CHAPTER – I
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The rapidly growing literature on economic development has perforce recognized the adverse growth of population on the living conditions and the growth of Nation. Given the limited resources and technology, growing population lowers the per-capita income and standard of living, reduces the availability of food supply, land area, increases investment on child development and so on. Therefore controlling population growth becomes a precondition for rapid growth of the economy and this is more soul in the case of developing countries, which are caught in the cobweb of the secondary phase of demographic transition. Earnest attempts have been made to check the raised tied-up of population in all countries of the world and family planning has become a handy tool to achieve this performance.

India, which has been in the midst of a population explosion, realized the fertility significance of family planning and adopted in the Five-Year Plan itself, which has a measure of promoting small family norms and family welfare. Successive Five-Year Plans have earmarked greater amount of outlays for this unique programme and several innovations have come. The Government has realized that the mere provision of inputs under family planning may not be a sufficient condition for fertility control and hence decided to offer packages of family planning services to eligible couple though a nation wide network of Primary Health Centres and Sub-centres.

Looking back, one can feel the remarkable strides and progress made by this programme in arresting the demographic growth of the country. Various cross section
studies and statewide studies conducted in India have endorsed the positive impact of family planning on birth control. However the performance of various sections and communities in a multi-religious society like India has not been uniform. In fact there is differing or varying performance levels within a state and across the state. These studies also have explained the factors responsible for interstate and intrastate variations in fertility levels.

They have uniformly identified that fertility control is a multi-faceted phenomenon and requires multi-disciplinary approach within which the birth control devices envisaged by family planning is only a simple component. Various social, economic, educational, sociological and psychological factors operate to produce a wholesome effect on fertility control. It is in this context, a state of fertility control in the background of the gamut of factors assumes significance.

The Union Territory of Pondicherry, an erstwhile French Colony, has made phenomenal progress in the area of fertility control and its performance vis-à-vis other states in the Indian Union is something unique. This unique performance may be due to the sincere efforts of the Government to spread the message of family planning, but here again the influence of other factors contributing to this fascinating decline could have been in operation. So far no economic or social research has been undertaken to study the positive declining fertility rate of the Union Territory of Pondicherry. The high literacy rate, progressive social outlook, migration of the people, better economic status, higher health status and several other factors must have accounted for short decline in birth rate.
In the field of educational attainment, the Union Territory of Pondicherry has made phenomenal progress. Even among Indian States, this territory has 74.74 per cent of its population being literate\(^1\). In the female literacy also, this Territory has made rapid strides. While female literacy rates in the country as a whole is only 39.42 per cent, the percentage for the Union Territory of Pondicherry is 65.63 (1997 - 98).

Closely related to education, is the health status of the population. During the recent past the Union Territory has made significant progress in the development of public health. The continued improvement in the health of the people has been related to their educational attainments and health policies, which have brought medical facilities both within their reach and means. As a result during 1997-98 the death rate (SRS estimates) was 6.7 (for 1000) and the birth rate was 19.5 (for 1000) which are comparable with the Kerala State which leads the Nation\(^2\). Further the eligible couple protected by family planning programmes during 1997-98 was 63.2 per cent. The per-capita expenditure on medical and health services was Rs.528.00 (1997-98) which is significantly considerable comparing with other states in the country.

The rapid decline in the fertility rate of this Union Territory has been attributed several reasons, such as educational attainments particularly for women, better health and family planning delivery system, higher per-capita income of the people, besides overall economic development of the Union Territory of Pondicherry. Economic indicators of the Union Territory over a period clearly prove the relationship between economic development and fertility decline. There are several studies that prove the fact very clearly.
THEORITICAL FRAME

The search for a logical relationship between economic development and fertility evoked greater interest among scholars. During Fifties and Sixties, most of the writings happen to be within the framework of the transmission theory affirmed the implicit assumption of an inverse relationship between economic development and fertility. Freedman\(^3\) argued that structural development (changing social structures, values and the development of the new norms) having negative impact on fertility where the outcome of the economic development process.

The positive association between fertility and economic development was demonstrated by Galbraith and Thomas, Dudley and Stys through their empirical exercises on temporal data on fertility rates and the economic situation over business cycles which analysing data from the United States during the period 1919-1931. Galbraith and Thomas demonstrated that marriage and birth rates are positively associated with business conditions. Dudley reached the same conclusion based on date from Germany during the 1920s. Easterlin attempt to explain the American baby boom of the 1950s in terms of higher wage levels due to improved business conditions. However during 1963 itself, Adelman\(^4\) study based on the cross sectional data affirmed the negative association between fertility and economic development. Adelman argues that the partial effect of income on birth rate is positive whereas the partial effect of education on the birth rate is negative but still the overall unconditional effect of income on fertility is negative.
To resolve these controversial viewpoint and empirical evidence certain conciliatory efforts were made during sixties. Newer concepts like the partial and total effect of economic development on fertility came into prominence.

Sinnon\(^5\) viewed that short run effects of income on fertility as partial and the long run effects via other fertility affecting variables as total. Sinnon’s conciliatory effort depicts a phase in which not only economic but also social considerations including level of education are viewed to be important for explaining varying demographic process over time and space.

The 1974 World population conference in Bucharest\(^6\) came out with the contents to ensure the link between fertility and economic development.

“The development is the best road to slow the population growth”.

“Development is the best contraceptive”

“Look after the population and population will look after itself” are the slogans which explains the importance between fertility and economic development.

Studies conducted so far on the fertility decline in India particularly in Kerala State have implicitly or explicitly assumed that apart from several social considerations (as pointed out by Sinnons) education is the most critical determinant of fertility. Most of the studies concluded that education affects family planning and fertility decline both directly and indirectly.

Various writers have advanced different hypotheses on the fertility decline in the country. Presently two schools of thought demonstrate the fertility transmission, more specifically fertility decline within marriage. The first is the transmission of
structural change according to which fertility transition is the consequences of the shifts in the balance of economic costs and benefits necessitated to the parents due to the child bearing. The second school of thought considers the diffusion proposition according to which the fertility decline among the married is mainly because of the spread of birth control technology.

According to Basu\textsuperscript{7} and Mencer\textsuperscript{8} fertility decline is included by the prevalence of widespread poverty and massive unemployment. Under the circumstances majority of the people feel that the changes of getting employment are bleak, which compelled them to reduce their family size.

Mahadevan\textsuperscript{9}, Bhat and Irudayarajan\textsuperscript{10} largely subscribed to the diffusion hypothesis. But the factors identified by them as responsible for the diffusion are different. The most important reason for diffusion is the enhanced status of Hindu women who traditionally enjoy dominance in the matrilineal Hindu family, which help them considerably in quick adoption of family planning. Mahadevan on the other hand, found improvement in general literacy and the provision of health and family planning as the most important factors accounting for the diffusion and consequent decline in fertility.

In India, Kerala State has given a model to the rest of the country in the way of implementation of family planning programmes to be followed. Kerala’s population growth rate during the decades, 1941-51, 1951-61 and 1961-71, have been 2.08, 2.22 and 2.37 per cent respectively in a year. But during 1971-81 the state population growth rate registered a decline, for the first time came down to 1.78 per cent a year, which further fell to 1.32 per cent during 1981-91. Therefore 1971-81 was indeed a
turning point in Kerala’s demographic history. It may be pointed out that out of the eleven states where the population growth rate showed a decline during 1971-81 to 1981-91, none except Kerala had crossed the magic level of 75 per cent literacy. The happening in 1971-81 such as the peaking of the country’s population growth rate, traumatic experience of birth control measures, the sharp decline in Kerala’s population growth rate and the state’s highest literacy rate together gave birth to the famous “Kerala Hypothesis”.

This hypothesis suits to the Union Territory of Pondicherry wherein the development of education particularly women’s education and public health system are found to be significant compared to the rest part of the country. Therefore the purpose of this study is to identify the factors and their influence in general and more specifically on women’s education on fertility behaviour of the people of the Union Territory of Pondicherry.

OBJECTIVES OF THE STUDY

More specifically the objectives of this study are as follows:

1. To identify the relation between education, family planning and fertility.
2. To assess the impact of women’s education on family planning and fertility.
3. To study the impact of education on age at marriage, age at adoption of family planning, time lag between marriage and adoption and adoption of family planning.
4. To examine the influence of education on the attitude of women towards family planning, size of the family, sex preference and the availability and reach of the family planning services.
HYPOTHESES

The hypotheses formulated and tested in this study are:

1. Education exerts a positive influence on adoption of family planning.

2. Education of women causes lowers fertility rate.

3. There is a positive influence of education of husband on family planning and fertility.

4. Inter-regional disparities prevail among Pondicherry, Karaikal, Mahe and Yanam regions in terms of the impact of education on family planning and fertility behaviour.

5. Significant difference between educated and illiterate women in term of their attitude and perception towards the size of the family, sex preference and family planning services exist.

6. There is a positive influence of education of women in the four regions of the Union Territory of Pondicherry on age at marriage, age at adoption, time lag between marriage and adoption and the method adopted for family planning.

METHODOLOGY

DATA COLLECTION

The basic objective of the study is to analyze the level of education of women, fertility behaviour, family planning adoption and other socio-economic variables. So it is planned to collect primary data covering wide range of demographic, economic and social factors and other attitudinal and behavioral aspects. A pre-tested questionnaire was prepared, tested and used for this purpose. The interview method was adopted and the researcher directly collected from all the samples with the help of some male and female investigators both in rural and urban areas. Both husband and
wife were interviewed because, for information regarding family history, birth history and contraceptive prevalence, it was needed to interview wife and for other information husband were needed to interview. Since the rural women were reluctant to provide information regarding birth and family planning history, female investigators were used for accuracy of data.

Besides the household level data, information regarding the general characteristics of the village and ward, such as availability of school, primary health facilities and family planning centres, banking, transportation, electricity, water and other public utilities were also collected. Thus the data set contains information on various socio-economic determinants of family planning and fertility behaviour in the four regions of the Union Territory of Pondicherry. The data collected has been processed and analysed with the help of the computer.

Apart from the primary data collection, secondary data were also collected from the books, journals, reports, official records and discussions with experts in the related fields. The chief sources of Government records pertaining to the Union Territory of Pondicherry are:


2. Pondicherry Economy in Figures (for various years), published by Directorate of Economics and Statistics, Pondicherry.


5. Five-Year Plan Documents released by the Directorate of Planning and Research, Government of Pondicherry, Pondicherry.

SAMPLE FRAME

The study is based on the four regions of the Union Territory of Pondicherry. The composition of this Territory is unique from other states and Union Territories in the sense that it is not a contiguous area but consists of four isolated pockets far away from one another. These four pockets are called as regions and each region is treated as a district for the population census. The four regions are Pondicherry, Karaikal, Mahe and Yanam. The Pondicherry, Karaikal and Mahe regions are developed regions in terms of well-known socio-economic indicators. On the other hand Yanam region represents the less developed compared to other regions of the Union Territory.

From each region two primary health centre (PHC) area were selected such a way that one with very high performance and another with less performance in terms of family welfare programmes during 1993-94 to 1997-98. Thus the PHCs at Odianchallai in Pondicherry region, T.R. Pattinam in Karaikal region, Mahe Town in Mahe region and Yanam Town in Yanam region showed high performance. The PHCs at Kurumbapet in Pondicherry region, Vizithiur in Karaikal region, Panthakkal in Mahe region and Kanakkalapet in Yanam region recorded poor performance in family welfare programmes in the Union Territory of Pondicherry during the period of study.
Each PHC selected in Pondicherry region catered a population of 3127 eligible couples in Odianchallai and 3013 in Kurumbapet. In Karaikal region, the PHC at T.R.Pattinam covered 3000 eligible couples and Vizithiur covered 2980 couples. In Mahe region the PHC at Mahe town covered 3000 eligible couples and in Pandakkal 2900 couples. In Yanam region the eligible couples covered at Yanam town was 2750 and at Kanakalpet 2800 couples.

Each PHC had minimum seven sub-centres during the study period in the entire Union Territory. The sub-centres under each PHC in Pondicherry, Karaikal and Mahe regions have better infrastructure facilities and cover a larger population because of the larger geographical area. The sub-centres under each PHC in Yanam region have lesser infrastructure facilities and cover less population.

Then the sub-centres functioning under each PHC were selected at random, ensuring that at least one third of the total sub-centres are covered. Two sub-centres, from each selected PHCs, were selected at random ensuring inclusion of one third of the total sub-centres from all the four regions. In order to have the maximum coverage of sub-centres from each PHC based on its performance, these sixteen sub-centres were selected for the study. Each sub-centre having approximately 400 eligible women, 300 are adopters and 100 are non-adopters. From these adopters and non-adopters, approximately 5.00 per cent of the adopters and 5.00 per cent of the non-adopters were selected for the study. This constitutes 187 adopters and 63 non-adopters in Pondicherry region, 113 adopters and 37 non-adopters in Karaikal region and 75 adopters and 25 non-adopters each in Mahe and Yanam region. Thus 450
adopters and 150 non-adopters totaling to 600 samples were selected in the entire Union Territory of Pondicherry.

ANALYSIS OF DATA

The sample data generated on various socio-economic and cultural determinants on family planning and fertility behaviour have been thoroughly analyzed to test the hypothesis formulated above. The relationship between education and contraceptive behaviour have been examined in detail in chapter - V with the help of a large number of two-way and three-way tables. The socio-economic and cultural characteristics have also been examined in relation to the level of education. Similarly the family planning adoption has been examined with the level of education of the women respondents. The significance of the difference between different educational groups in respect of socio-economic and demographic variables has been analysed.

To understand the determinants of family planning simple correlation have been found out among the seventeen socio-economic variables for the four regions. Later partial correlation has been estimated between education and important family planning and fertility variables holding other variables constant. Further rank correlation between education and family planning variables have been estimated. On the basis of the correlation analysis, Six regression models have been formulated to estimate the impact of education and other socio-economic variable on family planning, fertility, age at marriage, the method of family planning adopted, the time lag between marriage and adoption and the age at adoption. The models have been estimated by using ordinary least square method for the four regions separately.
Regression analysis measures only the direct impact of each variable on the dependant variable. In order to understand the direct as well as the indirect impact of education on family planning and the process through which education influence family planning and fertility, path analysis has been undertaken in this study. The direct as well as indirect routes through which education of the spouses influences family planning and fertility have been conceptualized. A set of seven recursive equations have been formulated and estimated to assess the direct as well as the indirect impact of education of the spouses on family planning.

1. \( Y_0 = P_{01} Y_1 + P_{02} Y_2 + P_{03} Y_3 + P_{05} Y_5 + P_{07} Y_7 + P_{011} Y_{11} \)

2. \( Y_{11} = P_{111} Y_1 + P_{112} Y_2 + P_{113} Y_3 + P_{115} Y_5 + P_{117} Y_7 \)

3. \( Y_2 = P_{23} Y_3 + P_{25} Y_5 + P_{27} Y_7 + P_{211} Y_{11} \)

4. \( Y_1 = P_{13} Y_3 + P_{15} Y_5 \)

5. \( Y_4 = P_{43} Y_3 + P_{46} Y_6 \)

6. \( Y_6 = P_{65} Y_5 + P_{64} Y_4 \)

7. \( Y_7 = P_{73} Y_3 + P_{75} Y_5 \)

where: \( Y_0 = \) Family planning status

\( P_{ij} = \) Coefficient associated with j \(^{th}\) variable, measuring the impact of i \(^{th}\) variable

Thus following the visual procedure, the direct and indirect path coefficients have been estimated for all the four regions separately.

Since most of the socio-economic variables are inter-dependent, the direction of causality cannot be easily determined. Moreover these variables jointly influence family planning and fertility. Therefore in order to account for the joint effort of the
socio-economic variables on family planning and fertility, principal component analysis has been undertaken for all the four regions of the Union Territory. There is no apriori basis on which one can group these variables. Therefore an attempt is made to apply Principal Component Analysis to combine the 17 socio-economic variables into a set of ‘Composite’ variables for each regions as shown in the following equations.

\[ \begin{align*}
  i & = 1, 2, 3, 4 \\
  P_{ih} & = 1 = \text{Pondicherry Region} \\
         & = 2 = \text{Karaikal Region} \\
         & = 3 = \text{Mahe Region} \\
         & = 4 = \text{Yanam Region} \\
  h & = 1 \ldots \ldots \ldots m
\end{align*} \]

where \( X_{ij} \) = the \( j^{th} \) variable observed on \( i^{th} \) region. ‘m’ takes the value of 250, 150, 100 and 100 in the case of Pondicherry, Karaikal, Mahe and Yanam regions respectively.

\[ P_{ih} = \text{the } h^{th} \text{ Composite variable value of the } i^{th} \text{ region.} \]

With the help of socio-economic variables, a set of six important principal component variables have been generated which are latter used as independent variables to determine family planning, fertility, age at marriage, age at adoption, time lag and the method of adoption in a multiple regression model frame work. The following equations have been formulated to estimate the impact of composite variables separately for four regions of the Union Territory of Pondicherry.
Equation : 1. \( X_{13} = f(P_1, P_2, P_3, P_4, P_5, P_6, P_7) \)

Equation : 2. \( X_{12} = f(P_1, P_2, P_3, P_4, P_5, P_6, P_7) \)

Equation : 3. \( X_{14} = f(P_1, P_2, P_3, P_4, P_5, P_6, P_7) \)

Equation : 4. \( X_{15} = f(P_1, P_2, P_3, P_4, P_5, P_6, P_7) \)

Equation : 5. \( X_{17} = f(P_1, P_2, P_3, P_4, P_5, P_6, P_7) \)

Equation : 6. \( X_{11} = f(P_1, P_2, P_3, P_4, P_5, P_6, P_7) \)

Where

- \( P_1 \) = Education index
- \( P_2 \) = Fertility
- \( P_3 \) = Type of Family
- \( P_4 \) = Age of the respondent
- \( P_5 \) = Economic status
- \( P_6 \) = Residential status
- \( P_7 \) = Employment status of the respondent
- \( X_{13} \) = Family planning adoption status
- \( X_{12} \) = Fertility
- \( X_{14} \) = Age at adoption of family planning
- \( X_{15} \) = Time lag between marriage and adoption
- \( X_{17} \) = Method of family planning
- \( X_{11} \) = Age at marriage

All the above equations have been estimated using O.L.S. method on 250, 150, 100 and 100 observations generated in the Pondicherry, Karaikal, Mahe and Yanam regions respectively, on the 7 composite variables.
FIELD SURVEY

LIMITATIONS

1. The Collection of primary data is restricted only to the period between 1993-94 and 1997-98.

2. During the collection of the primary data, the respondents were asked to recall the earlier family information and enter in the questionnaire, which was tested with cross-questions. However the accuracy of data may not be complete and it depends on the respondent’s recall of memory.

3. Some of the respondents did not answer some of the questions relating to their personal family matters. Such answers are incorporated under no answer, don’t want to answer and no comments in the concerned tables framed for the respective subjects.

4. The answers given by the respondents regarding the age at marriage, age at adoption of family planning, reason for the sex preference of their children, method of family planning adopted and incentives received were arbitrary and checked with their family members.

CHAPTER PLAN

Chapter -1: Introduction to the study on impact of women’s education on fertility behaviour and family planning in the Union Territory of Pondicherry – its Objectives, Hypotheses and Methodology.

Chapter -2: Presentation of a brief review of earlier studies relevant to the present work.

Chapter - 3: Brief profile of the study area and profile of education and public health-family planning development in the Union Territory of Pondicherry.
Chapter - 4: Socio-economic characteristics of the sample respondents pertaining to the study from the four regions of the Union Territory of Pondicherry.

Chapter -5: Examination of the relationship between education and contraceptive behaviour on the basis of the sample analysis.

Chapter - 6: Analysis of the determinants of family planning and fertility with the help of correlation and regression analysis.

Chapter - 7: Assessment of the direct as well as indirect impact of women’s education on family planning and fertility behaviour with the help of path analysis. The problem of causality and inter-dependents are analyzed with the help of principal component analysis.

Chapter - 8: Analysis of the attitude of the respondents towards the family planning services provided by the Government.

Chapter - 9: Summary and conclusion of the study and presentation of suggestions.
REFERENCES


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