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Policy Oriented Research into Determinants of Fertility

THE topic on determinants of fertility has received considerable research attention throughout the world. Although there is a wealth of information available on this aspect, it is paradoxical that much of this research information has not been utilised for policy formulation of population programmes.

There is a need to take stock of the available information on determinants of fertility particularly to help the policy makers in utilising it for policy formulation. There is also an important need to evolve a comprehensive research framework, so that research undertaken makes more sense to the potential users of the research findings.

This paper has attempted to make a review of research in this field. The findings of the research have been presented in brief and a comprehensive framework entitled a marital fertility determinants system has been evolved and proposed. The case for undertaking comprehensive research into determinants of fertility as an aid to population and development policy making in India has been put forward.

Policy Perspective

Human fertility differentials have received research attention the world over. Early studies in the field have been mainly concerned with understanding the differentials *per se*, rather than providing explanations for the phenomena observed. The phenomenon of differential fertility did not receive the attention of those who propounded theories of fertility change (Cho *et al*, 1970). With grow-

ing recognition of the problem of overpopulation and the appreciation of the need for fertility control through population policy and programmes, the emphasis shifted first to providing explanations for observed fertility differentials, and subsequently to developing theories and models. Many of these theories and models were subjected to empirical testing either with data collected for some other purpose, or a special survey was conducted for the study. Most of the studies were either cross-sectional or areal in nature. For variety of reasons the population policies of many countries failed to recognise the research information thus generated. As a result the population programme, which normally takes an antinatal stand, has family planning programme as its main component in most countries. The experience with this kind of an approach has not been altogether satisfactory.

This situation calls for more comprehensive research into determinants of fertility both from academic and population policy points of view. It would be worthwhile first to connect up the research information earlier generated through fertility determinant models and studies and come up with a framework for research.

An Overview of Research Information

A basic theory in demography is the theory of demographic transition which is an empirical generalization of population change. Available population statistics are inadequate for charting this process in early stages. The theory postulates three stages which each population goes through : pre-transitional, transitional and post-transitional. In the first stage there is little control of death rates and birth rates, both of which are high, but there is zero natural increase of population. In the second stage both birth rates and death rates are falling, through the former is higher than the latter, resulting in medium to high population growth. The post-transitional stage is reached if both birth rates and death rates are low, and population growth is zero, or very low on a long-term basis. The historical evidences and the uniformity observed validate this theory, but definitive causes for decline in fertility (and mortality) in a population have not been sorted out in this theory. There is an important lack of explanatory structure of especially the third stage of the theory of demographic transition (Leibenstein, 1957).

Economic Development and Fertility. Attempts have been made to explain the temporal decline in fertility through relating it to economic development especially growth of income. As early as 1941 Galbraith and Thomas observed a positive relationship of fertility and income over the trade cycle, Weintraub

(1962) reported a positive effect of income on fertility established through a regression analysis over areal units. Addman (1963) undertook a similar analysis and related age-specific fertility rates with income. She concluded that other things remaining constant age-specific fertility rates vary directly with income. These findings are contradictory to the commonly held view that the 'rich get richer and the poor get babies'. Bogue *(\969)* observed negative relationship between 'Gross Domestic Product' and 'Crude Birth Rate' for selected countries. Berelson (1966) found a strong negative relationship between GNP per head and per cent of couples wanting four or more children in developing countries. This anamalous situation was attempted to be resolved by several authorities (Heer, 1966; Friedlander and Silver, 1967; Ekanem, 1972). Results of these studies were not very conclusive. This led to the realisation that economic causes were not adequate to explain the high levels of fertility in less developed countries (Kuznets, 1971), and a theory of fertility based only on income cannot be justified (Pitchford, 1974).

Family Income and Fertility. Attempts were also made to study family income influences on couple feitility. Freedman and Coombs (1966) did not find 'relative income (concept introduced by Deborah Freedman in 1963 to measure income relative to those of members of similar educational and occupational status) effect on expected family size for low parity (less than 4) US couples, but observed that those who thought their current income was inadequate expected fewer children. As far as household expenditure can be taken to imply income level there is inverse relationship between income and fertility in India (NSSO, 1975). Simon (1969) suggested that overall effect of income on fertility can be positive or negative depending on the relative weights of various coefficients. Mahalanobis stated a hypothesis to explain the rise in fertility when per capita income was growing in India in the 1950's. According to this model, number of children born (or surviving) increases (because of improvement in nutritional status) with level of living up to a point, and then with further rise in level of living it gradually declines (Das Gupta *et al.*, 1955; Mauldin, 1960).

Fertility Decision Models, In order to understand the nature of influence of family income on fertility attempts have been made by many researchers to view it from the family size decision-making frameworks of couples and to come up with theoretical models. Some of these models have been empirically tested and the implications for population policy have been suggested. Leibenstein (1957) developed a framework for decision by a couple on whether to have an nth child (*n* — 3 or more) depending on 'utilities' and 'disutilities' of children. Using this

mode] he showed that family size should reduce with per capita income growth. Okun (1958), who was the first to analyse fertility with a set of indifference curves and income constraints, tried to explain the inverse relationship between fertility and income using a model in which parents are assumed to choose between children and other commodities. He concluded that (i) increase in income would imply an increase in optimum number of children because of shift in budget, if cost of a child does not vary by income, and (ii) increase in income may Dot result in any change of number of children, if cost per child rises with income. Becker (1960) propounded a theory of fertility on the lines of the theory of demand for consumer durables. Like consumer durables children provide utility which depend on tastes. He introduced a concept of 'child quality' which is the additional utility generated by additional expenditure. Beckers's main conclusion was that increase in family income implies increased quantity and quality of children - this relationship may be reversed due to differentials in contraceptive knowledge. Friedman (1962) and Bush (1973) described a model in which children arc regarded as investment goods, and a couple is expected to choose a family size which optimises a combination of current and future consumption. Neher (1971) extended this model by introducing the problem of mortality and another concept described as 'communal ethic'. The latter imposes a condition that the parents' production is shared equally by parents, children and grand parents. Several variants of fertility decision models were proposed by Heer and Smith, 1963; Paul Schultz, 1969; Cochrane, 1971 etc. Becker (1965) came up with a theory of allocation of time, which considerably influenced the subsequent development in fertility decision modes, viz., Willis (1973), DC Tray (1973), Gronau (1973), Becker and Lewis (1073) etc. Empirical testing of economic models was attempted by Cain and Weininger (1973), Snyder (1974), Mueller (1972) etc. These exercises supported some of the tenets of the underlying theory, but presented contradictory evidences on others. Mueller emphatically argued on the role of economic considerations in fertility decisions on the basis of her experience with two special indices 'Perceived utility of children', and 'Sensitivity to cost of raising children'. Most of the fertility decision models assume as if couples make a lifetime decision on number of children just after marriage. This has been challenged by Namboodiri (1974) who advocated existence of a 'family size threshold[1]—the number of children a couple would invariably have. The threshold hypothesis has also been supported by Leibenstein (1974) who cited other evidences (Gupta and Malaker, 1963; Easterlin, 1972) and recommended that "only marginal decisions need be calculated, not all decisions . . . .", This points up the need for developing sequential models for understanding fertility behaviour.

Effectiveness of Non-economic Factors. Econometric convenience has greatly influenced the development of economic theories of fertility, The economists have naturally taken better care of the economic factors, and the directly related non-economic factors (e.g. education), than other factors emphasised in the sociological and psychological literature. Importance of cultural factors (e.g. ethnicity, family size norm, son preference etc.) has been mentioned even in the economic literature (Duesenberry, 1960; Ryder, 1973; Hermalin, 1974). Cain and Weininger (1973), who tested Becker's model, came up with a suggestion that broad cultural factors may play a role in determining social acceptance of a small family norm. Goldberg (1957) strongly opined against explaining differential fertility only in relation to socio-economic status as it would leave 'a large gap between independent and dependent variables.' Relevance of other non-economic variables to fertility has been dealt with by various researchers-an illustrative list of such exercises is presented here :

Variables	*Reference*
Frequency of family gatherings	Goldberg (1957)
Interspouse communication	Hill, Stycos and Back (1959)
Family structure (activity sharing)	Stokes (1973)
Caste	Loebner and Driver (1973)
Ethnicity	Bean and Wood (1974)
Value orientations	Poston and Singleman (1975)
Women's rights	Dixon (1975), Germain (1975)
Economic dependence of women	Mazur (1973)
Labour force participation	Snyder(1974)
Social security system	Hohm (1975)

These studies may not have been able to demonstrate convincingly the role of each variable mentioned, because of problems of measurement, but they have led to the realization that a strictly economic approach is unlikely to be successful as a theory of fertility (Leibenstein, 1974; Easterlin, 1972,1975). These economists have attempted to incorporate non-economic aspects in their models, though not very successfully, while the behavioural scientists realized that 'priority should be given to the development and validation of measuring instruments' (Fawcett, 1972).

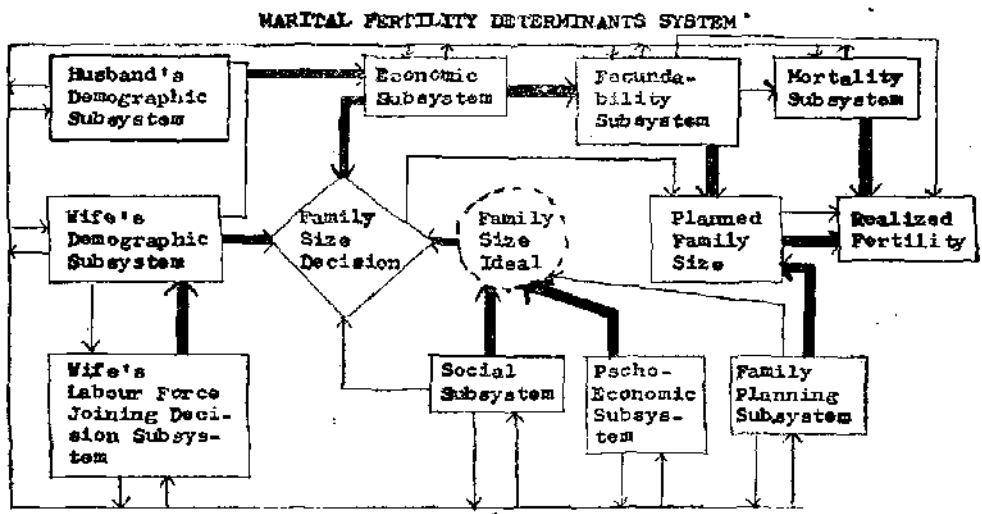
It should be amply clear from the discussions presented above that there are numerous variables which are associated with fertility, and the task of aegregat-

ing the factors which cause fertility differences is enormously complex, if at all feasible. Various model builders have worked with varying sets of premises, concepts and analytical approaches to understand the issue. Other researchers have undertaken field surveys, or analysed secondary data and derived conclusions which are essentially dominated by their professional backgrounds. The economists have concentrated their attention on economic variables paying least attention to social and psychological variables, the sociologists have given minimum consideration to economic variables, and so on. It would be worthwhile to consider the fertility determinants issue from a total systems view point—so that its results are less biased and more meaningful. Much research were done using data from developed countries; testing of fertility decision models also had been restricted mainly to these countries. It is necessary to conduct studies which are expected to yield results useful in assessing broadly the validity of the decision models in a developing country. Because of its interdisciplinary framework such studies may help the theorists to weigh their assumptions and conclusions, and modify the theories appropriately. The comprehensive research information thus generated, when integrated meaningfully, will be useful input to the decision-making problems of population policy planners and programme administrators.

A Marital Fertility Determinants System

The issue of determinants of fertility may be viewed from a total system view point so as to identify an interdisciplinary research framework that would project a picture of what determines fertility and how. A systems view is worked up by integrating the aspects and variables considered in relative isolation by various researchers, taking a clue from the findings of their studies; and providing a causal model of interrelationships. This has been attempted in a diagram entitled 'Marital Fertility Determinants System'. The total system is hypothesized to consist of the following subsystems :

(i) Husband's Demographic Sub-system,
(ii) Wife's Demographic Sub-system,
(iii) Wife's Labour Force Joining Decision Sub-system,
(iv) Economic Sub-system,
(v) Social Sub-system,
(vi) Psycho-economic Sub-system,
(vii) Fecundability Sub-system,
(viii) Mortality Sub-system, and
(ix) Family Planning Sub-system.



Note: This master chart shows the interrelationships between the major subsystems. Each subsystem can be detailed further. Darker arrows show stronger impacts.

The diagram portrays each sub-system, and also shows the linkages between the sub-systems and to the fertility determinants issues. The dependent variable which measures 'realized fertility' is the number of surviving children. It is postulated that a couple goes through a decision-making stage ('Family Size Decision') for deciding on how many more children it likes to have, no matter at what life cycle stage it is in. The seriousness of this decision increases with the addition of every child. Some of the sub-systems contribute inputs to the decision-making framework of couples and/or influence the intermediate variables viz., 'Family Size Ideal' and 'Planned Family Size' and thus determine actual fertility ('Realized Fertility').

Because of feasibility considerations it may not be possible to devote full attention to each sub-systems *per se* in a single study. We may not, for instance, study the determinants of wife's labour force participation although this deserves thorough investigation, and thus the relevant sub-systems may not be fully explored. Similarly only limited care may be taken of fecundability, mortalit} and family planning sub-systems. For gaining greater insights into the issues involved, the studies may first seek to determine the fertility differentials of Indian couples based on large-scale survey data,

A study may be devoted specifically to discovering the fertility dynamics of couples. This study should answer the following sub-problems :

(i) What are the correlates of family size ideals?
(ii) What are the inputs to the family size decisions of couples ?
(iii) What are the determinants of planned family size?
(iv) What are the determinants of realized fertility?

Family Size Ideal. The couples are assumed to form some idea about the number of children they should have. We hypothesize that FSI is influenced by the following variables :

(i) Value orientations, modernism, psychological dependence of children,
(ii) Family type, interpersonal and interspousal communication, family structure, membership of group.
(iii) Husband's education, income, media exposure.
(iv) Wife's education, income, media exposure.
(v) Number of living children.

Family Size Decision. Since all couples are not equally rational in decision-making, it is worthwhile to discover the considerations which couples perceive as relevant to family size decision-making.

Planned Family Size. The planned family size is the output of the family size decision process. PFS is determined by the following variables :

(i) Current family income, relative income, prospective income, current family expenditure, cost of child, utility of child,
(ii) Wife's labour force participation,
(iii) Family size ideal.
(iv) Consumption aspirations, perceived utility of children, sensitivity to cost of raising children, desired child quality, son/daughter preference,
(v) Child mortality experience/awareness of child mortality level,
(vi) Number of living children.

Realized Fertility. The realized fertility is the result of past family size decisions of a couple, and its success in implementing its family size plans. Since it is difficult, if not impossible, to find out past family size decisions of couples, the effect of other variables on it, with the exception of age (present, and at marriage) and duration of marriage, may not be clearly observable. We believe, however, that different sub-systems exert a direct or indirect effect on this variable. The variables which appear to be important in influencing realized fertility are fecundability, sex composition of children, child mortality experience and family planning use-effectiveness. The choice of variables, whose role on

determining realized fertility is to be studied, **will** be guided by the outcome of **other sub-problems already discussed.**

Concluding **Remarks-** Case of India

India is the first country in the world to initiate a government sponsored programme of family planning in the 1950's. This reflects the concern of the government in checking excessive population growth. There have been many shifts in the country's population policy depending on the success or failure of various approaches to family planning, and the introduction of improved methods of contraception. It is debatable to what extent the evolution of population policy in India was guided by the research information generated by demographers and other social scientists. It may be safe to assume that the population policy of India has failed to recognize much of the outcomes of research for a variety of reasons. India's experience with a population policy with family planning programme as its mainstay has not been altogether satisfactory. The growth in family planning adoption has been rather slow and uneven, and there is little conclusive research to testify to the direct impact of the family planning programme on the birth rate. This realization has led to experimentation with alternative packages of planning such as health and family planning, nutrition and family planning etc. Yet another development in this field has been the innovation of the campaign approach, especially the mass vasectomy campaign approach (Ghosh et *al.*, 1976). The results achieved have thrown some light as to how the family planning programme can be fruitfully adjusted. The policy-makers have been skeptical about the replication values of these experiments, and consequently hesitate to invest efforts in re-designing the programme. This concern is understandable, firstly in view of the inadequate theoretical background of many of these studies. Secondly, these changes, even if initiated, would still have a family planning bias, and thus would fail to take advantage of 'beyond family planning' measures (Berelson, 1969).

Studies on fertility determinants in a total systems framework will generate research information which will be meaningful input to the population policy decision and programme formulation exercise. This will, of course, require development of more powerful methods of research than used hitherto. Understanding of the relative importance of various factors in influencing fertility will enable the policy planners to decide on the needed emphasis on each of these. Knowledge of the decision-making frameworks of couples would help identify ways of influencing their decisions in a desired direction. Although, it may not directly yield policy statements, researchers should be able to come

up with, guidelines for short-run and long-nut policies. These information should be of use to the programme planners in re-directing the population policy and the family planning programme. Research in a total systems framework may imply policy formulation and action in a much wider context than normally considered in population planning. This should facilitate the desirable integration of the population programme into the overall framework of economic and social development.

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