AN ANALYSIS OF FAMILY PLANNING PERFORMANCE IN INDIA (1981-1991)

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

MASTER OF PHILOSOPHY

TARUN KUMAR PRADHAN

CENTRE FOR THE STUDY OF REGIONAL DEVELOPMENT
SCHOOL OF SOCIAL SCIENCES
JAWAHARLAL NEHRU UNIVERSITTY
NEW DELHI – 110067
INDIA
1998

जवाहरलाल नेहरू विश्वविद्यालय
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI - 110 067

CENTRE FOR THE STUDY OF REGIONAL DEVELOPMENT
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CERTIFICATE

This is to certify that the dissertation entitled **AN ANALYSIS OF FAMILY PLANNING PERFORMANCE IN INDIA (1981-1991)** submitted by **Tarun Kumar Pradhan**, in partial fulfilment of the requirements for the award of degree of Master of Philosophy of the University, is to the best of my knowledge, a bonafide work and may be placed before the examiners for evaluation.

PROF. SUDESH NANGIA
Chairperson

20/7/98

PROF. SUDESH NANGIA
Supervisor

GRAM : JAYENU TEL. : 6107676, 6167557 TELEX : 031-73167 JNU IN FAX : 91-011-6865886

TO

MY PARENTS

ACKNOWLEDGEMENTS

I am deeply indebted to my supervisor **Prof. Sudesh Nargia** whose valuable guidance and constant encouragement enabled me to complete my work in time.

I also acknowledge the cooperation extended to me by the librarian and staff of the following libraries J.N.U. Library, Institute of Health and Family Welfare Library and Ministry of Health and Family Welfare Library.

I warmly appreciate Mr. Verghese for allowing me to use the computer and assisted me in data processing on the computer.

I express my thanks to my friends Ananta Mallik, Parths Sahu, Subhranshu Tripathy and Zakir Ansari for their constant help.

Finally, I would like to thank Mr. Raju & Sanil for the sincerely in typing out the manuscript.

Pradhan

(TARUN KUMAR PRADHAN)

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CHAPTER - I

INTRODUCTION

1.1 Problem

India is the second most populous country in the world. According to the 1991 census the population of India is about 846 million. The population of India is next only to that of the people's republic of China. India has about 16 percent of the world's population while it has only 2.4 percent of the total land area of the world. [1] Under a shady family planning programme, India is sitting on the population time bomb. According to the latest census the country is going to be the world's most populous nation by 2040 A.D. if determined efforts to reverse the growth trend are not made. The annual growth of population of India is approximately 18 million, equivalent to the size of six Singapore's. Though during the last four and a half decades of planning the real national income increased by almost six times the per capita real income would grow by only 2.4 times. Most of the benefits of India's growth and development are eaten up by population growth.

Table-1.1, presents the growth of India's population from 1901 to 1991. The trend of population growth upto 1921 was undulating. The decades of marked increases regularly alternated with decades of small increases while during 1911-1921 a negative growth rate was experienced. The absolute number of people added to the population during each decade has been on the increase since 1921. The decimal rate of growth has also increased from 1921 upto 1971. From 1951 onwards, India's population has been growing at a phenomenal rate.

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[1] Choudhury Rabindra Kumar, Approach to Ninth Five Year Plan, how pragmatic are its salient features: Kurukshetra, March-April 1997, p.6, Published by Director, Publications Division, Ministry of I and B. Govt of India, New Delhi

Table 1.1

Population growth in India 1901-1991

Year	Population in million	Decade growth percent	Average annual exponential growth rate (percent)
1901	238.4	-	-
1911	252.1	+5.75	0.56
1921	251.3	-0.31	-0.03
1931	279.0	+11.00	1.04
1941	318.7	+14.22	1.33
1951	361.1	+13.31	1.25
1961	439.2	+21.51	1.96
1971	548.2	+24.80	2.20
1981	683.3	+24.66	2.22
1991	846.3	+23.85	2.14

Source: Census of India, 1991 Series-I, India, Paper-1 of 1991, Provisional Population Totals.

While during 1941-61 the average decennial growth rate was 13.31 percent during 1951-1990 it increased to 21.6 percent and during 1961-71 it was 24.8 percent. From 1901 to' 1911 there has been an increase of 25.50 percent in the population. India's population has more than doubled in a period of 50 years, that is from 1921 to 1971. The decimal population growth rate during 1961-71 was 24.80 percent during 1971-81 it was 24.66 and during 1981-91 it was 23.85 percent.

Table 1.2

Annual Birth Rate and Death Rate per 1000 population in 1981 and 1991 (15 major states)

States	Birth Rate		Death Rate	
	1981	1991	1981	1991
A.P.	31.7	26.0	11.1	9.7
Assam	33.0	30.9	12.6	11.5
Bihar	39.1	30.7	13.9	9.8
Gujarat	34.5	27.5	12.0	8.5
Haryana	36.5	33.1	11.3	8.2
Karnataka	28.3	26.9	9.1	9.0
Kerala	25.6	18.3	6.6	6.0
M.P.	37.6	35.8	16.6	13.8
Maharashtra	28.5	26.2	9.6	8.2
Orissa	33.1	28.8	13.1	12.8
Punjab	30.3	27.7	9.4	7.8
Rajasthan	37.1	35.0	14.3	10.1
T.N.	28.1	20.8	11.8	8.8
U.P.	39.4	35.7	16.3	11.3
W.Bengal	31.7	27.0	11.0	8.3

Source: Registrar General, India-Sample Registration System

From the above table 1.2 the birth rate was highest 39.4 in UP and lowest was 25.6 in Kerala in 1981. But in 1991 birth rate was highest 35.7 in UP and lowest 18.3 in Kerala. The states where the birth rate was 30 to 36 in Assam, Bihar, Haryana, M.P., Rajasthan and U.P. in 1991. The birth

rate which was below 20, was in Kerala and rest of the states had the range between 20 to 30 per thousand in 1991.

High growth rate of the population continues to be one of the major problems facing the country. The growth of population directly results in increased demand for investible surplus for absorbing the increased labour supply. At the same time such growth reduces the supply of investible surplus by increasing the consumption demand through rise in the dependency ratio, increased demand for food and other consumer goods, increased demand for housing, education etc. In view of the fact that India does not have the capacity to mobilise adequate resources to meet the increased demand for consumption as well as jobs, population is deemed to be a problem.

Although the 1991 census recorded a marginal decline in the annual growth rate of population from 2.22 percent in 1971-81 to 2.11 percent in 1981-91, this would still mean an addition of 18 million people to the country's population annually. The fast rate of population growth means that the economy has to grow faster to protect the already low level of percapita availability of food, clothing, housing, employment and social services. The country is committed to social and economic justice to the millions of people living under conditions of poverty and deprivation. Failure to do so within a reasonable time frame may generate social tensions and unrest. Besides this the environmental degradation which is associated with unchecked growth of population carries the inherent risk of natural calamities and disasters. In this context population control assumes an overriding importance in the Eighth Plan[2].

According to the provisional estimates of population (Adjusted) on the basis of 1991 census) provided by the registrar General India, would

[2] Eighth Five Year Plan (1992-97), Objectives, Perspective, Macro Dimensions, Policy Framework and Resources, Volume I, pp.331-336, Government of India, Planning Commission, New Delhi.

reach 927 million as 1-3-1996. However according to the report of the standing committee of Experts on population projection October 1989 the population of India would a million mark by 2001 –2006 and the growth would be 1.52 percent per annum. The long term demographic goals as laid down in the National Health Policy (1983) was to achieve a NRR of unity (NRR=1) by the year 2000 A.D. This corresponded to achieving a birth rate of 21 per thousand, death rate of 9 per thousand and natural population growth rate of 1.2 percent. However keeping in view the present levels of achievement it has been stated in the Eighth Five Year Plan document that NRR-1 would now be achievable only in the period 2011-16 A.D. The goals to be achieved by the end of the Eighth Plan (1992-97) under the family welfare programme are, CBR per 1000 is 26 and IMR per 1000 live births to be 70. This involves the raising the level of couple Protection rate to 56 percent by the end of the Eighth Plan (1997)[3].

Table 1.3

Achievements of the Family Welfare Programme

Parameter	1951-61	1981	Current levels
Birth Rate	41.7	37.2 (1971-81)	28.7 (SRS 94)
Death Rate	22.8	15.0 (1971-81)	9.3 (SRS 94)
Total Fertility Rate	5.97	4.5 (1971-81)	3.5 (SRS 93)
Infant Mortality Rate	146	110	74 (SRS 94)
Couple Protection Rate	10.4 (1970-71)	22.8	45.8 (31.3.95)

Source: Ministry of Health and Family Welfare Department, Family Welfare Programme in India Year Book, 1994-95, New Delhi.

[3] Ministry of Health and Family Welfare: Family Welfare Programme in India, Year Book, 1994-95, p.7-9. Department of Family Welfare, New Delhi.

Taking into account the attraction due to ageing (going out of the reproductive age group) mortality and in case of IUD, additional factors of expulsions and removals the number of couples currently protected as if march 1995 was estimated at 81.74 million forming 51.6 percent of the estimated 158.31 million eligible couples in the country. Taking into account the use of effectiveness of various methods which is taken as 100 percent for sterilization and oral pills 95 percent for IUD and 50 percent for condoms the number of couples effectively protected as of March 1995 was 72.55 million forming 45.8 percent of the total eligible couples of this 30.20% were protected by sterilisation 7.2 percent by IUD, 5.4 percent by condoms and 3 percent by oral pills.

Andhra Pradesh, Gujarat, Haryana, Karnataka, Kerala, M.P., Maharashtra, Punjab, T.N. have a higher percent of effectively protected than the all India average of 45.8. The birth rate has declined from 41.2 in 1961-71 to 30.2 in 1990 and 28.7 in 1994. The three year moving average of SRS estimate of birth rate was 37.2 in 1970-72 and 28.9 in 1992-94. Estimate of different fertility indicators also showed decline in 1994 as compared to 1995 for both birth rural and urban areas. Though the use of contraception has increased four times between 1970 and 1992 there is a large variation between the states. According to the National Family Health Survey 1992-93 percentage of currently married women using contraception in India (47%), Kerala (63.3%), Punjab (58.7%), Rajasthan (31.8%), T.N. (49.8%), U.P. (19.8%), W.B. (57.4%). From table-3 India has achieved the couple protection rate (CRP) is 45.8 (less than 50) upto 31-3-1995. Thus there is a need to understand the factors that influence the acceptability of contraception in order to improve contraceptive use in India.

1.2 OBJECTIVES OF THE STUDY

The specific objectives for the study are:

1. To findout the relationship between the socio-economic-demographic variables with the family planning performance.
2. To measure the pattern of development of the family planning performance.
3. To suggest measures to improve the performance of family planning programmes.

1.3 THE STUDY AREA

The study area has covered North, South, East, West and North-East of India. The states (15 states) we have chosen are Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya-Pradesh, Maharastra, Orissa, Punjab, Rajasthan, Tamil Nadu, Utter Pradesh and West-Bengal. These 15 major states represent the more than 80 percent of population of India. We have not taken all the states of India because the 1991 census was not conducted in Jammu and Kashmir and some small states like Goa were not the states in 1981 census. It is a better study by taking 15 major states instead of all states of India. Each 15 major states has population one or more than one crores.

1.4 DATA BASE AND METHODOLOGY

For the purpose of study secondary data has been used from the following sources:

1. Family welfare programme in India, Year Book 1980-81 and 1990-91 issued by Ministry of Health and Family Welfare, Government of India.
2. Census of India 1981 and 1991 issued by census of India, Registrar General and Census Commission India.

To study the relationship between the dependent and independent variables we have used the correlation technique which gives us an idea

about the size and direction of the relation between the variables. Since the simple correlation analysis explains only the relationship between the two variables at a time we have also used the step wise multiple regression analysis. Stepwise regression procedure helps in observing the effects of adding independent variables in a systematic way. In such a programme the analyst inputs data for a set of independent variables. The computer first selects the independent variable that results in the greatest reduction of unexplained variation and runs a simple regression. Then under operation control it performs successive regression analysis by adding one or more variable to each run. 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 be make a significant reduction in the unexplained variation.

Multiple regression analysis ascertain the relationship between the dependent and independent variables. A multiple regression equation is one where the number of independent variables are more than one. The equation would be

$Y = \alpha+\beta_1X_1+\beta_2X_2+.....+\beta_nX_n.$

Where,

Y is the dependent variables

α is the intercept term

$X_1, X_2,.....X_n$ are the independent variables and

$\beta_1,\beta_2,....., \beta_n$ are the coefficient for independent variables.

Thus coefficients $\beta_1,\beta_2,....., \beta_n$ measure the degree of variation in each independent variable i.e. $\beta_1 = Y/X_1$. These coefficients are estimated in the computer programme as the coefficient of determination R^2 which measures the proportion of variation in the dependent variable associated with variation, in the independent variables. The volume 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 would mean that all the variation in dependent variable is explained by simultaneous variations in the dependent 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 dependent variable) to unexplained variation. To test whether overall equation is significant we compare the value for the F-statistic with critical F-value. If the value for the F-statistic exceeds the critical F-value we can say that the regression equation 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 variable is significant at a particular level of significance.

The number of developed and developing countries in the world with national family planning programme have set demographic goals in terms of specific reduction of the crude birth rate within a definite framework. A variety of techniques have been utilised according to the availability of analytical skills and data to evaluate national family planning programmes at the regional or sub-regional levels. These methods usually provide a broad assessment about the family planning programme as to whether it could or not achieve the required target and the intermediate and ultimate goals of the programme. Hence the evaluation of family planning performance becomes more analytical and depends upon the power of technique. Further sub-regional level evaluation of programme performance by using sophisticated techniques may lead to surplus results, thereby suggesting the need for simple techniques which can identify regions with different performance levels. The taxonomic method

was proposed to UNESCO in 1968[4] as a means of comparing countries or areas with respect to levels of development. The taxonomic method is given below.

Let 1,2,3,.....,n be the n number of states and 1,2,3,....,m the number of variables dealing with a specific category of development (in this case of family planning performance). Then let Anxm be the data matrix representing the variables by state.

$P_1(x_1,x_2,.....,x_m)$, $P_2(x_1,x_2,.....,x_m)$,..... $P_N(x_1,x_2,.....,x_m)$ which can be represented by the following matrix.

Matrix - 1

$$\begin{bmatrix} X_{11},X_{12}.....X_{1m} \\ X_{21},X_{22}.....X_{2m} \\ ..... \\ ..... \\ X_{N1},X_{N2}.....X_{Nm} \end{bmatrix}$$

Thus every state is represented by a point or vector in an m-dimensional stage. In order to eliminate the influence of various units of measurement a standardisation of particular variables is carried out by the following formula.

$$\frac{X_j - \bar{X}_j}{s_j} \quad ..... (1)$$

Where j = 1,2,.....,m

And

$$\bar{x} = 1/N\sum_{i=1}^{N} X_{ij} \text{ and } S_j\ [1/N \sum_{i=1}^{N}(X_{ij} - \bar{x}_j)^2)^{1/2}]$$

[4] Frederick H. Harbison, Joan Maruhnic, Jane R. Resnick, Quantitative Analysis of Modernisation and Development, 1970 Page (1-7), Princeton University.

The standardised procedure now results in a new matrix where every state is represented by a standardised point or vector in an m-dimensional space. The standardised matrix would be:

Matrix - 2

$$\begin{bmatrix} D_{11}, D_{12} \ldots\ldots D_{1m} \\ D_{21}, D_{22} \ldots\ldots D_{2m} \\ \ldots\ldots\ldots\ldots \\ \ldots\ldots\ldots\ldots \\ D_{N1}, D_{N2} \ldots\ldots D_{Nm} \end{bmatrix}$$

Where

$$D11 = \frac{X_{11} - \bar{X}_{1.}}{s_1}$$

$$D12 = \frac{X_{12} - \bar{X}_{2.}}{s_2}$$

....

$$D1m = \frac{X_{1m} - \bar{X}_{m.}}{s_m}$$

From the above standardised the next step is to get the difference or distance from each point to every other point (1,2,.........N) for each of the m variables which results in another interim matrix

Matrix - 3

$$\begin{bmatrix} D_{11} - D_{21} & D_{12} - D_{22} \ldots\ldots\ldots\ldots & D_{1m} - D_{2m} \\ D_{11} - D_{31} & D_{12} - D_{32} \ldots\ldots\ldots\ldots & D_{1m} - D_{3m} \\ \ldots\ldots\ldots\ldots & \ldots\ldots\ldots\ldots & \ldots\ldots\ldots\ldots \\ \ldots\ldots\ldots\ldots & \ldots\ldots\ldots\ldots & \ldots\ldots\ldots\ldots \\ \ldots\ldots\ldots\ldots & \ldots\ldots\ldots\ldots & \ldots\ldots\ldots\ldots \\ D_{(N-1)} - D_{N1} & D_{(N-1)2} - D_{N2} \ldots\ldots\ldots\ldots & D_{(N-1)m} - D_{Nm} \end{bmatrix}$$

Finally the distance between points Pa and Pb for any set a subset of m variables is derived by the following formula

$$Cab = [\sum_{k=1}^{m}(D_{ak} - D_{bk})^2]^{1/2} \quad \ldots\ldots\ldots\ldots\ldots (2)$$

where the following relationships are apparent:

$C_{aa} = 0$; $C_{ab} = C_{ba}$; and $C_{ab} \leq C_{ak} + C_{kb}$

The above formula results in a symmetric matrix termed the distance matrix.

Matrix - 4

$$C = \begin{bmatrix} 0 & C_{12} & \ldots\ldots\ldots & C_{1N} \\ C_{21} & 0 & \ldots\ldots\ldots & C_{2N} \\ \ldots\ldots\ldots & 0 & . \ . & \ldots\ldots\ldots \\ \ldots\ldots\ldots & & 0 & \ldots\ldots \\ C_{N1} & C_{N2} & \ldots\ldots\ldots & 0 \end{bmatrix}$$

Within a given set of states this distance of each state to every other is a synthetic or composite distance. In otherwords it is a mathematical expression of several distances on each of several dimensions with which states can be compared . Once the matrix C (matrix 4) is given the minimum distance C_a from that state to all other states is the row can be found which is the index of resemblance – the closest point within a given frame of reference. Since the minimum distance between point P_a and all other points in the raw is the number C_a, P_b, can be called the model of P_a and P_a is the shadow of P_b, Some ambiguity could arise when there is more than on equal distance corresponding to a given point P_a. However the chance of such an event is nearly zero so the assumption is that there is one and only one closest point.

The next step is the determination of linkage relationships. The object is to find the shortest linear graph to represent groups of states. Once the single joint graph is determined the N-1 links are arranged in

decreasing order and the first K-1 links removed from this sequence. The number K is fixed by the critical minimum distance which is derived by the formula.

$C_{(+)} = \overline{C}+2Sc$ ..... (3)

Where $\overline{C} = 1/N \sum_{j=1}^{N} C_j$

Is the arithmetic mean of the distance C_j (the minimum in each row of the distance matrix) and

$Sc= [1/N\sum_{j=1}^{N}(C_j -\overline{C})^2)]^{1/2}$

is the standard deviation of the minimum distances in each row. The number K is the number of such graphs connected by links in the optimal (single joint) which are larger than $C_{(+)}$. The number of N elements in the set can be reduced farther with the second critical value.

$C_{(-)} = \overline{C}-2Sc$ ..... (4)

Now all nodes with distances shorter than $C_{(-)}$ are cancelled. Subsets of the set obtained by means of the best participation of this set into K points will be called typological groups. Every subgraph creates a distinctive typological group, embracing elements which may be considered as a measure of resemblance the greater is $C_{(+)}$ the smaller is the resemblance between all possible pairs of points. In planning the choice of goals is always a prime factor. Towards this purpose, patterns and measures of development can be derived from this taxonomic method. The object is to find a state or country upon which a model but which has to be on a higher level. One first has to assume the direction of change in a variable which tends to achieve higher development. For each variable in each set of N states there exists an 'ideal value' which is simply the best value for all variables included in the index but this is unlikely and variety of states may be used to stimulate this ideal state. Hence we can find the standardised value (from matrix – 2) which is the highest for variables which have a stimulant nature and the highest negative value for those variables which tend to hamper development. The pattern of development variables (C_{io})

is simply the distance of each state in the matrix to the ideal state (o) as derived by the following formula.

$$C_{io} = [\sum_{k=1}^{m}(D_{ik} - D_{ok})^2]^{1/2} \quad \ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Where i = 1,2,....., N) and 'O' is the maximum standardized value as determined from matrix 2. The large is this number C_{io} the greater is the distance from this particular state to its potential high point within the set or subset. The measure of development is a method of simulating the percentage of development in a particular area. In otherwords it is a function of the pattern of development and the 'critical distance' from the so-called, 'ideal' state. The following formulas may be applied:

$$d_i = C_{io}/C_o \quad \ldots\ldots\ldots\ldots\ldots\ldots (6)$$

where $C_0 = \overline{C}_{io} + 2\, S_{io}$

and $\overline{C}_{io} + 1/\, N\sum_{i=1}^{N}(C_{io}$ (the mean of the pattern of the development)

and $S_{io} = [1/N \sum_{i=1}^{N}(C_{io} - \overline{C}_{io})^2)^{1/2}]$

In the above equations (d_i) shall be called the measure of development. The closer d is to O the more developed is the country and the closer to 1 the less developed the state. The measure is constructed in such a way that it is always non-negative. It can exceed 1 but the probability of such an extent is small so that in the majority of cases the following inequality holds.

$$0<d<1$$

1.5 RESEARCH DESIGN

The organisation of the study in the ensuring chapters including the present chapter is given below:

CHAPTER I, gives the introduction to research including the topic selected area to the studied database, methodology, objectives of the work and tells about the method used.

CHAPTER II reviews the literature past family planning performance studies based on India. This chapter also gives the conceptual framework and also gives various path models developed over the time by various scholars and keeping the previous studies in mind working the variables and hypothesis have been developed.

CHAPTER III looks at association existing among dependent and independent variables by correlation and multiple regression analysis method. The pattern of development of family planning performance has been measured by taxonomic method.

CHAPTER IV is based on the conclusion of the study. This chapter also suggest measures which could help in increasing the acceptance of family planning.

A bibliography of the literature relevant to this work has been appended at the end.

In this chapter the statement of the problem, objectives of the study, the study area, database, methodology and the research design has been discussed.

In the next chapter we shall discuss the literature survey, selection of variables, conceptual framework and formation of hypothesis.

CHAPTER II

REVIEW OF LITERATURE AND CONCEPTUAL FRAMEWORK

(2.1) INTRODUCTION

A number of factors have been selected by researcher on the basis of empirical research, which explains differential use of family planning methods. Some of the major factors are social, economic, demographic and health factors. There are a considerable number of studies that deal with the different methods of the family planning performance. It is difficult to review all the studies. We therefore selected only a few of those studies. Hence we briefly reviewed the finding of those major studies in respect of the above mentioned factors. The review of literature survey is based on the following steps. These are (1) factors affecting family planning performance, (2) methods of family planning performance, (3) variable/indicators of the family planning performance, and (4) pattern of development of the family planning methods.

(2.2) LITERATURE SURVEY

Srikantan, Mulay and Radkar[1] have analysed the socio-demographic determinants that create the demand for family planning. Their study is followed by a multivate analysis of the relevant data from the National Fertility and Mortality survey, Maharashtra 1980 (NFMS), contains information of family planning use about 8000 women from rural and urban areas of the state. They have taken some variable which identified as closely associated with family planning acceptance.: (1) education of wife. (2) cast-cum-religion of the acceptor, (3) number of children living and (4) number of sons living . The number of children living and the number of

sons living are the more dominant among the variables. Higher education in an urban areas enhances the possibility of contraceptive adoption. In rural areas the level of interaction of caste and education with family size attitudes is less significant . The influence of the traditional milieu in rural areas appears so strong that higher education or an advanced caste does not generally lead to relative by greater contraceptive adoption. For urban-women, the interaction of caste and education with the number of living children is of a higher order compared to that with the number of living sons.

Srikantan[2] has found that both socio-economic development and family planning have substantial and important effects on fertility reduction. From the broader policy perspective is the socio-economic development and a family planning program are not independent of one another but have a positive interaction. The most appropriate to initiate a family planning progress as an integral part of social and economic development plans. Such an integration will exploit more adequately the interactive effects of socio-economic development and family planning on fertility. The comparative study for different countries carried out by Lapham[3] and Mauldin and Ross[4] shows that the variables measuring the programme effort are equally important as the variables determining the socio-economic setting. This is expected since population policies vary significantly even between countries at the same level of development. When the same analysis is made for states within a country, the

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[1] Srikanta K.S., Mulay Sanjeevanee and Radhkar Anjali, Correlates of Family Planning Acceptance: A Multivariate Analysis, Artha Vijnane, June 1992, $V_3$4, N2, pp.163-181.

[2] Srikantan, K.S., (1997), The Family Planning Program in the Socio-Economic Context, Population Council, New York.

[3] Lapham, R.J., and W. Parker Mauldin (1985), Contraceptive Prevalance: The Influence of Organised Family Planning Programme, Studies in Family Planning, vol.16, No.3

[4] Mauldin, W. Parker and John A. Ross (1991), Family Planning Programs: Efforts and Results, 1982-89, Studies in Family Planning, vol.22, No.6.

conclusions may not be similar. Jain's[5] study shows that adult female literacy and the level of urbanisation are the more important explanatory variables. Narayan Das[6] also arrives at similar findings. Jolly[7] uses all districts of India as the units of analysis. The study concludes that, improvements both in social and economic level reinforce each other in raising the level of family planning acceptance. In these studies female literacy is seen to have the largest impact on family and fertility. When the programme is in its infancy, the mostly higher parity women with lower levels of education appear to accept family planning; some educated women seem to accept contraception even at low parities because of their modern attitudes. There was consistent association between education and contraception and this has emerged from several studies. No significant difference has emerged between the educational levels of the acceptors and the general population in the conducted evaluation studies v.i.z. in rural Maharashtra by the Population Research Centre, Pune, (Bhate and Srikantan, 1987a and 1987b)[8]. There are a few studies Chaudhary[9], which indicate a clear link between education and practice of family planning. The association of educational level with acceptance of contraception should not be interpreted as the direct effect of formal education but as on its indirect impact through modern values, acquired by education or due to the association of socio-economic factors with a high level of women's education. This is one reason to find no significant

[5] Jain Anrudh (1985), Impact of Development and Population Policies on Fertility in India, Studies in Family Planing, Vol.16, No.4.

[6] Das Narayan (1973), Factor Analysis Model to Study Variation of Family Planning Performance in India, Demography India, Vol.2, No.2.

[7] Jolly, K.G. (1986), Family Planning in India, 1969-84: A Direct Level Study, Hindustan Publishing Corporation, Delhi.

[8] Bhate, Vaijayanti and K. Sivaswamy Srikantan (1987a), Family Planning Behavour in Maharashtra, Artha Vijnana, Vol.29, No.1 Bhate, Vaijayanti and K. Sivaswamy Srikantan (1987b), Family Welfare and Mett Programme: Rural Nasik District, 1984-85, Artha Vijnana, Vol.30, No.2.

[9] Chaudhary, R.N. (1979), Socio-Cultural Factor Affecting Practice of Contraception in a Metropolitan Urban Area of Bangladesh, Demography India, Vol.8, No.1 and 2.

relationship between education and contraception in a rural milieu where modern values have not permeated.

Srikantan[10], et. al. have studied that atmosphere is more open to modern values and ideas and conducive to the acceptance of contraception by less educated women. As far as rural areas are concerned caste and religion seem to be associated with the acceptance of contraceptive. Some studies Reddy[11] arrive at the finding that caste is a proximate correlate of attitude towards family planning acceptance and practice. Other studies have indicated that the association of caste with the level of acceptance is more complex. The more advanced the caste, the higher the level of acceptance seems to be. On the other hand it has been observed for Orissa that scheduled castes and Tribes have a higher acceptance rate than advanced castes. Preference for a son is so strong even among educated and advanced caste couples that unless they have at least one or sometimes even two sons, they are not ready to accept contraception. Use of spacing methods is also conditioned by the sex-composition of children. The desire for a son is a deep-rooted cultural factor and there are no indications of its weakening in the near future. A number of studies have brought out this finding, v.i.z (Srikantan and Bhate, 1989)[12]. A study by Srikantan and Saxena[13], has been done by states to study the relationship of the population growth rate during 1971-81 to such proximate variables as the level of contraceptive use in 1980 and social variables like female literacy levels in 1981. This analysis reveals that in general population growth is negatively related to the level of contraceptive use and to the

[10] Srikantan, et al. (1988), Fertility Differentials by Socio-Demographic Characteristics of couples in Maharashtra, 1980, Artha Vijnana, Vol.30, No.2.

[11] Reddy, M. Munnikrishna (1984), Socio-Economic and Demographic Factors and their Influence on Family Planning Behaviour Among Non-Adopters, Journal of Family Welfare, Vol.30, No.4.

[12] Srikantan, K.S. and Vaijayanti Bhate (1989), National Fertility and Mortality Survey, Maharashtra, 1980, Publication No.70, Gokhale Institute of Politics and Economics, Pune 13.

[13] Srikantan K. Sivaswamy and Saxena Swati (1981), "1981 Population Census Results in Perspectives", The Journal of Family Welfare, XXVIII(2), pp.5-16.

female literacy level. It was also found that the state those have been successful in family planning have also been successful in increasing their literacy rates.

Pai Panandiker[14] et.al attribute the differential performance by states to factors such as the socio-economic diversity, within the country, lack of commitment to the programme, inadequate health and transport infra-structure and inefficient management of the programme in some states, lack of local support in rural areas and unwillingness of family planning personnel to work in rural areas. Chatterjee[15], has studies the selection of personnel working at the grass roots level in the field of family planning in 14 states of India. For both male and female workers, the General information test was the best predictor, followed by the socio-economic status scale, intelligence test and the religion value scale. Mulay and Balasubrahmanian[16] presents the findings of an evaluation study of three projects of family planning and health undertaken by three non-governmental organisations (NGO) is Maharashtra state. The study identifies various factors like income generation and population education determine the performance of the NGO. Khan[17] compared the relative importance of program variables and individual characteristics in the decision to adopt sterilisation through multi-varieties analysis (Regression analysis). Data for this study were gathered in interview of 3, 904 male urban industrial workers randomly selected from eight industries four each from the eastern (Jamsedpur Ranchi) and western (Ahmedabad and

[14] Pai Panandiker, V.A. Bishnoi, R.N., and Sharma, O.P. (1983). Organisational Policy for Family Planning, Uppal Publishing House, New Delhi, pp. 213-218.

[15] Chatterjee B.B., et. al.; A multivariate method for selecting field level family planning workers in India, Journal of Family Welfare, December 1974, Volume XXI, No.2, pp.82-87.

[16] Mulay Sanjee Vanee and Balasubramanian K., (1992), "The performance of Non-governmental organizations in Family Planning and MCH in Maharashtra State", Artha Vijnan, June 1992, Vol.4, No.2, pp.209-231.

[17] Khan M.E. (1980), "Determinants of sterilisation in India". Operational Research Group, Delhi in the role of surveys in the analysis of Family Planning Programmes (ed) Albert I. Hermalin and Barbara Entwisle, International Union for the Scientific Study of Population, pp.120-121.

Bombay) part of India. The independent variables were (1)number of living children part of (2) number of male children; (3) perceived economic benefits of children; (4) felt economic burden of children; (5) knowledge of family planning; (6) Wife's attitude towards family planning; (7) motivational facilities; and (8) operational facilities. The above variables explain the adoption of sterilisation.

Usha Bombawale[18] has discussed about socio-religion thought and importance of male progency as well as factors of persistence and change in pattern of family formation in India. "In Hindu fold of life a son is desired because the son alone can carry out the security at the old age. Kirk[19] conclude that the "children are among the richest blessing that Allah bestow - He will provide for the soul. He permits to come into the world." This belief is quite common among the people of Pakistan. They believe that to adopt contraception is against God's will. Ashtaq Ahmad[20] (et.al) have studies to investigate the association if any, between fundamentalism and size and sex preference among women of rural Pakistan. The main assumption underlying this study was that fundamentalism is one of the major determinants of underlying family size and sex preferences among women of rural Pakistan. Education is the most important factor in lowering fundamentalism. The study of Rahman Miah[21] examine a host of socio-economic factors that determine infant/child mortality of married women at the different parity levels in Bangladesh. A multivariate analysis of 1975-76 of Bangladesh Fertility Survey (BFS) data shows the age is a significant

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[18] Bombawale, Usha; Family Planning in India: Change and Continuity, Social Change; September 1992: vol.22, No.3, p.38.

[19] Kirk, D.: "Factors affecting Muslim Nationality" in B erelson (eds) "Family Planning and Population Programmes" London: The University of Chicago Press, 1966.

[20] Ahmed Ashfaq (et. a l .) ; "Fundamentalism: A Determinant of Family Size and Sex Preferences in Rural Pakistan, Journal of Rural Development and Administration, Vol.XXII, No.1, Winter 1990, pp.68-95.

[21] Miah Mizanur Rahman: Factors influencing infant/child mortality in Bangladesh: Implication for Family Planning Programs and Politics, I nternational Journal of Sociology of the Family 1993, Vol.23 (Autumn), pp.21-34.

positive determinant of infant/ child mortality for low parity (3 and below child birth) women. For medium parity (4 to 5 children birth) women, infant/child deaths were significantly determined by the mother's age, religion, husband's education and the use of contraception which infant/child deaths of high parity women are significantly and negatively affected by their urban residence, husband's education and the practice of efficient methods of family planning.

Meredith[22] discussed the problems of implementing the policy such as the influence of peasants into the cities the attitudes of rural residents and the issues of minority groups. About 20% of Chinese live in urban areas. The one child policy has been most successful in urban areas worth over 90% compliance (Falbo 1990). The old ideas persists such as men being superior to women and without a son's it is difficult to solve practical working and living problems. These factors measure include an insurance plan for the elderly that will free them from worry at home and the formation of labour pools to help such families during harvest period. Those families who have no sons also get priority in various allocations and enjoy various kinds of welfare benefits. In addition, pension plans and insurance plans are being developed to aid the rural elderly to relative their concerns about their old age.

Agarwal[23] analysed state wise variations in acceptance rates in terms of manipulative (medical plus paramedical personnel per 10,000 eligible couples and expenditure on family planning programme per 10,000 eligible couples and expenditure on family planning programme per 10,000 couples) and non-manipulative variables (per capita income, percentage of

[22] Meredith, William H.; China's Family Planning Policy today; International Journal of Sociology of the Family (1993), vol. 23 (Autumn): pp.35-50.

[23] Agarwal, S.N. (1972), A survey of factors explaining variability in family planning performance in different states in India. Proceedings of 1972, All India Seminar on Family Planning problems in India, International Institute for Population Studies, Deonar, Bombay.

urban population and percentage of general literacy for ages 15 plus). Using the multiple correlation analysis he found that all variable together explained about 87% of the state wise variations. The manipulative variable explained about 56% of the state wise variations and there was an overlap in the average acceptance rate of family planning methods, per 100 currently married women between ages 15-44 during 1967-70. The non-manipulative variables explained about 19% of the state wise variations. The manipulative variable explained about 56% of the statewise variations and there was an overlap of 12% between the two sets of independent variables. Based on his analysis for the acceptance rates during the single years, 1967-68. 1968-69 and 1969-70. Agarwal concluded that the role of the non-manipulative variables in explaining state wise variability in acceptance rate goes on decreasing as the programme advances in time and in the near future manipulate variables will play a significant role in raising the level of acceptance of the family planning programme. The implicit conclusion seems to be that the manipulative variables are more important than the non-manipulative variables in explaining the statewise variation in acceptance rates. Vig[24] applied the technique of path analysis for studying the state wise variations in acceptance of family planning methods during 1966-71. He used six non-manipulative variables considered by Vig included percent general literacy percent urban population, percent non-agricultural population excluding percent industrial workers, percent non-Muslim population and per capita income. Total expenditure on family planning is taken as the programme variables and variation is explained is terms of medical personnel and field staff. Based on his analysis, Vig concluded that general literacy and urbanisation indirectly influence the acceptance of

[24] Vig, O.P. (1972), An application of path to study variation in the acceptance of the family planning performance in India, 1966-71, Proceedings of 1972 All India Seminar of Family Planning Problems in India. International Institute for Population Studies, Deonar, Bombay.

family planning programme. But industrialisation and economic prosperity has a direct influence on the acceptance of programme puts in the acceptance of significant. Misra[25] used regression analysis and analysis of variance to study the differential performance of states with respect to study the differential performance of states with respect to the acceptance of family planning methods. He used three dependent variables: (1) Cumulative performance rate of IUD and sterilisation per 1000 population until 1971-72; (2) present eligible couples protected by all methods until 1971-72 and (3) IUD and sterilisation performance during 1971-72 as per cent of eligible couples in each state. The analysis carried out by Misra indicates that (1) about 50% of the variability in all three dependent variables can be explained either by the medical and paramedical personnel per 10,000 eligible couples in 1969-70 or by the expenditure on family planning per 1000 eligible couples in 1968-69, and (2) about 80% of the variability in all three dependent variables was due to the joint effects of either the manipulative variables (medical and paramedical personnel) with the development variable - per capita income 1964-65 - or the manipulative, variable -expenditure on family planning with the development variable -per capita consumption of electricity in 1968-69. Based on his analysis, Misra concludes that the importance of these types of supported influences on family planning performance is by the statistical results presented by him. Jolly used regression analysis to investigate the differential performance of the programme at district level for India during 1969-80. According to Jolly, in a situation where the pattern of family services are uniform at the district level, the role of family planning inputs is explaining inter district variation in the performance of the programme could be very limited. So he focused attention on the role of various social and economic variables for an idea of factors that explains the

[25] Misra, Bhaskar. D (1973), Family Planning: Differential Performance of States, Economic and Political Weekly, September 29, 1973.

differentiates in the performance of family planning. Jolly selected 9 social and 7 economic variables. The selected social variables are percent Hindu population, literacy rate, percent urban population gini ratio, percent of Scheduled Caste/.Tribe population, percent electrified villages, mean age at marriage female and percent of non-Hindu population are district level. The economic variables are agricultural productivity, population density by gross cropped area, male participation rate, female participation rate, surfaced road mileage, percent irrigates crops and percent commercial crops. Family planning performance has been measured in terms of cumulative acceptance rate equivalent sterilisation per 100 currently married couples in the reproductive age groups and also percent of couples efficiently perfected (user rate) in 1980. Jolly[26] concluded that social variables explained variation better than economic variables through both explain statistically significant proportion of variation. Between the two social variables seems to have a better role to play in raising the level of family planning performances.

Many of these studies focused attention on fertility and natural acceptance of family planning methods. One of the variables that has been extinsively examined the connection with acceptance of family planning method is infant mortality rate. Rao[27] did a study on mortality in India in relation to prospects of fertility decline. He found the trends on mortality decline in India and several other Asian countries. He suggested that deliberate attempts of improving infant mortality through effective maternal and child care with family planning programme can accelerate an already existing trend of fertility decline as is perhaps true in case of Taiwan, Korea, Hong Kong.

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[26] Jolly, K.G., Family Planning in India: A district level study, 1969-1984, Population Research Centre, Institute of Economic Growth, Delhi.

[27] Rao, S. & Krishnaswamy (1970), Mortality in India in relation to prospects of fertility decline. Technical Paper 10, National Institute of Family Planning.

Memon[28] found that the main reason for resistance to family planning among the rural population in their uncertainty about the future of their infants in India. Likewise, Subhadra Devi[29] analysed a sample of 1948 currently married women in Kerala, and found less adoption of contraception due to high infant and child mortality. Lallith Dias and Malsiri Dias[30] studied the number of vasectomies performed during the period (1979-1982) of Sri Lanka. The conclusion of the study was that the financial incentives for sterilisation were offered in many third world countries like India, Bangladesh, Nepal, and Sri Lanka. The incentive paid in Sri Lanka was the highest paid greater seems to be the motivation to get a vasectomy done. Pathak and Prasad[31] analysed the socio-economic factors which affect the progress of family planning performance i.e., (sterilisation IUD and conventional contraceptive mainly " Nirodh in 18 states of India from 1967-1975. They have selected a common set of four variables namely (a) the number of service centres per 10,000 eligible couples, (b) per capita income, (c) percentage of urban population and (d) general literacy rate. For the socio-economic and performance variables Pathak and Prasad have used the methodology which are correlation and component analysis of simple correlation coefficients. From the conclusion it is clear that for almost all the methods , the performance of these which have higher per capita incomes have better and that for most of the time the literacy rate and urbanisation have worked through either the input variable (i.e. service centres) or per capita income. For the period 1967-70 the service centre top the list being followed by the percentage of urban

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[28] Krishna Memon, M.K. (1972), "Integration of Family Planning with General Health Care", The Journal of Family Welfare, VolXVIII, No.4, June 1972.

[29] Subhadra Devi, V. (1978), Effect of perception of infant mortality in actual family size. The Journal of Family Welfare, VolI, XXIV, No.4.

[30] Dias Lalith R. and Dias Malsiri K., "The Motivating Factor for Vasectomy in Srilanka", The Journal of Family Welfare (1988), Vol.30, No.4, pp.12-22.

[31] Pathak K.B. and Prasad C.V.S., Component Analysis of the Correlations of Some Factors with Family Planning Performance by Methods in India During 1967-73, The Journal of Family Welfare, March 1977, Vol. XXXIII, No.3, pp.3-12.

population. For the period 1970-73 the maximum direct effect is that of literacy being followed by the percentage of urban population variables like per capita income and the percentage of urban population are the most dominating variables influencing IUD insertion rates while for conventional contraceptive uses per capita income seems to be most dominant. The set of variables considered is not efficient in describing variation in sterilisation performance as well as IUD insertion through they have been also able to describe 72% and 80% of the variations in conventional contraceptive acceptance among the states for the periods 1967-70 and 1970-73 respectively. The improvements in the level of literacy and education particularly among housewives and the adult male population would be expected to play more important role in raising the level of overall adoption of family planning practices. Poffen benger and Frubuchen[32] studied the villager's attitudes towards the family planning programme of Nepal. As the cost of raising children increases in Nepal, increasing number of Nepal parents will desire to limit the growth of their family. Vasectomy was considered the best method for limiting family size because it was permanent and least likely to cause wealth problems. Katiyar[33] found out the demographic and socio-economic factors and the value orientations of individual which influence family size and composition with reference to both accepting and non-acceptors of family planning.

In a similar manner, religion is an important social factor influencing the contraceptive behaviours of the people. Religious differential in family planning performance could be due to current mortality attitude of community and due to the socio-economic levels of the religious groups.

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[32] Poffenberger Mark and Furbuchen Many; "Attitudes Affecting Family Planning Behaviour Among Villages in the Kathamandu Valley of Nepal", The Journal of Family Welfare, September (1975), Vol. XXII, No.1, pp.3-14.

[33] Katiyar, Ram Kishore, "Determinants of Values in the Small Family Norm", the Journal of Family Welfare, March 1976, vol. XXII, No.3, pp.62-67.

Balakrishan and Narayana Murthy[34] studies a sample of 14 leaders and 3375 non-leaders in the 16 states of India. They found the influence of religion towards family planning in leaders. But Vasanthini[35] in Mysore found religious as not an inhibiting factor in the acceptance of family planning. In the similar manner, Dandekar[36] studied a sample of 647 married women in Bombay and Hyderabad states. They found no religious dogma to disapprove contraception. Some of the studies found Muslims and Christian to be unfavourable towards family planning while other found Muslims, Christians and Parsis to be more favourable. While investigating a sample of 1000 married couples in Madras, Chandrasekhar found Muslim and Christian to be less investor in family planning. But Majundor[37] while studying a sample of 1525 low income group mean women in Kanpur found Muslim and Christian women are more anxious for family planning than the Hindu and Sikh women. Desai[38] found acceptance level high in Parsi women. Similarly, surveys of family planning clinic or public health centre patients have reported different figures. Swamy[39] who studied a sample of 175 rural and urban cases who came to the public health centre in Jammu and Kashmir state found only 6 Hindus and the remainder Muslims. But an analysis of 272 vasectomized cases in Kanpur by Banerji[40]

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[34] Balakrishna, S. and Murthy Narayana, M.V. (1968), "Some correlates of attitudes towards family planning", Journal of Family Welfare, 15(2): pp.41-58.

[35] Vasanthini, R. (1957), Acceptance of family planning in the rural study conducted at Ramanagram Family Planning Centre, Third All India Conference on Family Planning, 120-123, also Journal of Family Welfare, 3:14 -19, January-February, 1957.

[36] Dandekar, Kumidini (1959), A demographic survey of six rural communities, Gorkhale Institute of Economics, Publication, 37.

[37] Majumdar, D.N., Report on the enquiry into fertility and family planning among a section of married women in Kanpur, Lucknow; Department of Anthropology, Lucknow University, 1955-56:45.

[38] Desai, F.R. (1964), Attitude of Parsee Mother towards Family Planning, Diploma Thesis in Social Service Administration Tata Institute of Social Science.

[39] Swamy, Y.L. and Langoo, P.N. (1969), A study of male sterilisation in Jammy & Kashmir, Family Planning News, 10(1), pp.2-5.

[40] Banerji, T.P. (1961): A study of male sterilisation at Kanpur, Report on 202 cases of vasectomy, Journal of the Indian Association. 36(12); pp.578-580.

found no Muslims, one Christian and the remainder Hindus. Das[41] in the rural and urban areas of Baroda, examining 1219 males and 1422 females from urban Baroda, 982 males and 975 females from rural Baroda found urban-rural differences in the Knowledge.

Sweeney[42] on the basis of the studies conducted in twenty two countries concluded that advertisements in newspapers offerer materials for contraceptives, one sufficiently successful to warrant continuing family planning programme in India, Sri Lanka and Taiwan. In Japan, the first survey conducted by the Mainichi group of Newspapers showed that 60% of the respondents approved of contraception and about 20% were practising contraception. By 1963, 90% recognised the concept of planned birth and practice rate was 44%. Dubey[43] in a study of Delhi also found newspaper to be a significant source of information about the IUD. Kerlim[44] and Ali found radio messages effective in motivating people to take advantage to available community services and in stimulating discussions about family planning in rural and urban communities of Pakistan. Patel[45] studied the impact of two radio broadcast in family planning among 181 couples of a village in Ahmedabad and found that 25 to 50%, of the sample had heard the two broadcast on family planning and each listener on an average reported discussing with at least 6 persons about family planning. This study also highlighted the usefulness of providing family planning information through the more popular programme like Vividh Bharati, Radio

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[41] Das, N.P. 1972), Factors related to knowledge, family size preference, practice of family planning in India, Journal of Family Welfare, 19(1).

[42] Sweeney, W.O. (1977), Media communications in population/family planning programmes: A review, population reports J(16): 294-303.

[43] Dubey, Dinesh C. And Choldin, Harvey, M. (1967) Communication and Diffusion of the IUD: A case study in Urban India. Demography 4(2): 601-614.

[44] Kerlim, B. and S.M. Ali (1968), The Use of the radio in support of the family planning programme in Hyderabad district of West Pakistan; Pakistan Journal of Family Planning, 2(2): 1-3, July, 1968.

[45] Patel, V.M. (1968), A study of effectiveness of the radio as a medium of communication. The Journal of Family Welfare 14(3).

Ceylon etc. Danderkar[46] study indicated that the family planning clinic may not be very effective medium of communication. The study, experimented on communication and revealed that discussion regarding family planning with women patients required aptitude and skills, which were not necessary for an otherwise effective medical personnel. Information giving during the period of confinement was not effective and personal contract were lacking.

Srikantan and Balasubrahmanian[47] have studied the family planning programme of India. They have also evaluated the performance of the programme in the terms of acceptance and prevalence of various contraceptive methods. The contraceptive methods provided by the programme are vasectomy, tubectomy, IUD, conventional contraceptives. (Condoms, diaphragms, jelly / cream and foam tablets) and oral pills. Of all the methods of family planning, the actual emphasis of the programme falls in sterilisation mainly because the number of annual acceptors of their method is far larger then for IUD, which also has a much lower method continuation rate. Besides, sterilisation has a major share in the overall impact of the programme of fertility. The number of conventional, contraceptive users relates to the prevalence of such use rather then to new acceptors. Hence the trends in annual achievements are mainly governed by the number of sterilisation. The conclusion of the study gives the acceptance of vasectomy, tubectomy, IUD, equivalent sterilisation, for India from 1974-75 to 1980-81. Ministry of Health and Family Welfare[48] has worked our procedures for assessing the contributions of the different

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[46] Dandekar, Kumudini (1967), Communication in Family Planning, Bombay, Asia Publishing House, pp.56-104.

[47] Srikantan K.S. and Balasubramanian, Demographic Evaluation of India's Family Planning Programme, Artha Vijnana, September 1983, Vol.25, No.3 , pp.205-230.

[48] Ministry of Health and Family Welfare (1982), Government of India, pp.59 & 60.

methods in terms of equivalent sterilisation. As a rule of thumb the number of equivalent sterilisations for IUD and equivalent conventional contraceptives and oral pill users is calculated as 1/3 the number of IUD insertions, 1/18 the number of equivalent conventional contraceptives users and 1/9 the number of equivalent oral pill users. The religion and socio-economic breakdown of family planning acceptors has been studied by Childs[49], in the content of vasectomy camps, loop clinics and employees in government services. His area study comprised seven words of two contiguous panchayats Shaktikulangara and Thekkumbhagum, approximately seven miles north of Quilon on the coast of Kerala state. Couples were judged to be the acceptors of family planning if (a) either member had undergone sterilisation or (b) They were at present using Nirodh (Condom), IUD (Interauterine Contraceptive device), jelly, foam tablets, diaphragm or rhythm method. The conclusion of the study is the proportion of Hindu acceptors is significantly greater than that of Christian at the lower economic level, whereas among Hindu and Christians of higher economic status there is no significant difference in acceptance. The religion does not appear to play a role in the acceptance of family planning among upper economic status people. Prakasam and Subrahmanyam[50] attempted to describe briefly the taxonomic method and demonstrated its application to a quantitative analysis of family planning performance in India, by considering the state as a unit of analysis for the period of 1981. They used the variables like sterilisation, IUD, other methods, percentage effectively protected and number of sub centres functions for one lakh population for seventeen states, (1981). In their study, they concluded that the best pattern of development of family

[49] Childs, John Norris (1971), "Acceptance of Innovations in a South Indian Fishing Village, Journal of Family Welfare, March – 1975, Vol.XXI, No.3, pp.3-13.

[50] Prakasan C.P. and Subramanyam L.B. (1981), "Family Planning Performance in India: A Methodological Approach, The Journal of Family, Welfare, (19 85), Vol.31, No.3, pp.39-45

planning performance is in Gujarat, Maharashtra, Haryana and Himachal Pradesh. The medium pattern of family planning performance in Karnataka, T.N., Orissa, Kerala, Andhra Pradesh, West Bengal, Madhya Pradesh, Punjab, Uttar Pradesh, Rajastan and the low pattern of development of family planning performance in Jammu and Kashmit, Bihar and Assam. The study of Nair and George[51] proposed to present a brief account of the progress of the various components (IUD and sterilisation) of the family planning programme of 9 districts of Kerala from 1964 to 1970. They have also taken five socio-economic and demographic variables. These are (a) literacy (b) percentage of male and female and non-agricultural workers (c) urbanisation (d) percentage of Muslims and Christians and (e) number of hospital beds per lakhs of population. The final conclusions was the link between higher literacy level and higher achievement in family planning performance i.e. Female sterilisation and IUD. The percentage of non-agricultural workers showed a slight positive correlation coefficient with the vasectomy rate which was far below the level required for such measures to be of statistical significance. The rates of sterilisations and IUD on insertions were influenced to a very small extent by the proportion of male, female and non-agricultural workers in the population. The percentage of the urban population was found to be highly positively correlated with the rates of vasectomy, tubectomy and the IUD insertions. In districts where the percentage of Muslim was higher, the performance was lower and vice versa. In the case of Christians a positive correlation was obtained between their percentage among the population and performance rates in the districts . Positive and statistically significant correlation coefficients were obtained at (5 per cent level) during all the three year between performance rates of female sterilisation and number

[51] Nair, P.S. Gopinath and George N.V. (1972), "Correlates of inter-district variation in the progress of family planning in Kerala", Journal of Family Welfare, March 1972 , Vol. XVII, No.3, pp.37-49.

of beds lakh population. This indicate that in districts where there are better medical facilities the achievement is higher. Choudhary[52] et. At attempted to study the views of the people on the size of the family and its limitation, their knowledge regarding family the rural areas in the West Bengal. The conclusion was that more than 85% of the respondents had some knowledge of conception control; the average respondent had a knowledge of three different methods, i.e., vasectomy, IUD and Nirodh (Condom). Vasectomy and IUD were the most widely known methods, Knowledge of contraception was strongly correlated with education.

(2.3) SELECTION OF VARIABLES

In This study, in all eight variables which comprise seven independent and one dependent variables have been used. The independent variables have been grouped into four categories are (1) Social variables (2) economic variables (3) demographic variables and (4) Health facilities variables. Under social variables we are considering percent female literacy and percent Hindu/Muslim/Christian population. Percent urban population, percent female work participation and per capita income has been considered as economic variables. The demographic variables include only infant mortality rate. The number of hospital beds per one lakh population has been taken as health facilities . The dependent variable is referred as the performance variable which include the equivalent sterilisation.

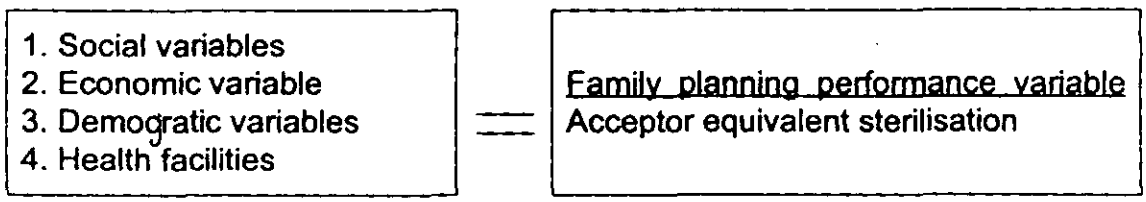
[52] Chowdhury A. Dutta et. al., (1971), "A short-term study of knowledge, attitude and practice related to family planning in Midnapur, The Journal of Family Welfare, June 1972, Vol.XVIII, No.4, pp.36-43.

2.4 VARIABLES USED IN THE STUDY

Social variable	1. Female Literacy	No. of female literates x 100 Total female population
	2. Religious composition	Hindu/Muslim/Christian population x100 Total Population
Economic variable	3. Urban population	Z Urban Population x 100 Total Population
	4. Female Work participation	Total female (Main+marginal) Workers x 100 Total female population
	5. Percapita income	Gross domestic Product at base/constant price 1981 Total population
Demographic variable	6. Infant mortality	Infant deaths 0-1 x 1000 Total Life berths
Health Variable	7. Health facilities	No of Hospital Beds x 100000 Total population
Performance Variable	8. Equivalent sterilisation	Sterilisation + 1/3 I.U.D. + 1/18 conventional contraceptive + 1/9 Oral Pills
Sterilisation	No of sterilised performed Total number of eligible couples, 15-44 years	
IUD	No of IUDs inserted Total number of eligible complex 15-44 years	
C.C. users	No. of conventional contraceptive users Total number of eligible couples, 15-44	
Oral Pills	No of O.P. users Total number of eligible couples, 15-44 years	

(2.5) CONCEPTUAL FRAMEWORK.

Empirical analysis[53] can be proceeded only in terms of an explicitly defined conceptual framework. Such a framework will help up to formulate the effect of various factors that effect the family planning performance on the basis of a theoretical and logical conception of the underlying casual chains as shown below. The framework could be verified empirically and the results interpreted quantitatively. The framework answers that to what extent does the family planning performance depend upon the various socio-economic, demographic and health facilities variables effect the family planning programme is given below.



FEMALE LITERACY

Several studies pointed out that an increase in female education resulted in increased use of contraception. Female education plays an important role in the acceptance of family planning methods, on education can raise the age at marriage as well as provide better employment opportunities which in turn may help to reduce ignorance about family planning methods. Moreover, higher education is associated with factors such a openness to newer ideas. Higher socio-economic status and standard of living. All those factors make the women more aware about their own health and that of their children. This helps in reducing infant mortality to adopt for a smaller family.

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[53] Srikantan, K.S., Family Planning Programme in the economic content. The Population Council (1977).

2. RELIGIOUS COMPOSITIONS

"Religion affiliation[54] has considered theoretical bearing on family planning performances. Religious differentials in family planning performance are largely a function of two broad factors. I.e., the current moral attitude of the religious groups". In Islam, sexual intercourse in marriage is only for procreation of children, Any artificial interference with the natural process of coitus and conception is contrary to the laws of God. Further, children are considered to be the gift of God. While in Christianity, birth control is permitted and is at the discretion of the couple. Although religion is an important variable determined contraception but we realised that religion is simply such as education, residence status and occupation are the over riding variables which effect the contraception of both the Muslims and Christian in respect their socio-economic status. Thus the Muslims are less inclined towards family planning than the Christians. As described in review of literature, Jolly(1978), Kanitkar and Murthy (1983) show that there is higher rate of acceptance of contraceptive methods among Hindus as compared to Muslims. This is because the Muslims are characterised by lower socio-economic status, lower status of women and lower education a compared to the Hindu and Christian population in India.

3. URBAN POPULATION

In a state where number of persons are living in urban areas, then one can expect high family planning performances. In urban areas, child is a source of non-economic benefits and parents do not expect economic support from children. But in the rural areas, the benefits from the children are more because they serve as a form of social insurance in the absence

[54] West off, Charles F. 1959, "Religious and Fertility in metropolitan America", in thirty years of research in human fertility: Retrospect and prospect. Annual Conference of Milbank memorial Fund, October 22-23, 1958, New York.

of social security programmes. This is because in the urban areas children are generally sent to schools and rural areas such educational facilities may not exist.

(4) FEMALE WORK PARTICIPATION

In female work status is an indicator of the status of women. Hence the relevant factor is not only the working status but also the extent of their wage employment away from home. This helps them to interact with the world outside the home. This in turn increase their participation in the decision making process. Besides, if women find alternative roles of self expression and self-development, they would not limit themselves to the role of life and mother. They would therefore, option for smaller families. Also every additional child increase the opportunity cost of working mother for not participating in the labour force during pregnancy and after. This indirect cost or opportunity cost has been found to be a factor in reducing the number of children and indirectly increasing the use of contraception.

5. PER CAPITA INCOME

Notestein (1945) pointed out in the theory of demographic transition that the reduction in the birth rate is a by product of industrialisation and modernisation which involved a rising standard of living. Coale and Hoover (1958) stated that transformation of agrarian society into industrialised society involve an increase in the standard of living and the acceptance of a smaller family size. Lienstein (1957) and Becker (1960) explained that with the increase in the standard of living the opportunity cost of an additional child also increase which result in the couples favour for a small family size and increased use of contraception increases with a increase in the standard of living population.

6. INFANT MORTALITY

A vital factor which militates against acceptance of the small family norm by reproductive couple in the uncertainty about their child's survival. A decline in the infant mortality reduces the number of children required to achieve a given family size and increase motivation to practice birth control So long as we are unable to ensure a reasonably high chance of survival of the child, and so long as the common man has a strong desire for a large family for valid reasons such as brighter chances of economic gains, and old age security, for example, - a small family norm is not likely to succeed.

7. HEALTH FACILITY

Family planning performances depends upon the availability of medical facilities, for example, if the number of beds available in the hospitals is sufficient people, will be more receptive to the family planning practices, as for sterilisation, proper bed facility must be given. This provides a type of security to the clients that they will be looked after well in the hospitals. Further, distance between the house and availability of medical facilities in terms of hospitals, dispensaries welfare centres, primary health centres will effect the family planning performances. The lower the distance between the two, the higher will be the performance. Moreover, family planning performance depends upon the consideration shown by the health staff, effectiveness of the medical service, provided for the treatment, context of their patient's satisfaction with health care and waiting time in the centre etc.

(2.6) HYPOTHESIS

Based upon the above conceptual framework, following hypotheses have been framed.

(1) those states where the female literacy is high family planning acceptance is high.

(2) States which have more percentage of Muslim population there family planning acceptance will be less and where the Hindu and the Christian population percentage is more, there family planning performance will be high.

(3) States which have higher percentage of urban population will be better in terms of family planning performance.

(4) Where female participation in the economic activities are more, there the family planning acceptance will be high.

(5) the states where the per capita income is high family planning performance will be high.

(6) The states having a lower infant mortality, will have a higher family planning acceptance.

(7) the states where the availability of medical facilities are more, there the family planning performance will be better.

In the present chapter, the selection of variables was done, after going through the relevant literature. The conceptual framework has been developed by using the same variables. Finally the formation of hypothesis has been done according to the literature survey.

In the next chapter we shall discuss about an analysis of determinants and pattern of family planning performance.

CHAPTER III

AN ANALYSIS OF DETERMIANNTS AND PATTERN OF FAMILY PLANNING PERFORMANCE

3.1 AN ANALYSIS OF DETERMINANTS OF FAMILY PLANNING PROGRAMME

In this chapter first of all the interstate variations among the variable for years 1981 to 1991 have been discussed.

Secondly the results of correlations analysis, have been presented, The relationship between the dependent and independent variables and the correlation among the independent in 1981 and 1991 have been studied.

Thirdly regression analysis has been done to determine the influence of one independent variable on the dependent variable holding all other variables constant.

Lastly the states are classified according to the pattern of development taking four method i.e. sterilisation IUD, conventional contraceptive and oral pills. To measure the pattern of development taxonomic method for both 1981 an d 1991 has been followed.

The coefficient of variation for the variables for India in 1981 and 1991 is given in Table 3.1.

Table 3.1 shows that the coefficient of variation for a variable 'equivalent sterilisation' was (41.46) in 1981 and (34.38) in 1991. In 1981 the coefficient of variation for the Hindu Population was (17.91), percent of Christian population was (17.47) for percent of Muslim population

(67.17), female literacy (48.52), urban population (32.84), Female work participation (47.43), per capita income (30.91), Infant mortality rate (28.39) and no of hospitals beds per lakh population (48.52). But in 1991 the value were (17.45), (18.14), (70.08), (40.53), (31.38), (42.77), (34.84),

Table- 3.1 COEFFICIENT OF VARIATION FOR VARIABLES IN INDIA FOR 1981 AND 1991.

VARIABLES	COEFFICIENT OF VARIATION	
	1981	1991
1. Equivalent Sterilisation	41.46	34.38
2. % Of Hindu Population	17.91	17.45
3. % Of Christian Population	17.48	18.14
4. % Of Muslim Population	67.17	70.08
5. % Of Female Literacy	48.52	40.53
6. % Of Urban Population	32.84	31.38
7. Female Work Participation Rate.	47.43	42.77
8. Per Capita Income	30.91	34.84
9. Infant Mortality Rate.	28.39	33.70
10. No of Hospital beds Per one Lakh Population	48.52	61.68

(33.70), (61.68) of the variables respectively. Among the variables the highest coefficient of variation has been for the per cent of Muslim Population 'in the year 1981. In 1991 the highest coefficient of variation has again found the variable of Muslim pcpulation with a coefficient value of 70.08. In 1981 the lowest coefficient of variation has been found for the variable percent of Christian Population', (17.48). In 1991 the

lowest coefficient of variation has been found for the variable percent of Hindu population with the coefficient value of Hindu population with the coefficient value of 17.45. Thus in both the times the highest coefficient of variation has been found for the percent of Muslims population. But the lowest coefficient of variation in the 1981 is for the variable 'percent of Christian population and in 1991, it is for the variable the percent of Hindu Population.

CORRELATIONS ANALYSIS (1981)

Table 3.2 presents the zero-order correlation coefficient matrix for India in 1981. Correlation between Dependent and Independent Variables: 1981.

(A) CORRELATION BETWEEN DEPENDENT AND INDEPENDENT VARIABLES: 1981

Among all the independent variables the highest coefficient of correlation has been found for the variable,' the number of hospitals beds per lakh population', with equivalent sterilisation. The value of the coefficient is 0.775. It is statistically significant at 1 percent level. It means that states with higher availability of medical facilities are likely to achieved higher family planning acceptance in terms of equivalent sterilisation.

The correlation coefficient between percent of female literacy and equivalent sterilisation is 0.6788 and is statistically , significant at 5 percent level. It means that where the proportion of female literacy rate is high, family planning acceptance will also be high.

The variable 'per capita income' is positively correlated with the equivalent sterilisation (0.6741) and is statistically significant at 5 percent

TABLE 3.2: ZERO ORDER CORRELATION COEFFICIENTS 1981 INDIA

Variables	Female Literacy Rate (x1)	% of Hindu Population (x2)	% of Christian Population (x3)	% of Muslim Population (x4)	% of urban population (x5)	Female work participation Rate (x6)	Per capita income (x7)	Infant mortality rate (x8)	No. of hospital beds per lakh population (x9)	Equivalent Sterilisation x(10)
X1	1.00									
X2	-0.4738	1.00								
X3	0.6022*	-0.2542	1.00							
X4	0.0496	0.2814	0.2195	1.00						
X5	0.4158	-0.1540	-0.1224	-0.1429	1.00					
X6	-0.0010	0.5449	0.2020	-0.0137	0.2864	1.00				
X7	0.5431	-0.4666	-0.1989	-0.4117	0.6842*	-0.1411	1.00			
X8	-0.7882**	0.4951	-0.5828	-0.2250	-0.3121	-0.0841	-0.3153	1.00		
X9	0.8991**	-0.5395	0.3789	0.0486	0.6167*	-0.0085	0.6498*	-0.8303**	1.00	
X10	0.6788*	-0.2564	0.0783	-0.2692	0.6726*	0.2921	0.6741*	-0.5670	0.7755**	1.00

* Significant at 5% level of significance

** Significant at 1% level of significance

level. We can say therefore, that states with higher amount per capita income will have higher rate of achievement family planning acceptance.

The correlation coefficient between 'percent of urban population' and 'equivalent sterilisation' is 0.6726 and is statistically significant at 5 per cent. The states with higher percentage of urban population higher will be the family planning performance.

The variables 'percent of Hindu Population percent of Muslim population' and 'infant mortality, rate are negatively correlated with the equivalent sterilisation. The variables like 'percent of Christian population and the female work participation rate are positively correlated with the equivalent sterilisation. But the coefficient values are statistically insignificant.

The coefficient of the variables 'the percent of Hindu population' is negative due to sampling fluctuation. The only valid conclusion could be that this variable does not significantly influence family planning acceptance, either positively, or negatively.

(B) CORRELATION AMONG INDEPENDENT VARIABLES: 1981

In 1981, among all the independent variables the highest coefficient of correlation has been found between the percent of female literacy and the hospital beds per on lakh population. It is statistically significant at 1 per cent level and coefficient value is 0.8991. It means that the states where the percent of female literacy is high, health facility is also high.

The coefficient of correlation between infant mortality rate and the no. of hospital beds per lakh population is 0.8303. It is also significant at 1 percent level. It means that higher the health facilities lower will be

infant mortality, rate. The coefficient of correlation between per cent of female literacy and infant mortality rate' is -0.7882. It is statistically significant at 1 per cent level. This represents that higher the percent of female literacy lower will be the infant mortality rate.

The coefficient of correlation between the percent of urban population ' and 'per capita income' is 0.6842 . It is statistically significant at 5 per cent level. This represents that higher the per cent of urban population higher will be the 'per capita income'.

The coefficient of correlation between the per capita income and the 'no of hospital beds per lakh population is 0.6498. It is statistically significant at 5 per cent level this means that higher standard of living higher will be the health facilities.

The coefficient of correlation between the population and the no. of hospital beds per one lakh population is 0.6167. this is statistically significant at 5 per cent level. This means that higher the urbanisation higher will be the health facilities.

The coefficient of correlation between the per cent of female literacy and the percent of Christian population is 0.6022. It is statistically significant at 5 per cent level. It means higher the Christian population higher will be the per cent of female literacy.

CORRELATION ANALYSIS (1991)

In Table 3.3, we have presented the zero-order correlation coefficient matrix for India in 1991. Correlation between Dependent and Independent variables 1991.

TABLE 3.3: ZERO ORDER CORRELATION COEFFICIENTS 1991 INDIA

Variables	Female Literacy Rate (x1)	% of Hindu Population (x2)	% of Christian Population (x3)	% of Muslim Population (x4)	% of urban population (x5)	Female work participation Rate (x6)	Per capita income (x7)	Infant mortality rate (x8)	No. of hospital beds per lakh population (x9)	Equivalent Sterilisation x(10)
X1	1.00									
X2	-0.3620	1.00								
X3	0.6314*	-0.1452	1.00							
X4	0.0461	0.2682	0.1583	1.00						
X5	0.4814	-0.1817	-0.0129	-0.1411	1.00					
X6	-0.1200	0.7648**	0.2055	0.2482	0.1167	1.00				
X7	0.4402	0.4252	-0.2316	-0.4266	0.6284*	-0.2782	1.00			
X8	0.8400**	-0.3781	0.4241	0.1507	0.6441*	-0.0085	0.4985	1.00		
X9	-0.7170*	0.4851	-0.5354	0.2642	-0.3456	0.2190	-0.1606	-0.7834**	1.00	
X10	0.5892	-0.3920	0.0517	0.5256	0.7582**	-0.2128	0.7333**	0.5280	-0.3358	1.00

* Significant at 5% level of significance

** Significant at 1% level of significance

(A) CORRELATION BETWEEN DEPENCENT AND INDEPENDENT VARIABLES, 1991

Among all the independent variables, the highest coefficient of correlation has been found for the variable 'percent of urban population' with equivalent sterilisation. The value of the coefficient is 0.7582. It is statistically significant at '1" per cent level. It means that states with higher per cent of urban population higher family planning acceptance in terms of equivalent sterilisation.

The correlation coefficient between per capita income and equivalent sterilisation is 0.7333 and is statistically significant at 1 percent level it means that where the per capita income in high, family planning acceptance will also be high.

The variables, the per cent of Hindu population (-0.3920), infant mortality rate (-0.3350) and the percent of female work participation (-0.2128) are negatively correlated with the equivalent sterilisation. The variable like female literacy rate (0.5892), per cent of the Christian population (0.0517), the per cent of Muslim population (0.5256) and the number of hospital beds per lakh population. (0.5280) are positively correlated with equivalent sterilisation. But the coefficient values of these variables are statistically insignificant. The coefficient of variable percent of female work participation is negative due to sampling fluctuation. The only valid conclusion could be that these variables does not significantly influence family planning acceptance, either positively or negatively.

(B) CORRELATION AMONG INDEPENDENT VARIABLES: 1991

In 1991, among all the independent variables, the highest coefficient of correlation has been found between the female literacy rate

and the hospital beds per lakh population. The correlation coefficient is 0.8400. It is statistically significant at 1 percent level. It means that the states where the percent of female literacy is high, health facility is also high.

The coefficient of correlation between infant mortality rate and hospital beds per lakh population is –0.7834. It is also significant at 1 percent level. It means that higher the health facilities lower will be infant mortality.

Negative association has been found between percent of female literacy and infant mortality. The coefficient value is –0.7170. It is statistically significant at 5 percent level. It means that higher will be the female literacy lower will be the infant mortality.

The percent of urban population is positively correlated with the number of hospital beds per lakh population. The coefficient of correlation is 0.6441. It is also statistically significant at 5 percent level. This represents that higher the urbanisation higher will be the medical facilities.

Another two variables percent of Christian population and percent of Hindu population is positively correlated with female literacy rate and female work participation rate respectively. The correlation coefficient between the percent of Hindu population and the female work participation rate is 0.7648. It is statistically significant at one percent level. In the same way the coefficient of the percent of Christian population and female literacy rate is 0.6314 and statistically significant at 5 percent level. This variable gives higher the Christian population higher the female literacy.

REGRESSION ANALYSIS: 1981

The results of multiple step-wise regression analysis for the year 1981 are presented in Table 3.4 and for the year 1991 in Table 3.5.

The variables that have been used for explaining the differentiated performance of family planning in 1981 and 1991 are available (1) Female Literacy rate (2) Percent of Hindu population (3) Percent of Christian population (4) Percent of Muslim population, (5) Percent of urban population, (6) Female work participation rate, (7) Percapital income, (8) Infant mortality rate, (9) No. of hospital beds per lakh population (independent variables) and (10) equivalence sterilisation is the dependent variable.

From the results of 1981 from table-3.4, it has been found that the value of R^2 is 0.60061 in Step-1, R^2 is 0.69504 in Step 2 and R^2 is 0.80209 in Step 3. The value of R^2 is highest in Step 9 is 0.88920 and $\bar{R}^2$ is highest in Step 7 is 0.77582. But both R^2 and $\bar{R}^2$ is statistically significant at 1% and 5% level of significance from Step 1 to Step 3. The regression coefficients from Step 1 to Step 3 show a consistently significant values for number of hospital beds per lakh population at 1 percent level of significance. The regression coefficient of percent of Muslim population and the percent of Hindu Population are significant at 5% level of significance in Step 3. After Step 3 the significance of regression coefficients do not remain consistent. The regression equation from the Step 3 is as follows:

Equivalent sterilisation = -2.28136 + 1.11008 (no. of hospital beds per
(6.211) lakh population)

- 0.24547 (percent Muslim
(-3.04) population)

TABLE 3.4

RESULTS OF REGRESSION OF DETERMIENANTS OF FAMILY PLANNING PERFORMANCE IN INDIA: 1981

Variables	Intercept	Regression Coefficient	Standard Error of Estimator	T-Value	R^2	Increase in R^2	R^{-2}	F
Step 1								
No. of Hospital beds per lakh population	-0.29540	0.84220	0.19048	4.422*	0.60061	--	0.56989	19.54981
Step 2								
No. of hospital beds per lakh population	-0.17228	0.85846	0.17345	4.949*	0.69504	0.09443	0.64421	13.6747
Percent of Muslim Population		–0.17304	0.08977	-1.928***				
Step 3								
No of Hospital beds per lakh population	-2.28136	1.11008	0.17872	6.211*	0.80207	0.10705	0.74811	14.859
Percent of Muslim Population		–2.24547	0.08116	-3.024**				
Percent of Hindu Population		0.89314	0.36617	2.439**				
Step 4								
No. of hospital beds for lack population	-2.27062	1.14921	0.18587	6.183*	0.81643	0.01434	0.74300	11.11887
Percent of Muslim Population		–0.22601	0.08488	-2.663**				
Percent of Hindu Population		0.84087	0.37456	2.245**				
Percent of Christian Population		–0.04948	0.05598	-0.884				

Continued.....

Table 3.4 continued.....

Step 5								
No. of hospital beds per lack population	-1.35740	1.0367	0.19887	5.123*	0.84595	0.02952	0.76036	9.88441
Percent of Muslim Population		–0.16690	0.09351	-1.785				
Percent of Hindu Population		0.28388	0.55742	0.509				
Percent of Christian Population		–0.0881	0.06156	–1.432				
Female work participation rate		0.25330	0.19269	1.313				
Step 6								
No. of hospital beds for lack population	-0.66648	0.49090	0.49373	0.984	0.86953	0.02358	0.77167	8.8858
Percent of Muslim Population		0.11040	0.10266	–1.075				
Percent of Hindu Population		–0.09362	0.62820	–0.149				
Percent of Christian Population		–17475	0.09379	–1.863				
Female work participation rate		–0.38483	0.21776	1.767				
Female literacy rate		–0.66648	0.51299	1.202				
Step 7								
No. of hospital beds per lack population	1.08877	0.49260	0.48922	1.007	0.88791	0.01838	0.77582	7.9214
Percent of Muslim Population		–0.14841	0.10773	–1.378				
Percent of Hindu Population		–0.29705	0.65077	–0.456				
Percent of Christian Population		–0.27577	0.13238	–2.083				
Female work participation rate		0.43938	0.22169	1.942				
Female Literacy rate		0.96224	0.60192	1.599				
Per capita income		0.58882	0.54953	–1.072				

Continued.....

Table 3.4 continued.....

Step 8								
No. of hospital beds per lack population	1.22589	0.44670	0.56590.	0.789	0.88881	0.0009	0.74056	5.99539
Percent of Muslim Population		–0.15750	0.12300	–1.280				
Percent of Hindu Population		–0.22940	0.76427	–0.300				
Percent of Christian Population		–0.27542	0.14242	–1.934				
Female work participation rate		0.41909	0.253.60	1.640				
Female Literacy rate		0.94620	0.65160	1.452				
Per capita income		–0.55912	0.60630	–0.922				
Infant mortality rate		–0.11038	0.50026	–0.221				
Step 9								
No. of hospital beds per lack population	1.08432	0.49325	0.71284	0.692	0.88920	0.00039	0.6975	4.45835
Percent of Muslim Population		–0.15273	0.13931	–1.096				
Percent of Hindu Population		–0.24780-	0.84739	–0.292				
Percent of Christian Population		0.27697	0.15619	–1.773				
Female work participation rate		0.43971	0.321047	1.372				
Female Literacy rate		0.92765	0.72637	1.277				
Per capita income		–0.52822	0.70340	–0.751				
Infant mortality rate		–0.07916	0.59631	-0.133				
Percent of urban population		–05672	0.43111	–0.132				

* Significant at 1% level of significance
** Significant at 5% level of significance
*** Significant at 10% level of significance

+ 0.89314 (Percent of Hindu
(2.439) population)

$\bar{R}^{-2}$ = 0. 74811 F = 14.859

From the above regression equation, we find that 74.81 percent of the variation in the equivalent sterilisation has been explained by the independent variables. The overall goodness of fit indicated by F-value as 14.859 is statistically significant at 1 percent level. Out of the above three variables the variable the number of hospital bed per lakh population is significant at 1 percent level of significance. It explains that of we increase health facility by one unit then the equivalent sterilisation increase by 1.11008 units. The other two variables i.e. the percent of Muslim population and percent of Hindu population are statistically significant at 5 percent level of significance. If we increase the percent of Muslim population by one unit then the equivalent sterilisation decreases by 0.24547 units. The another variable the percent of Hindu population significant at 5% level of significance. It explains that it we increase the percent of Hindu population by 1 unit then the equivalent sterilisation increase by 0.89314 units. So in 1981, the social factors like religion composition and health facilities are the important variable in the acceptance of family planning performance.

REGRESSION ANALYSIS: 1991

From the results of 1991 from table 3.5, it has been found that the value R^2 is 0.5749 in Step 1, R^2 is 0.7536 in Step 2 and R^2 is 0.85231 in Step-3. The value of R^2 is highest in Step 9 is 0.89942 and it increases continuously from Step 1 to step 9. At the same time $\bar{R}^{-2}$ is highest in Step 6 is 0.81838. After this step it decreases at a increasing rate. But the

TABLE 3.5

RESULTS OF REGRESSION OF DEERMINING OF FAMILY PLANNING PERFORMANCE IN INDIA: 1991

Variables	Intercept	Regression Coefficient	Standard Error of Estimator	T-Value	R^2	Increase in R^2	R^{-2}	F
Step 1								
Percent of urban population	0.5867	0.78779	0.18788	4.193*	0.57491	---	0.54221	17.5813
Step 2								
Percent of urban population	0.84213	0.72517	0.69796	4.823*	0.75366	0.1787	0.7126	18.356
Percent of Muslim population		–0.18298	–0.42707	-2.951**				
Step 3								
Percent of urban population	0.58804	-0.53821	0.13981	3.850*	0.85231	0.0987	0.81204	21.160
Percent of Muslim population		–0.20100	0.05059	-3.973*				
Female Literacy rate		0.34979	0.12904	2.711**				
Step 4								
Percent of urban population	0.45036	0.45335	0.15286	2.966**	0.87188	0.0195	0.82064	17.013
Percent of Muslim population		–0.19536	0.04963	-3.937*				
Female Literacy rate		0.51236	0.18219	2.812**				
Percent of Christian population		–0.05226	0.04224	-1.236				

Continued.....

Table 3.5 continued.....

Step 5								
Percent of urban population	0.40361	0.53066	0.17956	2.955**	0.88146	0.0096	0.8156	13.384
Percent of Muslim population		–0.17886	0.5391	-3.318*				
Female Literacy rate		0.66397	0.25640	2.590**				
Percent of Christian Population		–0.85475	0.04291	-1.269				
No. of hospital beds per lakh population		–0.15675	0.18385	–0.853				
Step 6								
Percent of urban population	0.93409	0.56263	0.18070	3.114**	0.89622	0.0148	0.081836	11.51408
Percent of Muslim population		–0.18827	0.05422	-3.472*				
Female Literacy rate		0.65701	0.25455	2.581**				
Percent of Christian Population		–0.06422	0.04355	-1.474				
No. of hospital beds per lakh population		–0.27188	0.21199	–1.283				
Infant mortality rate		–0.18141	17007	–1.067				
Step 7								
Percent of urban population	0.95377	0.55036	0.21298	2.584**	0.89649	0.00027	0.79298	8.66104
Percent of Muslim population		–0.19198	0.06398	–3.000**				
Female Literacy rate		0.67804	0.31263	2.169				
Percent of Christian Population		–0.06987	0.06234	–1.121				
No. of hospital beds per lakh population		–0.28316	0.24104	–1.175				
Infant mortality rate		–0.17887	0.22233	–0.894				
Female work participation rate		0.01747	0.12841	0.136				

Continued.....

Table 3.5 continued.....

Step 8								
Percent of urban population	1.31562	0.51180	0.24610	2.080	0.89925	0.00276	0.76491	6.69402
Percent of Muslim population		–0.18461	0.07056	–2.616**				
Female Literacy rate		0.79091	0.43428	1.821				
Percent of Christian Population		–0.09389	0.08904	–1.054				
No. of hospital beds per lakh population		–0.35768	0.31592	–1.132				
Infant mortality rate		–0.21597	0.24065	–0.897				
Female work participation rate		0.11809	0.28355	0.416				
Percent of Hindu population		–0.24326	0.60039	0.405				
Step 9								
Percent of urban population	1.45059	0.50982	0.27020	1.887	0.89942	0.00017	0.71838	4.8681
Percent of Muslim population		–0.18819	0.08627	–2.181				
Female Literacy rate		0.82832	0.62233	1.331				
Percent of Christian Population		–0.10286	0.13702	–0.7510				
No. of hospital beds per lakh population		–0.35947	0.34631	–1.038				
Infant mortality rate		–0.21143	0.26787	–0.789				
Female work participation rate		0.13296	0.34901	0.381				
Percent of Hindu population		–0.28393	0.78904	–0.360				
Percapital income		–0.04106	0.49088	–0.093				

* Significant at 1% level of significance
** Significant at 5% level of significance

regression coefficients from step 1 to step 3 shows a consistently significant values for percent of urban population at 1 percent level of significance percent of Muslim Population 1 percent level of Significance and female literacy rate at 5 percent level of significance. In step 3 the three variables are significant at 1 percent, 1 per and 5 percent level of significance respectively. The over all significance the value of F is significant at 1 percent upto the step 7 and after the step it is significant at 5 percent level of significance. After step 3, the significance of regression coefficient do not remain consistent.

The regression equation from the step 3 is as follows:

Equivalent sterilisation = 0.58804 + 0.53821 (Percent of urban
(3.850) population)

- 0.20100 (percent of Muslim
(-3.973) population)

+ 0.34979 (female literacy rate)
(2.711)

$R^2 = 0.8120$ F = 21.160

From the above regression equation we find that 81.20 percent of the variation in the equivalent sterilisation has been explained by the independent variables. The overall goodness of fit indicated by F-value as 21.16 is statistically significant at 1 percent level. Out of the above three variables the variable percent of urban population is significant at 1 percent level of significance. It explains that if we increase the percentage of urban population by one unit then the equivalent sterilisation increase by 0.53821 units. The regression coefficient of the variable percent of Muslim population statistically significant at 1 percent level. It means that

if we increase on unit of Muslim population then the equivalent sterilisation decrease by 0.20100 units. Finally the regression coefficient another variable the female literacy rate is statistically significant at 5 percent level. This variable explains that of we increase by one unit of female literacy rate then the equivalent sterilisation increase by 0.34979 units. So in 1991 the economic factors and social factors which includes the female literacy and religion composition are the important variables in the acceptance of family planning performance.

From the table 3.4 and 3.5 of the both time periods 1981 and 1991 all the variables are not statistically significant at 1 percent and 5 percent level after the step –3. An important point at this stage is note that as the analysis moves from step 3 to 4, a sudden fall in the significant regression coefficients is observed. The probable reason of this could be a high correlation between the independent variables. This multicollinearity has disturbed the standard errors to greater extent. As a consequence, the regression coefficients have become insignificant in step 4, though these regression coefficients are not much different from those given in step 3.

3.2 PERFORMANCE OF THE FAMILY PLANNING PROGRAMME

Table 3.6 and 3.7 represents the data on percentages of couples effectively protected for the fifteen major states of India for two selected years 1982 and 1993.

By states, there was a wide variation in the percentage of couples effectively protected by all methods in both the two years. Assam, Bihar, Rajasthan and UP were the four laggard states where the percentage of couples effectively protected was under 20 whereas Gujarat and Maharashtra had achieved a high level of performance with over 30 percent of couples protected in 1982. In terms of sterilisation Maharashtra

had the highest percentage of couples protected of 34.8 followed by Gujarat with 31.8 and Kerala with 30.7 in 1982.

There was a wide variation also in the percentage of couples effectively protected by all method in 1993. Assam, Bihar & Rajasthan were the laggard three states where the percentage of couples effectively protected was under 30 whereas Karnataka, Madhya Pradesh, Orissa, Uttar Pradesh and West Bengal were under 50 and more than 50 were in Gujarat, Maharashtra, Punjab and Tamil Nadu. But Punjab was the highest 70.9 percent couples effectively protected. In terms of sterilisation Kerala had the highest percentage of couples of 44.5 followed by Tamil Nadu with 43.9 and Maharastra with 40.9 in 1993. Punjab with the highest state couples effectively protected by other three methods of IUD, conventional contraceptives and oral pills in 1993. From the above two tables 3.6 and 3.7 the maximum percentage of the eligible couples were effectively protected by the method of sterilisation in both the two years.

Table 3.6: PERCENTAGE OF ELIGIBLE COUPLES EFFECTIVELY PROTECTED BY VARIOUS METHODS OF 1982

State	Percentage effectively protected			
	Sterilisation	IUD	Other Methods	All Methods
A.P.	26.6	0.3	0.3	27.2
Assam	17.3	0.7	0.3	18.3
Bihar	11.6	0.3	0.3	12.2
Gujarat	31.8	1.4	1.7	34.9
Haryana	23.0	3.0	2.6	28.6
Karnataka	22.2	1.6	0.9	24.7
Kerala	30.7	1.0	0.7	22.0
M.P.	20.8	0.5	0.5	21.8
Maharashtra	34.8	0.6	1.3	36.7
Orissa	24.7	0.8	0.6	26.1
Punjab	20.6	4.2	2.6	27.4
Rajasthan	13.3	0.6	0.6	14.5
Tamil Nadu	26.5	0.8	0.4	27.7
U.P.	8.2	2.0	1.1	11.3
West Bengal	23.0	0.6	0.7	24.4
India	20.7	1.1	2.0	23.7

Source: Ministry of Health and Family Welfare 1983-84, p.108.

Table 3.7:

PERCENTAGE OF ELIGIBLE COUPLES EFFECTIVELY PROTECTED BY VARIOUS METHODS OF 1993

State	Percentage effectively protected				
	Sterilisation	IUD	Conventional Contraception	Oral Pills	All Method
A.P.	36.4	4.2	3.3	1.4	45.3
Assam	22.9	1.5	0.5	0.3	25.2
Bihar	21.2	2.3	0.3	0.2	24.0
Gujarat	38.2	10.0	5.1	1.2	54.5
Haryana	33.2	10.8	7.5	1.1	52.7
Karnataka	39.6	5.8	1.7	1.1	48.2
Kerala	44.5	4.9	3.2	0.8	53.4
M.P.	26.6	5.1	4.6	1.6	37.9
Maharashtra	40.9	6.6	3.9	1.8	53.2
Orissa	29.5	5.4	2.4	0.8	38.1
Punjab	37.9	23.1	8.1	0.9	70.9
Rajasthan	22.1	4.2	2.4	0.6	29.3
Tamil Nadu	43.9	8.4	1.2	1.0	54.5
U.P.	19.2	9.4	3.6	0.9	33.2
West Bengal	28.6	2.6	4.5	1.5	34.3
India	30.3	6.3	4.9	2.0	43.5

Source: Ministry of Health and Family Welfare 1983-84, p.179.

The percentage of achievement of various methods of family planning is shown in table 3.8 from 1980-81 to 1990-91. The percentage of achievement was more than target of sterilisation in Gujarat, Kerala and more than 70 percent in Andhra Pradesh, Karnataka, Orissa, Punjab, Rajasthan, Tamil Nadu and West Bengal. The rest of states are less than 60 percent. There was no state where the percent of achievement was 100 percent. The more than 90 per cent achievement was in Gujarat, Kerala, Maharashtra and Tamil Nadu. In both the two time periods the percent of achievement was increased from 1980-81 to 1990-91 in some state and some were decreased from 90-91. In Haryana and Punjab the percent of achievement was more than target in MP, Punjab and UP for I.U.D., Gujarat, Kerala, MP, Maharahstra, Orissa, Punjab and UP for conventional contraceptions and AP, Gujarat, Haryana, MP, Maharashtra, Orissa, Punjab, Rajasthan and TN for OP. The maximum number of percentage of achievement was increased for CC and OP from 1980-81 to 1990-91.

TABLE 3.8: STATEWISE ACHIEVEMENTS IN RESPECT OF STERILISATION, IUD, C.C. USERS, O.P. USERS DURING 1980-81 AND 1990-91.

	Achievement % 1980-81				Achievement % 1990-91			
	Sterilisation	IUD	C.C.	O.P.	Sterilisation	IUD	C.C.	O.P.
AP	99.8	36.6	17.9	13.3	69.9	56.8	76.6	103.2
Assam	39.6	39.8	30.3	3.5	25.3	31.6	91.6	31.2
Bihar	34.9	30.2	29.5	4.8	48.8	42.3	42.8	29.7
Gujarat	123.6	86.6	66.5	72.1	93.2	98.2	134.9	127.3
Haryana	60.6	160.2	117.1	17.6	87.7	75.4	94.0	114.8
Karnataka	75.1	99.4	71.1	35.8	78.5	80.0	87.5	96.5
Kerala	113.0	70.7	18.5	4.1	95.3	79.8	102.9	80.8
MP	52.7	38.1	31.4	24.9	81.7	102.7	122.6	122.7
Maharashtra	105.5	65.0	83.4	25.7	96.0	89.9	114.6	150.1
Orissa	80.4	74.8	43.1	16.0	65.9	83.8	105.6	122.0
Punjab	72.5	185.0	107.5	4.6	76.7	116.0	104.2	131.4
Rajasthan	75.0	51.6	87.5	9.5	66.0	72.3	76.7	120.4
TN	76.2	66.2	44.3	12.7	90.0	76.2	76.3	101.8
UP	19.0	96.0	77.9	14.9	56.0	103.3	105.6	99.3
WB	91.3	88.7	48.1	18.0	64.1	62.3	75.5	88.9
All India	70.9	79.9	73.7	18.4	71.0	83.9	97.8	126.9

percentage of couples protected gives an adequate indication of sterilization done in rural and in urban centre, it would overstate the percentage of couples protected in urban areas. This would be especially true of the states of Assam and Kerala where many rural couples could

have availed themselves of sterilisation facilities provided in urban centres. It is seen that over 20 percent of the rural couples were protected by 1980-81 in Andhra Pradesh, Gujarat, Haryana, Karnataka, Kerala, M.P., Maharashtra, Orissa, Punjab and West Bengal. Over 40 percent of the urban couples were protected by 1980-81 in Andhra Pradesh, Assam, Haryana, Kerala, Maharashtra and TN. The urban bias of the programmes, measured in terms of the ratio of urban to rural percentage couples protected, was 2.2 for India. This ratio was over 2.0 for Andhra Pradesh, Assam, Bihar, Haryana, Kerala, Rajasthan and TN. While the urban bias by states was about the same magnitude for sterilization as for all methods, this bias was much more pronounced for IUD's and ECC users, since these methods were more readily available in urban areas. In a few states like Gujarat, Karnataka, Punjab and West Bengal, the family planning programme had already presented into the rural areas.

There are a number of reasons for the failure of the programme to penetrate into rural areas in most of the states of India. Pai Panandikar et. al. (1983) attribute the socio-economic diversity within the country, lack of commitment to the programme, inadequate health and transport infrastructure and inefficient management of the programme in some states, lack of local support in rural areas and unwillingness of family planning personnel to work in rural areas. The highly centralised programme with standardised norms and procedures and elaborate bureaucratic controls does not allow sufficient flexibility for the effective adoption of the programme to suit the local conditions prevailing in each state.

3.3 PATTERN & MEASURE OF DEVELOPMENT OF FAMILY PLANNING PERFORMANCE IN THE VARIOUS STATE OF INDIA: (1981)

The taxonomic method has been used for ranking, classifying and comparing region with respect to the level of development or performance. In the matrix-1 the first column consists of 15 states. The row is based upon the family planning performance indicator of different states of India in 1981. Here only four indicators are given which are used for the equivalent sterilisation. These users are taken from the 1000 eligible couples (15-49) years. The matrix is known as the data matrix representing the variables by the states . Let N be the number of states and M the number of variables dealing with a specific category of development.

In order to eliminate the influence of various units of measurements the standardisation procedure has been carried out ($Xm-\bar{X}m/Sm$) where every state refers to a 'standard point' or vector in an m-dimensional space. Matrix-2 is the standardised family planning performance indicators in Indian states.

TABLE 3.9: PERCENT OF COUPLES EFFECTIVELY PROTECTED IN RURAL AND URBAN AREAS BY STATE BY METHOD FOR: 1980-81

	Sterilisation				IUD Insertions and CC user				All methods			
	Rural	Urban	State	U/R	Rural	Urban	State	U/R	Rural	Urban	State	U/R
AP	21.5	43.4	25.7	2.0	0.4	0.8	0.5	2.0	21.9	44.2	26.2	2.0
ASS	11.7	85.8	17.8	7.3	0.5	4.2	0.8	8.4	12.2	90.0	18.5	7.4
BIH	10.1	23.6	11.3	2.3	0.4	1.5	0.5	3.8	10.5	25.1	11.9	2.4
GUJ	29.5	32.0	30.2	1.1	2.3	5.3	3.1	2.3	31.8	37.3	33.3	1.2
HAR	18.5	44.2	22.9	2.4	4.9	10.2	5.8	2.1	23.6	54.4	28.7	2.3
KAR	20.3	22.8	20.9	1.1	2.1	3.0	2.3	1.4	22.4	25.8	23.2	1.2
KER	20.5	77.5	29.7	3.8	1.0	2.4	1.2	2.4	22.5	79.9	30.9	3.6
MP	19.3	26.0	20.3	1.3	0.7	2.7	1.0	3.9	20.0	28.7	21.3	1.4
MAH	30.6	39.5	23.2	1.3	0.2	4.2	1.4	21.0	30.8	43.7	34.6	1.4
ORI	23.3	35.1	24.3	1.5	1.0	3.2	1.2	3.2	24.3	38.3	25.4	1.6
PUN	19.2	19.3	19.2	1.0	5.5	6.4	5.7	1.2	24.7	25.7	24.9	1.0
RAJ	9.2	26.0	12.1	2.8	0.8	4.4	1.4	5.5	10.0	30.4	13.5	3.0
TN	17.0	48.4	26.4	2.8	0.6	2.8	1.3	4.7	17.6	51.2	27.6	2.9
UP	7.3	13.8	8.1	1.9	2.4	4.4	2.7	1.8	9.7	18.2	10.8	1.9
WB	20.9	27.0	22.3	1.3	0.9	2.2	1.2	2.4	21.8	29.2	23.5	2.2
INDIA	16.4	35.5	20.0	2.2	2.1	5.2	2.7	2.5	18.5	40.7	22.7	2.2

Source: Ministry of Health & Family Welfare (1982), p.86.

Table 3.10

FAMILY PLANNING PERFORMANCE INDICATORS IN INDIAN STATES: 1981

Matrix - 1

States	Sterilisation	IUD	Conventional contraceptive	Oral Pills
AP	24.84	1.79	4.25	0.44
Assam	7.95	2.84	5.26	0.12
Bihar	7.23	1.63	5.29	0.17
Gujarat	35.19	7.18	29.61	2.78
Haryana	15.35	11.64	53.88	0.58
Karnataka	23.00	8.88	14.14	1.44
Kerala	31.23	5.08	4.54	0.28
MP	13.78	1.96	9.28	0.17
Maharashtra	28.48	3.46	14.65	0.91
Orissa	19.87	3.69	6.95	0.52
Punjab	19.59	19.48	44.53	0.22
Rajasthan	16.04	2.89	14.61	0.36
TN	16.74	3.93	8.45	0.49
UP	3.91	8.63	15.55	0.68
WB	24.84	3.67	10.80	0.80
Mean	19.19681	5.72500	16.15450	0.64902
Standard Deviation	8.98397	4.849155	14.97118	0.66568

Table 3.11

STANDARDISED FAMILY PLANNING PERFORMANCE INDICATORS OF INDIAN STATES: 1981

Matrix - 2

States	Sterilisation	IUD	Conventional contraception	Oral Pills
AP	0.6278	-0.8112	-0.7951	-0.3174
Assam	-1.2521	-0.7602	-0.7279	-0.7923
Bihar	-1.3325	-0.8443	-0.7257	-0.7141
Gujarat	1.7804	0.3006	0.8987	3.0744
Haryana	-0.4282	1.2199	2.5148	-0.0905
Karnataka	0.4229	0.6333	-0.1343	1.1878
Kerala	1.3389	-0.1322	-0.7759	-0.6677
MP	-0.6115	-0.7755	-0.4179	0.7207
Maharashtra	1.0335	-0.4667	-0.1007	0.3913
Orissa	0.0749	-0.4197	-0.6150	-0.1882
Punjab	0.8433	2.8360	1.8950	-0.6488
Rajasthan	-0.3511	-0.5847	-0.1034	-0.4361
TN	-0.2736	-0.3781	-0.5143	-0.2429
UP	-1.7015	0.581	-0.0406	-0.0725
WB	0.6287	-0.4233	-0.3577	0.2476

From the standardised matrix-2, distance from each state to every state, for the 'm' variables have been calculator by successive subtraction. Finally the distance between states of M variables are derived by using the formula:

$$Cab = \left[\sum_{K=1}^{M}(D_{ak} - D_{bk})^2\right]^{1/2}$$ where the following

relationships are apparent. Caa = 0, Cab = Cba and Cab ≤ Cak + Ckb. The above formula results in a symmetric matrix termed the distance matrix.

From the above matrix 3, the critical minimum distance C(+) is 2.4177. The critical value may be considered as measure of resemblance the greater is C(+) the smaller is the resemblance between all possible pairs of states. It should be recognized have that a state only be added to a given group of the distance to at least one state in the matrix 2 is less than the critical model distance. The simplest way of determining this would be to select a test variable and standardise it with respect to several groups, then choosing that group giving the lowest value. In explaining the choice of goals is always a prime factor towards this purpose patterns and measures of development can be derived from this taxonomic method. The object is to find a state or states upon which to 'model' oneself, but which has to be on a higher level. One first has to assure the direction of change in a variable which tends to achieve higher development. For each variable in each set of states, there exits an 'ideal' value, which is simply the best value held within the group by a given state. One particular state would have the 'best' value for all variables included in the index, but this is unlikely and a variety of states may be used to 'stimulate' this idea country. We can find the standardized value from matrix-2 which is the highest for variables which have a stimulant

Table 3.12: MATRIX 3 (DISTANCE MATRIX) : 1981

	AP	ASS	BIH	GUJ	HAR	KAR	KER	MP	MAH	ORI	PUN	RAJ	T.N.	UP	WB	Min. Dist. (Cj)
AP	0.000	1.9408	2.0015	4.1156	4.0304	2.1973	1.0432	1.3573	1.1259	0.7128	4.5816	1.2256	1.0448	2.8357	0.8130	0.7128
ASS	1.9408	0.0000	0.1402	5.2839	3.9498	3.0029	2.6694	0.7154	2.6654	1.5015	4.6330	1.660	1.2041	1.7429	2.2067	0.1482
BIH	2.0015	0.1402	0.0000	5.2908	3.9947	3.0378	2.7655	0.7870	2.7116	1.5651	4.7234	1.2227	1.2700	1.7601	2.2547	0.1402
GUJ	4.1156	5.2839	5.2908	0.0000	4.2905	2.5638	4.1461	4.7975	3.0569	4.8453	4.9296	4.3192	4.2036	4.7955	3.3794	2.5658
HAR	4.0304	3.9490	3.9947	4.2905	0.0000	3.1211	4.0128	3.6059	3.4732	3.5701	1.8762	3.1986	3.4276	2.9221	3.4913	1.8762
KAR	2.1973	3.0029	3.0770	2.5658	3.1211	0.0000	2.2971	2.6027	1.4890	1.8309	3.5334	2.1720	1.9185	2.4716	1.4460	1.4460
KER	1.0439	2.6694	2.7655	4.1461	4.0128	2.2971	0.0000	0.0000	1.2352	1.4834	4.3349	4.3124	1.6889	3.2303	1.3231	1.0439
MP	1.3573	0.7154	0.7870	1.7975	3.6059	2.6027	0.0000	2.0854	2.0343	0.592	4.3398	0.5330	0.7184	1.9072	1.6135	0.5330
MAH	1.1259	2.6654	2.7116	3.0569	3.4732	1.4890	1.2352	2.0343	0.0000	1.2335	4.1175	1.6173	1.5136	2.9720	0.5025	0.5025
ORI	0.7128	1.5015	1.5651	4.0453	3.5701	1.8309	1.4834	0.9592	1.2335	0.0000	4.1369	0.7293	0.3702	2.1295	0.7503	0.3702
PUN	4.5816	4.6380	4.7234	4.9296	1.8762	3.5334	4.3349	4.3390	4.1175	4.1369	0.0000	3.9870	4.0434	3.4830	4.1042	1.8762
RAJ	1.2256	1.1660	1.2227	4.3192	3.1986	2.1720	4.3124	0.5330	1.6173	0.7393	3.9870	0.0000	0.5081	1.8327	1.2321	0.5081
TN	1.8449	1.2021	1.2700	4.2036	3.4276	1.9185	1.6889	0.7184	1.5136	0.3702	4.0435	0.5081	0.0000	1.7972	1.0402	0.3702
UP	2.8357	1.7429	1.7601	4.7955	2.9221	2.4216	3.2303	1.9072	2.9720	2.1295	3.4830	1.8327	1.7972	0.0000	2.5838	1.7429
WB	0.8130	2.2067	2.2547	3.3794	3.4913	1.4460	1.3231	1.6135	0.5025	0.7503	4.1042	1.2321	1.0402	2.5838	0.0000	0.5025

Mean (c) = 0.9554
Standard Deviation(SD) = 0.7313
Critical minimum distance (C+) = 2.4177

nature, and the highest negative values for those variables which tend to hamper development

Table 3.13

DISTANCE FROM EACH STATE TO IDEAL(0): 1981

Matrix - 4

States	Sterilisation	IUD	C.C.	O.P.	S.S.	SQRT
AP	-1.15257	-3.64721	-3.30998	-3.3918	37.0910	6.0902
Assam	-3.03252	-3.59620	-3.24270	-3.8667	47.5962	6.8990
Bihar	-3.11286	-3.68037	-3.24051	-3.7885	48.0892	6.9346
Gujarat	0	-2.53540	-1.61609	0	9.0400	3.0067
Haryana	-2.20857	-1.61615	0	-3.1738	17.5633	4.1909
Kamataka	-1.35754	-2.20277	-2.64910	-1.8874	17.2754	4.1564
Kerala	-0.44149	-2.96821	-3.29875	3.7421	33.8301	5.8170
MP	-2.39187	-3.61151	-2.93276	-3.7951	41.7685	6.4629
Maharashtra	-0.74688	-3.30271	-2.61557	-2.6831	25.5062	5.0504
Orissa	-1.70553	-3.25575	-3.12988	-3.2626	33.9499	5.8267
Punjab	-1.73713	0	0.61979	-3.7232	17.2646	4.1551
Rajasthan	-2.13146	-3.42072	-2.61826	-3.5105	35.423	5.9518
TN	-2.05401	-3.20616	-3.02915	-3.3173	34.6789	5.8889
UP	-3.48188	-2.23793	-2.55539	-3.1488	33.4649	5.7935
WB	-1.15171	-3.25929	-2.87250	-2.8268	28.1972	5.3096

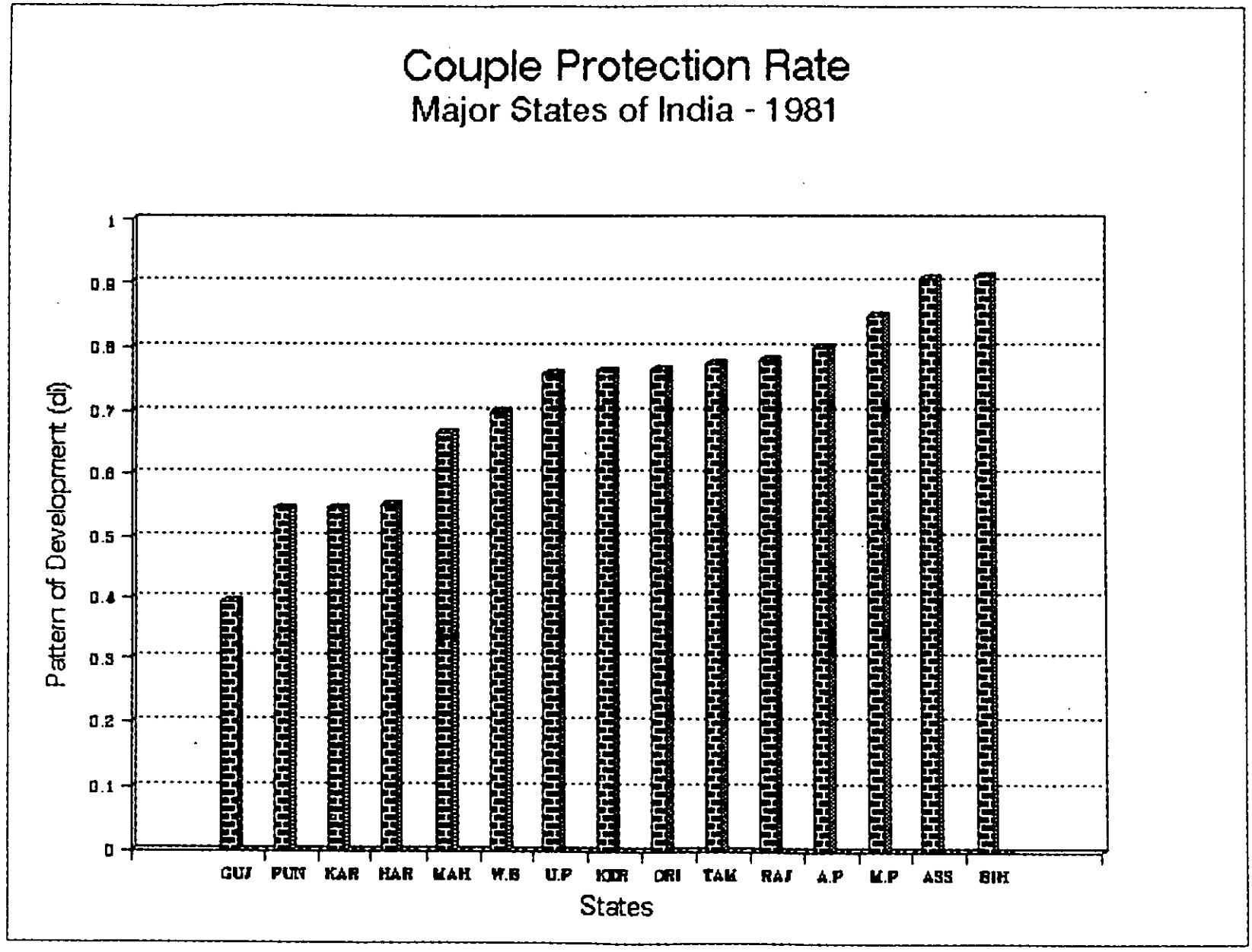
To measure the pattern and measure of development of family planning performance in Indian states the distance from the ideal sate (o) to every other state for which of the standardised values has been calculated and from these values, the "pattern" (Cio) and 'measure' (di) are derived. The 'pattern' (Cio) refers to the composite distance from the ideal state to every other state and 'measure' (di) is a function of pattern and critical minimum distance (CMD) from the idea state. Matrix 5 gives the values for 'measure' and 'pattern' for each state during 1981.

Table 3.14

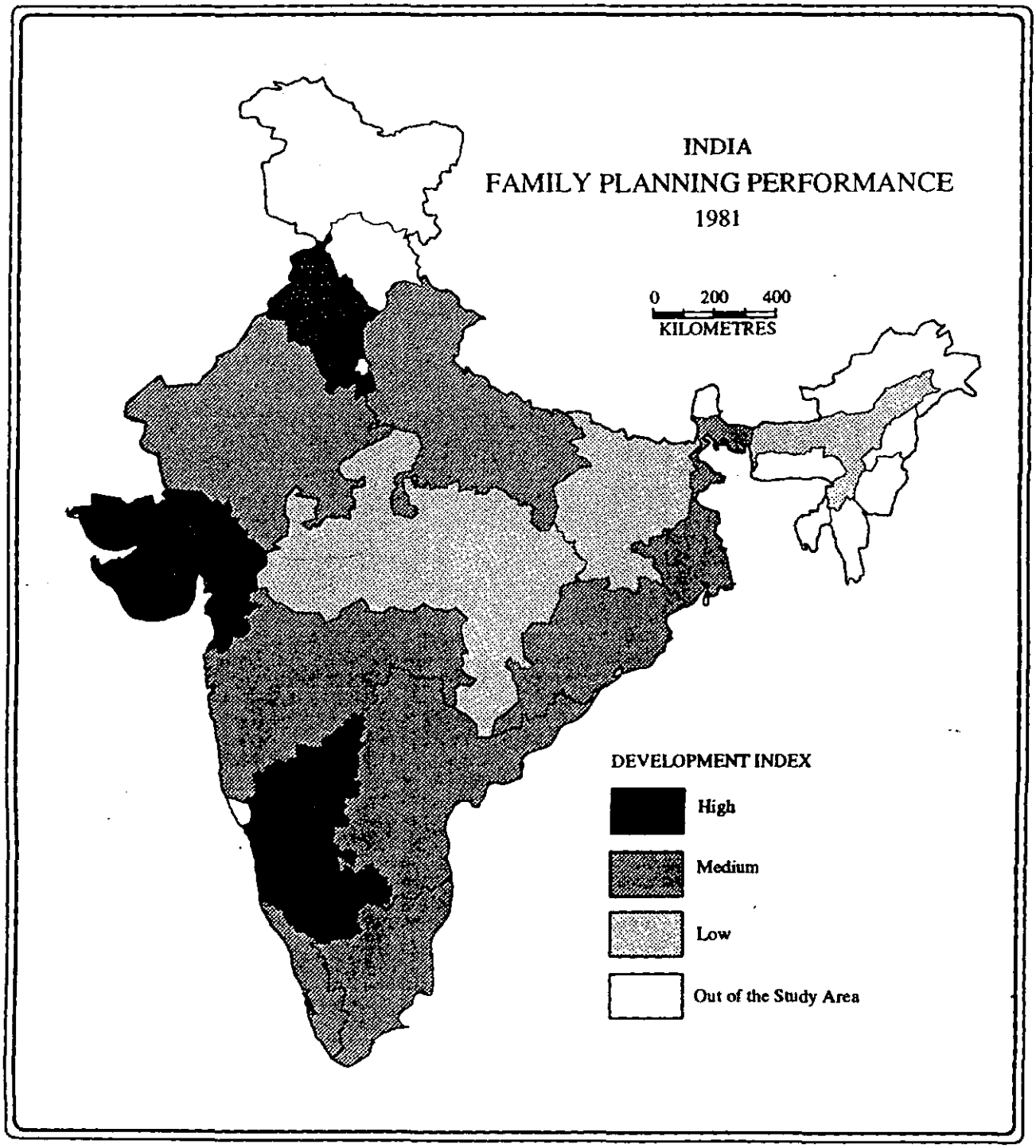
PATTERN AND MEASURE OF FAMILY PLANNING PERFORMANCE BY STATES: 1981

Matrix - 5

State	Cio	Di
Gujarat	3.0067	0.3953
Punjab	4.1551	0.5463
Karnataka	4.1564	0.5463
Haryana	4.1909	0.5510
Maharashtra	5.0504	0.6640
W.B.	5.3096	0.6981
UP	5.7935	0.7617
Kerala	5.8170	0.7648
Orissa	5.8267	0.7661
T.N.	5.8889	0.7743
Rajasthan	5.9518	0.7825
A.P.	6.0902	0.8007
MP	6.4629	0.8497
Assam	6.8990	0.9071
Bihar	6.9346	0.9118
Mean	5.4356	
Standard Deviation	1.0851	
(Co)	7.6857	



Important Note : Lower the value of (di) higher is the development.


INDIA
FAMILY PLANNING PERFORMANCE
1981
0 200 400
KILOMETRES
DEVELOPMENT INDEX
High
Medium
Low
Out of the Study Area

In the above matrix-5(di) is called the measure of development the closer (di) is to (0) the more developed the state and the closer to 1, the less developed the state. The measure is constructed in such a way that it is always non-negative. The value lies between (0) and (1), (o<d<1). The 'pattern' and measure in matrix –5 reveals that during 1981 Gujarat had the best pattern of family planning performance and Bihar had the least. States having a 'measure' value closer to '0' indicates more developed states 1 with better family planning performance, while those nearer to '1' indicates the least performance states. Based on these findings, the states have been classified a 'best', 'medium' and 'low performance states as follows:

Family Planning Performance during 1981	States
High	Gujarat, Punjab, Karnataka, Haryana
Medium	Maharashtra, W.B., U.P., Kerala, Orissa, T.N., Rajasthan
Low	A.P., M.P., Assam, Bihar

THE PATTERN AND MEASURE OF DEVELOPMENT OF FAMILY PLANNING PERFORMANCE IN THE VARIOUS STATES OF INDIA: 1991

The matrix 1 contains the same states and indicators of family planning performance those which are used in the matrix 1 of 1981.

Table-3.15

FAMILY PLANNING PERFORMANCE INDICATORS IN INDIAN STATES: 1991

Matrix-1

State	Sterilisation	IUD	CC	OP
AP	37.85	21.29	68.83	19.35
Assam	19.61	8.67	11.16	2.85
Bihar	17.13	12.84	9.82	3.04
Gujarat	34.83	65.42	117.25	16.59
Haryana	33.78	59.74	196.05	14.21
Karnataka	38.89	28.83	31.86	10.34
Kerala	45.10	28.34	72.40	9.62
MP	24.51	32.60	115.66	23.16
Maharashtra	41.46	35.44	83.35	32.30
Orissa	27.94	32.32	59.76	12.67
Punjab	31.03	136.95	116.38	21.22
Rajasthan	19.44	23.68	40.19	7.88
TN	40.85	44.77	31.72	18.88
UP	18.45	66.52	64.67	9.37
WB	29.37	12.85	28.95	10.15
Mean	30.6824	40.6834	73.1767	14.10885
SD	9.26901	32.3181	54.9355	7.939423

Table-3.16

STANDARDISED FAMILY PLANNING PERFORMANCE INDICATORS OF INDIAN STATES: 1991

Matrix-2

State	Sterilisation	IUD	CC	OP
AP	0.7734	-0.6002	-0.0792	0.6601
Assam	-1.1950	-0.9905	-1.1289	-1.4182
Bihar	-1.4616	-0.8617	-1.1534	-1.3945
Gujarat	0.4480	0.7654	0.8024	0.3129
Haryana	0.3340	0.5896	2.236	0.0120
Karnataka	0.8858	-0.36696	-0.7522	-0.4746
Kerala	1.5552	-0.3819	-0.0142	-0.5653
MP	-0.6654	-0.2503	0.7734	1.1394
Maharashtra	1.1624	-0.1624	0.1852	2.2914
Orissa	-0.2963	-0.2587	-0.2515	-0.1808
Punjab	0.0378	2.9787	1.6966	0.8959
Rajasthan	-1.2131	-0.5260	-0.6005	-0.7845
TN	1.0973	0.1265	-0.7547	0.6011
UP	-1.3202	0.7995	-0.1549	-0.5974
WB	-0.1421	-0.8613	-0.8050	-0.4981

Table 3.17: MATRIX 3 (DISTANCE MATRIX) : 1991

	AP	ASS	BIH	GUJ	HAR	KAR	KER	MP	MAH	ORI	PUN	RAJ	TAN	UP	WB	Min. Dist. (Cj)
AP	0.0000	3.0737	3.2309	1.6936	2.7187	1.3444	1.4712	1.7746	1.7533	1.4134	4.0692	2.5120	1.0454	2.8159	1.6657	1.0454
ASS	3.0737	0.0000	0.2981	3.5368	4.2672	2.3981	3.1471	3.3149	4.5616	1.9090	5.5329	0.9471	3.2741	2.2005	1.4411	0.2981
BIH	3.2309	0.2981	0.0000	3.6102	4.3362	2.6004	3.3641	3.3377	4.7699	2.0020	5.5104	0.9232	3.4155	2.1004	1.6328	0.2981
GUJ	1.6926	3.5368	3.6102	0.000	1.4804	2.1237	1.9950	1.7181	2.3805	1.7196	2.4913	2.7566	1.8268	2.2074	2.4971	1.4804
HAR	2.7187	4.2672	4.3362	1.4804	0.0000	3.2234	2.7993	2.2617	3.2640	2.7103	2.6207	3.5104	3.1768	2.9787	3.4416	1.4804
KAR	1.3444	2.3981	2.6004	2.1237	3.2234	0.0000	1.0000	2.7115	2.9406	1.3113	4.4482	2.1330	1.2021	2.5688	1.1420	1.0006
KER	1.4712	3.1471	3.3641	1.9950	2.7993	1.0006	0.0000	2.9112	2.8987	1.9098	4.3195	2.8418	1.5417	3.1120	1.9340	1.0006
MP	1.7746	3.3149	3.3377	1.7191	2.2617	2.7115	2.9112	0.0000	2.2409	1.7116	3.4398	2.4423	2.4236	2.3257	2.4125	1.7116
MAH	1.7533	4.6616	4.7699	2.3805	3.2640	2.9406	2.8987	2.2409	0.0000	2.9051	3.9196	3.9816	1.9566	3.9437	3.3094	1.7533
ORI	1.4134	1.9090	2.0020	1.7196	2.7103	1.3213	1.9098	1.7116	2.9051	0.0000	3.9429	1.1824	1.7190	1.5333	0.8911	0.8911
PUN	4.0692	5.5329	5.5104	2.4913	2.6207	4.4482	4.3195	3.4398	3.9196	3.9429	0.0000	4.6849	3.9184	3.5002	4.7937	2.4913
RAJ	2.5120	0.9471	0.9232	2.7566	3.5104	2.1330	2.8418	2.4423	3.9816	1.1824	4.6849	0.0000	2.7762	1.4149	1.1761	0.9232
TN	1.0454	3.2741	3.4155	1.8268	3.1768	1.2021	1.5417	2.4236	1.9566	1.7190	3.9184	2.7762	0.0000	2.8449	1.9294	1.0454
UP	2.8159	2.2005	2.1004	2.2014	2.9787	2.5688	3.1120	2.3257	3.9433	1.5333	3.5002	1.4149	2.8449	0.0000	2.1398	1.4149
WB	1.6697	1.4411	1.6328	2.4971	3.4416	1.4420	1.9340	2.4120	3.3096	0.8911	4.7937	1.1761	1.9294	2.1398	0.0000	0.8911

Mean (c) = 1.1817
Standard Deviation (SD) = 0.5450
Critical minimum distance (C+) = 2.2717

Table-3.18

DISTANCE FROM EACH STATE TO IDEAL (o): 1991

Matrix-4

States	Sterilisation	IUD	C.C.	O.P.	S.S.	SORT
AP	-0.7818	-3.5789	-2.3159	-1.63133	21.4446	4.6308
Assam	-2.7505	-3.9692	-3.3657	-3.70959	48.4070	6.9575
Bihar	-3.0169	-3.8404	-3.3901	-3.68586	48.9283	6.9949
Gujarat	-1.1072	-2.2133	-1.4344	-1.97853	12.6969	3.4781
Haryana	-1.2213	-2.3892	0	-2.27882	12.3926	3.5203
Karnataka	-0.6695	-3.3456	-2.9889	-2.76594	28.2252	5.3127
Kerala	0	-3.3606	-2.251	-2.85663	24.5210	4.9519
MP	-2.2207	-3.229	-1.4634	-1.15196	18.8262	4.3389
Maharashtra	-0.3928	-3.1411	-2.4883	0	14.229	3.7722
Orissa	-1.8515	-3.2374	-0.5402	-2.47217	26.2120	5.1198
Punjab	-1.5174	0	-0.5402	-1.39548	4.5417	2.1311
Rajasthan	-2.7683	-3.5047	-2.8372	-3.07584	37.4573	6.1202
TN	-0.4579	-2.8522	-2.9914	-1.69029	20.1508	4.4890
UP	-2.8755	-2.1792	-2.3916	-2.8887	27.0823	5.2041
WB	-1.6973	-3.84	-3.0418	-2.78951	34.6600	5.8873

TABLE-3.19

PATTERN AND MEASURE OF FAMILY PLANNING PERFORMANCE BY STATES: 1991

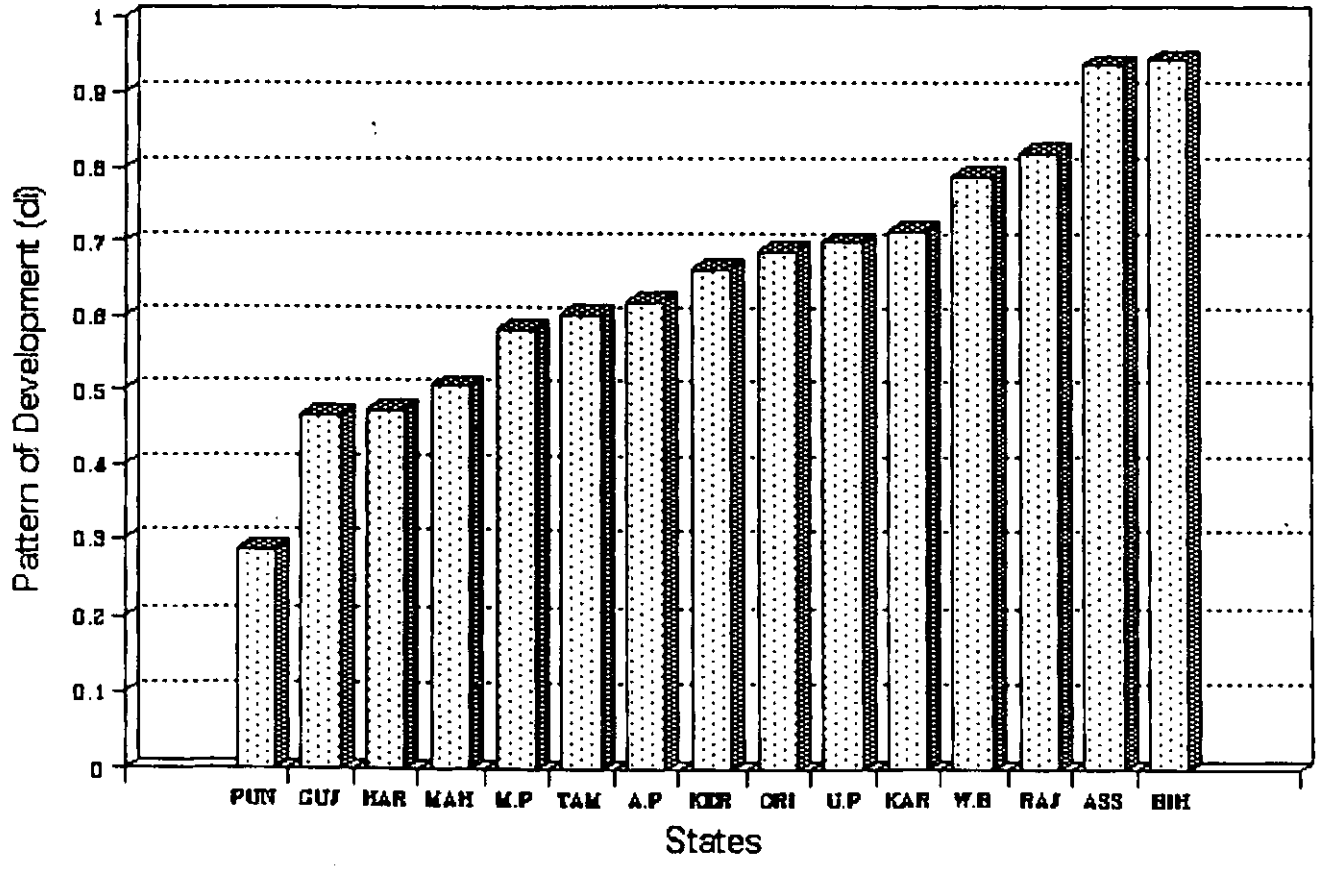
Matrix-5

State	Ci	Di
Punjab	2.1311	0.2868
Gujarat	3.4781	0.4880
Haryana	3.5203	0.4737
Maharashtra	3.7722	0.5076
MP	4.3389	0.5838
TN	4.4890	0.6040
AP	4.6308	0.6231
Kerala	4.9519	0.6663
Orissa	5.1198	0.6889
UP	5.2041	0.7002
Karnataka	5.3127	0.7148
WB	5.8873	0.7921
Rajasthan	6.1202	0.8235
Assam	6.9575	0.9362
Bihar	6.9947	0.9412

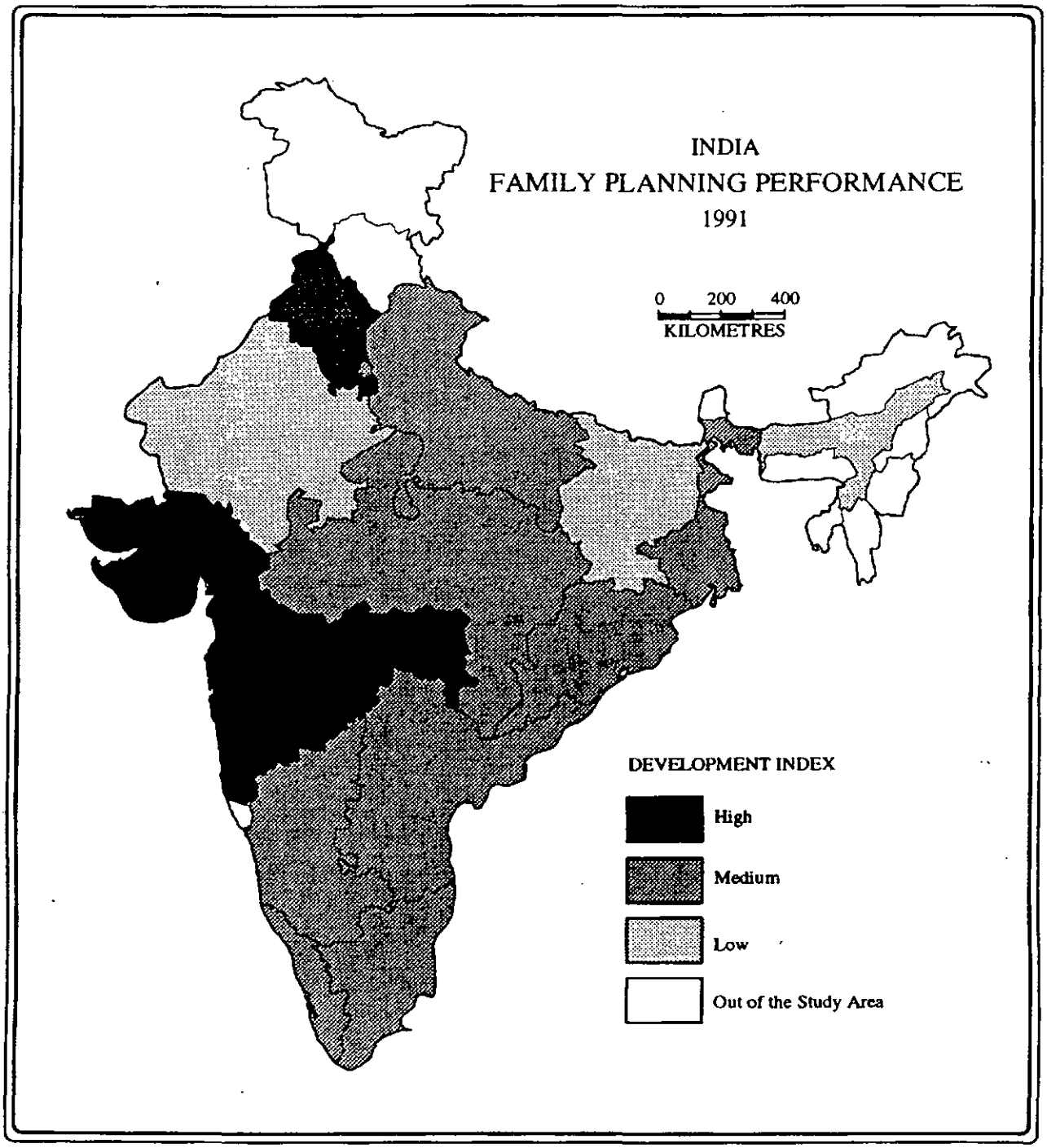
The pattern and measure in matrix-5 reveals that during 1991 Punjab had the best pattern of family planning performance and Bihar had the least. States having a measure value closer to 'o' indicate more

Couple Protection Rate

Major States of India - 1991



Important Note : Lower the value of (di) higher is the development.


INDIA
FAMILY PLANNING PERFORMANCE
1991
0 200 400
KILOMETRES
DEVELOPMENT INDEX
High
Medium
Low
Out of the Study Area

developed states or 1, with better family planning performance while those nearer to 1 indicates the least performance states. Based on these findings, the states been classified on 'high', 'medium', and 'low' as follows. In both 1981 and 1991 Assam and Bihar are the less developed states in family planning performance. But the like Gujarat, Punjab, Haryana are the best in both 1981 and 1991.

Family Planning performance during 1991	States
High	Punjab, Gujarat, Haryana, Maharashtra
Medium	MP, AP, Kerala, Orissa, UP, Karnataka, WB
Low	Rajasthan, Assam, Bihar

In current chapter has analysis the determinants and pattern of family planning performance, of major state.

In the next chapter presents the conclusion and suggestion of the family planning performance of the 15 major states.

CHAPTER IV

CONCLUSION

(1) In the present study an attempt has been made to find out the variables that have an impact on family planning performance in India. On the basis of the research findings of the present study, it has been observed that family planning performance has varied from state to state during the period under investigation (i.e. 1981-1991).

These variables are female literacy rate, religious composition (Hindu, Muslim and Christian population), percent of urban population, female work participation rate, per-capita income, infant mortality rate and no. of hospital beds per lakh population.

(2) The pattern of development of family planning performance of different states has been identified by using the taxonomic method. The study also attempts to analyse the difference in the family planning performance among the states of India. The study indicates that Gujarat, Punjab, Karnataka and Haryana were the highly developed states in acceptance of family planning performance measured in terms of equivalent sterilization (i.e. sterilisation, IUD, Conventional Contraception and Oral pills) in 1981. In the same year Andhra Pradesh, MP, Assam and Bihar were the lowest acceptors states. But in 1991, Punjab, Gujarat, Haryana and Maharashtra were high acceptors states in family planning performance. In the same time period i.e. in 1991 Rajasthan, Assam and Bihar were the lowest acceptors states. But in 1991, Punjab, Gujarat, Haryana and Maharashtra were high acceptors states in family planning performance. In the same time period i.e. in 1991 Rajasthan, Assam and Bihar were the lowest acceptors in family planning performance. On the basis of empirical studies in both time period 1981 and 1991 Punjab, Gujarat, Haryana, Maharashtra, Kerala and west-Bengal have been identified as the states with highest achievement of family planning performance. On the

other hand Rajasthan, Assam and Bihar states have indicated the lowest achievement in family planning performance. The achievement of sterilisation method such as IUD, Conventional Contraception and oral pills have increased in every state from the period of 1981 and 1991. But in the years the target and the percentage of achievements was not fulfilled in all methods in all states. It has been observed that those states where the gap between target and percentage of achievement are low are more developed in family planning performance and vice-versa. The percentage of eligible couples effectively protected through the sterilisation method is more compared to other methods in every states in both the time periods 1981 and 1991.

(3) The variables female literacy rate, religious composition, percent of urban population, female work participation rate, per-capita income, infant mortality rate and no. of hospital bed per lakh population in regression analysis indicate that socio-economic, demographic and health factors are directly or indirectly related with the family planning performance. In 1981, the variables which were directly related with the couple protection rate were female literacy rate, percent of urban population, percapita income and no of hospital beds per lakh population. The variables which are indirectly related are infant mortality rate, and religious composition. In 1991, the variables which are directly related with couple protection rate have percent of urban population and per capital income and the variables which are indirectly related are health variable, infant mortality rate, religious composition (percent of Hindu population), female work participation rate, female literacy rate. According to the results of R^2 in 1981, social and health facilities were the two important dominating factors for the degree of family planning performance in India. The determinants were factors like religious composition and the health facilities i.e. the no. of hospital beds per lakh population. But just after 10 years it, has been said that apart from medical and social condition, the addition of economic condition of the

people was the most significant determinant for the performance of the family planning in some major states of India. In 1991 the determinants were female literacy rate and religious composition, i.e. percent of Muslim population and percent of urban population.

(4) Based on the results derived from R^2 analysis, the study highlights certain measures to increase the performance in India. These four variables (a) female literacy rate, (b) religious composition, (c) level of urbanisation and (d) health infrastructure, determine the family planning performance for the years 1981 and 1991. The position of women in terms of education has to be improved, as education is the key that opens the door to life which is essentially social in character. Public opinion has to be created which will make imperative for every parent to see that not only the sons, but daughters too go to schools. Through education certain superstitions prevalent among different religious compositions of the society, like giving more importance to the birth of a son who would be an asset in the future, giving less and inferior education to daughters etc. can be removed. Moreover, education can help in reducing the size of a family to a considerable extent. In urban areas higher the levels of education, higher is the level of health facilities, sanitation, standard of living, communication and information. The government should take proper initiatives and steps to provide better health infrastructure like primary health centres, proper drainage system, better sanitation, communication and information like multimedia approach, in the rural areas. The study suggests that to increase the family planning performance in less developed state (Raasthan, Assam and Bihar), it is necessary to improve the status of women through socio-economic and health facilities in these states. The education of the people and urbanisation should also be improved for better family planning performance of these states. Finally it may be mentioned that only cooperation, incentive and dedicated efforts on the part of the government and people will go a long way in solving the population problem of the society.

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