CHAPTER X

MULTIPLE REGRESSION ANALYSIS OF FERTILITY BEHAVIOUR

In the preceding chapters, the causal relationship of each of the independent variables with fertility has been examined individually. Since fertility behaviour is determined by the simultaneous operation of a wide array of agricultural, socio-economic, demographic, cultural and psychological factors at a given point of time, the relative contribution of each of these factors in explaining the fertility behaviour can not be assessed correctly unless they are examined together. Hence, multiple regression analysis was adopted to estimate the percentage of variance in fertility behaviour explained by each of the independent variables and all of them together. Separate regression analysis were done to predict the fertility behaviour of the respondents in the backward and developed villages. Separate regressions for these two types of villages were carried out in order to know the similar and dissimilar factors influencing their fertility behaviour which may have important theoretical and policy implications. Though more than 75 variables were analysed for the entire study, only 38 variables which
were important and have shown distinct association with
fertility behaviour were included in the regression analy-
sis. The results of these regression equations strongly
support the observations already made, besides confirming
the importance of a few more new factors.

Table 10.1: Determinants of fertility behaviour of the
respondents in backward and developed villages,
as denoted by proportion of variance explained
($R^2$) by multiple regression analysis

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Proportion of Variance Explained ($R^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Developed Villages</td>
</tr>
<tr>
<td>Agricultural modernisation index</td>
<td>21.81 *</td>
</tr>
<tr>
<td>Educational aspiration index</td>
<td>8.44 *</td>
</tr>
<tr>
<td>Gross income</td>
<td>7.62 *</td>
</tr>
<tr>
<td>Net sown area of land</td>
<td>6.05 *</td>
</tr>
<tr>
<td>Socio-economic status index</td>
<td>5.58 *</td>
</tr>
<tr>
<td>Wife's age at marriage</td>
<td>4.93**</td>
</tr>
<tr>
<td>Perceived number of son(s) to</td>
<td>3.41**</td>
</tr>
<tr>
<td>support in old age</td>
<td></td>
</tr>
<tr>
<td>Fatality index</td>
<td>-</td>
</tr>
<tr>
<td>Persistence for son(s)</td>
<td>-</td>
</tr>
<tr>
<td>Expectation of dependence on son(s)</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>57.84</td>
</tr>
</tbody>
</table>

* Significant at 0.01 level; ** Significant at 0.05 level.

Note: The significance of each independent variable in
explaining total variance is computed by an F-test
using the formula
\[ P = \frac{R^2_{\text{change}/M}}{(1-R^2_{\text{Y} 1,2,\ldots,K})/(N-k-1)} \]

where \( R^2 \) change represents a squared part correlation that measures the incremental variance explained with the addition of each new variable;

\( K \) is the total number of independent variables;

\( M \) is the number of independent variables for which the significance test is being made, and

\( N \) is the total number of cases.

**DISCUSSION**

The total variance in fertility behaviour explained by the thirty eight variables considered for the regression analysis was 58 percent for the respondents in the developed villages as against 56 percent for the respondents in the backward villages. About 44 percent of the variance in fertility of the respondents in both developed (agricultural modernisation index, educational aspiration index, gross income and net sown area of land) and backward villages (perceived number of son(s) to support in oldage, fatality index, persistence for son(s) and net sown area of land) was explained by only four variables.

The predictors of fertility as well as the percent of variance explained differed significantly between the respondents of backward and developed villages. The four variables that predicted significant proportion of the variance in both sets of villages were a) agricultural
modernisation index, b) net sown area of land, c) socio-economic status index and d) perceived number of son(s) to support in old age. However, the percentage of variance explained by these four variables differed significantly between the backward and developed villages. Agricultural modernisation index emerged as the most powerful predictor of fertility accounting for 22 percent of the total variance in the fertility of the respondents in the developed villages, where as it ranked least (4%) in explaining the fertility behaviour for the respondents in the backward villages. The findings evidently confirm that agricultural modernisation significantly influenced the fertility behaviour of the respondents in the developed villages and to a lesser extent in the backward villages also. On the other hand perceived number of son(s) to support in old age was the single major variable which explained 15 percent of variance in the backward villages, while it was the least (3%) significant predictor for the respondents in the developed villages. Thus, oldage security was the predominant determinant of the fertility behaviour for the respondents in the backward villages. The net sown area of land and socio-economic status index were the two other important variables which ranked fourth and fifth respectively in both types of villages.

The variables predicting significant proportion of fertility variance for the respondents in the developed
villages by their order of rank were: Agricultural modernisation index (22%), educational aspiration index (8%), gross income (8%), net sown area of land (6%), socio-economic status index (6%), wives age at marriage (5%) and perceived number of son(s) to support in oldage (3%). On the other hand, perceived number of son(s) to support in oldage (15%), fatality index (13%), persistence for son(s) (8%), net sown area of land (8%), socio-economic status index (5%), agricultural modernisation index (4%) and expectation of dependence on sons (3%) were the significant predictors of fertility variance for the respondents in the backward villages.

The above analysis clearly shows that the agricultural related variables (agricultural modernisation index and net sown area of land) were the predominant determinants of fertility behaviour of the respondents in developed villages. Educational aspiration index and gross income, consequences of agricultural modernisation also influenced the fertility variance for the respondents in the developed villages. On the other hand, oldage security variables (perceived number of son(s) to support in oldage, persistence for son(s), expectation of dependence on son(s)) and fatality index emerged as the significant predictors of fertility behaviour of the respondents in the backward villages, which explains their high fertility levels.
Detailed discussion of each of the variables explaining significant proportion of variance in fertility of the respondents in the developed and backward villages is presented below.

AGRICULTURAL MODERNISATION INDEX

Agricultural modernisation index, which is a composite score measured through the variables viz., total land holding, source and system of irrigation, value of the produce, adoption of high yielding varieties, plant protection measures, total number of labourers hired, farm assets and live stocks—emerged as the most powerful predictor of fertility behaviour of the respondents in the developed villages. On the contrary, it was found to be less significant in predicting fertility variance for the respondents in the backward villages. The impact of agricultural modernisation on fertility behaviour (vide Chapter IX) confirmed the hypothesis that higher the agricultural modernisation, lower will be the fertility (Sig. at 0.01 level in the developed villages and Sig. at 0.05 level in the backward villages). In the regression analysis, this factor ranked first for the respondents in the developed villages and explained a variance of 22 percent (Sig. at 0.01 level) as against 4 percent (Sig. at 0.05 level) for the respondents in the backward villages.
The findings of the present research study indicate that by adopting modern agricultural operations which consequently results in increasing income, consumption and educational aspirations, opportunity costs of rearing children, and decreasing the benefits from rearing children may depress fertility. The trend clearly showed that agricultural modernisation as such is a vital factor in influencing the fertility behaviour of the respondents. Hence, any specific effort taken to modernise agriculture in the rural areas may have a crucial role in bringing down fertility levels.

**EDUCATIONAL ASPIRATION INDEX**

Educational aspiration index which consists of aspects like ideal education for sons and daughters, highest level of education willing to provide for sons and daughters, perception of financial burden for providing education, and benefits from daughter's education - emerged as the second important predictor of fertility behaviour for the respondents in the developed villages. It accounted for 8 percent (Sig. at 0.01 level) of the variation in fertility behaviour of the respondents in the developed villages. This variable could not predict significant variance in fertility of the respondents in the backward villages due to lack of awareness of benefits of education and also low level of educational aspirations.
The educational aspirations of the respondents showed a clear negative association with fertility (Sig. at 0.01 level in the developed villages and Sig. at 0.05 level in the backward villages). Rising educational aspirations have an impact on the perceived opportunity costs of rearing children, which in turn has a negative influence on fertility decisions. Thus educational aspirations for children is an important factor which influences fertility.

GROSS INCOME

Gross income of the family was the next important variable influencing fertility behaviour of the respondents in the developed villages. This variable showed negative correlation with fertility (Sig. at 0.05 level). The differential economic status of the respondents in the developed villages was one of the main reasons for differential fertility and it accounted for 8 percent (Sig. at 0.01 level) of variance. This variable could not predict significant proportion of the variance in fertility of the respondents in the backward villages due to their low economic status, a consequence of traditional agricultural operations and fear of adoption of innovations.

NET SOWN AREA OF LAND

Net sown area of land was the predominant determinant
of fertility behaviour, which explained 8 percent and 6 percent (Sig. at 0.01 level) of the variance in fertility for the respondents in the backward and developed villages respectively. A significant (at 0.05 level) inverse relationship between the net sown area of land and fertility behaviour was observed (vide Chapter IX). The net sown area of land ranked fourth in explaining the fertility behaviour of the respondents in both sets of villages. Obviously if the net sown area of land was more, then agricultural production will be high and the income to the farmers will be more. However, even if net sown area of land was more, but agricultural modernity was low, than the consequent production would be low. And income depended on agricultural production. The main reason for economic backwardness in the backward villages was due to low agricultural modernisation.

SOCIO-ECONOMIC STATUS INDEX

Socio-economic status index consisting of husband and wife's education, family type, gross income, type of house, house electrification and modern durables, accounted for 6 percent and 5 percent (Sig. at 0.01 level) of the variation in fertility behaviour of the respondents in developed and backward villages. It ranked fifth in both types of villages, but the percentage of variance explained was slightly higher for the respondents in the developed
villages than in the backward villages. The impact of socio-economic variables on fertility behaviour (vide Chapter III) also confirmed the hypothesis that higher the socio-economic status, lower the fertility (Sig. at 0.05 level). The trend of low fertility at higher levels of socio-economic status indicated that the respondents with higher socio-economic status preferred smaller family size.

FATALITY INDEX

Fatality index was the second predominant determinant of fertility behaviour of the respondents in the backward villages, but not for the respondents in the developed villages. This index covered various issues such as fate of human beings is decided by God, higher yield in agriculture depends on the will of God, the success in his life is predetermined by God, and irregular rains are due to God's displeasure (vide Chapter V). The data reflected that the respondents who scored 'low' on this index had lower number of children than those who scored high on the index in both types of villages. Fatality index predicted 13 percent of the variance in fertility of the respondents in the backward villages. Thus strong belief in traditional values, norms and fatalistic attitudes were some of the reasons contributing to high fertility in the backward villages.
Perceived number of son(s) to support in oldage was the most important variable that explained the highest proportion of variance in fertility of the respondents in the backward villages. Perception of number of son(s) to support in oldage observed for the respondents in the backward villages predicted 13 percent (Sig. at 0.01 level) of the total variance in their fertility. This variable was of least significance (3%) in predicting fertility behaviour for the respondents in the developed villages.

Perceived number of son(s) to support in oldage has shown significant (at 0.01 level) positive relationship with the fertility behaviour of the respondents in both backward and developed villages (Chapter VIII). The trend clearly showed that as the perceived number of sons increased fertility also correspondingly increased in both backward and developed villages. However, it may be observed that the respondents in the backward villages expected to depend on son(s) for financial support, while the respondents in the developed villages expected to depend on son(s) for the psychological satisfactions, companionship, comfort and care in oldage; love and attention that is provided only by children in the impersonal modern society of today. Thus the expectation of increasing benefits and privileges by son(s) to support in oldage was
one of the motivational factor to go for large families. Hence, necessary oldage security and retirement benefits have to be provided to reduce the dependence on children which in turn affects fertility.

PERSISTENCE FOR SON(S)

Persistence for son(s) was found to be another important factor, which ranked third in predicting the fertility behaviour of the respondents in the backward villages, accounting for a variance of 8 percent (Sig. at 0.01 level). This variable showed positive correlation with fertility behaviour of the respondents (vide Chapter VIII). Thus, strong feeling to have more sons is one of the major reasons to go for large families.

EXPECTATION OF DEPENDENCE ON SON(S)

Expectation of dependence on son(s) is also one of the important variables that explained significant (at 0.05 level) but small proportion (3%) of the variance in fertility behaviour of the respondents in the backward villages. A clear positive relationship between respondent's expectation of dependence on son(s) and their fertility behaviour has been observed (Sig. at 0.01 level, vide Chapter VIII). The data indicated that majority of the respondents in backward villages wanted son(s) not only for economic reasons and oldage security, but also
for family lineage, funeral rites, performance of rituals etc. As long as the economic and non-economic benefits of rearing children are high, it would be difficult to decrease fertility levels.

To conclude, the above analysis helped to identify seven major linear variables responsible for explaining the fertility behaviour of the respondents in both backward and developed villages. The overall fertility of the respondents in the backward and developed villages was differentially influenced by diverse category of variables. Agricultural modernisation index and educational aspiration index have explained maximum proportion of variance for the respondents in developed villages, where as the perceived number of son(s) to support in oldage and fatality index together regulated fertility behaviour of the respondents to a large extent in backward villages. Further, net sown area of land and socio-economic status have also played a predominant role in influencing the fertility behaviour of the respondents in both sets of villages.

Besides these, there were certain other variables which were important in explaining differential fertility, which would not show their influence under regression analysis as they showed relationship other than linear.
Thus the total explanation for the differential fertility of the sample population may have to be therefore, considered in the light of the preceding discussion under multiple regression analysis and also taking into account other major findings of the earlier chapters.