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MIGRATION, URBANISATION AND FERTILITY:
THE CASE OF THE INDIAN PUNJAB

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I. INTRODUCTION*

It is widely accepted that fertility in urban areas is often lower than in rural areas for given levels of education, income and age-sex structures of the respective populations. This fact, coupled with the rapid migration from rural areas, characteristic of most developing countries today, raises two important questions for researchers and policy makers. First, does rural-urban migration lower fertility and thereby bring down population growth in the economy? if so, how and why? And second, what will happen to the gap between rural and urban fertility, as urbanisation increases?

The present study examines these questions using data generated by two household surveys, one conducted in twenty-six selected villages of Ludhiana district in the Indian Punjab and the other in the city of Ludhiana.¹ The focus of these surveys was on studying the causes and consequences of migration, but questions on fertility were included to trace out the links between migration and population growth through the study of the fertility behaviour of migrant and non-migrant households at the micro level. There were 2696 currently married women in the rural survey and 2592 in the urban survey. Of these, 1567 women in the rural survey and 1943 in the urban survey were in the age group 15-44. Family planning questions were asked only of the currently married women in the age group 15-44.

In order to study the relationship between migration and fertility, it is necessary to consider socio-economic and demographic factors which influence fertility. It cannot be said that there is a firm theory here, for the strength and relevance of factors which affect fertility will vary from one social setting to another. However, perceptive studies of scholars like Leibenstein, Becker, Easterlin,

* The authors are grateful to C. Castor, P. Cornu and Roy Clough for programming and research assistance. The views expressed are those of the authors and not of the organisations to which they belong.

¹ The surveys were carried out by the ILO during 1977 in collaboration with the Department of Economics, Punjabi University, Patiala.

Schultz and others have been of value in identifying and analysing many such factors.

The economic theory of fertility behaviour considers fertility to be the outcome of an interrelated process of decision-making by the households to maximise utility. According to Leibenstein, families tend roughly to balance the utility of children against the cost of bearing and bringing them up.² This utility is three fold: (a) children are a source of personal satisfaction or pleasure; (b) their labour adds to the family income; and (c) they provide parents economic and social security in old age. Against this, there are direct costs involved in rearing children and the indirect costs which involve income earning opportunities lost by the parents in raising the children. According to this theory, the utility of children diminishes not only in direct proportion to the increase in the number of children, but also in proportion to the degree of economic development.

Becker extended the theory of utility maximisation to children by treating them as a form of consumer durable yielding a flow of services over time.³ He has argued that people behave as regards children as they do in respect of consumer durables. In other words, the income effect is positive in both the cases. But cross-section studies showed that high income families generally have fewer children. Becker explained this by saying that high income families want their children to be better gifted in terms of education, etc., for which reason their upbringing entails more expense. Other scholars have maintained that there is indeed a cost effect counteracting the positive income effect but it does not arise from the quality cost of children. In their view, it is rather a consequence of the fact that in higher income groups the education and hence the earning capacity of the mother are higher; and therefore the income the family has to forego in having more children is also higher.

² See H. Leibenstein: "An interpretation of the economic theory of fertility", Journal of Economic Literature, No. 12, June 1974, pp. 457-79.

³ Gary Becker: "An economic analysis of fertility" in Demographic and Economic Change in Developed Countries (Princeton, Princeton University Press, 1960), pp. 209-231.

Subsequently, sociological, demographic and other studies have necessitated the placing of fertility decisions in the context of a larger set of interdependent household factors. Easterlin has attempted to incorporate sociological and family planning factors in the micro-economic theory of fertility.⁴ The importance of community level variables and migrant status has also been emphasised.⁵ These variables, used in the specification of fertility equations in Part II, are briefly described below.

(a) Income

Household income is expected to be positively related to fertility since increased income will enable the family to support more children. However, increased income also affects preferences and norms for the disposal of income and may tend to lower fertility by raising the relative desire for material goods.

(b) Education

Education may affect fertility in three ways: (1) directly through school environment imparting new values and shaping attitudes relevant to ideal family size and family planning, (2) indirectly through changing age at marriage, facilitating communication between husband and wife, promoting labour force participation etc., and (3) jointly with other variables, such as social status or income.

⁴ Richard A. Easterlin: "The economics and sociology of fertility: A synthesis" in Historical Studies of Changing Fertility, ed. C. Tilly (Princeton, Princeton University Press, 1978).

⁵ Paul Schultz: "An economic model of family planning and fertility", Journal of Political Economy, March-April 1969. See also Richard Anker: "The effect of group level variables on fertility in a rural Indian sample", Journal of Development Studies, Vol. 14, October 1977.

(c) Women Work Participation

The relationship between work and fertility is likely to be negative. There are several ways in which work and lower fertility may be related.⁶ First, work experience of women may alter their view of their role, reducing their desire to have many children. Secondly, if the work of a woman gives her no opportunity to care for small children and there is no alternative means of that care, then there is a conflict between the roles of mother and worker which may be resolved either by her not having children or not working. Thirdly, work may enhance the power of women in their families relative to their husbands and this may increase their ability to limit fertility successfully if they want. Finally, work may increase women's exposure to family planning influences.

However, the negative relationship between work and fertility may be weak or absent in a country like India because of the nature of work (near home in household enterprise, cottage industries or domestic service) and availability of help in child care from within the extended family.

(d) Land Status

Farming households are more likely to have higher fertility than non-farming households. First, the costs of raising children are small compared to the physical help and general benefits that children can provide to a farming family.⁷ A farmer is likely to need help with the daily chores and at harvest time and other periods of labour shortage. The need for children would be felt greater by those households that have small landholdings since they cannot afford to hire any outside labour. Economic improvement for them can come

⁶ See Robert H. Weller: "A cross-sectional examination of the relationship between wife's current employment status and cumulative family size", presented to the annual meeting of the American Sociological Association, 1974.

⁷ See, for example, David G. Mandelbaum: Human Fertility in India (Berkeley, University of California Press, 1974).

only through increasing the family labour force. Secondly, with a large enough family a few children could be spared to live away from the family land, thus accumulating some savings which may be used to buy more land and to strengthen their position in the village.⁸ Thirdly, children provide insurance to the farmer in case of sickness, surety against debt and most reliable support in meeting social obligations and in family feuds and factional quarrels which are endemic in many villages in India.

(e) Family Status

A priori, the effect of family status (extended vs. nuclear) on fertility is difficult to predict. Living in an extended family household means the availability of one's mother or mother-in-law for taking care of the children.

But it is equally likely that women living in nuclear families have more children on the average than those in extended families.⁹ In a nuclear family, if parents have no satisfactory alternative source of old age support, their own children will be called upon to provide such support and this will tend to increase their demand for children. Further, couples in extended families have less privacy and so they are likely to have fewer children. Also, there is likely to be a stricter family discipline in extended families like that of the mother-in-law over her daughters-in-law. The mother-in-law in an extended family may see to it that her daughters-in-law observe the taboos which bring about traditionally proper birth spacings and that she herself manages to stop having children when her daughters-in-law begin to bear.

⁸ See, for example, Oded Stark: "Desired fertility and rural-to-urban migration in LDC's: The positive connection", The David Horowitz Institute for the Research of Developing Countries, Tel Aviv University, Research Report No. 6/78, September 1978.

⁹ This has been reported in many studies of rural and urban areas in India. See, for example, K. Pakrasi and Chittaranjin Malaker: "The relationship between family type and fertility", Millbank Memorial Fund Quarterly No. 45, 1967; and I.Z. Hussain: "An urban fertility field: A report on city of Lucknow", Demographic Research Centre, Lucknow, 1970.

(f) Caste

Social anthropologists in India have emphasised the importance of social status and caste in studies of fertility differentials. The wealthier families which usually belong to higher castes tend to bear fewer children than families belonging to lower castes, though the operative forces may be more economic and educational than strictly caste.

(g) Mortality

Infant and child mortality is so high through most of India that parents commonly feel that they must have many babies in order to make sure of having enough grown-up children. They, therefore, tend to compensate for the loss either by replacing the deceased children or by responding in advance with higher fertility in anticipation of the mortality threat. However, mortality also increases the child-bearing cost. The net effect on fertility may, therefore, be either positive or negative depending on the relative strength of the two factors.

(h) Age at Marriage

Age at marriage is a potentially important determinant of total fertility, since a higher age at marriage tends to reduce the period during which married women bear children. However, as we shall see later, the age at marriage is itself influenced by a number of factors including education, migrant status and pre-marital employment status of women.

Besides age at marriage, it is necessary to consider (for functional specification of the fertility equation) the age of women to control the effect of biological factors, since our sample includes women who are still in the child-bearing period. As the relationship between the number of children ever born and age is likely to be non-linear, a variable "age square" is also included in fertility equations.¹⁰

¹⁰ See Ghazi M. Farooq: "Household fertility decision-making in Nigeria", Population and Employment Working Paper No. 75 (Geneva, ILO, July 1979).

(i) Family Planning Factors

If for a given couple, the biological reproduction potential is greater than the number of children it may like to have based on socioeconomic conditions, then some contraceptive practice has to be adopted by the couple to control the number of children. Knowledge and use of contraceptive methods can therefore be used as a proxy for the conscious decision of the couple to limit the family size and is expected to be negatively related to the number of children ever born. However, in practice it would be difficult to establish whether the higher fertility sub-groups have larger families because they want them or because they do not have the knowledge or means to restrict family size.

(j) Community Level Variables

Analysis based on rural survey data also includes some community level variables. The presence of a health centre in the village is likely to spread knowledge and use of contraceptive methods and thus have a negative effect on fertility. On the other hand, it may raise the probability of child survival and improve the health of children by reducing sickness. The improvement in the health of children may not only increase their potential productivity but also lower the cost of children to the parents by reducing expenditure on health care and loss of work that parents may have to incur on that score and this may have a positive effect on the demand for children.¹¹

The existence of a school in the village is likely to lower fertility since it would mean greater opportunities for women to participate in the educational process and induce a more modern outlook on life. It may also influence the formation of attitudes and values favourable to small family size and weaken the influence of tradition.

The distance to the nearest town is expected to be positively related to fertility. The larger the distance to the town, the farther away is the village from the city influences which are generally con-

¹¹ See M.T.R. Sarma: "Demand for children in rural India", (Geneva, ILO, 1979, mimeo).

ducive to lower fertility. One would, therefore, expect greater prevalence of traditional attitudes in such villages. Also, farming households will need greater help in buying their inputs and marketing their agricultural produce and this is likely to have a positive effect on the demand for children.

(k) Migrant Status

Migration is likely to affect fertility behaviour by influencing changes both at the micro and macro levels. First, migration affects the level and distribution of income in rural and urban areas, and income distribution is known to be an important determinant of fertility and aggregate population growth.¹² Secondly, migration of unmarried males of young, working age might result in severe imbalances of the sex ratio both in rural and urban areas and influence the proportion of persons able to find marriage partners.¹³ Thirdly, large-scale emigration of males in search of employment opportunities can have adverse effects upon the family structure, frequently contributing to its effective dissolution. Separation of husbands from wives during the crucial life-cycle phase when couples are fertile and economically active may have the effect of lowering the completed family size. Fourthly, the decision to migrate or to start a family tends to occur at about the same age period. Since marriage, migration and labour force participation are conscious decisions of the individual, it is possible that a person may delay his marriage so that he can migrate

¹² G.B. Rodgers, M.J.D. Hopkins and R. Wéry: Population, Employment and Inequality: BACHUE-Philippines (Farnborough, Saxon House, 1978). Also see W. Rich: Smaller Families through Social and Economic Progress (Washington DC, Overseas Development Council, 1973).

¹³ United Nations, World Population Conference Background Paper, Budapest, Romania, 19-30 August 1974.

and help out his family.¹⁴ Migration may thus influence fertility by greater participation in the labour force, delaying marriage, postponing children-bearing, and reducing desired family size. Fifthly, migration through increased contacts with the more modernised sectors may influence the value system of the rural communities and rural inhabitants may internalise lower fertility norms. Returning migrants may also spread new values and information about family planning and may introduce new family size concepts.

The effect of migration on fertility is primarily of interest when the area of origin and destination differ with respect to reproductive norms and behaviour. It has been frequently observed that fertility in urban areas is lower than rural areas. Among other factors, the lower fertility in urban areas may be due to improved communications, higher levels of modernisation and greater rationality. Costs in terms of demands on the time of parents and education and maintenance expenditure increase in urban areas. Also, parents have a target number of children and lower fertility may be a response to lower infant mortality rates due to improved health standards, medical care and better nutrition in urban areas.¹⁵

It is expected, therefore, that migration itself and exposure to the milieu of low fertility will bring about lower fertility among migrants. Migration from the rural areas, by separating the members of the extended family, attenuates the obligations it involves. With the establishment of nuclear families in the urban areas, the rearing of children requires more parental time and more market goods and services. Since the goods and services which were formerly provided by the

¹⁴ It is also possible that a person may marry and then migrate so that he can qualify for certain benefits. A study of Indonesia, based on 1971 Census and survey data, found that recruitment criteria of transmigration, one of which requires them to be married, had probably encouraged young aspirant migrants to get married to qualify for the programme. See Mayling Oey: "Migration and fertility in Indonesia", in Policy Science and Population (Lexington, DC, Heath, 1975).

¹⁵ See V. Prachuabmoh: "Rural and urban population of Thailand: Comparative profiles", ITS Research Report No. 8, Bangkok 1972.

extended family have now to be purchased, the demand for children is reduced.¹⁶ In addition, the new context in which migrants live - in the form of new kinds of jobs, new surroundings and especially the new educational and income opportunities that become available - creates a new outlook on the world, and when it is accompanied by a new flow of modern goods, it generates gradually rising consumption standards. These processes not only weaken the influences favouring high fertility, but also set up steady pressures towards rising consumption standards that inhibit people to have large families.¹⁷

It is quite likely that in the short run the preferences do not change or change slowly. Given this, when, as a result of migration, income increases or is higher than it would have been otherwise, migrants who feel that they can afford to have more children will indeed desire more children. Further, the higher survival probability in an urban environment would reduce the expected cost of raising a child and consequently increase the number of children demanded. However, in the long run the net effect of migration-related factors on the demand for children is likely to be negative. This is largely because, in the long run, important structural and attitudinal changes take place. The increase in income would also eventually lead the parents to spend more on better clothing and housing, more nutritious food, more comfortable and leisurely life, and to spend more on their children for quality education. The impact would be greater when migrants tend to copy the higher consumption standards of other social groups in the urban areas.¹⁸ The enjoyment of modern urban goods also requires cultivation of life styles other than those centering on

¹⁶ It is also likely that following rural-urban migration the desired number of children by the nuclear family may even be greater, particularly if the nuclear unit has to rely on its own children for old age support.

¹⁷ See H. Leibenstein: "Socio-economic fertility theories and their relevance to population policy", International Labour Review, Vol. 105, May-June 1974.

¹⁸ See H. Leibenstein, op. cit., p. 453.

children. Thus, the relative strength of a household's desire for goods unrelated to children increases, and the desired size of the family decreases.¹⁹

As regards costs, many studies have shown that the relative cost of bearing and rearing children of a given quality is usually higher in urban than in rural areas. There are two main reasons for this: one, the price of food is higher in urban areas, and two, farm children take away less time from a mother's paid work and themselves contribute more time toward family work than do urban children.

Urbanisation brings about changes not only in the amount of income the parents are willing to spend on children but also alter the economic utility of the children to their parents. The utility of children as security in old age decreases, because the parents begin to develop a propensity to save for their old age and thus reduce their dependence on children as a buffer against adversity.²⁰ The emergence of the nuclear family breaks down the historic economic interdependence between parents and children and ultimately leads to a decrease in economic utility of children. In rural areas children are valued as an asset to parents, as security in old age, and a large number of children means a large family labour force, a necessity for agricultural production, but in urban areas children tend to become increasingly a financial burden.

Urbanisation also tends to reduce the subjective as well as market costs of regulating fertility. In higher density urban situations, access to knowledge of controlling fertility is likely to be greater and market costs are consequently reduced. Subjective costs also are likely to be lower because of the role of urban environment in breaking down traditional attitudes and overcoming the reluctance to try new ways of doing things.

¹⁹ Richard A. Easterlin: "The economics and sociology of fertility: A synthesis" in Charles Tilly (ed.): Historical Studies of Changing Fertility (Princeton, Princeton University Press, 1978).

²⁰ Nam Hoon Cho et al: Effects of Economic Factors on Fertility Behaviour (Korean Institute of Family Planning, December 1977).

Although urbanisation reduces the demand for children, yet, because of socialisation in an area of high reproductive norms and behaviour, migrants are more likely to have higher fertility than other urban residents. The earlier the age at which migrants arrive in the urban areas, the more likely tend the fertility levels of migrants to be the same as those of urban natives. On the contrary, it is also possible that migrants have an above average savings rate and need for income, so that for any given income or for any given level of education migrants would have a lower fertility level than urban residents.

Another factor bearing on fertility of migrants is the relationship between work and fertility. Since migrant women are more likely to have greater labour force participation than rural stayers, because of greater opportunities and rewards for working away from home, they are likely to have comparatively lower fertility.

PART II

Whether migrants have lower or higher fertility than the urban natives or rural stayers is a question which can be answered firmly only in the light of carefully analysed empirical information. The findings of the two surveys to which a reference was made in the beginning, based on descriptive and multivariate regression analyses, are presented below in three sections. Section A deals with the actual fertility behaviour in terms of the completed family size. Section B examines age at marriage of different socio-economic and migrant status groups. Section C scrutinizes data relating to the desired family size and examines whether and to what extent the differences in the actual family size among different migrant status groups are due to the difference in the family size preferences.

A. Completed Family Size

Table 1 presents data on the completed family size measured by the number of children ever born (CEB) to currently married women

(aged 15-44). The data show that the mean number of children ever born to this group is 3.4 in the rural and 3.1 in the urban areas. The number of children born varies with the current age and the number of years since marriage. The completed family size for rural and urban women aged 40-44 is between 5 and 6 children.

Socio-economic differentials in fertility

The age at marriage appears to have a close relationship with fertility. For rural women, those marrying between 12 and 14 have an average of 4.6 children and those marrying between 20 and 24 an average of 2.7. For the urban women, the corresponding figures are 3.6 and 2.3.

The relationship between social status and fertility is perceptible but its role seems to be less significant (statistically) in urban than in rural areas. Women of lower castes have larger families (rural 3.8, urban 3.4) and cultivating castes smaller (rural 3.1, urban 3.0) than average. This is explained partly by educational and income differences and partly by the various customs, especially with regard to the age at marriage.

The relationship between education and fertility is also marked both in rural and urban areas. The number of children ever born declines significantly with the level of education of women (rural, 3.8, 2.6, 2.0; urban 3.8, 3.2, 2.2). Women who have had no education have nearly twice as many children as those who have attained at least a high school level.

The education of the husband is also negatively related to fertility but this relationship is not as strong as in the case of the education of women (rural, 3.9, 3.2, 2.6; urban 3.9, 3.4, 2.7). Thus, from the point of view of fertility education of women is more important as it can produce significant changes in their attitudes towards family size and greater awareness and use of birth control methods. At the same time, it enables them to participate more effectively in the decision-making processes in the family and resist pressures to keep on bearing children.

Table 1: For currently married women aged 15-44 the
mean number of children ever born (CEB) by
present place of residence and other back-
ground variables

(Results of the χ^2 test for the significance of the
differences in group means are given in brackets)

Variable	Present place of residence			
	Rural		Urban	
	No. of children ever born	No. of women	No. of children ever born	No. of women
All **	3.4	1567	3.1	1943
1. <u>Current age</u>	(**)		(**)	
15-19 *	0.9	44	0.4	38
20-24 **	1.4	317	1.2	310
25-29 **	2.8	418	2.3	498
30-34 *	3.0	297	3.5	419
35-39 **	4.8	274	4.2	377
40-44 *	5.4	217	5.0	301
2. <u>Years since marriage</u>	(**)		(**)	
0-4	1.0	276	0.9	377
5-9 *	2.4	350	2.2	403
10-14	3.5	340	3.4	411
15-19 *	4.4	269	4.1	338
20+ **	5.4	332	4.9	414
3. <u>Age at marriage</u>	(**)		(**)	
-12	3.2	12	2.3	6
12-14	4.6	105	4.2	87
15-19	3.6	1033	3.5	1084
20-24 +	2.7	394	2.5	701
25+	1.8	23	1.9	65
4. <u>Caste</u>	(**)		(**)	
High *	3.5	106	3.1	971
Cultivating	3.1	723	3.0	281
Artisan	3.4	301	3.2	428
Low *	3.8	437	3.4	263

/Continued ...

Variable	Present place of residence			
	Rural		Urban	
	No. of children ever born	No. of women	No. of children ever born	No. of women
5. <u>Education of women</u>	(**)		(**)	
No formal education	3.8	1093	3.8	666
Less than high school **	2.6	370	3.2	758
High school and above	2.0	104	2.2	519
6. <u>Activity status of women</u>				
Employee	2.9	39	3.2	82
Housekeeping **	3.4	1517	3.1	1860
Other	3.3	11	4.0	1
7. <u>Education of husband</u>	(**)		(**)	
No formal education	3.9	671	3.9	315
Less than high school	3.2	518	3.4	704
High school and above	2.6	320	2.7	924
8. <u>Household income</u> ¹	(**)		(**)	
Decile 1	3.7	110	3.3	116
2 *	3.5	147	2.9	165
3	3.5	139	3.4	196
4	3.3	146	3.4	183
5 *	4.1	146	3.5	187
6	3.8	151	3.4	192
7 *	3.7	162	3.1	196
8	3.0	158	3.2	221
9	3.0	183	3.0	219
10 *	2.8	225	2.4	268

¹ Decile groupings refer to the income distribution of the overall population in the rural and urban areas.

** Differences in group means significant at one per cent; * at 5 per cent; + at 10 per cent. Where nothing is indicated, the difference is not significant.

Symbols in brackets refer to vertical tests (within rural and urban areas) and symbols in boxes to horizontal tests (between rural and urban areas).

Employment of women does not appear to have a strong negative relationship with fertility in India as it may be in some more industrialised countries. (Differences in group means between working and non-working women are insignificant at 10 per cent level both for rural and urban areas.) This may be due to the nature of work and the child care help normally available from within the family or from outside. In the rural areas women who are employed do have fewer children but this may as well be a consequence of their education than of their employment.

The income of the household has a significant relationship with fertility. Because of excessive disaggregation the pattern is not quite clear, but it appears that the number of children peaks in the fifth and sixth deciles and then declines.

Rural-urban differentials

The data show that fertility is generally higher in the rural than in the urban areas (3.4 children ever born to currently married rural women aged 15-44 as compared to 3.1 in the case of urban women). This differential widens when we standardise it for the current age (and is present in each age group) because the age distributions of the two populations are different - rural women are younger on an average.

As will be seen later, rural women tend to marry earlier. But even when allowance is made for this factor, rural fertility remains higher. Among those who have been married for 20 years or more, rural women have 5.4 and urban women 4.9 children - a difference of nearly half a child.

The rural-urban differential is greater for high and low caste women (0.4 in each case) than for cultivating and artisan castes (0.1 and 0.2 respectively).

With regard to income distribution, the fertility patterns are similar in both the surveys: the fertility levels peak in the middle income groups and then decline gradually over higher income groups. However, it is not possible to assess the probable role of income distribution in explaining the rural-urban fertility differential because

the decile groupings are different for the two surveys. Cross comparisons by absolute income groupings will not be helpful either, because the cost of living varies greatly between the two areas.

When women are classified by their or their husband's education, the rural-urban fertility differential does not appear to exist for the uneducated women although there is some differential for those in "less than high school" and "high school and above" categories. However, further scrutiny of data shows that the absence of rural-urban fertility differentials for the uneducated women is largely due to the difference in the age distribution in the two areas: more of the uneducated women in the urban areas are of an older age. Table 2 standardises the mean number of children born with respect to both education and current age. The data show that the uneducated urban women in each age group do in fact have lower fertility than the uneducated rural women. For the educated women, it is just the opposite. This differential appears only in the older age groups (over 30 for less than high school and 34 for high school and above) and widens with the level of education. The completed family size for educated women in the urban areas (women aged 40-44) is higher by nearly half a child than their counterparts in the rural areas.

Migration and fertility

From the methodological point of view, it is not easy to determine whether migrants' fertility is higher or lower than urban fertility because there is no agreement as to what constitutes urban fertility. It was, therefore, necessary to use more than one migrant-non-migrant definition in order to gauge the effect of different classifications on fertility differentials. For presenting the results from the rural and urban surveys (Table 3) the different migrant status groups are defined as follows:

Rural

1. In-migrant²¹ (IM) - both husband and wife are in-migrants to the present village.

²¹ An in-migrant in the survey was defined as a person who was not born in the village but had in-migrated since 1961.

Table 2: For currently married women aged 15-44 the mean number of children ever born (CEB) by present place of residence, education and current age

Variable Education/current age	Present place of residence			
	Rural		Urban	
	Mean CEB	No. of women	Mean CEB	No. of women
All **	3.4	1567	3.1	1943
1. <u>No formal education</u>				
15-19 *	1.1	28	0.3	15
20-24	1.5	184	1.4	71
25-29 *	3.0	271	2.6	138
30-34	4.1	216	3.9	144
35-39 *	5.0	221	4.6	154
40-44	5.6	173	5.4	144
All	<u>3.8</u>	1093	<u>3.8</u>	666
2. <u>Less than high school</u>				
15-19	0.5	15	0.6	13
20-24	1.3	107	1.3	125
25-29	2.6	110	2.5	177
30-34	3.3	63	3.6	175
35-39	3.9	38	4.2	147
40-44	5.0	37	5.0	121
All **	<u>2.6</u>	370	<u>3.2</u>	758
3. <u>High school and above</u>				
15-19	0.0	1	0.1	10
20-24	0.8	26	0.9	114
25-29	1.8	37	1.8	183
30-34	3.0	18	3.0	100
35-39	3.2	15	4.5	76
40-44	3.0	7	3.5	36
All	<u>2.0</u>	104	<u>2.2</u>	519

** Differences in group means significant at one per cent; * at five per cent. Where nothing is indicated, the difference is not significant.

Symbols in boxes refer to horizontal tests.

2. Out-migrant²² (OM) - only the husband is an out-migrant.
3. Returned-migrant²³ (RM) - either husband or wife is a returned-migrant.
4. Non-migrant (NM) - either husband or both husband and wife were born in the present village.

Urban

1. Natives - both husband and wife were born in the Ludhiana city.
2. Wife in-migrant - husband was born in Ludhiana city but wife has in-migrated.
3. Husband in-migrant - wife was born in Ludhiana city but husband has in-migrated.
4. Long-standing in-migrant - both husband and wife in-migrated before 1961.
5. Recent in-migrant - either husband or wife or both have in-migrated since 1961 (both in-migrants).

The relationship between migration and fertility comes out quite clearly. In the rural survey, women whose husbands are outmigrants have lower fertility than any other group (OM 2.6, IM 3.5, RM 3.1, NM 3.5). This may be due to a number of reasons. First, husbands have gone out and their separation is likely to reduce fertility. Secondly, even if husbands occasionally visit their families, they may be subject to modern influences, particularly if they have gone to an urban area. Thirdly, as we shall see later, the age at marriage is higher for out-migrants than for non-migrants and this has a negative effect on fertility. There is some indication of this influence in Table 3. While the mean number of children in four out of six age groups

²² An out-migrant was defined as a person who was previously a member of the household but had left since 1961 to live or work elsewhere.

²³ A returned-migrant was defined as a person who had lived away, either working or looking for work or for study, for at least one month, and had returned since 1961, no matter when he/she out-migrated.

Table 3: For currently married women aged 15-44, the mean number of children ever born (CEB) by present place of residence, migrant status, current age and years since marriage

Variable	Present place of residence									
	Rural					Urban				
	Migrant Status**					Migrant Status **				
	IM	OM	RM	NM		Natives	Wife IM	Husband IM	Both long-term IM	Both recent IM
N =	428	188	88	863		129	326	152	458	878
All	3.5	2.6**	3.1	3.5		2.6	2.7	2.8	4.4	2.8
1. <u>Current age</u>										
15-19	0.4	0.2+	0.0	1.2		0.0	0.3	-	1.0	0.5
20-24	1.5	1.4	1.6	1.4		<u>0.8*</u>	1.1	1.5	<u>3.0**</u>	1.2
25-29	2.9	2.3**	2.5	2.9		2.4	2.0	2.1	<u>2.9*</u>	2.3
30-34	4.0	2.9**	3.6	4.1		3.8	3.5	3.6	3.9**	3.4
35-39	4.9	3.9*	3.1**	5.0		4.5	4.7*	4.1	4.2	4.0
40-44	4.9	6.4	5.3	5.6		<u>5.1</u>	5.5*	4.3	5.2*	4.6
2. <u>Years since marriage</u>										
0-4	1.1	0.8	1.2	1.0		0.8	0.9	1.2*	1.9**	0.9
5-9	2.6	2.3	<u>2.1</u>	2.4		2.3	2.0	2.4	2.7*	2.1
10-14	3.5	2.9**	3.0+	3.7		3.4	3.5	3.3	3.7+	3.4
15-19	4.5	3.9	3.6+	4.6		4.6	4.4+	4.4	4.0	3.9
20+	5.2	5.3	4.8+	5.6		4.8	5.6**	4.4	5.0*	4.6

Notes:

(a) IM = In-migrant, OM = Out-migrant, RM = Returned migrant, NM = Non-migrant

(b) Figures underlined are based on less than 10 observations.

(c) For rural differences, the means for IM, OM and RM in each age group and years since marriage are tested to see whether or not they are significantly different from the corresponding mean in the non-migrant category (NM); for urban differences, the means between recent in-migrants and other migrant status groups are tested for significance.

(d) Difference in group means between non-migrants (NM) in rural areas and long-term in-migrants (IM) in urban areas was tested for each group under "current age" and "years since marriage". All differences were significant at one per cent level. Difference in group means between nonmigrants in rural areas and recent in-migrants in urban areas was also tested. Except for "current age" 25-29 and "years since marriage" 10-14, all differences were significant at one per cent level.

** Differences in group means significant at one per cent; at 5 per cent; + at 10 per cent.

in the case of out-migrant category is significantly different from the corresponding mean in the non-migrant category, there is only one significantly different mean when standardised for duration of marriage. The decline in the level of significance shows in part that the major influence on reduced fertility of out-migrants is delayed marriage.

Returned migrants to the rural areas, too, have lower fertility than non-migrants, but after return the influence of factors which tend to reduce fertility is weakened, particularly of separation between husband and wife. Further, if they are unsuccessful migrants, the degree of their adaptation to the urban fertility norms and behaviour is also likely to be small.

In-migrants have fertility patterns which are similar to those of rural non-migrants. This is hardly surprising since in migrants to the Ludhiana district are largely from other rural areas and are more likely to possess rural fertility norms.

In the urban survey, the natives have the lowest fertility (NAT 2.6, WIM 2.7, HIM 2.8, LIM 4.4, RIM 2.8) and the long-standing in-migrants the highest fertility. The migrants tend to have higher fertility than the natives even when standardised for current age, years since marriage and other background variables, although the differences decline with age and years since marriage.

It is interesting to compare the fertility of recent in-migrants with that of long-standing in-migrants and of the latter with that of rural stayers. An assessment of data shows that recent in-migrants have lower fertility when standardised for current age, duration of marriage and other background variables than long-standing immigrants and also have lower fertility than urban natives. This suggests that migration has the effect of reducing fertility for a fairly substantial period subsequent to the migration itself, with the underlying pattern taking time to emerge as shown in Table 4. As the duration of stay in the city increases, fertility also goes up. For example, at ages 20-24, women who have been in the city longer than five years have nearly twice the number of children than those who have been less than five years. However, recent migrants of an older age who presumably had completed or nearly completed families before migration do not have noticeably different number of children than older long-standing migrants.

Table 4: Mean number of children ever born (CEB) to currently married women aged 15-44 who in-migrated since 1961 by the length of their stay in the city, current age and years since marriage

Variable	Length of stay in the city (years)				No. of women
	1-4	5-8	9-12	13-16	
All **	1.5 (336)	2.5 (370)	3.3 (246)	3.6 (220)	1172
<u>1. Current age</u>					
15-19	0.4	0.5	-	-	34
20-24 **	0.8	1.5	1.9	1.7	246
25-29 **	1.4	2.2	3.0	3.1	391
30-34 **	2.8	3.0	3.3	3.7	269
35-39	3.8	4.2	3.9	3.7	143
40-44	4.3	5.0	5.5	4.1	89
<u>2. Years since marriage</u>					
0-4 **	0.7	1.4	0.9	1.0	299
5-9 **	1.5	2.0	2.8	3.1	320
10-14 *	3.1	3.2	3.2	3.7	286
15-19	3.7	3.7	4.1	3.7	144
20-24 +	4.2	4.8	5.2	3.6	88
25 and over	4.4	5.3	4.2	5.4	34

** Differences in means across length of stay in the city significant at one per cent level; * at 5 per cent; + at 10 per cent. Where nothing is indicated, the difference is not significant.

Over-all, the migrants have higher fertility than the urban natives but lower fertility than the rural stayers (the non-migrants in rural areas). Thus, migration has the effect of reducing completed family size as also of lowering fertility during the period immediately following migration.

Regression results

In order to assess the quantitative impact of socio-economic and other variables on fertility and to see whether migrant status, given other factors, has an independent influence on actual fertility behaviour we have estimated fertility equations separately for rural and urban areas.

Rural

The definitions and the mean values of the variables used in the estimation of rural fertility equations are as under:

<u>Variable</u>	<u>Definition of the variable</u>	<u>Currently married women aged 15-44</u>		<u>All currently married women</u>	
		<u>Mean</u>	<u>S.D.*</u>	<u>Mean</u>	<u>S.D.</u>
I	<u>Dependent variable</u>				
CEB	Number of children ever born	3.38		4.48	
II	<u>Independent variables</u>				
INC	Household income during the last 12 months (in rupees)	5998	6538	6113	9076
EDW1	1 if wife has no formal education, 0 otherwise	0.70	0.46	0.79	0.41
EDW2	1 if wife has less than high school formal education, 0 otherwise	0.24	0.42	0.17	0.37
EDW3	1 if wife has high school or more education, 0 otherwise	0.07	0.24	0.04	0.19
EMPW	1 if wife is working, 0 otherwise	0.03	0.17	0.03	0.17
MORT	Child survival rate (per cent)	78.80	32.61	77.57	30.04

* Standard deviation.

Variable	Definition of the variable	Currently married women aged 15-44		All currently married women	
		Mean	S.D.	Mean	S.D.
AW	Age of wife	29.98	6.70	41.00	15.51
AWSQ	Age squared	943.95	414.41	1921.74	1461.98
AM	Age at marriage	17.71	2.61	17.25	2.67
RM	1 if wife or husband is returned migrant, 0 otherwise	0.06	0.23	0.04	0.20
OM	1 if husband is out-migrant, 0 otherwise	0.12	0.32	0.07	0.26
IMPAK	1 if in-migrated from Pakistan, 0 otherwise	0.04	0.19	0.06	0.24
IM	1 if in-migrated from other areas, 0 otherwise	0.23	0.42	0.30	0.46
CA1	1 if belong to high caste, 0 otherwise	0.07	0.25	0.08	0.27
CA2	1 if belong to cultivating caste, 0 otherwise*	0.46	0.49	0.48	0.49
CA3	1 if belong to artisan caste, 0 otherwise	0.19	0.39	0.19	0.38
CA4	1 if belong to low caste, 0 otherwise	0.28	0.45	0.25	0.44
FARM	1 if household owns or cultivates land, 0 otherwise	0.56	0.49	0.57	0.49
NUCL	1 if household is nuclear, 0 otherwise	0.43	0.49	0.38	0.48
BCM	1 if currently using contraceptive methods, 0 otherwise	0.76	0.42	0.46	0.49
DISTT	Distance to the nearest town (in kms)	13.15	6.03	13.01	6.16
PRIMS	1 if village has a primary school, 0 otherwise	0.83	0.37	0.84	0.36
MIDDS	1 if village has a middle school, 0 otherwise	0.36	0.47	0.36	0.47
HIGHS	1 if village has a high school, 0 otherwise	0.24	0.42	0.25	0.43
CLINIC	1 if village has a clinic, 0 otherwise	0.34	0.47	0.34	0.47

* Does not necessarily imply that all of them own land.

Separate regressions were run for both the samples of currently married women aged 15-44 and of all currently married women. All variables were introduced stepwise in order to see the change in the size and significance of other regression coefficients. Some of these results are presented in Table 5. The first three equations refer to the sample of currently married women aged 15-44. While equation 1 excludes the use of birth control methods (BCM) and community variables, these are shown to have been included in two steps in equations 2 and 3. Equation 4 includes all variables and is estimated for a sample of all currently married women.

However, since marriage, fertility, migration and labour force participation are simultaneously determined variables, the regression results presented in Table 5 may have "simultaneity bias" and therefore need to be interpreted cautiously. But in a country like India where traditional values still prevail and the labour force participation of women is low, the bias in the estimated parameters may not be as serious as it would be in an industrialised society.

Regression results show that, other things remaining the same, education of women has a strong negative effect on fertility. Further, the negative effect of education on fertility increases with the level of education. The coefficients of EDW2 and EDW3 suggest that women with less than high school education will have, on the average, about a quarter and those with at least high school education more than half a live birth less than women who have no formal education.

Women's employment (EMPW) is negatively associated with fertility but its coefficient is significant only at 10 per cent level for all currently married women and insignificant for currently married women aged 15-44. This suggests that female employment has a weak influence on fertility levels. However, such a conclusion would be highly tentative since the survey did not distinguish the women's domestic activities and their activities on the farm.²⁴ Also, the significance and larger absolute value of the coefficient in equation 4 for all married women

²⁴ There is also the problem of associating current employment status with the past fertility behaviour.

Table 5: Estimated regression equations for the determinants of fertility (CEB) behaviour among rural women in the Ludhiana district of the Indian Punjab

(t-values are given in brackets)

Independent variable	Currently married women aged 15-44			All currently married women
	(1)	Equation (2)	(3)	Equation (4)
Constant	-4.156	-4.288	-4.199	-1.973
INC	-0.015* (2.16)	-0.014* (1.97)	-0.013+ (1.83)	0.012** (2.5)
EDW2	-0.178+ (1.65)	-0.175 (1.62)	-0.178+ (1.64)	-0.229+ (1.87)
EDW3	-0.570** (3.03)	-0.537** (2.83)	-0.519** (2.70)	-0.552** (2.41)
EMPW	-0.127 (0.53)	-0.127 (0.53)	-0.141 (0.59)	-0.460+ (1.85)
MORT	0.008** (5.77)	0.007** (5.77)	0.008** (5.60)	0.010** (6.89)
AW	0.505** (8.27)	0.498** (8.17)	0.502** (8.21)	0.335** (24.15)
AWSQ	-0.005** (5.17)	-0.005** (5.02)	-0.005** (5.06)	-0.003** (18.2)
AM	-0.179** (10.62)	-0.177** (10.45)	-0.177** (10.49)	-0.153** (9.55)
RM	-0.360+ (1.94)	-0.342+ (1.84)	-0.358+ (1.92)	-0.322 (1.53)
OM	-0.250+ (1.85)	-0.270* (2.00)	-0.281* (2.07)	-0.141 (0.85)
IMPAK	-0.092 (0.41)	-0.146 (0.64)	-0.188 (0.83)	0.197 (1.07)
IM	-0.141 (1.37)	-0.174+ (1.68)	-0.184+ (1.77)	-0.307** (3.19)
CA1	-0.087 (0.45)	-0.090 (0.47)	-0.066 (0.34)	-0.472** (2.56)
CA2	-0.506** (3.96)	-0.490** (3.81)	-0.493** (3.83)	-0.682** (5.48)
CA3	-0.164 (1.27)	-0.197 (1.52)	-0.199 (1.54)	-0.234+ (1.79)

Continued/...

Independent variable	Currently married women aged 15-44			All currently married women
	(1)	Equation (2)	(3)	Equation (4)
FARM	0.204* (1.96)	0.149 (1.38)	0.141 (1.28)	0.293** (2.73)
NUCL	0.402** (4.17)	0.373** (3.83)	0.363** (3.73)	0.424** (4.62)
BCM		0.165+ (1.65)	0.152 (1.51)	
DISTT		0.015* (2.04)	0.022** (2.59)	0.019* (2.32)
PRIMS		-0.152 (1.34)	-0.359+ (1.80)	-0.363+ (1.85)
MIDDS			-0.292+ (1.67)	-0.432** (2.54)
HIGHS			0.191 (1.31)	0.252+ (1.78)
CLINIC			0.102 (0.58)	0.253 (1.48)
R ² (adjusted for degrees of freedom)	0.499	0.501	0.501	0.428
F	92.95	79.67	69.46	32.58
Average CEB	3.38	3.38	3.38	4.48
No. of observations	1567	1567	1567	2696

** Significant at one percent;

* Significant at 5 per cent;

+ Significant at 10 percent.

(i.e., when the older women are included in the sample) suggest that the causal process producing the inverse statistical relationship between female employment and fertility may run back from fertility to employment behaviour. Which implies that the older women who have fewer children are also more likely to work.

Mortality (MORT) has a positive coefficient and is significant in all the equations. The coefficients of age (AW) and age squared (AWSQ) have the right sign and are significant both for currently married women aged 15-44 and all currently married women.

Age at marriage (AM) has a negative coefficient and is significant in all equations though the absolute size and significance of the coefficients increase when older women are excluded from the sample. This suggests that the role of age at marriage in lowering the completed family size has increased in recent years and can be an important source of diminishing birth rates.

All the migrant status variables (RM, OM, IMPAK, and IM) have a negative sign in equation 3 and their coefficients are also significant (OM at 5 per cent, and RM and IM at 10 per cent level) except the coefficient of IMPAK. This suggests that migrants do in fact have lower fertility than non-migrants in the rural areas. The insignificance of the coefficient of IMPAK is not surprising. The in-migrants from Pakistan are long-standing migrants and are more likely to have the same fertility norms as the rural non-migrants. It is also interesting to observe that the absolute magnitude of the coefficients of RM, OM and IM declines in that order, suggesting that the incidence of migration in reducing fertility is greater for returned migrants than for out-migrants and in-migrants. This is understandable, since for out-migrants the effect of migration is not yet complete and in the case of in-migrants no separation is involved. The coefficients of RM and OM are insignificant in equation 4, largely because the current migrant status has hardly any relevance for older women.

As we shall see later, out-migrants have higher age at marriage than other groups in the rural areas. But the regression results

suggest that even when age at marriage and other socio-economic variables are controlled for, migration still has the effect of reducing the completed family size.

Caste variables (CA1, CA2, CA3) have a negative sign but only the coefficient of CA2 is statistically significant at the 5 per cent level in equation 3. This shows that, ceteris paribus, cultivating castes have on the average lower fertility than low caste women, who constitute the category excluded from the regressions. However, when older women are included in the sample (see equation 4 in Table 5), all the caste variables turn out to be significant, indicating that the influence of caste on fertility has perhaps been weakening over time.²⁵

The farm variable (FARM) is positively associated with fertility and is consistent with theoretical expectations, although the size and significance of its coefficient decline when distance to the nearest town (DISST) is included in the equation. As discussed earlier, with the increase in distance from the nearest town the farming households need greater help from their children and this increases their demand for children. DISST, therefore, picks up a part of the influence of the FARM variable on fertility. For all currently married women both DISST and FARM variables are significant. The evidence therefore, suggests that women belonging to farming households have higher completed family size than those who do not own or cultivate land.

The nuclear household variable (NUCL) has a positive sign and its coefficient is significant at the one per cent level. The magnitude of the coefficient indicates that women living in nuclear families, given other things, have nearly one-third to one-half more live births on the average than those in extended families.

²⁵ Separate regressions were run for women aged 15-44 and 44+ to find out whether the significance of caste variables in equation 4 was due to increased number of observations. The results showed that this was not so.

Distance to the nearest town or city (DISST) has a positive influence on fertility and its coefficient is significant at the one per cent level.

The variable BCM which is a proxy for the conscious decision of the couple to control their fertility has a positive coefficient that is significant in equation 2 and is not significant due to multicollinearity in equation 3 when other variables, such as the presence of school and clinic in the village, are also included. However, the positive sign implies that the causation perhaps runs from fertility to birth control methods. Women who have larger families are also more likely to be the ones who are currently using contraceptive methods to control their fertility.

As expected, the coefficients of primary (PRIMS) and middle school (MIDDS) in the village have a negative sign and are significant both in equations 3 and 4. But the coefficient of high school (HIGHS) turns out to be positive. However, the coefficient is insignificant in equation 3 but is significant at the 10 per cent level in equation 4. This may be partly due to reduced cost of educating children and partly to expectation of higher income since high school is a minimum qualification needed in India for most government and other jobs.

Urban

Regression equations for the urban sample are presented in Table 6. Equations 1 and 2 are estimated using ordinary least squares method for currently married women aged 15-44 and equations 3 and 4 for all currently married women. The definitions and the mean values of the variables used in the estimation of urban fertility equations are given opposite:

Variable	Definitions of the Variable	Currently married women aged 15-44		All currently married women	
		Mean	S.D.*	Mean	S.D.*
I	<u>Dependent variable</u>				
CEB	Number of children ever born	3.13	2.05	3.76	2.38
II	<u>Independent variables</u>				
INC	Household income during the last 12 months (in rupees)	10465	13085	10927	13295
EDW1	1 if wife has no formal education, 0 otherwise	0.34	0.47	0.41	0.49
EDW2	1 if wife has less than high school formal education, 0 otherwise	0.39	0.48	0.37	0.48
EDW3	1 if wife has high or more education, 0 otherwise	0.27	0.44	0.22	0.41
EMPW	1 if wife is working, 0 otherwise	0.05	0.21	0.04	0.20
ENTER	1 if household owns an enterprise, 0 otherwise	0.43	0.49	0.44	0.49
MORT	Child survival rate (per cent)	82.58	31.70	82.68	29.51
AW	Age of wife	30.86	6.65	36.13	11.32
AWSQ	Age squared	996.63	417.51	1433.54	922.79
AM	Age at marriage	18.63	2.80	18.20	2.87
NAT	1 if either or both are Natives, 0 otherwise	0.31	0.46	0.28	0.45
IML	1 if both husband and wife in-migrated after 1961	0.24	0.42	0.34	0.47
IMR	1 if both husband and wife in-migrated after 1961	0.45	0.49	0.38	0.49
IMRF	Product of dummy for recent in-migrant (since 1961) and duration of stay in the city	3.60	4.93	3.11	4.79
IMR ₁	1 if years since in-migration 0-4, 0 otherwise	0.15	0.36	0.12	0.33
IMR ₂	1 if years since in-migration 5-9, 0 otherwise	0.16	0.36	0.13	0.34

* Standard deviation

Variable	Definitions of the Variable	Currently married women aged 15-44		All currently married women	
		Mean	S.D.	Mean	S.D.
IMR ₃	1 if years since in-migration 10-16, 0 otherwise	0.14	0.35	0.13	0.33
CA1	1 if belong to high caste, 0 otherwise	0.50	0.50	0.51	0.50
CA2	1 if belong to cultivating castes, 0 otherwise	0.14	0.35	0.15	0.35
CA3	1 if belong to artisan caste, 0 otherwise	0.22	0.41	0.21	0.41
CA4	1 if belong to low caste, 0 otherwise	0.14	0.34	0.13	0.34
NUCL	1 if household is nuclear, 0 otherwise	0.61	0.48	0.59	0.49

As in the case of rural areas, the effect of education on fertility is negative. However, the negative effect of education is statistically more significant for the urban than for the rural sample. Even the coefficient of less than high school education (EDW2) is significant at one per cent level for the urban sample, whereas it is significant only at the 10 per cent level for the rural sample.

Employment of women (EMPW) has a positive sign. However, its coefficients are insignificant in all the equations.

The household enterprise variable (ENTER) has a significant coefficient with a positive sign, indicating that households that own or are engaged in self-employment have, on average, higher fertility than households consisting of wage-earners only. This is largely because the former are more likely to make greater use of their children as workers, which tends to encourage fertility.

The coefficient estimates of mortality (MORT), age of wife (AW) and age square (AWSQ) are consistent with the theoretical expectations and are more or less similar to those for the rural areas.

As regards the migrant status variables, IML has a positive sign in equations 1 and 2 and a negative sign in equations 3 and 4. However, its coefficients are insignificant in all the equations, which shows that long-standing in-migrants (those who have been in the city longer) do not have significantly different fertility as compared to the excluded group of natives. The variable IMR in equations 2 and 4 has a negative coefficient which is significant at the one per cent level indicating that, given other things, recent in-migrants have, on average, significantly lower fertility than natives (or long-standing in-migrants). The positive and significant coefficient of IMRF in both equations 2 and 4 shows that with the length of stay in the city increasing, the fertility of the migrants also increases and eventually reaches the same levels as those of the longstanding in-migrants and urban natives. The same conclusion follows from the alternative specification of the model as in equations 1 and 3 where recent immigrants (since 1961) are divided into three groups according to the length of their stay in the city.

Caste variables (CA1, CA2 and CA3) have the expected sign and their coefficients are significant for all currently married women (equations 3 and 4) but are not significant for currently married women aged 15-44 (equations 1 and 2). Thus for women in the child bearing age, there is no evidence that women belonging to high and other castes have significantly lower fertility as compared to the excluded category of low castes. Moreover, the insignificance of the coefficients in equations 1 and 2 also suggests that, given other things, the (non-statistical) significance of caste as an important determinant of fertility behaviour is declining over time.

Finally, the nuclear household variable (NUCL) has a positive coefficient and is significant as in the rural case, although the magnitude of the coefficient is smaller for the urban as compared to the rural sample.

Table 6: Estimated regression equations for the determinants of fertility (CEB) behaviour among urban women in the Ludhiana district of the Indian Punjab

(t-values are given in brackets)

Independent variable	Currently married women aged 15-44		All currently married women	
	Equation (1)	Equation (2)	Equation (3)	Equation (4)
Constant	-2.630	-2.702	-2.235	-2.230
INC (in thousands)	-0.006* (2.17)	-0.006* (2.19)	-0.004 (1.38)	-0.004 (1.38)
EDW2	-0.186** (2.34)	0.190** (2.38)	-0.191** (2.39)	-0.194** (2.43)
EDW3	-0.496** (4.87)	-0.499** (4.91)	-0.590** (5.50)	-0.594** (5.54)
EMPW	0.075 (0.48)	0.071 (0.45)	0.026 (0.15)	0.022 (0.13)
ENTER	0.192** (2.77)	0.199** (2.87)	0.199** (2.80)	0.202** (2.85)
MORT	0.009** (8.33)	0.009** (8.39)	0.008** (6.47)	0.008** (6.53)
AW	0.366** (7.40)	0.372** (7.54)	0.335** (17.52)	0.335** (17.50)
AWSQ	-0.003** (4.28)	-0.003** (4.42)	-0.003** (12.19)	-0.003** (12.18)
AM	-0.148** (11.48)	-0.149** (36.52)	-0.133** (10.33)	-0.133** (10.36)
IML	0.016 ((0.16)	0.029 (0.30)	-0.123 (1.29)	-0.113 (1.18)
IMR1	-0.476** (4.59)	-	0.466** (4.02)	-
IMR2	-0.177+ (1.73)	-	-0.173 (1.54)	-
IMR3	-0.056 (0.52)	-	-0.063 (0.55)	-
IMR	-	-0.513** (4.31)	-	-0.501** (3.76)

Continued/...

Independent variable	Currently married women aged 15-44		All currently married women	
	Equation (1)	Equation (2)	Equation (3)	Equation (4)
IMRF	-	0.037** (3.18)	-	0.036** (2.78)
CA1	-0.110 (1.02)	-0.114 (1.06)	-0.226* (2.05)	-0.231* (2.09)
CA2	-0.174 (1.41)	-0.184 (1.49)	-0.250* (1.97)	-0.260* (2.04)
CA3	-0.052 (0.46)	-0.059 (0.51)	-0.236* (1.99)	-0.242* (2.04)
NUCL	0.284** (3.79)	0.279** (3.72)	0.252** (3.40)	0.249** (3.36)
R ² (adjusted for degrees of freedom)	0.527	0.526	0.504	0.504
F	128.09	135.71	156.01	165.49
Average CEB	3.13	3.13	3.76	3.76
Number of observations	1943	1943	2592	2592

** Significant at the one per cent level:

* Significant at the 5 per cent level

+ Significant at the 10 per cent level

B. Age at marriage

Table 7 represents data on the mean age at marriage of both rural and urban women who married before 25, and are currently 25 or over.²⁶ The mean age at marriage is 17.1 for rural women and 17.9 for urban women.

Education appears to be an important factor determining age at marriage. In the case of rural women, the mean age at marriage of the uneducated is 16.3, of women with less than high school education 17.7, and with high school education and above 19.4. For urban women the corresponding figures are 17.1, 17.8, and 19.8. Schooling and marriage are fairly incompatible and marriage is rare even during college or university years, apart from a small proportion of the married who obtain or finish their education after marriage. Hence the educated women generally marry at a later age.

Social status and custom also affect the age at marriage. Members of the cultivating castes, at each educational level, tend to marry later than other groups both in the rural and urban areas.

However, it is interesting to observe in Table 7 that for a given level of education, the mean age at marriage declines with the current age for both rural and urban women. For example, among the uneducated, rural women currently aged over 50 have a mean age at marriage of 16.5, while those currently aged between 25 and 29 have a mean age of 17.7. For the urban women, the corresponding figures are 16.3 and 18.1. This shows that over time, ceteris paribus, the mean age at marriage of women in the Punjab is rising.

²⁶ The estimates of the mean age at marriage are derived from a sample of ever-married women (i.e., including widows, divorcees or separated) and therefore are subject to considerable downward biases due to truncation, particularly when the age at marriage is rising. For example, women who are currently 15 years old and are married will be included in this mean, but 15 year olds who will marry later are excluded from the calculation. Since in India we would expect most of the women to get married before the age of 25, most of the bias can be eliminated if the analysis is restricted to those women who are at least 25 years of age and were married before the age of 25. See, for example, WFS: Guidelines for Country Report No.1 (London, December 1977).

Many studies based on field work have concluded that this delay in age at marriage has been brought about largely because of economic reasons.²⁷ The recent intensification of agriculture in the area has increased the work load of a farming family, not only in the field but also in the home. So the longer a girl remains unmarried, the longer the benefit to her family of her work contribution. Moreover, a grown, unmarried girl can earn part of her dowry by working and thus reducing the financial burden on parents. The increasing education and employment opportunities for women and a general shift in attitudes have also reduced parents' fears that their daughter can remain unmarried if the marriage is delayed.

Table 8 is an attempt to study the differentials in the age at marriage of different migrant status groups and to see the extent to which these differentials can explain the differences in the fertility patterns of migrant and non-migrant groups observed earlier in this paper. The data from the rural survey show that out-migrants marry later than other groups (IM 16.8, OM 18.1, RM 17.6, NM 17.1) which provides at least some explanation for lower fertility observed among them. This pattern of later marriage among out-migrants however, is only true for women under 35. Older women among out-migrants had, in fact, lower mean age at marriage than other migrant groups. This suggests that there has been a change in the marriage pattern itself over time. Out-migrants have only in recent years begun to delay marriage, whereas earlier marriage perhaps occurred prior to migration.

The same pattern is revealed for the recent in-migrants from rural areas to the Ludhiana city in the urban survey (see column 3). Those aged 40 or over show more or less the same mean age at marriage as the rural non-migrants, while those under 40 seem to have married later. From this it is perhaps clear that migrants from rural areas who migrated later in life show age at marriage comparable to rural non-migrants (i.e., "normal" rural marital age), but those who migrated closer to their marriage had delayed their marriage.

²⁷ Mahmood Mamdani: The Myth of Population Control: Family Caste, and Class in an Indian Village (New York, Monthly Review Press, 1972).

Table 7: Mean age at marriage of women who were married before the age of 25 and currently aged 25 years or more by present place of residence, current age, caste and education

Variable	Education**				No. of women
	No formal education	Less than high school	High school and above	All	
<u>Rural</u>					
All**	16.8	17.7	19.4	17.1	2296
1. <u>Current age</u>	(**)	(**)	(**)	(**)	
25-29	17.7	18.3	20.2	18.0	413
30-34	17.2	18.4	18.4	17.5	293
35-39	17.1	18.1	20.4	17.4	277
40-44	16.7	17.1	19.1	16.8	226
45-49	16.6	17.1	15.0	16.7	262
50+	16.5	15.9	15.5	16.4	825
2. <u>Caste</u>	(**)	(**)	(**)	(**)	
High	16.5	17.0	19.3	17.0	192
Cultivating	17.0	18.0	19.7	17.2	1131
Artisan	16.8	17.4	18.6	16.9	404
Low	16.8	17.1	18.3	16.7	569
<u>Urban</u>					
All**	17.1	17.8	19.8	17.9	2174
1. <u>Current age</u>	(**)	(**)	(**)	(**)	
25-29	18.1	18.5	20.5	19.1	469
30-34	17.6	18.4	19.7	18.4	400
35-39	17.3	17.6	20.1	17.9	365
40-44	17.1	17.4	19.4	17.5	296
45-49	17.0	17.5	18.1	17.2	270
50+	16.3	16.8	17.5	16.5	374
2. <u>Caste</u>	(**)	(**)	(**)	(**)	
High	17.1	17.7	19.8	18.1	1108
Cultivating	17.3	18.3	19.8	18.0	323
Artisan	17.0	17.9	20.1	17.6	463
Low	17.0	17.5	19.8	17.3	280

** Differences in group means significant at one per cent;

* Significant at 5 per cent;

+ Significant at 10 per cent.

Symbols in brackets refer to vertical tests and symbols in boxes to horizontal tests.

Table 8: Mean age at marriage of women who were married before the age of 25 currently aged 25 years or more by present place of residence, current age and migrant status

Rural

Variable	Migrant status ^[1]				No. of women
	IM	OM	RM	NM	
All**	16.8	18.1	17.6	17.1	
No. of women	886	141	98	1171	2296
<u>Current age</u>					
25-29	18.1	18.8	18.0	17.9	413
30-34	17.6	18.4	18.2	17.2	293
35-39	17.6	17.5	17.7	17.3	277
40-44	16.7	16.4	16.7	17.0	226
45-49	16.7	16.4	16.7	16.7	262
50+	16.3	16.3	17.6	16.5	825

Urban

Variable	Migrant Status				Natives	No. of women
	Recent IM from ²		Long-standing IM from ³			
	Urban	Rural	Urban	Rural		
All*	18.8	18.2	17.3	17.2	18.3	
No. of women	494	415	616	411	238	2174
<u>Current age</u>						
25-29	19.3	18.9	18.7	17.9	19.3	469
30-34	19.0	18.1	18.0	17.5	18.8	400
35-39	18.7	18.1	17.6	17.8	17.2	365
40-44	17.8	16.5	17.5	17.7	17.6	296
45-49	17.7	16.8	17.4	17.0	17.4	270
50+	17.1	16.6	16.6	16.2	16.7	374

¹ IM = In-migrant; OM = out-migrant; RM = returned migrant; NM = Non-migrant.

² Rural/urban classification is based on previous place of residence.

³ Since for persons who-in-migrated before 1961 the previous place of residence is not known, rural/urban classification is based on the place of birth.

** Differences in group means significant at one per cent; * at 5 per cent; + at 10 per cent.

Table 9 shows the relationship between marriage and migration more clearly. All women for whom data were available on their (or their husband's) year of migration and age at marriage are included. For the urban in-migrants as well as out-migrants in the rural areas, the same picture emerges. Those migrating before marriage have higher mean age at marriage, suggesting that their marriage had perhaps been delayed as a result of the migration. The other groups where the migration took place after marriage show a similar effect of migration on marriage. Those migrating soon after marriage show a slightly higher age at marriage than those who migrate at least five years after marriage. For the later group it is unlikely that migration affects the age at marriage.

Table 9: Age at marriage of selected currently married women aged 15-44 by their present place of residence, migrant status and closeness of the period of migration to marriage (i.e., migrated before or after marriage)

Closeness of the period of migration to marriage	Rural	Urban		
	Out-migrants since 1961	In-migrants since 1961		
		Wife in-migrant	Husband in-migrant	Both husband and wife in-migrant
	(**)	(**)	(**)	(**)
Migrated before marriage	19.2 (77)	19.8 (176)	19.6 (34)	19.8 (440)
Migrated within 5 years of marriage	17.8 (31)	18.3 (41)	19.1 (13)	18.6 (243)
Migrated more than 5 years after marriage	17.5 (77)	17.9 (14)	16.9 (17)	17.0 (420)

Note: Number of women given in brackets.

** Differences in group means (vertical) significant at one per cent.

C. Desired Family Size

In this section, we shall look at the family size preferences of different socio-economic and migrant status groups and see the extent to which the differences in actual fertility behaviour of these groups observed earlier in section A can be explained by the difference in their desired family size. For example, we have seen in Section A that out-migrants have lower fertility than non-migrants in the rural areas. But it is not clear whether out-migrants have smaller families because they prefer it so or because other factors such as separation inherent in the migration process render it impossible for them to achieve their desired family size.

The desired family size is based on the question asked in the survey: "How many children do you want to have?" (If she says, "It is up to God", then ask, "If God would give you what you wished, what would you ask for?"). Table 10 shows the mean desired number of children for currently married women (aged 15-44) by their caste, level of education and current age.

Urban women desire fewer children than rural (urban 3.5, rural 3.8) and within rural and urban areas uneducated and low caste desire more children than educated and high caste. But the most interesting feature of this table for the meaningfulness of family-size preferences is that the average number of children stated as desired increases steadily with the current age of the woman. This reflects the increasing effect of rationalising actual fertility as women pass through the childbearing years and the size of their actual family increases, rather than reflecting a trend toward smaller family size ideals among women in younger age groups.

Table 11 is an attempt to estimate the extent to which these responses are rationalisations. The proportion who desire a number in excess of their actual number ($D > A$) shows a rapid decline with an increase in the number of living children, whereas the proportion who desire a number equal to the current family size increases rapidly. Among both rural and urban women, the vast majority with two or fewer living children state a preference for a number larger than the number they actually have. But once the number of living children

Table 10: For currently married women aged 15-44, the number children desired by present place of residence, current age, education and caste

Variable	Rural		Urban	
	Mean number of children desired	No. of women	Mean number of children desired	No. of women
All	3.8	1503 ^a	3.5	1905 ^a
1. <u>Current age</u>	(**)		(**)	
15-19	3.1	44	2.9	38
20-24	3.2	315	2.8	308
25-29	3.5	406	3.0	490
30-34	4.0	294	3.6	417
35-39	4.4	257	4.0	372
40-44	4.5	187	4.4	280
2. <u>Education</u>	(**)		(**)	
No formal education	4.0	1036	3.9	648
Less than high school	3.4	365	3.6	746
High school and above	3.1	102	2.9	511
3. <u>Caste</u>	(**)		(**)	
High	3.8	99	3.4	957
Cultivating	3.5	686	3.4	273
Artisan	4.0	292	3.5	417
Low	4.1	426	3.8	258

^a 64 women in the rural and 38 in the urban survey either refused to give information on desired family size and contraceptive use or gave incomplete information. These cases were, therefore, eliminated from further analysis.

** Differences in group means (vertical) significant at one per cent. Differences in group means (horizontal) were also tested and were all significant at one per cent.

is more than three, women with a given number of children are more likely to state that number as their preference. Thus, in the rural survey 74 per cent of those with four children, 78 per cent of those with five and nearly 100 per cent of those with seven state that they desire no more than the actual number of children that they have. A similar pattern is observed in the urban survey, in which 84 per cent of women with three children, 90 per cent of those with four and 95 per cent with seven desire no more than the number of children they actually have.

However, the finding that after two or three children, women are more likely to state that number as their preference than women with a smaller number of children tells us only that the desired and actual number are related but it does not indicate if the actual number of children determines the number stated as the desired number (rationalisation) or if the number desired determines the actual number (fertility control). More likely the first is the actual case.

As a result, the interpretation of figures relating to desired family size should be carried out with caution. Among different groups, small differences in the number of children desired may reflect differences in the actual family size rather than any differences in the family size preference.

Bearing these points in mind, Table 12 still provides some useful information. First, despite the differences in actual fertility and age at marriage observed earlier among different migrant status groups, the desired family size does not appear to be much influenced by the migrant status. In the rural survey, the desired number of children are 3.9 for in-migrants, 3.4 for out-migrants, 3.7 for returned-migrants and 3.9 for non-migrants. Thus, in-migrants have the same mean number of children desired as the non-migrants and their family size preferences are not much affected even when the number of children desired is standardised by current age. However, on the other hand, out-migrants and returned-migrants appear to prefer a slightly lower family size than do non-migrants (and in-migrants). But since the desired family size of out-migrants and returned-migrants in the younger age cohorts is the same or even higher than

of the non-migrants and the differences appear only for older women, it can be argued that the small differences observed are probably due to the differences in the actual family size and not to any initial desire on the part of out-migrants and returned migrants to have fewer children than non-migrants desire.

Table 11: Per cent distribution of currently married women aged 15-44 according to whether the desired family size (D) is less than, equal to or greater than the achieved family size (A) by number of living children

Variable	Present Place of Residence							
	Rural				Urban			
	Per cent of women D < A	D = A	D > A	No. of women	Per cent of women D < A	D = A	D > A	No. of women
All	3	43	54		2	57	41	
N =	45	646	812	1503	36	1084	785	1905
No. of living children								
0	-	-	100	173	-	-	100	200
1	-	4	96	263	-	6	94	296
2	-	28	72	280	-	47	53	410
3	2	59	39	272	1	84	15	377
4	3	74	23	218	2	90	8	299
5	8	78	14	145	3	92	5	161
6	3	88	9	96	4	94	2	107
7	3	97	-	40	5	95	-	37
8+	100	-	-	16	100	-	-	18

Table 12: Mean number of children desired by currently married
women aged 15-44 by present place of residence,
migrant status and current age

(Figures in brackets indicate the mean number of living children)

Rural

Variable	Migrant status								No. of women
	IM		OM		RM		NM		
All**	3.9	(3.0)	3.4	(2.2)	3.7	(2.8)	3.9	(2.9)	
N	408		185		84		826		1503
<u>Current age</u>									
15-19	3.0	(0.4)	3.5	(0.2)	3.0	(-)	3.1	(0.9)	44
20-24	3.1	(1.2)	3.2	(1.3)	3.3	(1.2)	3.3	(1.2)	315
25-29	3.7	(2.6)	3.2	(2.1)	3.3	(2.1)	3.6	(2.5)	406
30-34	4.1	(3.4)	3.3	(2.4)	3.9	(3.2)	4.1	(3.5)	294
35-39	4.5	(4.2)	3.8	(3.3)	3.4	(3.0)	4.5	(4.2)	257
40-44	4.3	(4.1)	5.1	(5.1)	4.6	(4.3)	4.5	(4.5)	187

Urban

Variable	Migrant status						No. of women
	Recent IM	Long-standing IM	Husband IM	Wife IM	Natives		
All**	3.3 (2.5)	4.1 (3.8)	3.3 (2.5)	3.4 (2.5)	3.3 (2.3)		
N	869	439	149	323	125	1905	
<u>Current age</u>							
15-19	3.0 (0.4)	- (1.0)	- (-)	2.9 (0.2)	2.8 (-)	38	
20-24	2.9 (1.0)	2.7 (1.9)	2.9 (1.3)	2.7 (1.0)	2.8 (0.8)	308	
25-29	3.0 (2.1)	3.2 (2.7)	2.9 (2.0)	2.9 (1.9)	2.9 (1.9)	490	
30-34	3.4 (3.0)	3.8 (3.4)	3.8 (3.2)	3.5 (3.3)	3.8 (3.5)	417	
35-39	3.9 (3.6)	4.0 (3.8)	3.4 (3.2)	4.5 (4.4)	4.2 (4.0)	372	
40-44	4.0 (3.8)	4.6 (4.6)	4.2 (4.1)	4.7 (4.9)	4.2 (4.6)	280	

** Differences in group means significant at one per cent.

Similarly, in the urban survey women belonging to different migrant categories desire nearly the same number of children (between 3.3 and 3.4) as the natives do. Only the long-standing migrants desire more children (4.1) than the other groups do, but this is due to the fact that these women are older. Thus when we standardise the desired family size for current age of the women, these differences largely disappear.

Since migrant status does not appear to have much of an influence on the desired family size which is the same for migrants and non-migrants and actual families are smaller for migrants, it may be inferred that migrants are either in the process of enlarging their families or desire to do so. Rural out-migrants desire 3.4 children on an average but currently have only 2.2. Similarly, recent in-migrants to urban areas desire 3.3 children but currently have 2.5 children, whereas long-standing migrants desire 4.1 children and have 3.8 children currently. The act of migration therefore, tends to result in the migrant families delaying or postponing having children rather than deciding to settle for a smaller family size than do non-migrants. However, in the process they may end up with a lower completed family size than non-migrants do.

Conclusions

The main findings of this study may now be briefly enumerated:

1. The fertility patterns for similar population groups are significantly different in rural and urban areas. Families in urban areas desire as well as have a smaller number of children than those in rural areas. The study further shows that migrants to the urban areas have slightly higher fertility than natives but lower fertility than rural stayers. In the rural areas, out-migrants and returned-migrants have lower fertility than non-migrants. It has also been observed that migrants tend to marry at a later age and separation has the effect of lowering their completed family size. Increasing migration and urbanisation are, therefore, likely to reduce fertility as well as the over-all rate of population growth in the economy.²⁸

²⁸ To the extent migration and urbanisation also lower mortality, the effect on reducing the over-all rate of population growth is reduced.

2. Among the demographic factors affecting fertility the age of women at the time of marriage appears to be a major influence. There is some belief, however, that even if women marry later they catch up so that the postponement of marriage in itself may not prove to have an ultimate effect on family size, although it will have some effect on the birth rate. But the regression results in this paper show that controlling for age and other background variables, the age at marriage has a significant effect on reducing the family size. The data also show that the age at marriage has been rising in recent years, partly due to education and partly due to other factors. This is a trend favourable to reducing population pressure both in the rural and urban areas.

3. Mortality has been observed to have a close positive relationship with fertility. Reduction in child mortality through education and improved health care services is likely to reduce the demand for children.

4. Caste is not of much consequence as a determinant of fertility as it used to be, although it still has some influence on age at marriage and level of education which are important determinants of fertility.

5. Education, both of husband and wife, is a positive factor in reducing fertility. Female education not only has a direct impact on actual fertility and desired family size, but it is also likely to influence the nature and extent of female labour force participation and age at marriage. The latter has been observed to have a significant influence on actual fertility behaviour. Therefore, it is important that female education is increased, with emphasis in health and family planning. The increased public investment in it would bring about reduced fertility relatively quickly and with a continuing effect.

6. Employment of women does not appear to be a significant factor in reducing fertility. This conclusion is, however, tentative as the surveys did not differentiate between the woman's domestic activities and their activities on the farm or in household enterprise. Further research is required which takes into account this distinction.

7. The results of the survey indicate that women belonging to households that own an enterprise or are engaged in self-employment

have, on average, higher fertility than women belonging to household consisting of wage-earners only. This is largely because the former are more likely to make greater use of their children as workers, which tends to increase their demand for children. Therefore, the policies (such as foreign trade, urban and industrial growth policies) which induce a shift from self-and family-employment to wage-employment may have some direct or indirect impact on fertility reduction.

8. Farming households have been noted to prefer more children largely for reasons of augmenting their supply of labour. This suggests that policies which encourage farmers to introduce mechanisation in agriculture and land reform programmes which emphasise the sub-division of large and medium sized farms into small farms (which could be operated by husband and wife without substantial help from their children) are likely to reduce the demand for labour. As a result, the economic value of children to farming households is likely to diminish and this may have a depressing effect on fertility. But mechanisation may also induce other economic and social changes in the rural areas so that its net effect on fertility may be difficult to gauge a priori. There are also the negative side effects of excessive mechanisation such as the decline in agricultural wages, unemployment and falling incomes of the rural poor which should not be overlooked while formulating policies which encourage farmers to adopt labour-saving technology.

9. The form of family organisation is another major influence on fertility, nuclear families showing higher fertility than extended families. Since the sociological forces operating in the region are gradually breaking up the extended family system which has served as a social security system in the Indian society for a long time, the change in the form of family organisation is likely to increase fertility unless counterbalanced by social security measures.

While it may not be feasible to introduce the social security system at the present time, part of the future direction of government policy-making should be toward the establishment of such a system in order to establish the small family norm. As an alternative to a state-operated system, one may conceive of an old-age support system

administered by agricultural co-operatives or farmers' associations. In such a system, members would contribute during their working years and thus become eligible for a kind of old-age pension. A related policy suggestion concerns the development of savings media and institutions accessible to rural people. Life insurance and associated savings schemes, are potentially an important means of old-age support and should be promoted vigorously.

The results of the study, in general, suggest that parents in both rural and urban areas, in deciding the number of children they should have, do respond to the advantages and disadvantages of having children. But since educational and income opportunities are generally greater in urban areas, because health facilities are somewhat more available, and because communication channels are relatively more effective, more urban than village people shift to patterns of lower fertility. There is also some evidence that the act of migration itself causes a decline in fertility and contributes to the reduction of the over-all rate of births and the consequent demographic pressure. Therefore, the policies to reduce rural-urban migration are more likely to increase the rate of population growth for the nation as a whole unless steps are simultaneously taken to introduce lower fertility norms in the rural areas and to reduce the rural-urban fertility differentials. But since the rural-urban fertility differentials are largely due to the disparities in economic and social development between the two areas, the thrust of population policies ought to be on narrowing these disparities. This can be achieved only if population policies are considered as an essential component of the nation's over-all development strategy, linking and harmonising them with policies on economic and social development.

Selected Publications of the Population and Labour Policies

Research Programme¹

1. General Material on the Research Programme

ILO: World Employment Programme: Population and Development - A progress report on ILO research with special reference to labour, employment and income distribution (Geneva, February 1979), 2nd edition, Reference WEP 2-21/PR.5. (*)

This report includes a full bibliography. It is available in French and Spanish as well as English.

2. Books and Monographs

R. Anker: Research on Women's Roles and Demographic Change: Survey Questionnaires for Households, Women, Men and Communities with Background Explanations (Geneva, ILO, 1980). (*)

S. Braganca et al: The Simulation of Economic and Demographic Development in Brazil (Geneva, ILO, 1980). (*)

M.G. Castro, L.M. Fraenkel et al: Migration in Brazil: Approaches to Analysis and Policy Design (Brussels, Ordina, 1979). (***)

W.J. House and H. Rempel: The Kenya Employment Problem (Nairobi, Oxford University Press, 1978). (***)

A.S. Oberai: Changes in the Structure of Employment with Economic Development (Geneva, ILO, 1978). (**)

G. Pyatt and A. Roe: Social Accounting for Development Planning, with special reference to Sri Lanka (Cambridge University Press, 1977). (***)

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G.B. Rodgers, M.J.D. Hopkins, R. Wéry: Population, Employment and Inequality: BACHUE-Philippines (Farnborough, Saxon House, 1978). (***)

G. Standing: Labour Force Participation and Development (Geneva, ILO, 1978). (**)

G. Standing and G. Sheehan (eds.): Labour Force Participation in Low-Income Countries (Geneva, ILO, 1978). (**)

M. Todaro: Internal Migration in Developing Countries (Geneva, ILO, 1976). (**)

¹ Availability code: * available on request from ILO, Population and Labour Policies Branch; ** available for sale from ILO Publications; *** available for sale from a commercial publisher.

3. Articles

- I. Adelman, M.J.D. Hopkins, S. Robinson, G.B. Rodgers and R. Wéry: "A comparison of two models for income distribution planning", Journal of Policy Modeling, Vol. 1, No.1, 1979.
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- : "An analysis of fertility differentials in developing countries", Review of Economics and Statistics, Vol. lx, No.4, February 1978.
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- A.S. Oberai and H.K. Manmohan Singh: "Migration, remittances and rural development: Findings of a case study in the Indian Punjab", International Labour Review, Vol. 115, No.2 (Geneva, ILO, March-April 1980).
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- C. Oppong: "Household economic demographic decision-making: Introductory statement", IUSSP Proceedings of 1978 Helsinki Conference, 11 pp.
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- R. Wéry, G.B. Rodgers and M.J.D. Hopkins: "Population, employment and poverty in the Philippines", World Development, Vol. 6, 1978.

4. Recent Working Papers in print¹

WEP Working Papers are preliminary documents circulated informally in a limited number of copies solely to stimulate discussion and critical comment. They are restricted and should not be cited without permission. A set of selected WEP Research Working Papers, completed by annual supplements, is available in microfiche form for sale to the public; orders should be sent to ILO Publications, International Labour Office, CH-1211 Geneva 22, Switzerland. Many, but not all, of the papers in this series exist or may be issued in microfiche form.

- WEP 2-21/WP.46 The impact of population growth on land, labour and productivity in rural Korea
- by Yunshik Chang, Kap Hwan Oh and Hae Young Lee, February 1977.
- WEP 2-21/WP.48 Population, employment and poverty in the Philippines²
- by R. Wéry, G.B. Rodgers and M.J.D. Hopkins, February 1977.
- WEP 2-21/WP.49 Demography and distribution
- by G.B. Rodgers, February 1977.
- WEP 2-21/WP.51 Demand for education in the Philippines
- by René Wéry, March 1977.
- WEP 2-21/WP.52 Population, economic growth and rural-urban income distribution: An empirical analysis
- by R. Scott Moreland, March 1977.
- WEP 2-21/WP.53 The effects of economic policy on fertility
- by G.B. Rodgers and R. Wéry, April 1977.
- WEP 2-21/WP.55 BACHUE-Yugoslavia: Regionalised policy simulation economic-demographic model of Yugoslavia - conceptual basis
- by Miroslav Macura, Bojan Popovic and Miroslav Rasevic, July 1977.
- WEP 2-21/WP.56 The determinants of internal migration in Kenya: A district level analysis
- by James C. Knowles and Richard Anker, October 1977.
- WEP 2-21/WP.57 Fécondité et attitudes en Sierra Leone
- by René Wéry, November 1977.
- WEP 2-21/WP.58 Migrations internes aux Philippines dans les années soixante
- by René Wéry, November 1977.
- WEP 2-21/WP.59 An analysis of income transfers in a developing country: The case of Kenya
- by James C. Knowles and Richard Anker, November 1977.
- WEP 2-21/WP.60 An empirical analysis of mortality differentials in Kenya at the micro and macro levels
- by Richard Anker and James C. Knowles, November 1977.
- WEP 2-21/WP.63 Urban employment in the 1980's: The cases of Kenya and the Philippines
- by Gerry B. Rodgers and Richard Anker, May 1978.

¹ These working papers are available free, while stocks last, from ILO, Population and Labour Policies Branch, CH-1211 Geneva 22, Switzerland.

² Also available in French and Spanish.

- WEP 2-21/WP.66 Population, progrès technique et social, développement, économique et emploi - Modèle démographique et socio-économique
- by G. Blardone, M.Ch. Leroy et G. Parisot, avec la collaboration de P. Collin, E. Fauvet, Ch. Harzo, J.A. Sanchez, R. Vallette, D. Vernay, June 1978.
- WEP 2-21/WP.68 Migration, labour force absorption and mobility: Women in Kingston, Jamaica
- by Guy Standing, October 1978.
- WEP 2-21/WP.69 Demographic change and the role of women: A research programme in developing countries
- by Richard Anker, November 1978.
- WEP 2-21/WP.70 A demographic-economic model for developing countries: BACHUE-International
- by R. Scott Moreland, December 1978.
- WEP 2-21/WP.71 Approaches to the analysis of poverty
- by G.B. Rodgers, May 1979.
- WEP 2-21/WP.72 Migration and modes of exploitation: The social origins of immobility and mobility
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- WEP 2-21/WP.73 Semi-feudalism, migration and the State in Guyana
- by Guy Standing, September 1979.
- WEP 2-21/WP.74 Transmigration and accumulation in Indonesia
- by J.P. Perez-Sainz, September 1979.
- WEP 2-21/WP.75A Household fertility decision-making in Nigeria
- by Ghazi M. Farooq, July 1979.
- WEP 2-21/WP.76 Female labour force participation and the production system in Brazil
- by Maria Helena de Cunha Rato, August 1979.
- WEP 2-21/WP.78 Interpretation of relations among mortality, economics of the household, and the health environment
- by T. Paul Schultz, September 1979.
- WEP 2-21/WP.79 Family structure and women's reproductive and productive roles: Some conceptual and methodological issues
- by Christine Oppong, September 1979.
- WEP 2-21/WP.80 The participation of Arab women in the labour force: Development factors and policies
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- WEP 2-21/WP.81 The economic roles of children in low-income countries: A framework for analysis
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- WEP 2-21/WP.82 Feasibility Study for the Construction of an Economic-Demographic Model for Indonesia
- by Andrew Elek, January 1980.
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- by Warren C. Robinson and Stanley P. Stephenson Jr., January 1980.
- WEP 2-21/WP.84 Bachue Modules: Population, Household Income and Labour Market
- by René Wéry, January 1980.

- WEP 2-21/WP.85 Analysing Women's Labour Force Activity with the WFS: Insights from Sri Lanka
- by Guy Standing, March 1980.
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- by René Wéry and Gerry Rodgers, April 1980.
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- WEP 2-21/WP.89 Labour market structure, child employment, and reproductive behaviour in rural South Asia
- by Mead Cain and A.B.M. Khorshed Alam Mozumder, June 1980.
- WEP 2-21/WP.90 Household and non-household activities of youths: Issues of modelling, data and estimation strategies
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- by Richard Blandy, August 1980
- WEP 2-21/WP.93 The Labour Market of Bachue-Brazil
- by Maria Helena da Cunha Rato and Sergio Luiz de Bragança, September 1980
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- by A.S. Oberai and H.K. Manmohan Singh, September 1980