SPATIO-TEMPORAL DIMENSION OF RELATIONSHIP BETWEEN FERTILITY AND ITS DITERMINANTS IN INDIA:

A COMPARATIVE STUDY OF RAJASTHAN AND TAMIL NADU

Jeetendra D. Soni*
Moumita Basu*
And
Atul Kumar Mishra*

ABSTRACT

This paper makes an attempt to understand the variation in fertility behaviour, its determinants and spatio-temporal dimensions in India.

A turning point in Indian fertility behaviour has been observed since 1960s with the emergence of regional variations in it, which is discernible from various empirical studies. To identify the causes behind the emergence of such spatial differentials, a comparative analysis of regions with extremities in their performance of demographic characteristics can give us a better insight. For this study, two states, Tamil Nadu exhibiting a promising and Rajasthan showing unimpressive demographic characteristics have been compared.

The nature and magnitude of influence of pertinent determinants on fertility behaviour have been established with statistical methods. Here, social factors emerged as most important determinants followed by economic factors. On the basis of the findings of this study, an endeavor is made in formulating relevant and effective future strategies for study areas.

THE RESEARCH PAPER

In India efforts to control population growth have been made since independence. Nevertheless even after sustained efforts for more than half a century, India has not been able to achieve worthwhile progress in population stabilization. Therefore it can be said that our strategy to control population growth through family planning programmes could not yield expected results. The failure of programmes of population control to achieve substantial results motivates us to decipher various aspects of population growth so that the future strategy to check rapid population growth can be designed in a proper way to get the desired outcomes. On the similar line of thought, in the recent past especially following CAIRO summit, need to incorporate socio-economic aspects into population control programmes have been advocated.

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*All are PhD. Research Scholars in Centre for the Study of Regional Development, Jawaharlal Nehru University, New Delhi, 110067, India.
Jeetendra D. Soni, # 208, Periyar Hostel, J.N.U., New Delhi, 110067, India. Ph. No.-919868045152
Moumita Basu, # 111, Block no. III, Yamuna Hostel, J.N.U., New Delhi, 110067, India. Ph. No.-919818064779
Atul Kumar Mishra, # 159, Periyar Hostel, J.N.U., New Delhi, 110067, India. Ph. No.-919868447469

In this study, an attempt has been made to identify relatively more important socio-economic and demographic variables, which have maximum contribution in determining fertility behaviour. The main objective of this research is to see the spatial pattern of fertility behaviour and its determinants. Here, various important socio-economic and demographic variables determining fertility behaviour in Rajasthan and Tamil Nadu have been ascertained. Further an attempt has been made to compare and contrast the pattern of association among various socio-economic and demographic variables and fertility in these two states.

Evaluation of plethora of literature clearly brings out the message that social, economic and demographic factors have very strong association with fertility behaviour. On the basis of this, a few important variables have been chosen to evaluate the influence of socio-economic and demographic characteristics of the society on fertility behaviour in this piece of work. Here these aspects are studied spatially and temporally.

The influence of explanatory variables on fertility behaviour has been examined in two different states like Rajasthan and Tamil Nadu. Out of these two states, Rajasthan is one of the northern states, which is experiencing high fertility rates and showing marginal decline in its growth rate of population in the recent past. On the other side, Tamil Nadu is situated in the southern belt of low fertility and has shown a significant decline in fertility in the last few decades. These two states of differing characteristics have been selected to examine the differences regarding the nature and magnitude of influence of different explanatory variables on fertility behaviour. This exercise is carried out for these two states, taking two different reference time periods, to examine the temporal change in nature of the relationship between fertility behaviour and its determinants.

To achieve the above stated objectives, district level data have been collected and transformed in the required form for further statistical analysis. Here for the selection of the important explanatory variables among the considered variables and to identify the variability in their explanation, multiple regression techniques of zero order correlation coefficient matrices and stepwise regression are applied. To carry out this analysis TFR, which is taken as a summary measure of fertility behaviour in this study, has been adopted as a dependent variable and the other socio-economic and demographic variables have been considered as independent explanatory variables.

With the help of **stepwise regression analysis**, the most important explanatory variables influencing fertility behaviour have been sorted out among all the considered variables. However, this technique fails to establish causal relationships among the dependent variable and independent variables. To establish causal links or direct and indirect effect of each explanatory variable on dependent variable, **path analysis** has been used in this study. This analysis is based on the preconceived chains of causal links among the considered variables and for this a conceptual framework has been prepared on the basis of existing theoretical base. The variables, which emerged significantly important in multiple regression techniques have been placed in the conceptual framework for path analysis and causal links or direct and indirect effect of these variables on fertility have been established for the states of Rajasthan and Tamil Nadu.

In the results of stepwise regression analysis, social factors have emerged as the most significant factors to influence fertility behaviour in both the states. Further these variables are followed by economic variables in Rajasthan, while for Tamil Nadu, demographic variables have emerged as the second most important determinant aspects of fertility next to the social factors. The above difference can be explained in the following manner. For an economically backward state like Rajasthan, economic aspects have played important role in the determination of fertility behaviour as these are considered to be the key factors in influencing the way of life. However, for places of relatively better economic conditions like Tamil Nadu, other factors like demographic aspects play an important role in determining the family size, next to the social factors.

Among the social variables also, the magnitude to influence the fertility behaviour of different social variables are not found to be identical for different places and for different reference periods for the same region. Among the social variables, female education is found to be an important predictor variable for explaining variation in fertility levels in both the places. Female education has potential to influence fertility behaviour-both directly and indirectly with considerable magnitude. In Rajasthan, female literacy has emerged as the most potent factor in determining fertility behaviour. On the other hand, in Tamil Nadu, female literacy upto secondary and above is explaining the maximum variation in fertility behaviour. This might be so because in Tamil Nadu, female literacy is widely spread. Hence the level of female education is more significant in explaining fertility behaviour. In Rajasthan, female literacy itself is an important contributing factor in fertility decline because of the poor status of female literacy

there. From this work therefore, we can infer that female education which helps in enlightening one's mind and widens life's perspective, is the best contraceptive.

The physical standard of living is found to be the second most important social variable in explaining fertility behaviour in both the places. However, its influence is found more pronounced in Rajasthan in comparison to Tamil Nadu. The poor social and economic infrastructural facilities in the former might be responsible for this.

In case of economic variables, the level of economic development of society, which is represented by proportion of main workers in the non-primary sector, has emerged as the most powerful indicator in determining reduction in fertility levels in both the places. In case of Rajasthan it is followed by female work participation where the poor status of females is an important contributing factor for high fertility and little improvement in this may bring changes in fertility behaviour. On the contrary, in Tamil Nadu the female work participation is already high. So it is not providing much of explanation for the dynamics in fertility behaviour. Here, land man ratio, which indicates the pressure on land, has emerged as an important variable because in a densely populated state like Tamil Nadu, the pressure on land is high. The high agricultural density in the state curtails the potential of land to absorb further increase in population size and ultimately contributes towards the increasing acceptance of small family norms. In Rajasthan, since the agricultural density is low and land-man ratio is high, it is not contributing significantly for bringing variations in fertility.

Among the demographic variables, child mortality rate (CMR) and female age at marriage have emerged as significant explanatory variables influencing fertility behaviour in Rajasthan and Tamil Nadu. CMR is positively related with fertility while female age at marriage has an inverse relation with it. In 1981, for both the states, maximum variation in fertility behaviour is explained by CMR but in 1991, female age at marriage has become the most influential factor in determining the fertility level. It is found to be so because during 1981, CMR was high and it was playing an important role in deciding fertility. During 1991, child mortality rates reduced considerably and the influence of this variable on fertility has also reduced. Along with this, during 1981 low female age at marriage was a usual practice in the society. This scenario changed during 1980s. In the relatively advanced section of the society female age at

marriage started showing increasing trends. Thus the variation in female age at marriage among different groups has become more important in explaining fertility behaviour in 1991.

In this work we find that the nature and magnitude of the influence of various socio-economic and demographic aspects on fertility behaviour is showing spatial and temporal variations. The socio-economic status of any region plays an important role in shaping the idea regarding family size for the concerned population. Thus we can conclude that the level of socio-economic development of any region governs the relationship of the various explanatory variables with fertility behaviour. Further, the nature and magnitude of the effect of various socio-economic and demographic variables on fertility behaviour also changes with changing levels of the socio-economic status of any society with time. It is also concluded that the relationship between fertility and its determinants is highly complex in nature. It presents varying scenario for different regions and also varies for different reference periods even for the same region.

With the above discussion it is evident that the social, economic and demographic aspects of a society are the actual determinants of its fertility behaviour. It can be therefore said that mere family planning programmes have not been sufficient for simulating any significant fertility decline. Its future contribution of lowering fertility levels in the region would be significant only after the socio-economic factors permit smaller family norms (Mehta, 1993).

Since the socio-economic status has laid immense impact on fertility behaviour, therefore various policies and developmental processes for the socio-economic development of all the groups are likely to contribute in the reduction of fertility differentials. The standard of living, which reflects the overall status of a society, influences the need for family planning and adoption of small family norms. It also decides the extent to which the need for family planning is to be met. It is very much clear that until and unless the overall socio-economic development takes place, usage of family planning norms will not be achieved upto the expected levels. The over all development on the socio-economic front will not only strengthen the family planning programmes but also contribute to the other sectors as well.

A significant decline in fertility level for the country as a whole in the near future is possible only when small family norm is widely accepted across all sections of the society.

The population status of India presents a complex picture, expectedly so, given the country's immense cultural and economic diversities. Therefore there cannot be any one miracle formula, which will cover the entire country (Singh and Choudhary, 1994). We find that among the various socio-economic and demographic factors, considered in this work, some of them have negative impact on fertility behaviour and act as barriers for population control. The effects of these negative factors have to be mitigated. The present work shows that there is regional variation in the pattern of the nature and extent of the influence of various explanatory variables on fertility behaviour. Therefore, the strategy for the removal for these obstacles should be formulated regionally with the consideration of their priorities in different regions. There are certain specific socio-economic and demographic problems for population control, which are region specific. Some times the magnitude and dimension of such problems within a region are also seen to change with time.

This study has considered the various important socio-economic and demographic variables. There are some other variables also which affect the decision regarding family size. The refined economic variables like per capita income and expenditure, the psychological factors like perception of people towards family size, motivation to control fertility and cultural practices and others are some of these variables. The profound effect of these variables on fertility behaviour is envisaged in various studies. The inclusion of these variables could have improved the precession and predictability of the results. However, unfortunately the unavailability of data regarding such factors has imposed certain limitations, thereby restricting the scope of this research to a limited framework.

Thus we conclude that various population policies and programmes for population control should include socio-economic factors as important ingredients. Further, these programmes should be region specific. The formulation of these programmes should be based on extensive fieldwork. The empirical studies of specific regions reveal the grassroot level relationship between fertility and its determinants. On the basis of results of such studies, important explanatory variables should be taken into consideration. After receiving these information, strategies for controlling fertility should be adopted. In the processes of formulation of such strategies, weightages should be rationalized for the different attributes for population control in specific regions. At the same time these programmes should be evaluated from time to time, as the influence of various explanatory variables too changes accordingly.