent level. The negative sign shows that higher the percentage of villages having primary school, the lower will be the mean age at marriage. This relationship is also against our hypothesis. We find a negative correlation between percentage of villages having middle school and percentage of villages having primary schools. The correlation coefficietn value is -0.5736 and is statistically significant at 1 percent level. It means that higher the percentage of villages having middle school the lower will be the percentage of villages having primary school.

The correlation coefficient between percentage of villages having highschool and percentage of female educated upto primary level is 0.5493 and it statistically significant at 1 percent level it means that districts with high percentage of high schools are likely to have higher percentage of females educated upto primary level. The variable percentage of villages having high school is negatively correlated with child mortality rate. The coefficient value is -0.5439. The negative sign shows that the higher the percentage of villages having high school lower the child mortality and it is statistically significant at 1 percent level.

The positive association between percentage of villages having high school and percentage of villages having middle school has been found between these two variables. The coefficient value is 0.8500 and is statistically significant at 1 percent level. The variable percentage of villages having college is positively related with female literacy rate, female educated upto primary level, and female educated upto matriculation. The coefficient of correlation of thes variables are 0.6451; 0.5853; and 0.5973 respectively and all these are statistically significant at 1 percent level.

The coefficient of correlation between the variable percentage of villages having college and mean age at marriage is 0.6808 and is statistically significant at 1 percent level. It means that the districts which is having high percentage of villages having college will be having a high female mean age at marriage. The variable percentage of villageshaving college is negatively correlated with child mortaility rate the coefficient value is -0.5519 and is statisticaly significant at 1 percent level. It means that districts with high availability of colleges are likely to achieve low child mortality rate.

It is unexpected that the variable percentage of villages having an educational amenities is negatively associated with female literacy rate, female education upto primary level, female educated upto graduation level and also with mean age at marriage. This relationship is different from hypothesis. But in this series the variable percentage of educational ammenities is positively associated with the variable percentage of villages

TABLE NO : [5-2]

ZERO ORDER CORRELATION MATRIX, KARNATAKA.

	TFR	FLR	FPRIM	FMET	FGRAD	MAM	CMR	PURBAN	PSCH	HSCH	COLL	AMEN	PIA	CPR
TFR	1.0000													
FLR	-.0530	1.0000												
FPRIM	-.3743	.9703	1.0000											
FMET	-.6674	.8946	.7722	1.0000										
FGRAD	-.6195	.6624	.5079	.038	1.0000									
MAM	-.5044	.8776	.8765	.7352	.4407	1.0000								
CMR	.5092	-.7341	-.7180	-.6989	-.5668	-.6250	1.0000							
PURBAN	.1395	.3235	.1944	.5852	.7988	.0342	-.1743	1.0000						
PSCH	.2568	-.6694	-.7081	-.4725	-.1584	-.7130	.5130	.0777	1.0000					
MSCH	.0538	.3497	.4316	.1563	-.061	.2449	-.2962	-.0134	-.5736	1.0000				
HSCH	-.1531	.5009	.5493	.3301	.1075	.4407	-.5439	-.1073	-.5190	.8500	1.0000			
COLL	-.5026	.6451	.5852	.5973	.3582	.808	-.5519	-.0319	-.5938	-.4969	-.7615	1.0000		
AMEN	.3835	-.3250	-.2737	-.3532	-.2516	-.4587	.2346	.0066	.2496	.6028	.4465	.0214	1.0000	
PIA	.0177	.2344	.3039	.1073	.0707	.0838	-.2123	.1132	-.1340	.0243	-.0124	-.2068	-.2376	1.0000
CPR	.5335	.2283	.2297	.1149	-.0340	.4057	-.0274	-.3724	.2175	.2045	-.1288	.1538	-.5067	.2050

1.0000

TFR FLR FPRIM FMET FGRAD MAM CMR PURBAN PSCH HSCH COLL AMEN PIA. CPR.

having middle school and the coefficient value is .6127 and is statistically significant at 1 percent level. We have obtained the expected positive correlationship between percentage of irrigated area and the variables which shows the educational level of females including female literacy rate.

(ii) Correlation between dependent and independent variables:

Among all the independent variables, the highest coefficient of correlation has been found for the variable females educated upto matriculation with Total fertility rate. Here the variable female educated upto matriculation is negatively correlated with Total fertility rate. The value of correlation coefficient is -0.6674. It is statistically significant at 1 percent level. It means that females educated upto matriculation will be having low number of children. This result supports our hypothesis. The variable females educated upto graduation is also shows a negative corrlation with Total fertility rate. The value of correlation coefficient is -0.0195 and is statistically significant at 1 percent level. It means that those females who are educated upto graduation have less number of children.

The variable couple protection rate is somewhat highly and negatively correlated with total fertility rate. The value of coefficient is - 0.5335 and is statistically significant at 1 percent level. It means that, as the couple protection rate increases the total fertility rate will decreases. It is as we have expected.

The variables female literacy rate and female educated upto educated upto primary level are as we have expected, negatively correlated with total fertility rate. The correlation values are - 0.5030, and - 0.3743 respectively. It means that as the educational level of females increases then the fertility is also declining.

We find a negative correlation between mean age at marriage and Total fertility rate. The value of correlation coefficient is - 0.5044 and this relationship reflects our hypothesis. The variable child mortality rate is positively related with total fertility rate. The value of correlation coefficient is 0.5092. It means that when fertility increases then the child mortality also increases.

(c) **REGRESSION ANALYSIS**

The results of multiple stepwise regression analysis for the state Karnataka are presented in Table [5.3], [5.4], [5.5] & [5.6] for selection -I, II, III and IV.

From the results of multiple stepwise regression analysis from table [5.3] it has been found that the value of R^{-2} is highest in step 4. The value of R^{-2} is 0.5989. The regression equation from this step is as follows:

$$\underset{}{TFR} = \underset{}{5.1139} \underset{[-4.281]}{- 0.459\ CPR} \underset{[3.186]}{+0.0104\ CMR} \underset{[-2.130]}{-0.0110\ PURBAN} \underset{[1.952]}{+0.0089\ PIA}$$

$$R^{-2} = 0.5989 \qquad F = 7.7192$$

From the above regression equation, we find that 59.8 percent of the variation in the total fertility rate has been explained by the independent variable. The overall goodness of fit indicated by F-value is statistically significant at 1 percent level.

From the t-values in the brackets we find that the variable couple protection rate is statistically significant at 1 percent level. The regression coefficient is - 0.0459, which means that if we increase couple protection rate by 1 unit, then the T.F.R decreases by .04 units holding all other variables constant. The variable child mortality rate is statistically significant at 1 percent level and this variable is in the expected direction. It explains that if we decrease the child mortality by one unit point, then the total fertility rate is also decreases by .01 points.

In this equation we find that the variable percentage of urban population is statistically significant at 5 percent level. It explains that if we increase the percentage of urban population by one percent, then the total fertility rate is decreases by 0.01 units.

The variable percentage of irrigated area is statistically significant at 10 percent level. But this is not in the expected direction. It explains that if one increase the percentage irrigated area' by one unit then the 'TFR' is also increases by units.

TABLE NO : (5-3)

MULTIPLE REGRESSION ANALYSIS. KARNATAKA

DEPENDENT VARIABLE T.F.R.

SELECTION-I

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STADARD ERROR	T-VALUE	R^2	F-VALUE
CPR	5.72368	-.03427	.01318	-2.601	.24259	6.76521
CPR	4.62946	-.03340	0.01102	-3.031	0.47065	9.00211
CMR		0.01050	0.003637	2.885		
CPR	5.19585	-0.04063	0.1132	-3.591	0.52377	7.59893
CMR		+0.009326	0.00352	2.649		
PURBAN		-0.0093141	0.005581	-0.669		
CPR	5.11395	-.04597	.01074	-4.281	.59890	7.71925
CMR		.01046	.003282	3.186		
PURBAN		-.01108	.005201	-2.130		
GIA		.00892	.0045	1.952		
CPR	3.91555	-.05157	.01286	-4.011	.58907	6.16059
CMR		.01295	.004515	2.869		
PURBAN		-.01176	.005330	-2.206		
GIA		.009781	.004745	2.061		
MAM		.06554	.08037	.815		
CPR	4.11076	-.05157	.01337	-3.856	.55540	4.74770
CMR		.01324	.005216	2.538		
PURBAN		-.01224	.006763.	-1.810		
GIA		.009602	.005139	1.868		
MAM		.04982	.15092	.330		
FLR		.002163	.01729	.125		
CPR	4.1423	-.05168	.01516	-3.408	.51500	3.73053
CMR		.01325	.005513	-2.404		
PURBAN		-.01229	.007407	-1.659		
GIA		.00957	.005503	1.741		
MAM		.04858	.17034	.285		
FLR		-.0002280	.01906	.120		
AMEN		-.0001246	.006510	-.019		

SELECTION-II

From the results of regression analysis in selection II Table No.2 it has been found that the value of R^{-2} is highest in step 5, the value of R^{-2} is 0.6143. The regression equation from this step is as follows.

$$TFR = 4.6393 - \underset{[-4.533]}{0.0505}\ CPR + \underset{[3.179]}{0.0144}\ CMR - \underset{[-2.394]}{0.0125}\ PURBAN + \underset{[1.777]}{0.0080}\ PIA + \underset{[1.249]}{0.0249}\ FPRIM$$

$R^{-2} = 0.6143$ $\qquad$ $F = 6.7348$

The above regression equation shows that 61.4 percent of variation in total fertility rate has been explained by the independent variables. The overall goodness of fit indicated by F-value as 6.7348 and is statistically significant at 1 percent level.

From the t-values in the brackets we find that variable couple protection rate is statistically significant at 1 percent level explaining that if we increase couple protection rate by one unit, then the total fertility rate is decreases by 0.05 units.

The variable child mortality rate is also statistically significant at 1 percent level. Explaining that, if 1 unit increase/decrease in child mortality then we can expect an increase/decrease of 0.014 in total fertility rate. We find that the variable percentage of urban population is statistically significant at 5 percent level and it is in the expected

direction. This variable explains that if we increase the percentage of urban population by one percentage point, then the T.F.R decreases by 0.012 points.

The variable percentage of irrigated area is statistically significant at 10 percent level. The positive influence of percentage of irrigated area on T.F.R is quite opposite to our hypothesis and we are not sure why the regression coefficient for percentage of irrigated area is positive. We have the some unexpected result in the case of female educated upto primary level but it is only statistically significant at 25 percent level.

Table (5-4)

MULTIPLE REGRESSION ANALYSIS. KARNATAKA

DEPENDENT VARIABLE T.F.R.

SELECTION-II

	VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STADARD ERROR	T-VALUE	R^{-2}	F-VALUE
I	CPR	5.72368	-.03427	.01318	-2.601	.24259	6.76521
II	CPR	4.62846	-.03340	.01102	-3.031	.47065	9.00211
	CMR		.01050	.00363	2.585		
III	CPR	5.19585	-.04063	.01132	-3.591	.52377	7.5989
	CMR		.00932	.00352	2.649		
	PURBAN		-.00931	.00558	-1.669		
IV	CPR	5.11395	-.04597	.01074	-4.281	.59890	7.71925
	CMR		.01046	.00328	3.186		
	PURBAN		-.01108	.00520	-2.130		
	PIA		.00892	.00457	1.952		
V	CPR	4.6393	-.05058	.01116	-4.533	.61435	6.7348
	CMR		.01449	.00455	3.179		
	PURBAN		-.01252	.005229	-2.394		
	PIA		.00805	.00453	1.777		
	FPRIM		.02790	.02234	1.249		
VI	CPR	5.37042	-.04822	.01336	-3.609	.58645	
	CMR		.01432	.00474	3.016		
	PURBAN		-.01262	.00542	-2.328		
	PIA		.00700	.00557	1.257		
	FPRIM		.04021	.04197	0.958		
	MAM		-.05143	.14629	-0.352		

Selection III

From the 3rd regression analysis it has been found that the value of R^{-2} is highest in step 6. The value of R^{-2} is 0.7339. The regression equation from this step is as follows.

$$\begin{array}{l} TFR = 1.5515 - 0.2651\ FMET - 0.0395\ CPR + 0.2492\ MAM \\ \qquad\qquad\quad [-2.843] \qquad [-3.537] \qquad [2.726] \end{array}$$

$$\begin{array}{l} + 0.0094\ PURBAN + 0.0064\ GIA + 0.0047\ CMR \\ \quad [1.101] \qquad\quad [1.608] \qquad [1.017] \end{array}$$

$R^{-2} = 0.7339$ $\qquad\qquad$ $F = 9.2768$

We find that from the above regression equation, 73.3 percent of variation in T.F.R has been explained by the independent variables. The overall goodness of fit indicated by F-value as 9.2768 is statistically at 1 percent level.

The t-value shows that the variable female educated upto matriculation level is statistically significant at 1 percent level, explaining that if the increase female educated upto matriculation by one unit, then the TFR is decreases by 0.26 units.

The variable couple protection rate is again statistically significant of 1 percent level. It explains that if we increase CPR by one percent point, the T.F.R is decreases by 0.03 points.

We have percentage of urban population is positively influencing the TFR. This result is totally unexpected. However

it is only statistically significant at 30 percent level. Here we are not sure why the regression coefficient for percent urban population is positve. Here not only the above mentioned variable but mean age at marriage is also having a positive influence on T.F.R and it is statistically significant at 1 percent level. This is totally against our hypothesis.

The variable percentage of irrigated area is also positively influencing total fertility rate and it is statistically significant at 10 percent level. It explains that if we increase gross irrigated area by 1 unit the TFR is also increases by .006 units. But child mortality rate is only statistically significant at 30 percent level.

Table (5-5)

MULTIPLE REGRESSION ANALYSIS. KARANATAKA

DEPENDENT VARIABLE T.F.R.

SELECTION-III

	VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STADARD ERROR	T-VALUE	R^{-2}	F-VALUE
I	FMET	5.10936	-.15147	.4099	-3.695	.41282	13.6550
II	FMET	5.9774	-.13939	.03345	-4.167	.61406	15.3199
	CPR		-.0294	.00946	-3.141		
III	FMET	4.13043	-.19965	.04888	-4.085	.65000	12.14270
	CPR		-.03769	.01026	-3.674		
	MAM		.13271	.08164	1.626		
IV	FMET	1.73635	-.33110	.07471	-4.432	.71943	12.5388
	CPR		-.03068	.00973	-3.152		
	MAM		.25970	.09362	2.774		
	PURBAN		.01595	.00734	2.171		
V	FMET	1.84579	-.32423	.07304	-4.439	.7332	10.8960
	CPR		-.03414	.00985	-3.466		
	MAM		0.2553	.09134	2.796		
	PURBAN		0.01419	.00728	1.947		
	PIA		0.00483	.00368	1.314		
VI	FMET	1.55153	-.26511	.09326	-2.843	.73397	9.2768
	CPR		-.03954	.01118	-3.537		
	MAM		0.24923	.09142	2.726		
	PURBAN		0.00949	.00861	1.101		
	PIA		0.00642	.00399	1.608		
	CMR		0.00472	.00464	1.017		
VII	FMET	1.55661	-0.26461	0.09847	-2.687	0.7098	7.2899
	CPR		-0.03972	0.01289	-3.083		
	MAM		-0.24971	0.09652	2.587		
	PURBAN		0.00938	0.009501	0.988		
	PIA		0.00643	0.00417	1.540		
	CMR		0.00469	0.00494	0.950		
	HSCH		-0.000712	0.02064	-0.035		

Selection IV

We have the results of multiple stepwise regression of selection IV in Table [5.6] of has been found that the value of R^{-2} is highest in step 5. The value of R^{-2} is 0.7816. The regression equation from this step is as follows:

$$TFR = 3.5353 - \underset{[-4.5031]}{0.9980}\ FGRAD + \underset{[2.580]}{0.0223}\ PURBAN - \underset{[-2.833]}{0.2670}\ CPR + \underset{[1.817]}{0.1132}\ MAM - \underset{[-1.014]}{0.3598}\ COLL$$

$R^{-2} = 0.7816$ $\qquad$ $F = 13.8877$

The above regression equation shows that 78.16 percent of the variation in the total fertility rate has been explained by the independent variables. The overall goodness of fit indicated by F-value is statistically significant at 1 percent level.

The t-values in the brackets shows that, the variable percentage of females educated upto graduation is statistically significant at 1 percent level. The regression coefficient is -0.9980, which means that, if we increase percentage of females educated upto graduation by one unit, then the T.F.R decreases by 0.9980 units holdling all other variables constant.

The variable percentage of urban population is here positively influencing total fertility rate. This positive influence is quiet opposite to our hypothesis and we are not sure why the regression coefficient for this variable is positive. However it is statistically significant at 2 percent level.

In the same equation, the variable couple protection rate is statistically significant at 1 percent level. As we have expected it is negatively influencing total fertility rate. This explains that, if we increase couple protection rate by one percent point the TFR decreases by 0.026 units.

The variables mean age at marriage and percentage of villages having colleges are influencing total fertility rate in a unusual way in the sense that the former variable influences T.F.R positively and the later influences T.F.R negatively. These variables are statistically significant at 10 and 20 percent levels respectively.

Table (5-6)

MULTIPLE REGRESSION ANALYSIS.KARANATAKA

DEPENDENT VARIABLE T.F.R.

SELECTION-IV

	VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STADARD ERROR	T-VALUE	R^{-2}	F-VALUE
I	FGRAD	4.9198	-.48034	.1476	-3.254	.34752	10.58704
II	FGRAD	4.46807	-1.08835	.1666	-6.532	.69915	21.91554
	PURBAN		0.03064	.00670	4.568		
III	FGRAD	5.2413	-.9065	.16791	-5.399	.76249	20.2625
	PURBAN		.0210	.00727	2.892		
	CPR		-.02069	.00901	-2.295		
IV	FGRAD	3.8950	-1.09075	.20205	-5.398	.78122	17.0690
	PURBAN		.02624	.00778	3.371		
	CPR		-.02334	.00882	-2.643		
	MAM		.08169	.05405	1.511		
V	FGRAD	3.5353	-.9980	.22161	-4.5031	.78166	13.8877
	PURBAN		.02236	.00866	2.5802		
	CPR		-.02670	.00942	-2.833		
	MAM		.11327	.06234	1.817		
	COLL		-.3598	.35499	-1.01430		
VI	FGRAD	3.6508	-.98891	.22918	-4.315	.76804	10.93329
	%URB		.02171	.00903	2.404		
	CPR		-.0277	.00993	-2.790		
	MAM		.10676	.06563	1.627		
	COLL		-.3124	.37866	-.825		
	PIA		.001761	.00361	.487		
VII	FGRAD	3.46151	-.92368	.32577	-2.835	.74892	8.6702
	PURBAN		.01950	.01205	1.618		
	CPR		-.02994	.01282	-2.335		
	MAM		.11351	.07204	1.576		
	COLL		-.30618	.39452	-.776		
	GIA		.002428	.00439	.552		
	CMR		.001487	.00506	.294		

MULTICOLLINEARITY.

In Karnataka selection I doesnot have the problem of multicollinearity. But in selection II the variables percentage of females educated upto primary level and child mortality rates are highly correlated. The value of this correlation is -0.7180. So we removed the variable child mortality rate and a regression analysis for the rest of the variables was performed. Therefore the result of the modified regression results are given in the table 5-7.

It has been found that the value of R^{-2} is highest in the Step 4. The value of R^{-2} is 0.3634. The regression equation from this step is as follows.

$$TFR = 6.3461 - 0.0434\ CPR - 0.0117\ PURBAN + 0.0078\ PIA - 0.0223\ FPRIM.$$
$$[-3.095] \quad [-1.755] \quad [1.345] \quad [-1.104]$$

$R^{-2} = 0.3634$ $\qquad$ $F = 3.5695$

From the above regression equation, we find that 36.34 percent of the variation in total fertility rate has been explained by the independent variables. The overall goodness of fit indicated by the F-value is statistically significant at 3 percent level.

From the t-value in the brackets we find that the variable couple protection rate is statistically significant at 1 percent level. The regression coefficient is -0.0434 explaining that

if we increase couple protection rate by 1 unit then the T.F.R. decreases by .04 units holding all the other variables constant.

The remaining variables, percentage of urban population, percentage of irrigated area and females educated upto primary level are statistically significant only at 10, 20 and 28 percent levels respectively.

TABLE NO. 5-7

MULTIPLE REGRESSION ANALYSIS. KARNAKATA
DEPENDENT VARIABLE T.F.R.
SELECTION-II

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUE	R^{-2}	F-VALUE
CPR	5.7236	-0.0342	0.0131	-2.601	0.2425	6.7652
CPR	6.3086	-0.0436	0.0132	-3.306	0.3446	5.7334
PURBAN		-0.0122	0.0064	-1.910		
CPR	6.3466	-0.0477	0.0136	-3.507	0.3541	4.2899
PURBAN		-0.0137	0.0065	-2.113		
PIA		0.0068	0.0057	1.111		
CPR	6.3461	-0.0434	0.0140	-3.095	0.3634	3.5695
PURBAN		-0.0117	0.0067	-1.755		
PIA		0.0078	0.0058	1.345		
FPRIM		-0.0223	0.0202	-1.104		

SELECTION-III

In selection III, the variable mean age at marriage is highly correlated with females educated upto matricultion. The value of correlation coefficient is .7352. In order to avide the problem of multicollinearity we removed the variable mean age at marriage. The modified regression results are given in table (5-8) .

It has been found that the value of R^{-2} is highest in the step 3. The value of R^{-2} is 0.6285. The regression equation from this step is as follows.

$$TFR = 5.9549 - 0.1430\ FMET - 0.0320\ CPR + 0.5416\ PIA$$
$$(-4.341) \qquad (-3.388) \qquad (1.274)$$

$R^{-2}=0.6285$ F= 11.1525

From the above regression equation, we find that 62.8 percent of variation in total fertility rate has been explained by the indepencdept variables. The overall goodness of fit indicated by the F-value is statistically significant at 1 percent level.

From the t-values in the brackets we find that the variable females educated upto matriculation level is statistically significant at 1 percent level. The regression coefficient is -0.1430 which means that if we increase this independent variable by 1 unit then the total fertility rate decreases by 0.14 units holding all the other variables constant.

In the same equation, the variable couple protection rate is as we have expected negatively influencing T.F.R., and it is statistically signiticant at 1 percent level. The regression coefficient is 0.0320 explaining that a increase in couple protection rate by 1 unit causes a decline in TFR by .03 units. We have noticed in the equation, that the percentage of irrigated area is statistically significant only at 22 percent.

TABLE NO. 5-8

MULTIPLE REGRESSION ANALYSIS. KARNAKATA
DEPENDENT VARIABLE T.F.R.
SELECTION-III

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUE	R^{-2}	F-VALUE
FMET	5.1093	-0.1514	0.0409	-3.695	.4128	13.6550
FMET	5.9774	-0.1393	0.0334	-4.167	.6140	15.3199
CPR		-0.0297	0.0094	-3.141		
FMET	5.9549	-0.1430	0.0329	-4.341	.6285	11.1525
CPR		-0.0320	0.0094	-3.388		
PIA		0.5416	0.0042	1.274		
FMET	5.4622	-0.1123	0.0463	-2.424	0.6258	8.528
CPR		-0.0331	0.0095	-3.463		
PIA		0.0062	0.0043	1.441		
CMR		0.0041	0.0043	0.945		
FMET	5.4343	-0.0854	0.0806	-1.059	0.6023	6.453
CPR		-0.0374	0.0136	-2.719		
PIA		0.0070	0.0048	1.450		
CMR		0.0055	0.0056	0.981		
PURBAN		-0.0036	0.0087	-0.414		

SELECTION-IV

In selection IV the variable females educated upto graduation and percentage of urban population are highly correlated (.7988). We also noticed the high correlation between mean age at marriage and percentage of villages having college (.6806). Therefore we removed percentage of urban population and perecentage of villages having colleges. The modified regression result is shown in table no. (5-9) indicates that the value of R^{-2} is highest in step 2. The value of R^{-2} is 0.6532. The

regression equation from this step is as follows.

$$TFR = 6.0088 - 0.4950\ FGRAD - 0.0356\ CPR$$
$$[-4.597] \qquad [-3.998]$$

$R^{-2} = 0.6532$ $\qquad$ $F = 17.9518.$

From the above regression equation we find that 65.3 percent of the variation in total fertility rate has been explained by the independent variables. The overall goodness of fit indicated by the F-value is statistically significant at 1 percent level.

The t-value in the brackets shows that the variable females educated upto graduation is statistically significant at one percent level the regression coefficient is -0.4950, which means that if we increase female educate upto graduation by 1 unit then TFR decreases by .49 units holding all the other variables constant.

In the same equation we find that the variable couple protection rate, as we expected negatively influences T.F.R. and it is statisically significant at 1 percent level the regression coefficient is -0.0356 explaining that if we increase CPR by 1 unit than the total fertility rate decreases by .03 units.

TABLE NO. 5-9
MULTIPLE REGRESSION ANALYSIS. KARNAKATA
DEPENDENT VARIABLE T.F.R.
SELECTION-IV

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUE	R^{-2}	F-VALUE
FGRAD	4.9198	-0.4803	0.1476	-3.254	0.3475	10.5870
FGRAD	6.0088	-0.4950	0.1076	-4.597	0.6532	17.5918
CPR		-0.0356	0.0089	-3.998		
FGRAD	5.9910	-0.4962	0.1282	-3.871	0.6300	11.2203
CPR		-0.0357	0.0104	-3.428		
MAM		0.0012	0.0630	0.020		
CPR	6.3461	-0.0434	0.0140	-3.095	0.3634	3.5695
PURBAN		-0.0117	0.0067	-1.755		
PIA		0.0078	0.0058	1.345		
FPRIM		-0.0223	0.0202	-1.104		

CHAPTER IV

PUNJAB

Mean and coefficient of variation of the variables in Punjab

Table [6.1]

Vatiables	Mean	Coefficient of variation
Dependent variable		
1. T.F.R.	3.25	11.36
Explanatory variables.		
1. FLR	33.33	24.42
2. FPRIM	11.65	33.94
3. FMET	4.15	29.43
4. FGRAD	1.38	39.75
5. MAM	18.81	1.39
6. CMR	95.00	8.42
7. PURBAN	26.65	28.25
8. PSCH	49.00	52.16
9. MSCH	6.69	57.71
10.HSCH	4.66	59.74
11.COLL	0.13	150.26
12.AMEN	57.85	52.92
13.PIA	81.96	23.10
14.CPR	41.43	24.57

The table [6-1] shows that, the dependent variable T.F.R., has a variation of 11.36 percent. The appendix shows that this variation ranges from 2.5 children per women to 3.8 children per women in Ludhiana and Firozpur districts of Punjab in 1981.

Among the explanatory variables, the variable percentage of villages having colleges shows a high coefficient of variation which in 150.26. This variable ranges from 0 to 0.72. The districts Kapurthala, Rupnagar and Faridkot has no colleges at all. The 0.72 value is found in Ludhiana districts.

The variable percentage of villages having high-school has a high coefficient of variation which is 59.74 per cent ranging from 0 to 8.36 in Rupnagar. Faridkot, and Ludhiana district. The variable percentage of villages having middle school has a coefficient of variation 57.71. This variable has the third highest coefficient of variation among the independent variables ranging from 0 to 12.27. A value of 0 is found in Rupnagar and Faridkot districts and 12.27 in Sangrur districts of Punjab.

We find the 4th highest coefficient of variation in percentage of villages having an educational amenities which is 52.16 per cent ranging from 0 to 93.86 per cent in Rupnagar, Faridkot and in Bhatinda districts. In general we have noticed high coefficient of variation in variables which represents educational institutions.

We have the lowest coefficient of variation in variable mean age at marriage which is 1.39 percent ranging from 18.4 to 19.1. The districts Rupnagar and Patiala has a mean age at marriage of 18.4 years and Amritsar, Faridkot has a mean age at marriage of 19.1 years. The variable child mortality rate has a low coefficient of variation which is 8.92 ranging from 80 to 108 in Rupnagar, Kapurthala, Sangrun districts. This rest of the variables have a moderate variation.

CORRELATION ANALYSIS

[i]. Correlation within the independent variables.

Among all the independent variables, the highest coefficient of correlation has been found between percentage of villages having an educational amenities and percentage of villages having primary schools. The value of correlation coefficient is 0.9960 and it is statistically significant at 1 percent level. Similarly the correlation coefficient between percentage of villages having an educational amenities and percentage of villages having middle school is 0.9582.

Here again the correlation coefficient between of village has on educational ammenities percentage of villages has highschool is 8700, and these relationships are statistically significant at 1 percent level. The variable percentage of villages having High School is positively correlated with percentage of villages having primary school The value of correlation coefficient is 0.8525. It is statistically significant at 1 per cent level. Similarly the variable percentage of villages having middle School is positively correlated with percentage of villages having high school and it is statistically significant at 1 per cent level. In the same manner the variable percentage of villages having middle school is positively correlated with percentage of villages having primary school. The correlation coefficient is 0.9322 and is statistically significant at 1 per cent level.

The variable females educated upto matriculation is as we have expected and is positively and highly correlated with female literacy rate and also with female educated upto primary level. The correlation coefficient value is 0.8161 and 0.6770 respectively. Both these relationships are statistically significant at 1 per cent level. But as we have noticed the correlation results are not surprising because the variable female literates includes female educated upto matriculation and the variable females educated upto matriculation level includes females educated upto primary level. This same is the case with the correlation between female literary and female educated upto primary level and it is statistically significant at 1 per cent level.

Here the variable percentage irrigated area is highly positively correlated with percentage of urban population the value of correlation coefficient is 0.6516. It means that in a district where the percentage of irrigated area in high than the percentage of urban population will be also high in that particular district.

The variable percentage of urban population is positively associated with females educated upto matriculation level. The value of coefficient is 0.6482. Here the positive sign denotes that if in a particular district the percentage of urban population is high then the variable female educated upto matriculation' will also be high. This relationship reflects our hypothesis.

The rest of the relationship between independent variables in general, as me have observed from the correlation matrix, by and large falls in line in the expected direction.

[ii]. Correlation between dependent and independent variables:

Among all the independent variables, the highest coefficient of correlation has been found for the variable percentage of female educated upto matriculation level with total fertility rate. In this relationship the variable female educated upto matriculation as expected has negatively influence or the total fertility as the variable female educated upto matriculation increases the total fertility decreases. The value of correlations is -0.8298 and it is statistically significant at 1 per cent level.

As we have mentioned above, here the variable female educated upto graduation in also negatively correlated with total fertility rate. The negative sign denotes, if female educated upto graduation increases the T.F.R. decreases, the coefficient value is -6631 and it is statistically significant at 1 per cent level.

We have found that the variable female literacy rate is negatively correlated with total fertility rate the value of correlation coefficient is -0.7824 and it is statistically significant at 1 per cent level. This relationship explains that as the female literacy increases the total fertility rate defines. In fact all the variables which denotes the female

TABALE NO :(6-2)
ZERO ORDER CORRELATION MATRIX PUNJAB.

	TFR	FLT	FPRI	FMET	FGRA	MAM	CMR	PURBAN	M.SCH	HSCH	COLL	AMEN	PIA	CPR.
TFR	1.0000													
FLR	-.7824	1.0000												
F.PRI	-.4507	.86275	1.0000											
F.MET	-.3231	.6558	.5322	1.0000										
F.GRAD	-.6231	.6558	.3771	.5322	1.0000									
M.A.M.	-.3010	.1326	-.1431	.3413	.1093	1.0000								
C.M.R.	.3099	-.3399	-.2183	-.2431	-.3706	.1863	1.0000							
PURBAN	-.7134	.4368	.1689	.6482.	.2543	.4433	.2028	1.0000						
P.SCH	.1574	-.2200	-.0234	.0789	-.2509	.925	.3145	.3395	1.0000					
M.SCH	.1663	-.3161	-.1093	.0569	-.4072	.1854	.4543	.2651	.9322	1.0000				
HISCH	-.0628	-.0456	.687	.2554	-.1567	.3980	.3334	.3668	.8525	.9034	1.0000			
COLL	-.5297	.3990	.2788	.6091	.4660	.4565	-.3411	.5651	.3569	.3121	.5716	1.0000		
AMEA	-.1754	-.2617	-.0573	.0536	-.2941	.0995	.3628	.3138	.9960	.9582	.8700	.3378	1.0000	
PIA	-.0896	-.2366	-.4868	.0261	-.2412	.5443	.2957	.6516	.5054	.5169	.4100	.1422	.5109	1.0000
C.P.R.	0996	.2836	.1724	-.1101	.1952	.0952	.0954	-.4360	.1029	-.1460	-.2909	.0001	.2516	-.1526	-.17776	1.0000

educational level are correlated with total fertility rate in the expected direction, only the intensity of the relationship varies according to the level of education.

The variable mean age at marriage in negatively correlated with total fertility rate the value of correlation coefficient is -0.3010. It explains that as the mean age at marriage increases the fertility decreases. We have found the positive correlation between child mortality rate and total fertility rate. The value of correlation coefficient 0.3.99. The positive sign explains that if child mortality in high then the fertility will also be high.

The variable percentage of urban population is highly negatively correlated with total fertility rate. The correlation coefficient value is -0.7134. The negative sign explain that if the percentage of urban population is high in a particular districts then the fertility rate will be low in that district. This relationship is statistically significant at 1 per cent level.

The variable percentage or villages having primary schools and percentage of villages having middle school are contrast to our expectation i.e. positively correlated with total fertility rate. The coefficient values are 0.1574 and 0.1663 respectively. We are not sure why these two variables positively influence the fertility rate. The variables percentage of villages having highschools and percentage villages having college are as expected negatively influencing total fertility rate. The

variable percentage of villages having an educational ammenities in positively correlated with total fertility rate. The value of coefficient is 0.1754. Here also we do not know why this relationship is positive.

As we have expected, we have the negative relationship between, percentage of irrigated area and total fertility. The negative sign denotes that if the percentage irrigated area is high in a particular area, then the total fertility rate will be low. Even though we got a weak relationship between these two variables but they are in the right direction. The variable couple protection rate is negatively correlated with total fertility rate and the coefficient value is -0.0996. It explains that if the couple protection rate is high then obviously there will be low total fertility rate.

REGRESSION ANALYSIS

The results of multiple step-wise regression analysis are presented in the following tables. [6-3]

Selections-I

From the regression results from table [6-3] Selection I. It has been found that the value of R^{-2} is highest in step 3. The value of R^{-2} is 0.7560. The regression equation from this step is as follows:-

$$TFR = 4.5639 - 0.0211\ FLR - 0.0287\ PURBAN + 0.0028\ AMEN$$
$$[-2.483] \quad [-3.073] \quad [1.338]$$

$$R^{-2} = 0.7560 \qquad F = 12.3626$$

The above regression equation shows that, 75.6 per cent of the variation in the total fertility rate has been explained by the independent variables. The F-value indicates the overall goodness of sit and it is statistically significant at 1 per cent level.

The t-values in the brackets, shows that the variable 'female literacy rate' is statistically significant at 3 per cent level. The regression coefficient of this variable is -0.0211. It explains that if we increase female literacy rate by one percentage point then the total fertility rate declines by 0.02 units holding all other variable constant.

The variable percentage of urban population is as we expected influencing total fertility rate negatively. The t-value in the bracket shows that it is statistically significant at 1 per cent. The explains that if we increase the variable percentage of urban population by one unit then we can measure a decline of 0.02 unit in total fertility rate. Here we have obtained this influence as we have expected.

In the same selection the variable percentage of villages having an educational amenities positively influences total fertility. The positive influence of this variable on total fertilities is totally unexpected. However the value of regression coefficient is 0.0028 and it is statistically significant only at 20 percent level.

TABLE :(6-3)
Multiple Regression Analysis - Punjab , Selection-I

VARIABLES		INTERCEPTS	REGRESSION COEFFICIENT	STADARD ERROR	T-VALUE	R^{-2}
I	FLR	4.4493	-.03560	0.00895	-3.973	-57340
II	FLR	4.7428	-.02647	0.007856	-3.370	.73461
	PURBAN		-.02259	0.008494	-2.660	
III	FLR	4.5639	-.02115	.008517	-2.4833	.75461
	PURBAN		-.02877	.00936	-3.0731	
	AMEN		0.00287	.00214	1.33820	
VI	FLR	4.3848	-.02270	.0085722	-2.602	.75307
	PURBAN		-.02911	.009425	-3.089	
	AMEN		-.00311	.02174	1.434	
	CPR		.00544	.005726	0.951	
V	FLR	3.95542	-.01388	.01466	-.946	.73732
	PURBAN		-.04256	.02015	-2.112	
	AMEN		0.00303	.00224	1.351	
	CPR		0.00628	.00600	1.047	
	GIA		0.00565	.00742	.762	
VI	FLR	4.54349	-0.00653	0.01840	-0.355	
	PURBAN		-0.05667	0.02878	-1.969	
	AMEN		0.00384	0.00259	1.478	
	CPR		0.00472	0.00663	0.712	
	GIA		0.01050	0.01027	1.022	
	CMR		-0.00879	0.01226	-0.718	
VII	FLR	8.01582	-0.00190	0.02123	-0.090	0.67152
	PURBAN		-0.96126	0.03182	-1.925	
	AMEN		0.00359	0.00281	1.275	
	CPR		0.00569	0.00729	0.780	
	GIA		0.01405	0.01255	1.120	
	CMR		-0.008421	0.01315	-0.640	
	MAM		-0.20499	0.34643	-0.592	

SELECTION-II

From the regression results from table [6-4], it has been found that the value of R^{-2} is highest in step 4. The value of R^{-2} is 0.7796. We have formed regression equation for the 4th step.

$$TFR = 4.8588 - 0.0654\ PURBAN + 0.0133\ PIA + 0.0050\ PSCH - 0.0125\ CMR$$
$$[-5.909] \qquad [2.915] \qquad [2.070] \qquad [-1.489]$$

$R^{-2} = 7796$ $\qquad$ $F = 10.7278$

The above regression equation shows that, 77.9 percent of the variation in the total fertility rate has been explained by the independent variables. In this equation the F-values indicates the overall goodness fit and it is statistically significant at 1 per cent level.

Among the variables in the 4th step, the variable percentage of urban population has a higher regression coefficient and it is statistically significant at 1 per cent level, explaining if we increase percentage of urban population by one unit there will be a decrease in total fertility rate by 0.065 units.

In the same equation the variables percentage of irrigated area percentage of village having primary school and child mortality rate are in the unexpected direction. The variables irrigated area and percentage of villages having primary school are positively influencing total fertility rate. All the variables

which are mentioned above are statistically significant at 2,10 and 20 per cent level we are not sure how PIA & PS are influencing total fertility rate in an opposite direction than expected.

TABLE No.[6-4.])
Multiple regression Analysis , Punjab Selection II

VARIABLES		INTERCEPTS	REGRESSION COEFFICIENT	STADARD ERROR	T-VALUE	R/2
I	PURBAN	4.1936	-0.03510	0.01090	-3.219	0.4584
II	PURBAN	3.7054	-0.05600	0.01073	-5.219	0.6989
	GIA		0.01275	0.00426	2.990	
III	PURBAN	3.7355	-0.05625	0.00985	-5.708	0.7460
	GIA		0.00997	0.00427	2.335	
	PSCH		0.00508	0.00245	2.070	
	CMR		-0.0125	0.00845	-1.489	
IV	PURBAN	4.8588	-0.06549	0.01108	-5.909	0.77961
	GIA		0.01332	0.00456	2.070	
	PSCH		0.00508	0.00245	2.070	
	CMR		-0.0125	0.00845	-1.489	
V	PURBAN	4.8008	-0.07882	0.02012	-3.922	0.76791
	GIA		0.02018	0.09727	2.074	
	PSCH		0.00433	0.00268	1.612	
	CMR		-0.01664	0.01003	-.1659	
	FPRIM		0.0234	0.02916	0.805	
VI	PURBAN	4.43318	-0.07969	0.0211	-.3775	0.744
	GIA		0.02059	0.01022	0.015	
	PSCH		0.00431	0.00281	-1.533	
	CMR		-0.0147	0.01089	-1.353	
	FPRIM		0.02369	0.0305	0.775	
	CDR		0.00418	0.00619	0.676	
VII	PURBAN	8.6136	-0.0794	0.0218	-3.647	0.72799
	GIA		0.0233	0.01105	2.110	
	PSCH		0.00344	0.00309	1.112	
	CMR		-0.029	0.01145	-1.132	
	FPRIM		0.0275	0.3190	0.863	
	CPR		0.00570	0.00664	0.858	
	MAM		0.00570	0.00664	0.831	

From the result of multiple-step-wise regression analysis, from table[6-5] it has been observed that the value of $\bar{R}^2$ is highest in step 4 of selection III. The value of R^{-2} is 0.7118. The regression equation from this step is an follows.

$$TFR = 4.1214 - 0.1315\ FMET - 0.0341\ PURBAN + 0.0238\ HSCH + 0.0058\ PIA$$
$$[-1.431] \quad [-1.718] \quad [0.963] \quad [0.956]$$

$R^{-2} = 0.7118$ $\qquad$ $F = 7.7942$

From the above regression equation, we find that 71.18 per cent of the variation in the total fertility rate has been explaihed by the independent variables. The overall goodness of bit indicated by F-value is statistically significant at 1 per cent level.

From the t-values in the brackets, we find that the variable female educated upto graduation is statistically significant at 2 per cent level. The regression coefficient is -0.1315, which mean that if we increase percentage of females educated upto matriculation by one unit then the total fertility rate will decrease by .13 units.

The variable percentage of urban population is statistically significant at 10 per cent level and this influences total fertility rate negatively. The negative sign indicates that if we increase the variable percentage of urban population by one percent then the total fertility rate declines by .03 points. The independent variables negative influence fertility in the expected direction.

The variables percentage of villages having High School and irrigated area are positively influencing total fertility rate. These variables are statistically significant only at 35 and 40 per cent levels respectively.

TABLE NO. (6-5)

Multiple Regression Analisys , Punjab Selection III

VARIABLES		INTERCEPTS	REGRESSION COEFFICIENT	STADARD ERROR	T-VALUE	R^{-2}
I	FMET	4.3024	-0.2514	0.0548	-4.702	0.6574
II	FMET	4.4524	-0.1919	0.06741	-2.848	0.6843
	PURBAN		-0.0148	0.01094	-1.361	
III	FMET	4.4217	-0.1942	0.0640	-3.031	0.61498
	PURBAN		-0.0190	0.01081	-1.761	
	HSCH		0.0238	0.0247	0.963	
	GIA		0.0058	0.0061	0.956	
IV	FMET	4.12146	-0.1315	0.0919	-1.431	
	PURBAN		-0.0341	0.01915	-1.781	0.71187
	HSCH		0.0238	0.0247	0.963	
	GIA		0.0058	.0061	0.956	
V	FMET	4.7742	-0.1058	0.1014	-1.043	0.69136
	PURBAN		-0.0450	0.0248	-1.814	
	HSCH		0.0300	0.00790	1.114	
	GIA		0.00930	0.01121	1.177	
	CMR		-0.00819	0.9821	-0.731	
VI	FMET	9.41749	-0.0628	0.1203	-0.522	0.6664
	PURBAN		-0.0523	0.0276	-1.895	
	HSCH		0.0328	0.02833	1.159	
	GIA		0.0130	0.9638	1.353	
	CMR		-0.9357	0.0117	-0.796	
	MAM		-0.2570	0.3462	-0.742	
VII	FMET	13.6396	0.07500	0.3042	0.247	0.6076
	PURBAN		-0.0793	0.0615	-1.287	
	HSCH		0.2588	0.0337	0.768	
	GIA		0.0231	0.0227	1.020	
	CMR		-0.0087	0.0128	-0.679	
	MAM		-0.5399	0.6777	-0.797	
	CPR		0.0093	0.0187	0.501	

Selection -IV

From the selection IV regression analysis it has been found that the value of R^{-2} is highest in step 4. The value of R^{-2} is 0.7614. The regression equation from this step is as follows.

$$TFR = 4.8533 - 0.0503\ PURBAN - 0.2287\ FGRAD + 0.0107\ PIA - 0.0086\ CMR$$
$$[-3.872] \qquad [-1.851] \qquad [2.051] \qquad [-1.013]$$

$R^{-2} = 0.7614$ $\qquad\qquad$ $F = 9.777$

We have found that from the above regression equation, 76.14 per cent of the variation in total fertility rate has been explained by the independent variables. The overall goodness of fit indicated by F-value is 9.777 is statistically significant at 1 per cent level.

The t-value in the bracket shows that the variable percentage of urban population is statistically significant at 1 per cent level explaining that if percentage of urban population increase by one unit then the total fertility rate decreases by 0.05 unit. This influence of this explanatory variable on T.F.R. is as we have hypolitized.

The explanatory variable female educated upto graduation negatively influences total fertility rate. This variable is statistically significant at 1 per cent level. explaining that if we increase female educated upto graduation by 1 per cent point then total fertility rate decreases by 0.22 units.

In the same equation are found that the variable percentage of irrigated area is positively influencing total fertility rate and it is statistically significant at 7 per cent level, explaining that if we increase percentage of irrigated area by 1 percent the T.F.R. is also increases by 0.01 points. This influence is not in the expected direction. The variable child mortality rate is statistically significant only at 35 percent level.

TABLE (6-6)

Multiple Regression Analysis , Punjab

Selection IV

VARIABLES		INTERCEPTS	REGRESSION COEFFICIENT	STADARD ERROR	T-VALUE	R/2
I	PURBAN	4.1936	-0.0351	0.01090	-3.219	0.4598
II	PURBAN	4.518	-0.286	.000835	-3 428	0.7029
	FGRAD	-0.34	0.1147	-3.031		
III	PURBAN	4.0821	-0.0442	0.01154	-3.8736	0.7606
	FGRAD		-0.2255	0.1237	-1.822	
	GIA		0.00813	.000456	1.780	
IV	PURBAN	4.8533	-0.0503	0.0130	-3.8721	0.7614
	FGRAD		-0.2287	0.1236	-1.851	
	CMR		0.1017	0.0085	-1.013	
V	PURBAN	4.4990	-0.0511	0.0136	-3.748	0.7396
	FGRAD		-0.2276	0.1291	-1.763	
	GIA		0.01114	0.0055	2.017	
	CMR		-0.0067	.0093	-0.723	
	MAM		0.0402	0.0062	0.643	
VI	PURBAN	8.4727	-0.0509	0.0140	-3.620	0.7226
	FGRAD		-0.1962	0.1390	-1.412	
	GIA		0.0130	0.00615	2.111	
	CMR		-0.0050	0.00991	-0.505	
	CPR		-0.0054	0.00670	0.815	
	MAM		-0.2338	0.2938	-0.796	
VII	PURBAN	10.9149	-0.0572	0.01582	-3.618	0.7142
	FGRAD		-0.2160	0.1427	-1.514	
	GIA		0.0147	0.00651	2.255	
	CMR		-0.0034	0.0102	-0.336	
	CPR		-0.00551	0.0068	-1.108	
	MAM		-0.3717	0.3335	-1.114	
	COLL		0.4242	0.4595	0.923	

MULTICOLLINEARITY.

In Punjab, when we looked at the correlation coefficient we found that there was no sprious problem in selection I, but in selection II, III and IV we suspect multicollinearity among the independent variables.

In selection II, the variables percentage of urban population and percentage of irrigated area are highly correlated. The value of correlation coefficient is 0.6516. So we remove the variable percentage of irrigated area. The results of the modified regression are given in table. (6 - 7)

It has been found that the value of $^{-2}$ is highest in step 2 The value ofR^{-2} is 0.6204. The regression equation from this step is as follows.

$$TFR = 4.0739 - \underset{(-\ 4.389)}{0.0426\ PURBAN} + \underset{(2.287)}{0.0065\ PSCH.}$$

R^{-2} =0.6204 F=9.9903

From the above regression equation we find that 62 percent of the variation in T.F.R has been explained by the independent variables. The overall goodness of fit indicated by the F-value is stastistically significant at 1 percent level.

The t-values in the brackets shows that the variable percentage of urban population is statistically significant at 1 percent level. The regression coeffticient is -0.0426, explaioning that if we increase percentage of urban population

by 1 unit then T.F.R. decreases by .04 units holding all the other variables constant.

In the same equation the variable percentage of villages having primary schools unexpectedly influenicing T.F.R. positively. However it is statistically significant only at 4 percent level. Here we are not surse why this variable positively influencing total fertility rate.

PUNJAB
TABLE (6-7)

MULTIPLE REGRESSION ANALYSIS

SELECTION-II

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUE	R^{-2}	F-VALUE
PURAN	4.1936	-0.351	0.0109	-3.219	.4598	10.3643
PURBAN	4.0739	-0.0426	0.0097	-4.3891	0.6204	9.9903
FSCH		0.0065	0.0028	2.2874		
PURBAN	4.1199	-0.0428	0.0101	-3.897	0.5731	5.9224
PSCH		0.0060	0.0033	1.980		
CMR		-0.0046	0.0102	-0.046		

In selection III, the variables females educated upto matriculation level and percent urban population is highly correlated (.6482), so we removed the variable percent urban population and a regression analysis for the rest of the variables was performed. The result of the modified

regression are given in table (6-8)

It has been found that the value of R^{-2} is highest in the step 1. The value of R^{-2} is 0.6574. The regression equation from this step is as follows.

TFR = 4.3024 - 0.2514 FMET.
(- 4.702)

R^{-2}=0.6574 F= 22.1093.

The above regression equation shows that 65.7 percent of the variation in total fertility rate has been explained by the independent variable. The overall goodness of fit indicated by the F-value is statistically significant at 1 percent level.

From the t-value in the brackets we find that the variable females educated upto matriculation levlel is statistically significant at 1 percent level. The regression coefficient is -0.2514. Which means that if we increse females educated upto matriculation by 1 unit then the fertility will decreases by .25 units holding all the other variables constant.

PUNJAB = III

TABLE (6-8)

MULTIPLE REGRESSION ANALYSIS

SELECTION-III

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUE	R^{-2}	F-VALUE
FMET.	4.3024	-0.2514	0.0534	-4.7021	0.6574	22.1093
FMEP	4.2548	-0.2637	0.0560	-4.708	0.6484	11.1437
HSCH		0.0212	0.245	0.863		
FMET	4.4857	-0.2678	0.0574	-4.664	0.6336	7.3407
HSCH		0.0304	0.0276	1.101		
PIA		-0.0031	0.0039	-0.798		

selection-IV:

In selection IV the variables percentage of irrigated area is highly correlated with percentage of urban population (0.6516). So we removed the variable percentage of irrigated area. Therefore the modified regression results are given in the table (6-9)

It has been found that the value of R^{-2} is highest in step 2. The value of R^{-2} is 0.7029. The regression equation from this step is as follows.

$$TFR = 4.5018 - \underset{(-3.428)}{0.0286}\ PURBAN - \underset{(-3.031)}{0.3477}\ FGRAD.$$

$R^{-2} = 0.7029$ $\qquad$ $F = 14.0173.$

From the above regression equation we find that 70.2

percent of the variation in total fertility rate has been explained by the independent variables. The overall goodness of fit indicated by the F-value is statistically significant at 1 percent level.

The t-value in the brackets shows that the variable percent urban population is statistically significant at 1 percent lelvel. The value of regression coefficient is 0.0286 explaining that if we incerease the dependent variable by 1 unit. Then the T.F.R. decreases by .02 units holding all the other variables constant.

In the same equation the variable females educated upto graduation is statistically significant at 1 percent level and it is in the expected direction. The value of regression coefficient is 0.3474 explaining that if we increase females educated upto graduation by 1 unit then the total fertility rate decreases by 0.34 units. This influence is in agrement with our hypothesis.

PUNJAB
TABLE (6-9)

MULTIPLE REGRESSION ANALYSIS

SELECTION-IV

VARIABLES	INTERCEPTS	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUE	R^{-2}	F-VALUE
PUBAN	4.1936	-0.0351	0.0109	-3.219	0.4598	10.3643
PURBAN	4.5018	-0.0286	0.0083	-3.428	0.7029	14.0173
FGRAD		-0.3477	0.1147	-3.031		

4. Rajasthan.

The following table shows the coefficient of variation for the state of Rajasthan. The district-wise estimates of variables are given in appendix table.

TABLE (7.1)

COEFFICIENT OF VARIATIONS OF VARIABLES IN RAJASTHAN. 1981.

Variables	Mean	Coefficient of variation
Dependent variable		
1. T.F.R.	6.04	6.63
Explanatory variables.		
1. FLR.	10.49	41.21
2. FPRIM.	3.21	36.80
3. FMET.	0.64	66.83
4. FGRAD.	0.35	97.14
5. MAM.	15.68	5.90
6. CMR.	114.57	23.01
7. PURBAN.	19.30	53.22
8. PSCH.	51.78	23.63
9. MSCH.	5.31	40.18
10. HSCH.	1.61	67.02
11. COLL.	0.05	151.11
12. AMEN.	54.97	23.95
13. PIA.	20.28	65.78
14. CPR.	17.07	24.52

The table [7-1] shows that the dependent variable, Total fertility rate has a low coefficient of variation of 6.63 percent. The appendix shows that this variation ranges from 5.3 to 7 children per women in Bhillwara and Bharat pur districts of Rajasthan.

Among the explanatory variables, the variables percentage of villages having college shows a high coefficient of variation which is 151.11. This variables ranges from 0 to 0.29. We have noticed 0 in more than half of the district of Rajasthan & the volue 0.29 in Jhunjhunu district. The variable percentage of females educated upto graduation is alos having a high coefficient of variation which is 97.14 percent ranging from 0.04 to 1.24 percent in Barmer and Jaipur districts. The percentage of vilages having highschool is also having a some what high coefficient of variation whihc is 67.02 percent ranging from 0.46 to 5.48 in Jaisalmer and Jhunjhunun districts respectively.

The variable percentage of female educated upto matriculation in having a coefficient of variation 66.83 percent and it is ranging from 0.15 to 1.75 percent in Barmer and Ajmer districts of Rajasthan. In Rajsathan, the agricultural indicator gross irrigated area is also having a high coefficient of variation of 65.78 percent. This variation ranging from 0.05 to 44.85 percent in Jaisalmer and Jaipur districts respectively.

Among the explanatory variables we have found, that mean age at marriage is having a low coefficient of variation which is 5.90 perccent and it is rangies from 14 to 17.30 years in Tonk and Jalor districts.

The variable child mertality rate has a some what low coefficient of vatriation which is 23.01 and it is ranging from 74 in Bikaner district to 203 in Tonk districts. Here the rest of the independent variables are having a moderate variations.

CORRELATION ANALYSIS

We have presented the Zero-order correlation coefficient matric for the state of Rajasthan in table [7.2].

[1]. correlation within the independent variables.

The correlation within the independent varibles an observed form the correlation matric, by and large falls in line in the expected direction. Here let us discuss only the highly correlated independent variables.

In Rajasthan among all the independent variables, the highest coefficient of variation has been found between the percentage of villages having an educational aminities and percentage of villages, having primary schools. The coefficient value is .9958. It is staitiscally significiant at 1 percent level. The result is not serprising that percentage of villages having educational amenities includes percentage of villages having primary schools.

As mentioned above the same variable percentage of villages having an educational amenities is highly correlated

with percentage of villages having middle school, and percentage of villages having colleges. The value of correlation coefficient is 0.8234, 0.6424 and 0.5084 respectively and there for statistically, significant at 1 percent level.

The having percentage of villages having college in highly correlated with percentage of vilages having middle school, and percentage of village having high school. The correlation values are 0.4784, 0.6936 and 0.8132 and these values are statisticaly significant at 1 percent level. The positive sign indicates that higher the percentage of villages having colleges, higher will be the precentage of villages having primary schools, middle schools and high schools in that particular area. In the same way the variable percentage of village having high schools is positively correlated with percentage of villages having primary and middle schools. The value of correlation coefficient is 0.5986 and 0.8580 and they are statistically significant at 1 percent level.

The variable couple protection rate is positively correlated with female literacy rate, female and educated upto primary level, female educated upto metriculation level. The correlation coefficient values are 0.6161, 0.6655 and 0.5290 and thus values are statistically significant at 1 percent level. The positive sign shows that if there is a high level of female litery rate, female educated upto primary, and metriculation level and the couple protrction rate will also be high in those areas.

As we have expected the variables percentage of upto population is highly positively correlated with female litery rate, female educated upto matriculation and females educated upto graduation, the coefficient values are 0.8757, 0.8155, 0.8855 and 0.8327. All these values are statistically significant at 1 percent level. The positive sign represents that if in a particulare district the percentage of urban population is high it means in that area the variables that represents educational level will also be high.

The variable femalels educated upto graduation is highly and positively correlation with female literacy rate, females educated upto metriculation level: the coefficient values are 0.8933, and 0.9495 and thus values are statistically significiant at 1 percent level. There results one not rueprising that females educate upto graduation included in female litery rate, females educated upto primary and graduation level.

II. Correlation between dependent and indepedent variables: Rajsathan.

Here the correlation for most of the independent variables are in the expected direction the variable female literacy rate in negatively correlated with total fertility rate the negative sign represents that if female literacy is high in a particular area then the total fertility rate will be also high in that area. In the same way the dependent variable total fertility rate is correlated with females educated upto metriculation and females educated upto graduation. Here the variables and not statistically significant at 1 percent level.

TABLE NO : [7-2]
ZERO OREDER CORRELATIONMATRIX
RAJASTHAN

	TFR	FLR	FPRI	FMET	FGRA	MAM	CMR	PURBAN	M.SCH	HSCH	COLL	AMEN	PIA	CPR
TFR	1.0000													
FLR	-.1653	1.0000												
F.PRIM	-.1912	.9737	1.0000											
F.MET	-.1829	.9535	.8967	1.0000										
F.GRAD	-.1217	.8933	.80211	.94952	1.0000									
M.A.M.	.0735	-.2039	-.1780	-.0191	-.1745	1.0000								
C.M.R.	.2063	-.1521	-.1622	-.1952	-.0578	-.3452	1.0000							
PURBAN	-.1141	.8557	.8155	.8855.	.8327	-.2393	-.3276	1.0000						
P.SCH	-.2308	-.0612	-.02029	-.0545	-.0839	.2759	-.2764	.1839	1.0000					
M.SCH	-.0110	.20861	.27343	.1387	.09782	.0851	.3082	.3151	.7798	1.0000				
HISCH	.0099	.21806	.2938	.0882	.12167	-.1190	-.1695	.2417	.5986	.8580	1.0000			
COLL	-.0841	.3591	.3714	.3037	.3854	.3411	-.1117	.4120	.4784	.6963	.8132	1.0000		
AMEN	-.2082	-.0474	-.0003	-.0546	-.9012	.2704	-.2985	.1885	.99580	.82342	.64246	.50842	1.0000	
PIA	-.0263	.3279	.3351	.3045	-.3225	-.2238	.5236	.1062	-.2230	-.0452	-.0296	-.0032	-.2252	1.0000
C.P.R.	-.1059	.6161	.6655	.520	.3923	-.0638	-.1636	.4047	-.1095	.2649	.2337	.2389	-.0715	.3117 10000

The variable mean age at marriage is positively related with total fertility rate which we unexpected the positive sign denoted that higher the mean age at marriage the higher will be total fertility rate.

The variable child mortality rate is positively associated with total fertility rate. The positive sign shows that high the child mortality then higher will be the total fertility rate.

The rest of the variables bu and large in the expected direction, but no variable is statistically significant at 1 percent level.

REGRESSION ANALYSIS

From the regression results from the table [7.3] selection I, it has been found that the value of R^{-2} is highest in the step 7. The value of R^{-2} is -0.1444 the regression equation from this step is as follows;

$$\underset{}{TFR} = \underset{}{3.690} + \underset{[1.496]}{0.0060\ CMR} + \underset{[0.745]}{0.0060\ AMEN} - \underset{[-\ 0.539}{0.0048\ PIA} + \underset{[0.625]}{0.0741\ MAM}$$

$$+ \underset{[0.496]}{0.0149\ CPR} - \underset{[-\ 0.582]}{0.0377\ FLR} + \underset{[0.544]}{0.0142\ PURBAN}$$

$$R^{-2} = -0.1444 \qquad F = 0.5493$$

From the above regression equation we find that 14 percent of the variation in the 'Total fertility rate' has been explained by the independent variables. The overall goodness of fit indicated by F - value in statistically significant only at 78

percent level, Indicateng that the indepedent variable joinbing do not explain TFR. The regression cofficient if variable also statisfically not significient even at 10 persent levle.

TABLE No. (7-3)

Multiple Regr essin Analysis Rajasthan

Selection -I

VARIABLES		INTERCEPTS	REGRESSION COEFFICIENT	STADARD ERROR	T-VALUE	R^2	F-VALUE
I	CMR	5.6689	2.6088	2.4031	1.086	.0070	1.1785
			0.0026				
			.0036				
			.0091				
			.0046				
II	CMR	5.0115	3.6865	2.4593	1.499	.0527	1.6953
	AMEN		9.1246	6.2150	1.468		
III	CMR	4.9889	4.6841	0.00285	1.641	.0319	1.2751
	AMEN		0.0087	0.00630	1.387		
	GIA		-0.0049	0.00697	-0.712		
IV	CMR	4.2229	0.0040	0.00298	1.687	-0.00199	0.9875
	AMEN		0.0081	0.00652	1.248		
	GIA		-0.0048	0.00709	-0.680		
	MAM		0.0475	0.09415	0.505		
V	CMR	4.0628	0.00536	0.00338	1.586	-0.0494	0.7646
	AMEN		0.00826	0.00669	1.233		
	GIA		-0.00571	0.00825	-0.692		
	MAM		0.0497	0.0968	0.514		
	CPR		0.00518	0.02294	0.226		
VI	CMR	4.1854	0.005148	0.00362	1.422	.01020	0.6142
	AMEN		0.00830	0.00686	1.209		
	GIA		-0.00517	0.00883	-0.586		
	MAM		0.0439	0.1029	0.427		
	CPR		0.0078	0.02674	0.295		
	FLR		-0.0056	0.02673	-0.212		
VII	CMR	3.6390	0.006056	0.00404	1.496	-0.1444	0.5493
	AMEN		0.006052	0.00812	0.745		
	GIA		-0.00485	0.00901	-0.539		
	MAM		0.07419	0.11864	0.625		
	CPR		0.01495	0.0301	0.496		
	FLR		-0.03774	0.0648	-0.582		
	%URB		0.01422	0.02613	0.544		

Selection - II

From the regression results from selection II, if has been found that the value of R^{-2} is highest in the step 7. The value of R^{-2} is -0.1107. The regression equation from this step is an follows.

$$TFR = 3.7217 + \underset{[1.017]}{0.0080\ PSCH} + \underset{[1.500]}{0.0058\ CMR} - \underset{[-0.842]}{0.1477\ FPRIM} + \underset{[0.697]}{0.0209\ C}$$

$$+ \underset{[0.673]}{0.0124\ PURBAN} + \underset{[0.581]}{0.06587\ MAM} - \underset{[-0.501]}{0.0044\ PIA}$$

$R^{-2} = -0.1107$ $\qquad$ $F = 0.6439.$

Just as in the case of selection I, this regression equation is also not statisficaly significent. thre R^{-2} has a negative value and none of the regions coefficicnt is statisfically significent even at 10 persent level.

TABLE No. (7-4)

Multiple Regression Analysis Rajasthan

Selection - II

VARIABLES		INTERCEPTS	REGRESSION COEFFICIENT	STADARD ERROR	T-VALUE	R/2	F-VALUE	
I	PSCH	5.6543	0.00756	0.00651	1.162	0.01380	1.34994	
II	PSCH	4.9832	0.0103	0.00660	1.162	0.01328	1.18444	
	CMR		0.0036	0.00242	1.506			
III	PSCH	-0.0474	0.00998	1.00669	1.492			
	CMR		0.00335	0.00249	1.343			
	FPRIM		-0.474	0.0674	-0.703			
IV	PSCH	5.0387	0.01047	0.00690	1.517	0.00616	1.0382	
	CMR		0.00348	.00255	1.362			
	FPRIM		-0.1425	0.1624	-0.816			
	CPR		0.0116	0.02600	0.450			
V	PSCH	4.9948	0.00958	0.00723	1.324	-0.03005		0.85413
	CMR		0.00393	0.00275	1.432			
	FPRIM		-0.1425	0.1624	-0.879			
	CPR		0.0166	0.02817	0.590			
	PURBAN		0.00826	0.01615	0.512			
VI	PSCH	3.9521	0.00824	0.00775	1.064	-0.06698		0.7384
	CMR		0.00472	0.00313	1.506			
	FPRIM		-0.1630	0.01694	-0.962			
	CPR		0.01779	0.02879	0.619			
	PURBAN		0.01245	0.01809	0.688			
	MAM		0.06148	0.11083	0.555			
VII	PSCH	3.7217	0.00805	0.00791	1.017	-0.11075		.64391
	CMR		0.00582	0.00388	1.500			
	FPRIM		-0.1477	0.1755	-0.842			
	CPR		0.02090	0.0299	0.697			
	PURBAN		0.01243	0.0184	0.697			
	MAM		0.06587	0.1134	0.581			
	GIA		-0.00444	0.0087	-0.501			

Selection-III

From the result of multiple step-wise regression analysis from table [7-5] it has been observed that the value of R^{-2} is highest in step 7 of selection III. The value of R^{-2} is -0.1301. The regression eqaution from this step in as follows.

$$TFR = 2.3299 + \underset{[1.612]}{0.0064}\ CMR - \underset{[-0.335]}{0.00307}\ GIA + \underset{[1.322]}{0.1590}\ MAM - \underset{[-0.106]}{0.0094}\ HSC$$

$$+ \underset{[1.325]}{0.0334}\ PURBAN - \underset{[-1.312]}{0.7931}\ FMET + \underset{[0.512]}{0.0138}\ CPR$$

$R^{-2} = -0.1301$ $\qquad$ $F = 0.5887.$

Even this regression equation is not statistically significant.

TABLE No. (7-5)

Multiple Regression Analysis Rajasthan
Selection - III

VARIABLES		INTERCEPTS	REGRESSION COEFFICIENT	STADARD ERROR	T-VALUE	R/2	F-VALUE
I	CMR	5.6689	0.00260	0.00240	1.086	0.00709	1.17851
II	CMR	5.61070	0.00382	0.00284	1.346	-0.00689	0.91442
	GIA		-0.00578	0.00708	-0.17		
III	CMR	4.4353	0.00442	0.00298	1.484		
	GIA		-0.0055	0.00716	-0767		
	MAM		0.06903	0.0937	0.737		
IV	CMR	4.2165	0.00473	0.00312	1.515		
	GIA		-0.00569	0.00731	-0.778		
	MAM		0.07691	0.0972	0.791		
	HSCH		0.0340	0.07920	0.429		
V	CMR	3.8766	0.00536	0.00374	1.432	-0.11442	0.4866
	GIA		-0.00659	0.00797	-0.826		
	MAM		0.0901	0.10757	0.838		
	HSCH		0.03075	0.08158	0.377		
	PURBAN		0.00330	0.0102	0.323		
VI	CMR	2.7707	0.00578	0.00371	1.559	-0.08626	0.66914
	GIA		-0.00194	0.00873	-0.222		
	MAM		0.1483	0.11622	1.277		
	HSCH		0.00332	0.0835	0.040		
	PURBAN		0.0297	0.0237	1.254		
	FMET		-0.6678	0.54192	-1.232		
VII	CMR	2.3299	0.00640	0.00397	1.612	-0.13015	0.5887
	GIA		-0.00307	0.00917	-0.335		
	MAM		0.15909	0.1203	1.322		
	HSCH		-0.00941	0.0887	-0.106		
	PURBAN		0.0334	0.0252	1.325		
	FMET		-0.7931	0.6045	-1.312		
	CPR		0.0138	0.0270	0.512		

Selection-IV

From the selection IV, it has been found that the value of R^{-2} is highest in step 7. Table (7.6)The value of R^{-2} is -0.2117. The regression eqation from this step is as follows.

$$TFR = 3.3912 + \underset{[1.463]}{0.0061}\ CMR - \underset{[-0.600]}{0.0056}\ PIA + \underset{[0.915]}{0.1064}\ MAM + \underset{[0.789]}{0.0159}\ PURB$$

$$- \underset{[-0.686]}{0.3781}\ FGRAD - \underset{[-0.146]}{0.1775}\ COLL + \underset{[0.091]}{0.0023}\ CPR$$

$R^{-2} = -0.2117$ $\qquad$ $F = 0.3759.$

Just as in the case of other selection the regression equatioin is not satisfically significint. So we cannot derine meaningful infomation from time eqution.

MULTICOLLINEARTY

In Rajasthan we removed prcentage of urban population due to multicollinearty. But even after that no variable emerged as important, so we didnot included the eqution and the tables.

Table (7-7)

SUMMARY RESULTS OF THE ANAYLSIS FOR EXPLAINING T.F.R

STATE/SECLECTION	VARIABLE	REGRESSION COEFFICIENT
KERALA	MAM	-0.8538
I	PURBAN	(-6.996)
		-0.0167
		(-1.887)
II	MAM	-0.5040
		(02.832)
	CPR	-0.0245
		(-2.225)
	PURBAN	-0.0122
		(-1.436)
		-0.0045
	PSCH	(1.411)
		-0.0468
	FPRIM	(-1.069)
III	MAM	-0.8538
		(-6.992)
	PURBAN	-0.0167
		(-1.887)
IV	MAM	-0.7902
		(-4.620)
	COLI	-0.0376
		(-1.052)
KARNATAKA		
I	CPR	-0.0459
		(-4.281)
	CMR	0.0104
		(3.183)
	PURBAN	-0.0110
		(-2.130)
	PIA	0.0089
		(1.952)
II	CPR	-0.0434
		(-3.095)
	PURBAN	-0.0117
		(-1.755)
	PIA	+0.0078
		(1.345)
	FPRIM	-0.0223
		(-1.104)
III	FMET	-0.1430

(-40341)

Continue .....

STATE/SECLECTION	VARIABLE	REGRESSION COEFFICIENT
	CPR	-0.0320
		(-3.388)
	PIA	0.5416
		(1.274)
IV	FGRAD	-0.4950
		(-4.597)
	CPR	-0.0356
		(-3.998)
PUNJAB	FLR	-0.0211
I		(-2.483)
	PURBAN	-0.0087
		(-3.073)
	AMEN	0.0028
		(1.338)
II	PURBAN	-0.0426
		(-4.489)
	PSCH	0.0065
		(2.287)
III	FMGT	-0.2514
		(-4.702)
IV	PURBAN	-0.0286
		(-3.428)
	FGRAD	-0.3477
		(-3.031)
RAJASTHAN		
I	CMR	0.0051
	AMEN	0.0083
	PIA	-0.0051
	MAM	0.0439
	CPR	0.0078
	FLR	-0.0056
II	PSCH	0.0098
	CMR	0.0086
	FPRIM	-0.0522
	CPR	0.0141
	PIA	-0.0044
	MAM	0.0340
III	CMR	0.0044
	PIA	-0.0051
	MAM	0.0734
	HSCH	0.0316

Continue.....

STATE/SECLECTION	VARIABLE	REGRESSION COEFFICIENT
	FMET	-0.0657
	CPR	0.0035
IV	CMR	0.0045
	PIA	-0.0058
	MAM	0.0674
	CPR	0.0037
	COLL.	-0.0979
	FGRAD	-0.0207

The above table shows the cream of the results of the analysis for explaining total fertility rate, for all the four states individually. When we compare the better off states of south and north we find that in Kerala female literacy/educational level is not an important variable in reducing fertility. But mean age at marriage emerges as an important variable in explaining fertility decline. The reason may be the effect of female literacy/education on fertility is through mean age at marriage. In Kerla percentage of urban population is to some extent an important variable. In Punjab, female literacy and females educated upto matriculation is important in explaining fertility. Here the developmental variable percentage of urban population emerges as important uariable as well as female literacy & female educated upto graduation.

While comparing the high fertility states of south and northen India, we find that there is a negativ effect on fertility only after females are educated upto matriculation and above. Hera couple protection rate also emerges as an important variable in determining fertility. The reason may be because of the family welfare programme in Karnataka. In the poorest state of Rajasthan, none of the variable is important in determining fertility. This may be because the low level of variables.

The overall result suggest that females educated upto matriculation and females educated upto graduation is important in reducing fertility. Here females educated upto matriculation seems to be the cut off point in causing an effective decline in fertility. All the result shows that the developmental of variable, percentage of urban population is also important.

CHAPTER 5

CONCLUSION

The study has attempted to find out the effect of female literacy/education on fertility in two Southern States and in two Northern States of India. Both theoritical and empirical evidence indicate that there is an apparently inverse relationship between the level of educational attainment of women and their fertility. This study shows that, this inverse relationship is not invariant in all the states and also the effect of education on fertility is not a direct effect but it acts through the proximate variables and therefore it is an indirect effect.

To generate policy implication it is necessary to know what characterstics of education decreases fertility. It may be that education itself has no effect, but our educational system selects out individuals with certain characteristics (like: intelligence, ambition) and those characteristics may lead to lower fertility, even if higher education were not achieved. Education may provide explicit skills. Such as literacy which results in lower fertility either through better jobs opportunities or through improved ability to acquire new information and to use

contraceptive technologies. Education particularly matriculation level education may serve as a simple alternative to early marriages in societies where there are very few alternatives.

In India, the status of women is quiet low, leading to their unquestioning acceptance of excessive child-bearing without any alternative avenues for self expression. The general low level of living leads to an apathetic state of mind, and there is hardly any desire to improve the standard of life. The lack of female education acts as a constraint on rational and secular living, and the influence of religious dogmas persists. To tackle all this factor the government must provide acceleration in the development of education, universal education, adult education and family education inorder to maximise results in reducing fertility and for other reasons effective implementation of M.C.H. and immunisation programmes which will reduce child mortality rate. In fact our government has a responsibility for the health of our people which can be fulfiled only by the provision of adequate health and social measures. A main social target of government and international organisations in the coming decades should be the attainment by all the people by the year of 2000 of a level of health that will permit them to lead a socially and economically productive life. The national

health policy such as primary health care, Health education, health promotion, Maternal and child health services can be effectively implemented.

Literacy education is a key to every type of development, and therefore each of India's development plans accords a high priority to education. In the 1981 census, it was found that the general literacy rate in India was 36.17%. Not much progress has not been achieved despite the efforts made for adult educationand the Directive principles of the Indian Constitution that there should be free and compulsory education for all children below the age of 14 years. The problems posed by rural illiteracy and female illiteracy are even worse. The rapid increase in population places heavy obstacles in the path of educational planning. So our government must provide more schools and more teachers, and cheep text books and other educational materials have to be provided. In India despite the substantial progres which has been achieved in the expansion of educational facilities, the target laid down for elementary education must be fulfiled. In general the progress in the enrolement of girls in schools, however, has not been very satisfactory. Although a large enomorous some of money is devoted to education, providing education to the people benefits not only the nation by improving worker capacity and production but

also by reducing the problem of excessive population growth which tend to erode economic and social development.

REFERENCES AND BIBLIOGRAPHY

Agarwala, N.S. "Some Problems of India's population", Volva and Co., Bombay 1986.

Ahmed, Bashir, "Determinants of Contraceptive use in rural Bangladesh: Demography, Vol. 24 No.3, August 1987.

Anker, Richard. "An Analysis of Fertility Differentials in Developing Countries" International Labour Review (ILO) population and employment working paper, No.16, 1975.

Arnold, Freed, and Others, "The Value of Children: A Cross-National Study" Vol.I, Introduction and Comparative Analysis. Honolulu: The East-West Center, 1975.

Ashish Bose and M.K. Premi (1992) Population Transition in South Asia, B.R. Publishing Corporation, Delhi.

Asha A. Bhende and Tara Kanitkar (1985). "Principles of Population Studies" Himalaya publishing House, Bombay.

Ather, S.A. "Evaluation Survey on Young Women Fertility". Demography India, Vol.17. No.1, 1988.

Bangladesh Contraceptive Prevalence Survey. 1979., Government of Bangladesh, Planning Commission, The Second Five Year Plan of Bangladesh, 1980-85, Dhaka.

Barket-e-Khuda, Sushil Howalder and Sarah, P, Haribison. "The impact of Development programmes on fertility in Bangladesh". Demography India.

Barket-e-Khuda, Age at Marriage and Fertility in a Rural Area of Bangladesh. Asian Profile, Hong Kong 1985.

Behvaman; S.J. Corsa, L. and Freedman, R. "Fertility and Family Planning, A World View". The University of Michigan, A Sesquicentennial publications, 1969.

Ben-Porath, "Economic Analysis For Fertility in Isreal. Points and Counter Points". Journal of Political Economy, Vol. 18, 1973.

Birdsall, Nancy and Mc Greevy, W.P "The Policy Relavence of Recent Social Research on Fertility". Washington. D.C., Interdisciplinary Communicatins programme, Smithsonian Institute, 1974.

Birdsall, Nancy. "Analytical Approaches to the relationship of population growth and development. Population and Development Review. 1977.

Bongarts, J, and H. Delgudo (1979) "Effect of Nutritional Status on Fertility in Rural Guatemala" in "Patterns and Determinants of Nutritional Fertility", H.Leridon and J. Menken, eds. Oridina, Liege.

Bongarts, J. and Potter, R.G., Fertility Biology and Behaviour. An Analysis of the Proximate Determinants Academic Press, New York.

Bongarts, J. "Intermediate Variables and Martial Fertility". Population Studies. 30, 2, 277-241.

Cochrane, Susan H. 1979. Fertility and Education: What do we Really Know? Baltimore: John Hopkins University Press.

Cox, D.R. Regression Model and Life Tables. Journal of the Royal Statistical Society. B 34: 187-220, 1972.

Dennis P. Hogan, Aphichat Chamratrithirong and Peter Xenons. "Cultural and Economic Factors in the Fertility of Thai Women." Papers of the East-West Population Institute. No. 107, 1987.

Ekanem, Ita, "A Further note on the Relationship Between Economic Development and Fertility." Demography, Vol. 16. 1972.

Ford, R. Thomas and De Jong, F. Gordon "Social Demography" Prentice-Hall, Inc., Englewood Cliffs, N. J. 1970.

Friedlander, Stanley, and Norris Silver. "A Quantitative Study of the Determinants of fertility Behaviour" Demography, Vol. 4, No.1, 1967.

Government of Bangladesh, "The Bangladesh Fertility Survey 1975, Ministry of Health and Population Control: Dhaka. 1978.

Heer, David. "Economic Development and Fertility". Demography, Vol.3, No.2. 1966.

Kathleen Newland, " women and populaion growth : Choice Beyond childbearing". World Watch Paper 16 December 1977.

Kulkarni, P.M., "Regional variation in fertility in China", Demograply India, Vol 18, 1989.

Mahadevan, K. 'Fertility and Mortallity. Theory, Methodology and Empirical issues". Sage publications. New Delhi. 1986.

M.M. Huq and Rokeya katun, Fertility impact of female education in Bangladesh". Population and Development Planning unit, planning commission Dhaka. 1985.

Namboodiri, N.K. Some observations on the economic framework for fertility analysis. population studies 1974.

Office of the Registrar General, India 1987. Fertility and Child mortality Estimates of Karnataka. Occassional paper No. 11 of 1987. New Delhi.

Office of the Registrar General, India 1988. Fertility and Child Mortality Estimates of Kerala. Occassional paper No. 2 of 1988. New Delhi.

Office of the Registrar General, India 1988. Fertility and child mortality Estimates of Punjab. Occassional paper No. 10 of 1988. New Delhi.

Office of the Registrar General, India. 1988. Fertility in India: An analysis of 1981 Census Data. Occassional paper No. 13 of 1988. New Delhi.

Office of the Registrar General, India. 1989. Child mortality, Age at marriage and Fertility in India occasional paper No. 2 of 1989. New Delhi.

O.P. Sharma, and Robert D.Retherford 1987, Recent literacy Trends in India Occassional paper No. 1 of 1987. New Delhi.

O.P. Sharma, and Robert D.Retherford, "Effect of Female literacy on Fertility in India" Occasional paper No. 1 of 1990. Office of the Registrar General and Census commissioner, India.

Panikkar, P.G.K [1975] "Fall in Mortality rates in Kerala : an explanatory hypothesis. Economic and political weekly. November 22:1811-18.

Safilios-Rothchild, constantina. "Sociological Factors Affecting Fertility in Urban Greece : A preliminary Report : Journal of Marriage and the Family, Vol 31, 1969.

Schult 2, T. Paul, "Fertility patterns and their determinants in the Arab Middle East. " Economic Development and population growth in the Middle East. New York : ElSevier, 1972.

Simon, Julian L. The Effect of income on Fertility, chapel Hill : North carolina populatin centre, 1974.

Singh, R.P. and Richard J, "Socio economic and Demographic corrdates of Age at Marriage, Demography Vol 18, No 1&2 1989.

Streadfield, Mavvi Singasimbum, and Iam Diamond, "Maternal education and child immunization." Demography, vol.27, No. 3 August 1990.

Styeos, J., and Robert weller. "Female working Roles and Fertility" Demography, Vol 4, No. 1, 1967.

United Nations Recent Levels and Methods New York : Academic press 1989.

United Nations, "The Determinants and consequences of population Trends population studies. No. 350 Vol 1, New York.

World Bank, "populatin policies and Economic Development, "World Bank staff Report, Baltimore : John Hopkins University press 1974.

World Fertility Survey, "The Survey of Fertility in Thailand". Country Report, Vol.1. Institute of population studies. Bangkok. 1977.

Yang Yixing, "A Brief Analysis on Educational Attainment and occupational structure of China's Minority women and their Relations to population Development." Population Research Quarterly Vol 4, No. 1 1987.

EXPANSION OF ABBREVIATED TERMS

TFR = Total Fertility Rate.

FLR = Female Litevancy Rate.

FPRIM = Percentage of Females Education upto Primary Level.

FMET = Percentage of Females Educated upto Matriculation.

FGRAD = Percentage of Females Educated upto Graduation.

MAM = Mean Age at Marriage.

CMR = Child Mortality Rate.

PURBAN = Percentage of Urban Population.

PSCH = Percentage of Villlages having Primary School.

MSCH = Percentage of Villages having Middle School.

HSCH = Percentage of Villages having High School.

COLL = Percentage of Villages having College.

AMEN = Percentage of Villages having an Educational Amenities.

PIA = Persentage of Irrigated Area.

CPR = Couple Protections Rate.

DISTRICTS	TFR	PLR	FPRIM	FMET	FGRAD	MAM	CMR	PURBA	PSCH	MSCH	HSCH	COIL	IA	CPR
CANNANORE	4.20	59.50	22.39	3.97	0.45	18.20	52.00	23.40	99.44	93.82	42.70	2.81	0.00	31.40
KOZHIKODE	3.40	63.80	24.33	3.55	0.52	18.10	54.00	27.20	99.08	93.58	48.62	4.59	0.00	46.00
MALAPPURAM	5.00	55.30	23.38	2.10	0.30	17.80	67.00	7.40	100.00	90.60	43.59	2.56	0.00	16.80
PALGHAT	4.20	51.50	18.61	3.75	0.51	18.30	73.00	10.10	91.33	74.67	44.00	1.33	0.00	22.10
TRICHUR	2.70	70.20	21.00	7.33	1.10	19.80	45.00	21.10	82.68	57.14	40.69	3.46	0.00	47.50
ERNAKULAM	2.70	72.90	21.78	7.99	1.81	20.00	42.00	39.60	100.00	83.50	79.61	5.83	0.00	49.00
IDUKKI	3.30	62.60	22.34	5.32	0.60	19.30	76.00	4.60	0.00	0.00	0.00	0.00	0.00	26.20
KOTTAYAM	2.70	79.40	24.58	9.64	1.78	19.80	37.00	9.40	96.04	89.11	74.26	7.92	0.00	57.10
ALLEPPEY	2.70	75.10	24.13	7.80	1.36	19.90	42.00	7.20	96.94	90.82	80.61	11.22	0.00	51.10
QUILON	3.10	70.20	20.75	6.84	7.07	19.60	46.00	13.20	100.00	96.94	86.73	10.20	0.00	60.30
TRIVANDRUM	2.50	65.80	21.17	6.95	2.00	19.90	45.00	25.30	95.56	84.44	64.44	10.00	0.00	30.80
WAYANAD	4.40	51.50	18.51	2.89	0.31	18.60	89.00	0.00	0.00	0.00	0.00	0.00	0.00	17.30
BANGALORE	4.10	42.20	12.28	7.14	2.13	17.60	79.00	64.50	67.13	14.86	2.31	0.08	22.86	20.00
BELGAUM	4.40	24.10	7.99	2.55	0.37	16.30	99.00	22.50	60.97	49.14	6.39	0.00	20.26	31.20
BELLARY	5.00	19.30	6.85	1.82	0.32	16.60	133.00	33.00	68.25	41.60	5.43	0.00	25.30	28.10
BIDAR	5.10	14.30	4.37	1.15	0.16	15.70	105.00	17.80	75.47	23.52	5.58	0.00	7.51	24.80
BIJAPUR	5.00	18.50	6.08	1.60	0.15	15.80	121.00	24.10	53.59	52.22	4.04	0.00	10.32	25.00
CHICKMAGALUR	4.60	34.00	12.18	3.09	0.42	18.20	104.00	17.50	58.74	27.44	2.95	0.00	11.67	38.30
CHITRADURGA	4.90	27.10	9.28	2.43	0.32	17.00	113.00	23.50	75.68	26.48	4.24	0.00	24.94	33.20
DAKSHINKANNAD	4.80	45.30	17.12	4.16	0.66	18.50	57.00	24.50	43.96	80.82	13.44	0.30	35.73	24.40
DHARWAD	5.00	29.80	10.08	2.69	0.52	16.90	113.00	35.20	59.54	41.21	4.90	0.15	8.28	30.00
GULBARGA	4.80	13.30	4.11	1.27	0.22	15.80	107.00	22.90	81.37	18.71	3.83	0.00	2.24	22.00
HASSAN	4.60	26.40	9.95	2.36	0.33	17.90	99.00	14.60	58.55	11.70	1.94	0.00	17.74	36.90
KOLAR	4.60	22.60	7.14	2.46	0.31	17.40	97.00	22.40	53.98	13.26	1.56	0.00	23.62	33.60
MANDYA	4.50	19.90	6.79	1.53	0.20	16.00	103.00	15.50	70.20	17.85	2.91	0.00	41.74	39.00
MYSORE	4.40	23.00	7.27	2.77	0.83	16.20	98.00	27.40	71.50	18.77	3.39	0.00	17.09	33.00
RAICHUR	5.20	13.40	4.40	1.02	0.12	16.00	116.00	19.30	70.66	19.18	2.45	0.00	14.47	22.50
SHIMOGA	4.80	34.60	12.24	3.35	0.51	17.30	103.00	25.70	60.02	20.74	3.22	0.00	48.34	32.60
TUMKUR	4.50	25.40	9.05	2.24	0.27	17.00	112.00	13.80	66.76	18.11	3.18	0.00	15.04	31.60
UTTARKANNAD	4.90	38.90	13.20	4.13	0.55	17.80	91.00	25.40	54.13	23.55	5.48	0.15	17.73	26.70
KODAGU	3.80	43.30	13.48	5.57	0.93	19.20	83.00	15.50	47.08	47.42	11.00	0.69	3.09	32.10
GURDASPUR	3.60	32.70	14.18	3.97	0.76	18.70	96.00	21.70	44.17	5.70	2.88	0.07	70.33	38.00
AMRITSAR	3.30	34.40	11.47	4.89	1.21	19.10	90.00	33.00	68.67	8.13	6.52	0.17	97.60	47.30
FIRAZPUR	3.80	24.20	8.58	2.52	0.81	8.90	92.00	22.80	62.17	9.17	5.73	0.13	93.29	47.60
LUDHIANA	2.50	44.20	14.71	6.75	2.19	19.20	87.00	42.00	64.60	9.18	8.36	0.72	93.69	44.40
JALANDHAR	2.70	42.50	14.67	5.32	1.48	18.80	96.00	35.30	55.83	8.11	5.38	0.08	94.57	40.00
KAPURTHALAA	3.20	38.30	13.97	4.15	1.12	19.00	108.00	30.00	43.35	6.47	5.22	0.00	91.24	46.90
HOSHIARPUR	3.30	41.20	16.63	4.49	2.21	18.80	98.00	14.40	39.95	4.87	5.18	0.19	43.99	45.90

DISTRICTS	TFR	PIR	FPRIM	FMET	FGRAD	MAM	CMR	PURBAN	PSCH	MSCH	HSCH	COLL	PIA	CPR
RUPNAGAR	3.10	38.90	14.96	4.39	1.43	18.40	80.00	21.60	0.00	0.00	0.00	0.00	45.09	44.70
PATIALA	3.30	33.70	11.80	3.80	2.01	18.40	91.00	29.60	62.34	5.23	2.30	0.07	85.76	39.50
SANGRUR	3.50	22.70	8.39	4.24	0.85	18.80	108.00	22.80	70.24	12.27	6.49	0.00	93.66	11.30
BATHINDA	3.60	20.30	6.74	2.27	0.78	18.60	99.00	22.70	76.75	11.26	7.89	0.15	82.25	50.50
FARIDKOT	3.20	26.90	3.78	3.04	1.71	19.10	95.00	23.90	0.00	0.00	0.00	0.00	92.07	41.60
GANGANAGAR	5.70	14.20	4.66	1.01	0.37	16.80	102.00	20.60	36.06	4.40	0.92	0.00	38.20	24.50
BIKANER	6.00	17.60	5.19	1.30	0.73	15.40	74.00	39.50	53.15	6.30	1.30	0.00	4.41	22.30
CHARU	6.10	9.80	3.13	0.59	0.14	15.30	98.00	29.20	58.94	4.82	1.29	0.00	0.09	17.10
JHUNJHUNUN	5.90	11.40	3.67	0.43	0.25	15.50	113.00	20.70	66.67	11.11	5.48	0.29	12.68	20.90
ALWAR	6.40	11.40	3.93	0.64	0.33	16.00	170.00	11.10	51.52	5.67	2.25	0.05	31.97	17.90
BHARATPUR	7.00	10.10	3.22	0.57	0.29	16.00	199.00	17.10	54.18	4.76	1.02	0.00	28.37	17.10
SEWAIMADHOPUR	6.70	8.20	2.69	0.35	0.17	15.10	189.00	13.40	52.97	4.44	1.83	0.00	25.55	13.20
JAIPUR	6.20	17.20	4.66	1.52	1.24	15.20	144.00	36.60	44.43	5.22	1.83	0.15	44.83	20.70
SIKAR	6.20	9.10	3.25	0.33	0.11	15.00	119.00	20.30	71.36	9.26	3.83	0.12	20.29	17.30
AJMER	5.50	21.90	6.48	1.73	1.20	15.40	162.00	42.80	60.90	6.29	2.62	0.21	26.04	21.30
TANK	6.50	8.30	2.33	0.40	0.41	14.00	3.00	18.40	39.07	3.38	1.19	0.10	19.29	14.60
JAISAIMER	5.50	5.30	1.67	0.28	0.10	16.40	108.00	13.60	41.90	3.47	0.46	0.00	0.05	8.60
JODHPUR	6.10	14.50	3.86	1.32	0.87	16.40	107.00	34.80	69.76	9.13	2.43	0.14	6.29	15.40
NAGAUR	6.10	7.10	2.36	0.31	0.06	15.30	118.00	14.60	65.30	5.84	1.73	0.16	5.94	16.60
PALI	6.00	8.80	2.85	0.45	0.13	16.20	168.00	18.40	66.02	8.13	2.18	0.12	25.92	17.30
BARMER	6.20	3.70	1.30	0.15	0.04	16.90	129.00	8.80	60.22	3.11	1.19	0.00	2.27	7.60
JALOR	6.50	4.40	1.26	0.17	0.06	17.30	137.00	8.10	70.76	6.05	1.18	0.00	19.27	12.60
SIROHI	5.80	9.90	3.08	0.58	0.21	17.10	157.00	17.90	58.16	5.67	0.71	0.00	32.97	18.30
BHILWARA	5.30	9.00	2.86	0.53	0.25	14.50	183.00	14.40	47.21	5.84	1.72	0.00	33.64	20.60
UDAIPUR	5.60	10.80	3.14	0.76	0.61	15.80	156.00	15.10	40.63	3.59	1.22	0.06	25.55	16.30
CHITTAURGARH	5.40	9.40	2.99	0.43	0.22	14.70	176.00	13.20	33.73	3.16	0.94	0.00	21.68	10.10
DUNGRPUR	6.10	8.00	2.86	0.30	0.13	16.50	142.00	6.50	48.85	5.33	1.45	0.00	9.51	17.10
BANSINARA	6.10	7.10	2.27	0.42	0.12	16.90	138.00	6.20	36.34	3.06	0.90	0.00	8.79	22.50
BUNDI	5.90	8.90	2.69	0.53	0.25	14.10	165.00	17.00	45.68	4.12	0.82	0.00	44.76	15.70
KOTA	6.30	17.40	4.45	1.15	0.81	15.20	142.00	31.90	39.63	3.15	1.00	0.00	28.39	18.70
JHALAWAR	6.10	9.30	2.70	0.41	0.15	14.70	160.00	11.70	33.03	2.85	0.56	0.00	10.54	19.60

ABSTRACT

EFFECT OF FEMALE EDUCATION ON FERTILITY

A large number of previous studies have shown that female literacy has a strong negative effect on fertility. In this study we bring additional evidience form two northrn states and two Southern states namely Punjab, Rajasthan, Kerala and Karnataka to bear on this question. This evidence is based on district level data for the above mentioned states from Indai's 1981 census. We have organised our study as follows. An Introduction followed by a review of past literature from India, Bangladesh, China, Thialand, Isreal, Jordan, etc is presented. In the third chapter we deals with the conceptual framework; Here an attempt has been made to trace the impact of female literacy educatin on fertility through the proximate variables. A conceptual framework has been developed. The conceptual framework shows that developmental variables influence female literacy/education, proximate variables and child mortality. We have discussed the relationship between female literacy/ education and proximate variables. We have also discussed the link between literacy/education and child mortality rate. In this same chapter we have formed our hypothesis on the basis of the conceptual framework. One of the important hypothesis is that

fertility is inversaly related with female literacy/education. We used correlation technique and multiple stepwise regression analysis.

In the fourth chapter we have discussed the inter-district variations among the variables for the states of Kerala, Karnataka, Punjab and Rajasthan. We have also studied the relationship between the independent variables and correlation between the dependent and independent variables. In the same chapter, to determine the influence of one independent variable on the dependent variable holding all the other variables constant, we have presented the multiple regression analysis. The regression analysis for each state consists of four selections depending literacy & education levels. During the process of multiple regression analysis we find multicollinearity among certain variables & we attmepted to the problem of multicollinearity.

The results for explaining total fertility rate show that above metriculation level of education negatively influences fertility. When we compare the better off states of South we find that in better of state in South we find that female literacy/educational level is not an important variable in reducing fertility. But mean age at marriage emerges as important

variable in explaining fertility decline. At the same time in North we find females educated upto matriculation is emerges as an important variable. Among the high fertility states of South & North we find that females educated upto matriculation emerges as an important variable in reducing fertility. In Rajasthan none of the vairables is in determining fertility. In the last chapter we have concluded our study.