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SOCIO-ECONOMIC DETERMINANTS OF FERTILITY
IN BANGLADESH : A REVIEW

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PREFACE

Any review of the socio-economic determinants of fertility in Bangladesh must be prefaced with an acknowledgement that much is yet ^{to} be known in order to understand the phenomena adequately. While many more studies are necessary to create further knowledge about the intricate and complex dynamics of fertility, it is more important and challenging to tie together the available knowledge already created through various surveys and research in the field of human fertility in Bangladesh and utilize them in policymaking for future action and research. The present review is the first endeavor of its kind in Bangladesh; it provides us with some knowledge of which socio-economic factors affect fertility and what action and research implications they suggest.

This review is intended to serve as a basis for formulating the Population Statement of the 1983 Country Development Strategy Statement for Bangladesh to be prepared by the United States Agency for International Development (USAID). My appreciation goes to both Mr. John Dumm and Dr. Carol E. Carpenter-Taman of the USAID Dacca Office for requesting me to do this review. The kind permission which the Vice-Chancellor of the University of Dacca accorded me for undertaking this work is deeply appreciated.

My colleague, Mr. Shamsheer Ali, and three of our MSS final year students --- MAM Hanifuddin, Abdul Haque Talukder, and

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The timing of the work was perfect -- it corresponded with the summer and Ranzan vacation of the University. I am happy that the time was productively spent.

Finally, the views expressed herein are not necessarily those of USAID or its staff, nor do they reflect policy positions of that agency; it is I, alone, who is solely responsible for its contents.

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M. Alauddin

DEFINITIONS

Age-Specific Fertility Rates (ASFR):

Number of live births to women in a given age group per 1,000 women in the same age group, in a given year. It is usually calculated for 5-year age groups.

Crude Birth Rate (CBR):

Number of live births per year per 1,000 of population.

Crude Death Rate (CDR):

Number of deaths per year per 1,000 of population.

Child-Woman Ratio (CWR):

Number of children under 5 years old per 1,000 women aged 15-44 in a population. This crude fertility measure, based on basic census data, is sometimes used when more specific fertility information is not available.

Growth Rate (GR):

The rate at which a population is increasing (or decreasing) in a given year due to natural increase and net migration, expressed as a percentage of the base population.

Marital Fertility Rate (MFR):

Number of legitimate live births per 1,000 married women aged 15-44 years in a given year.

Total Fertility Rate (TFR):

The average number of children that would be born per woman if she were to live to the end of her child-bearing years, and bear children according to a given set of age-specific fertility rates. The Total Fertility Rate often serves as an estimate of the average number of children per family.

Gross Reproduction Rate (GRR):

This is the same as the Total Fertility Rate, but refers to the number of daughters a woman would have under prevailing fertility patterns.

Net Reproduction Rate (NRR):

The number of daughters a woman would have under prevailing fertility and mortality patterns, who would survive to the mean age of childbearing.

ABBREVIATIONS

BARD	-	Bangladesh Academy for Rural Development
BAVS	-	Bangladesh Association for Voluntary Sterilization
BRAC	-	Bangladesh Rural Advancement Committee
BFS	-	Bangladesh Fertility Survey
BRSFM	-	Bangladesh Retrospective Survey of Fertility and Mortality
URL	-	Cholera Research Laboratory. It has now been renamed as International Center for Diarrhoeal Disease Research, Bangladesh (ICDDR,B)
DSS	-	Demographic Surveillance System
ICDDR,B	--	International Center for Diarrhoeal Disease Research, Bangladesh
IPPF	-	International Planned Parenthood Federation
IRDP	-	Integrated Rural Development Programs
ISRT	-	Institute of Statistical Research and Training
IUCW	--	International Union for Child Welfare
KAP	--	Knowledge of, Attitude to, and Practice of Family Planning
MSS	-	Master's in Social Science
NIPORT	-	National Institute of Population Research and Training
RSS	-	Rural Social Service
SES	-	Socio-economic Status
USAID	-	The United States Agency for International Development

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EXECUTIVE SUMMARY*

This paper seeks to identify, analyze, and systematically present the socio-economic determinants/correlates of fertility based on the findings of available surveys, censuses, research and evaluation studies. The key factors of fertility have been rank ordered, followed by recommendations for intervention and further research.

Demographic Determinants of Fertility

The intermediate/proximate variables, such as age at marriage and proportions married which are closely related to socio-economic factors have significant influence on Bangladesh fertility. Demographically, Bangladesh is characterized by early and universal marriage. Nine out of ten girls are married in their teens; the proportion of women 15-19 ever married in Bangladesh is the highest in the subcontinent. The general pattern is that the younger the age at marriage, the longer the duration of marital life and the higher the fertility. The BFS (1978), however, reported an inverted U shape relationship between age at marriage and fertility. Women marrying at very young ages (below 12) have lower fertility than those marrying at 12-17, probably due to adolescent sterility or sub-fecundity. Those marrying at 18 and above have lower fertility than those marrying at younger ages.

*The author acknowledges contribution of Dr. Carol Carpenter-Yaman in the preparation of the summary.

The concentrated age range of marriages contributes to a concentration of births: two-thirds of total children are born to women in their twenties. Such concentration of births to younger women contributes to a short length of generation.

Given (1) the current age structure of Bangladesh, (2) the continuing pattern of early and almost universal marriage, and (3) the concentration of marriages within a short age range, the crude birth rate is likely to increase if marital fertility is not lowered through delay age at marriage and use of effective contraception. A far-reaching demographic effect could be made by raising the age at marriage and spreading the age at first marriage over a wider range (say from 13-19 to 18-25).

Socio-economic Determinants of Fertility

Rural-Urban Differentials

The mean parity of urban women is higher than that of rural women, *After* standardization for duration of marriage. Urban fertility may be higher due to better health and nutrition, better housing and sanitation, or better medical facilities. Alternatively, urban women tend to breast-feed less than rural women and this may shorten the duration of lactational amenorrhea. Although urban fertility is higher, both ever use and current use of contraception is greater among urban women than rural women. Perhaps differential access to family planning information and services along with other socio-economic variables contribute to higher contraceptive practice in the urban areas.

Social Class

Fertility is low at the high and low ends of the socio-economic scale and high in the middle and lower middle class. The contraceptive use pattern corresponds to the fertility pattern: usage is higher for the higher and lower social classes than for the middle classes.

Higher income groups are most likely to be current or ever users of contraception, except sterilization. Most sterilization acceptors are from the poorest segments of the population.

Landownership

There are a cluster of attributes which center around landownership that all contribute to high fertility:

- a. Economic condition and social standing in rural Bangladesh are measured in terms of landholdings; small variations in landholdings lead to marked differences in social class.
- b. Landownership is positively related to fertility and inversely related to infant and child mortality. Size of landholdings is positively related to fertility.
- c. Richer parents have more children including more living sons; their sons start domestic work early, contribute more to agricultural production, inherit land, and maintain control of land. Their sons marry at an early age, and they enjoy the support of their children in their old age. They

have a smaller proportion of sons living away from home, and the mean age of sons leaving home is much higher than among the poorest.

d. The landowning group enjoys higher social status, derives more benefits from rural development, has a higher stake in the prevailing social traditions and, therefore, the rural conservatism, reflecting more religiosity in the traditional sense and rigidity on purdah. All of the above factors are directly related to high fertility.

The above mentioned factors cluster together and make significant impact on fertility. The landowning group adds significantly to the total fertility of the country not only by themselves, but also by acting as a reference group for others.

Lower fertility and highest acceptance of terminal methods are found among the landless and among those not gainfully employed. It is hypothesized that the adoption of terminal methods among the landless poor may not be a response to modernization or the seeking of better opportunities for self and children, but rather a response to economic hardship. The fear of falling further below subsistence level, or the use of program incentives to cope with immediate economic need may be what brings about the higher rate of sterilization acceptance among this group.

Education

Level of education is positively related to age of marriage. As found in many countries, there is an inverse relationship between education and fertility. But in Bangladesh, this pattern does not hold. When duration of marriage is controlled, women with primary education have the highest fertility. Women with above primary education have the lowest fertility in both rural and urban areas. Men's education, by itself, does not have a significant effect on fertility.

One possible explanation for the relationship of primary education and high fertility is that those who have no schooling and have lowest fertility are the rural poor while those who have primary education are not from economically depressed groups, but from the rural middle class.

Universal primary education will not, in itself, have much immediate effect on fertility. The numbers proceeding to middle and high school, however, will later have a dampening effect on fertility.

There is a direct relationship between level of education and actual contraceptive use. Women's education is the single most important factor determining the knowledge of clinical methods of contraception.

Employment and Decision-making Authority

Employment outside the home and decision-making authority of the women in the family (which are intercorrelated with

education) are inversely related to fertility and positively to use of contraception.

Working women, whether in rural or urban areas, whether uneducated or highly educated, whether rich or poor, have lower fertility than their non-working counterparts, provided duration of marriage is controlled.

Religion and Religiosity

Muslim women tend to have lower education and higher fertility than non-Muslims. Hindus are more frequently educated at higher levels, marry later, and practice contraception more frequently than Muslims.

Muslims rank higher than Hindus on religiosity, and religiosity is found to be associated with higher average fertility. Individuals with strong religious values are more likely to (1) be non-adopters of family planning, (2) express a desire for a larger number of children, and (3) actually have a large number of children.

Purdah

It is interesting to find that men claimed more adherence to purdah than the women themselves professed. Muslims men claim more purdah than Hindu men. Muslim women claim more purdah than Hindu women. Those not practicing purdah have fewer children and desired fewer children than those practicing purdah. On the other hand, adherence to purdah is positively correlated with fertility and negatively with ever use of modern contraceptive methods.

Education is inversely related to observance of purdah and, in turn, to fertility. It is hypothesized that by increasing female education, adherence to purdah may be decreased and, subsequently, fertility will be reduced.

Lactation, Nutrition and Infant Mortality

Postpartum sterility plays a significant role in this essentially non-contracepting society. Lactational amenorrhea is the prime factor responsible for the prolonged birth intervals. High infant mortality acts in competition with lactational amenorrhea, as it interrupts lactation, shortens postpartum amenorrhea, and increases susceptibility to conception.

Reduced infant and child mortality, by prolonging lactation and, thus, the extension of amenorrhea, should increase the interval between births and in this way, lead to a fertility decline. Alternatively, a program to improve maternal and child nutrition, for example, may reduce infant mortality, but could possibly lead to the shortening of the duration of lactational amenorrhea by 50 percent or more. This would shorten the birth interval and lead to a corresponding rise in the birth rate.

Postpartum sterility is associated with socio-economic status and urban-rural residence: lactational amenorrhea is longer for the low SES group and is longer in the rural areas, thereby depressing fertility somewhat.

Children born to women with less than primary schooling exhibit twice the mortality rate than those born to women with

primary^{or} higher education. At the aggregate level, communities enjoying a high level of health surveillance showed roughly 25 percent lower mortality than those having a low level surveillance.

Rural Development, Modernization, and Family Planning

Village level education-related factors (proportion of families sending their children to school, mean level of education desired for children, access to educational institutions, presence of a youth club in village) are directly related to knowledge of contraceptive methods. Modern agricultural practices are found to be positively related to knowledge of non-clinical methods.

Development and family planning programs have almost equal contributions to the explanation of village-level contraception, with development having a slightly higher contribution than family planning. The combined effects of development and family planning are greater than the effects of either of them separately.

Both village access to means of transportation and extent of family planning workers' visits to the village seem to serve as facilitating conditions to individual practice. High accessibility to means of transportation, both road and water ways, is significantly associated with a high level of contraceptive practice. Villages where the family planning worker visited "many" times during the last year had the highest level of contraceptive practice; no visits or some visits were

associated with lower than average contraceptive practice in the village.

The limited available data suggest that rural development programs (such as cooperatives, mothers' clubs, rural transportation infra-structure, youth organizations, schooling facilities, accessibility of village health and family planning services, Swanirvar programs, community development programs with the involvement of the local leadership and people's participation) have potential for bringing declines in fertility.

Relative Importance of the Determinants

While assessing the relative importance of the socio-economic determinants, several methodological limitations of the studies reviewed were noted: (1) the majority of the studies did not use sophisticated multivariate analytic techniques, (2) the nature and sample sizes often limited the generalizability of the findings, and (3) some of the studies were conducted on an ad-hoc basis and fertility was analyzed as a secondary rather than primary objective.

In the absence of any clear guide from the studies themselves, (1) the consistency of results in terms of their influence on fertility, (2) the clustering of variables in terms of their effects on fertility, (3) the magnitude of the contribution of a variable either alone or in combination, and (4) the proportion of population a given variable affects were

all considered when assessing the relative importance of the determinants.

Among the intermediate/socio-economic factors which influence fertility, the key ones are:

1. Age at marriage and proportions of population married in each age group. Bangladesh has the highest proportions married in the subcontinent. Except for very young marriages, duration of marriage, which is largely a function of age at marriage, contributes to high fertility both in rural and urban areas.
2. Landownership which is associated with other factors, such as agricultural occupation, rural conservatism, rigidity on purdah, limited education for girls, only domestic roles for women contribute to high fertility in Bangladesh.
3. Biological effects of postpartum sterility play a significant role in depressing fertility in Bangladesh society where contraception is still low. Postpartum sterility is associated with socio-economic status and rural-urban residence: lactational amenorrhea is longer for the low SES group and is longer in the rural area.
4. Education is another key factor related to fertility. A small amount of education for women or men does not help to lower fertility: primary education of women is associated with highest mean parity both in rural and urban areas when duration of marriage is controlled. Higher than primary education for

women depresses fertility while the same level of education for men increases fertility.

5. Rural development programs, such as cooperatives, mothers' club, agriculture modernization, transportation systems and swanirvar programs have direct or indirect influence on increasing the use contraception.

Recommended Areas of Action

The areas of intervention described in the text are briefly listed : (a) delay age at marriage, (b) provide education* to girls with back-up vocational training and income-generating activities for the girls who drop-out of school so that they can earn income for their parents and have some opportunity for continuing education, (c) organize women and young girls to orient them to new ideas, development programs, and so forth, (d) gear family planning programs to reach younger wives, (e) pay more attention to rural middle class women and organize them around agro-based small-scale industry, (f) organize primary decision makers, such as husbands and other elder members of the family, (g) link contraception with rural development programs (i) conduct mass education programs on the importance of breast-feeding, (j) develop rural transportation

*Education for girls is considered very critical. Given the present disparity in literacy between males and females, lower enrollment of females and high drop-out rates for them, it is recommended that girls be given a "beautification kit" (will include such items as a school uniform, a bar of soap, a ribbon, and a pair of sandals) as an incentive.

infra-structure, (k) make the family planning field workers to motivate and follow-up their clients, (l) institutionalize marriage and vital registration systems, (m) popularize traditional contraceptive methods through religious leaders, and (n) develop a partnership between the family planning program and the village leadership.

Recommendation for Research

Beyond specifying substantive areas for future research, there are two primary recommendations: (a) analysis of fertility should be done in a multivariate fashion to determine the net and relative contributions of various socio-economic factors reported to have impact on fertility and (b) computer facilities should be made available. The former will largely be dependent on the latter. Due to the limitations of computer facilities, especially of package programs for social science analysis, the social scientists -- both national and international -- working in Bangladesh are making less than optimal contribution to the understanding of fertility dynamics in Bangladesh.

INTRODUCTION

This paper seeks to review the existing research literature on the socio-economic determinants¹ of fertility in Bangladesh in order to: (1) identify, analyze, and systematically present the socio-economic determinants of fertility as found in different studies, surveys, censuses and evaluations; (2) evaluate the relative importance of the various determinants of fertility; (3) recommend areas of action in light of the determinants of fertility and (4) point out the areas in which future study is needed for an adequate understanding of the social and economic correlates of fertility in Bangladesh.

Regarding the procedure, first we tried to make an exhaustive list of the existing research studies, surveys, censuses, and evaluations relating to Bangladesh fertility and family planning conducted within or outside Bangladesh. We could identify from various sources close to 300 studies of fertility and family planning/population control in Bangladesh -- large and small, published and unpublished, completed and on-going, conducted during the last 30 years covering the period between 1950-1980. All of these studies were then located and reviewed for the identification of those research that studied fertility in relation to socio-economic variables. Only one-fourth of these studies were identified to have studied fertility either as major or minor objective.

¹A caveat is in order: the determinants identified in this paper are, at best, the correlates of fertility. The terms, determinants and correlates, are, however, used interchangeably in this analysis.

The paper is divided into five sections. In this introductory section, we present some general demographic data and examine the demographic correlates of fertility. In section two, we present the various socio-economic factors affecting fertility in Bangladesh. In section three, we discuss the relative importance of the correlates of fertility. In sections four and five, we recommend intervention in different areas and suggest future research on fertility in Bangladesh, respectively.

The Population of Bangladesh

The Planning Commission estimates the total population of Bangladesh in 1980 to be 90 million. Within a small geographic area of only 55,598 square miles, the population density of the country is one of the highest in the world. The population of the country has grown at an increasingly higher rate between 1950 and 1975. The rate of growth rose from one percent in 1951 to 2.8 percent in 1975 but it dropped to 2.5 percent in 1978 and has remained constant since then. The population growth has been steep since 1961 and the extent of increase in numbers during 1961-1971 period is comparable to the total population increase over the previous six decades.

While the birth rate did not fluctuate much over the years, the increase in the rate of growth was caused mainly by a rapid decline in the death rate. Table 1 shows the population growth trend from 1951 to 1980.

TABLE 1
POPULATION AND DIFFERENT RATES FOR BANGLADESH,
1951-1980

Years/Source	Population Size in Millions	Natural Rate of Population Growth	Crude Birth Rate	Crude Death Rate	Total Fertility Rate
1951 Census	42.6	1.0	47.8	38.2	-
1961 Census	53.4	2.0	50.2	28.4	7.3
1974 Census	76.4	2.8	47.4	19.4	7.0
1975 BFS	78.5	2.8	47.0	19.0	6.3
1978 Estimate	84.5	2.5	44.0	19.0	-
1980 Planning Commission Estimate	90.0	2.5	44.0	19.0	5.9

The BFS (1978) estimated that in 1975 the birth rate was 47 and the death rate was 19. These estimates are close to the census estimates for 1974. No reliable data for 1980 are available; the estimates of the Planning Commission suggest that the crude birth rate has fallen to 44 and the crude death rate has been constant at 19, thus making the growth rate 2.5.

Due to constant high fertility and mortality in the past, the proportion of population below 15 years has remained almost constant at over 45 percent of the population during the period between 1961 and 1974. The proportion in the age group 0-14 was, in fact, slightly higher in 1974 compared to that in 1961. This suggests that there has not been any decline in fertility over this period.

The available data on age-specific marital fertility rates indicate a decline over the period 1960-1968, while the continuation of the trend is not reflected in the 1970s. The total fertility rate among the married women also reflects very little change between 1968 and 1974. A reduction in birth rate is observed for the 15-19 age group; a similar trend is

TABLE 2
AGE-SPECIFIC AND TOTAL FERTILITY RATES PER 1,000 WOMEN ACCORDING TO SELECTED STUDIES

Age Group	Popu- lation Growth Estimate (1962- 1965)	Impact Survey		Cholera Research Laboratory	Cholera Research Labora- tory	Bangladesh retrospec- tive Survey on Fertility & Mortality	Bangladesh Fertility Survey
		1964-65	1966-68	Laboratory (1967-68)	(1972-73)	(1973-74)	(1975) ^a
15-19	276	232	252	232	139	198	203
20-24	359	340	301	334	283	337	332
25-29	356	314	250	297	277	311	301
30-34	260	230	198	204	221	262	236
35-39	150	130	126	128	118	197	152
40-44	56	45	37	44	53	95	69
45-49	n.a.	n.a.	3	n.a.	9	14	22
TFR	7.3	6.5	6.0	6.2	5.5	7.1	6.6

n.a. Not available

^aYear shown in parenthesis is when the survey was conducted.

discernible in the age groups up to 25-29, while no such reduction is observed in the higher age groups. Which demographic, social and economic factors affect the levels of fertility in Bangladesh are identified and analyzed in this paper.

Demographic Correlates of Fertility

Age at marriage and proportions of the population marrying at different ages have profound implications for the determination of gross fertility. The age structure of the population, particularly of the females, is also an important demographic variable that influences fertility level, including crude birth rate. An understanding of the dynamics of these demographic characteristics and their impact on fertility has attained added significance for Bangladesh, because "delayed marriage" is proposed as the number one strategy of the population planning program during the Second Five Year Plan, 1980-1985.

Age at Marriage

A rising trend in age at marriage has been observed in recent years (Aziz, 1978; BFS, 1978; Rabbani et al, 1979; Maloney et al, 1980). The median age at marriage for the BFS sample women aged 30 or more is about 12.5 but rises to 13.2, 13.5 and 15.0 for age groups 25-29, 20-24, and 15-19 respectively. The percent married by age 12 falls from over 40 percent for older women to 15 percent for those currently aged 15-19. The proportion married before age 15 shows a steep decline from over 80 percent for older women to 50 percent for younger women. The proportion of women "never married" also

indicates a rising trend. For data up to 1965, less than 13 percent of the women aged 15-19 were "never married." This proportion rises to around 25 percent in 1974. The BRSEFM data (U.K. 1977) show the proportion "never married" in this age group to be 32 percent in 1973-1974 (Rabbani et al, 1979).

Proportions Marrying

Early and universal marriage is the prevailing pattern both in rural and urban areas of Bangladesh. Also marriages are concentrated within a short range of ages. According to the BFS (1978), the most recent nationwide survey, nearly half of the 15-years old girls had been married and this proportion rises to 90 percent for 19 year olds. This means that 9 out of every 10 girls were married during their teens (Table 3). Only 5 percent of the women in age group 20-24 were not married in Bangladesh, compared to 61 percent in Sri Lanka.

TABLE 3
PROPORTION MARRIED BY CURRENT AGE

Current Age	12	13	14	15	16	17	18	19	20
Percent Female Ever Married	7	14	25	47	60	76	85	90	93

Source: World Fertility Survey. The Bangladesh Fertility Survey, 1975 - A Summary of Findings. The Hague: International Statistical Institute, No. 13, April 1979.

Further data indicate that at any point in time the proportion of currently married women is very high in both rural and urban areas of Bangladesh (Table 4). In a study of inter-

country comparison, Bongaarts (1978) showed the index of proportion married for Bangladesh to be the highest. The proportion of women aged 15-19 ever married in Bangladesh is the highest in the sub-continent and is 10 times higher than in Sri Lanka.

The proportions of males and females reported "never married" at ages 45-49 in all censuses and surveys provide further evidence that marriage is universal in Bangladesh. The percentages of males and females reported to be never married in the age group 45-49 in the 1951 census were as low as 1.3 and 0.2, respectively. These proportions declined further to 0.8 and 0.1, respectively, in 1961. The 1974 census, however, recorded an increase to 1.1 and 0.3 percent. Nevertheless, it suggests that no significant change in the overall practice of marriage has occurred since 1951.

TABLE 4

PERCENTAGE OF WOMEN CURRENTLY MARRIED,
AGE 10-49 AT DIFFERENT POINTS IN TIME

Source	Rural	Urban
1961 Census	80	79
1974 Census	87	86
1975 BFS	82	82

Source: M. Shahidullah, "Differential Nuptiality Patterns in Bangladesh." Master's Thesis, Canberra: Australian National University, 1979.

Marriage Patterns and Fertility

The noticeable increase in age at marriage has both potential and actual effect on fertility. Duza (1964) found strong and fairly consistent correlation between age at marriage, proportion of women 15-44 married and fertility; the former was negatively and the latter was positively related to fertility. Afzal (1967) affirmed Duza's findings. He reported a negative association between age at marriage and marital fertility rates for rural as well as urban girls in Bangladesh. He also demonstrated a clear positive association between duration of marriage and fertility.

Stoeckel and Choudhury (1969) examined a hypothesis concerning the relationship between female marital fertility and age at marriage with data drawn from 15 villages of Comilla-Kotwali Thana. The results indicated that fertility was higher for women married below the age of 15 than for those married at 15 or after.

Similarly, Maloney et al (1980) reported that men who married in their early teens have close to 8 children, but those marrying at age 20-24 have 7.3 and those marrying at age 25-29 have 6.8 children. According to BFS (1978) data, women marrying at ages 18 and above (Table 5) have lower fertility than women marrying at ages 17 and below. The same data provide evidence that fertility for women marrying at very young ages (below 12 years) is slightly lower than that for women marrying at 12-17 years but quite markedly higher than those marrying at 18 and above. It is likely that those women who married

before age 12 had lower fertility because of adolescent sterility or sub-fecundity.

TABLE 5

MEAN NUMBER OF CHILDREN EVER BORN TO WOMEN CURRENTLY
AGED 40-44 BY AGE AT FIRST MARRIAGE

Age at First Marriage	<u>Current Age</u> 40-44
Less than 10	7.0
10 - 11	6.9
12 - 14	7.3
15 - 17	7.2
18 and over	6.3
All	7.1

Source: World Fertility Survey. The Bangladesh Fertility Survey, 1975 - A Summary of Findings, The Hague: International Statistical Institute, 1979, p.7.

Ruzicka and Chowdhury (1978) showed that duration of marriage is positively associated with fertility. Using data from the continuous registration system conducted by the CRI, now ICDDR,B in 233 villages of Matlab Thana, they estimated the total effective reproductive span of the average married woman in Bangladesh at about 27 years or 320 months. They also found that the average interval between live births was, in rural Bangladesh, 31-34 months. Given such an average interval between live births, a fecund woman would theoretically experience between 9 and 10 full-term pregnancies in the course of her married life. This purely theoretical estimate was supported

by the empirical findings from the demographic surveillance system. Women aged 40 years or more who were in marital union and delivered a live birth in 1976 had experienced -- on average eight previous pregnancies carried to term, thereby suggesting that longer duration of marital life contributes to high fertility.

In three path analyses models -- one for rural, one for urban, and the other for a national sample of the BFS, Ahmed (1979) found "duration of marriage" to be the most important variable that directly affected the number of children ever born. In all the three models, the path coefficients were both positive and of highest magnitude (.785 for rural, .831 for urban, and .835 for the Bangladesh sample as a whole).

The positive relationship between proportion married and fertility becomes all the more a critical factor to future fertility when we consider the age composition of the female population of Bangladesh. In the age structure of the female population (Table 6), there are larger cohorts of girls aged 5-9 and 10-14 than the younger or older cohorts. Such age composition does not give us a favourable indication of fertility declines in the future. Because of the still prevailing patterns of early and almost universal marriage as well as a concentration of marriages within a short age range, these cohorts of females who are entering or will soon start entering into marriage will contribute substantially to marital fertility. It is then unlikely that the crude birth rate will fall -- rather it will tend to rise if marital fertility is not

lowered enough, through effective contraception and through delaying marriage itself, to counteract the momentum of fertility built in the age structure.

TABLE 6
PERCENTAGE DISTRIBUTION OF MALES AND FEMALES IN
BANGLADESH BY AGE; BRSEFM, 1974^a AND BFS, 1975^a

Age Group	MALES		FEMALES	
	BRSEFM 1974	BFS 1975	BRSEFM 1974	BFS 1975
0 - 4	14.5	14.4	16.0	15.6
5 - 9	16.7	17.2	18.0	17.6
10-14	14.5	15.1	13.6	14.9
15-24	16.2	17.6	16.5	19.0
25-34	12.7	11.6	13.5	12.0
35-44	10.3	8.9	9.5	8.3
45-59	9.1	8.6	8.1	8.5
60 and over	6.0	6.6	4.8	4.2
Total	100.0	100.0	100.0	100.0

^aYear of the survey and not of the publication of the report.

In this connection one may also closely examine the pattern of age-specific fertility as estimated by the BFS and presented in Table 2. It will be noted that two-thirds of the total children are born to women within their twenties and only one-third after the mother is thirty. Such a large concentration of births to mothers within their twenties seems largely to be a function of early and universal marriage. These births to

younger women in turn contribute to shortening the length of generation.

For a far-reaching demographic effect, raising the age at marriage and spreading of female age at first marriage over a wider range are considered critical for Bangladesh fertility in the future. Later marriage and dispersal of the current concentration of marriages from within the age range of 13-19 to a different schedule, say from 18-25, would bring about a shorter period of reproductive life exposed to the possibility of pregnancy, and a longer interval between generations.

Of 26 developing countries in which fertility declined during the last two decades, delayed age at marriage contributed to such decline in eight. These are China, Hong Kong, Malaysia, Indonesia, the Philippines, Singapore, Sri Lanka, and Tunisia. Rising age at marriage has also helped reduce population growth in Europe and in Japan (Ujang, 1980).

The question then is : how to bring about a change in the marriage pattern which is intricably imbedded in the culture and the socio-economic conditions of the society? In their pioneering work, Davis and Blake (1956) recognized age at marriage and proportions married as intermediate variables which are strongly influenced by cultural, social and economic factors. The primary characteristic of such intermediate variables are their direct influence on fertility; Bongaarts (1978) calls them "proximate" determinants of fertility. As age at marriage is one of the principal proximate determinants of fertility, where research is available, socio-economic factors influencing it will be discussed in the paper.

SOCIAL AND ECONOMIC DETERMINANTS OF FERTILITY

The factors most often studied in relation to Bangladesh fertility are the same as those social and economic variables which are studied throughout the world: rural-urban background, region, migration status, social class, educational attainment and literacy, husband's occupation and family income, family structure and employment status of the wife. Besides these we consider such factors as religion and religiosity, purdah, land-ownership, status of women, value of children, experience of infant mortality, breastfeeding and lactational amenorrhea, and broader phenomena like rural development and modernity. These latter factors seem likely to have special significance to Bangladesh fertility. We attempt throughout our discussion to indicate areas which are not yet explored but are nonetheless important for understanding fertility behaviour in Bangladesh. We also attempt to note certain variables that are specific to our culture, particularly in the rural area.

Rural-Urban Differences

It is generally expected that rural women experience higher fertility than urban women; the BFS data as analyzed by Ahmed (1979) show, however, little difference either in terms of mean number of children ever born or in terms of completed family size. The mean number of children ever born to ever married women by their current age shows that the rural women had about 0.2 of a child more than the urban women in all age groups (Table 7). After standardizing for age, the overall

TABLE 7

MEAN NUMBER OF CHILDREN EVER BORN TO EVER MARRIED
WOMEN AGED 10-49, BY CURRENT AGE AND RURAL-URBAN
PLACE OF RESIDENCE: BFS, 1976

Current Age	Rural (N=5024)	Urban (N=1489)
10 - 19	0.62	0.78
20 - 29	3.13	2.91
30 - 39	6.05	5.85
40 - 49	6.94	6.74
Observed mean	3.96	3.86
Standardised mean*	3.96	3.82

Source: Bashir-Ud-Din Ahmed, "Differential Fertility in Bangladesh." Master's Thesis, Canberra: Australian National University, 1979, p.21.

*The standard population is the weighted BFS national sample of ever married women aged 10-49. The weights were 0.347 for urban and 1.194 for rural.

rural parity and urban parity are 4.0 and 3.8, respectively. But after standardization for duration of marriage (Table 8), the difference tends to increase and in the opposite direction; that is, the mean parity becomes lower for the rural than for the urban women. While there is no difference in fertility between rural and urban women married for 20 or more years, urban younger women married for less than 20 years tend to have higher fertility than their rural sisters. The magnitude of difference in fertility for urban women is still higher for those who had been married for 10 years. The higher fertility

for young urban women may be because they are likely to have no adolescent sterility or sub-fecundity as the rural ones do.

TABLE 8

MEAN NUMBER OF CHILDREN EVER BORN TO EVER MARRIED
WOMEN AGED 10-49, BY DURATION OF MARRIAGE AND
RURAL-URBAN PLACE OF RESIDENCE: BFS, 1976

Duration of marriage (in years)	Rural (N=5024)	Urban (N=1489)
10	1.11	1.47
10 - 19	4.07	4.31
20 +	6.84	6.84
Observed mean	3.96	3.86
Standardised mean*	3.93	4.14

Source: Bashir-Ud-Din Ahmed "Differential Fertility in Bangladesh," Master's Thesis, Canberra: Australian National University, 1979, p.22.

*The standard population is the BFS weighted sample of ever married women aged 10-49 by duration of marriage.

Again, a comparison between the mean parity of rural women with rural childhood background of themselves and their husbands and urban women with urban childhood background of themselves and their husbands, shows that urban fertility becomes higher than rural fertility after controlling for duration of marriage. The urban residence during childhood, whether of the husband or of the wife, does not seem to act in part or in combination to decrease fertility once duration of marriage is controlled. Rather, it tends to increase the fertility of ever married

women. Better health and nutrition from better food, better housing and sanitation, and better medical facilities in urban areas might contribute to the higher fertility found in urban areas. Breast-feeding and lactation could also contribute to higher urban fertility. There is empirical evidence that the mean length of breast-feeding is lower for urban women than for rural women (BFS, 1978). This, as well as their better nutritional status may shorten the duration of lactational amenorrhea for urban women.

The absence of any marked rural-urban fertility difference in Bangladesh as revealed by BFS data is supported by data available from other sources as well. The report on the 1974 BRFSM revealed that the age-standardized mean parity for urban women is 4.0 and that for rural women 4.1 (UK, 1977). An argument is put forward that rural urban migrants carry rural characteristics and, therefore, have fertility almost equal to the level of rural fertility; but it does not seem plausible, when residence background of the urban population is taken into account. According to 1974 census, of the total population enumerated in urban areas, 52.2 percent are urban resident since birth, 30.2 percent have less than ten years of residence, and the remaining 17.6 percent have ten or more years of residence in urban area (Bangladesh, 1977).

Consistent with the findings of slightly higher fertility for urban women, Ahmed (1962) observed a positive correlation between urbanization on the one hand and child-woman ratio or child-married woman ratio, on the other, in Pakistan. Duza

(1967), on the contrary, based on the 1961 census data, found a negative association between urbanization and fertility measured in terms of child-woman ratio. He was critical of Ahmed's finding of a positive correlation between urbanity and fertility, because it was based on the grossly incorrect age data of the 1951 census.

Rural-Urban Differences in Family Planning

For both urban and rural women, a high percentage claim some knowledge of contraceptive methods. Rural-urban differentials are far more pronounced for contraceptive use patterns than knowledge. Twenty-eight percent of the urban women claim to have ever used contraception compared with 12.3 percent of rural women. Current use of contraception by women exposed to the risk of childbearing shows a similar difference: 22.6 percent of the exposed urban women and 8.5 percent of the exposed rural women were currently using a method (BFS, 1978).

The rural-urban difference in fertility is very small, yet the differences in both ever and current use of contraception among the urban women are much greater for all ages and for all family sizes than rural women. Despite 2 to 3 times higher rate of contraceptive practice for urban women, as compared to rural women, in all age groups, fertility for urban women is not lower. The mean number of children for older urban women (married for 20 or more years) is the same as for rural women and is slightly higher for urban younger women than rural. This may seem contrary to the expected

effect of family planning on fertility. The apparent contradiction is due to the fact that the older women use contraception for preventing additional births to their already achieved large family. The younger urban women use contraception to keep their family size small. The contraceptive use structure (defined in terms of age and family size of the users) in the latter group of women is in the desired direction and has greater demographic implications than the former. While there is a need and scope for still higher contraceptive prevalence in the urban areas, the question, nevertheless, remains why the rural contraceptive prevalence is so much lower than urban although the level of fertility is not markedly different. It merits examination if differential access to family planning information and services along with other socio-economic variables contribute to higher contraceptive practice in the urban than in the rural area.

Regional Difference

Regional differences in fertility per se are not our interest in this analysis. Rather identification of factors, for example, level of agricultural development, education, urbanization, availability of health and other social services, etc., which are associated with the levels of regional fertility is our critical concern. Analysis of fertility of districts, thanas, or any other aggregate unit in relation to ecological factors, local culture, demographic, social and economic characteristics, development inputs, family planning efforts would

help policymaking with regard to differential allocation of scarce resources and efforts.

Unfortunately, fertility and mortality estimates for Bangladesh by region are very scarce. Using unadjusted 1974 census data, Chen and Chaudhury (1975) made an attempt to determine differential fertility by examining modified child-woman ratios (children under five divided by female population 10 years and above) according to districts. The modified ratios ranged from .51 to .59 without any clear pattern. Rabbani et al (1979) estimated CWR (unmodified) for the four divisions of Bangladesh by rural and urban areas (Table 9). There are variations in CWR by division -- Chittagong has the lowest and Rajshahi, the highest CWR, according to 1974 census data. The

TABLE 9
CWR BY DIVISION AND BY RURAL-URBAN AREA, 1961-1974

Division	All Areas		Rural		Urban	
	1961	1974	1961	1974	1961	1974
Dacca	870	843	870	855	866	759
Chittagong	830	822	830	826	830	769
Khulna	891	859	893	868	824	748
Rajshahi	887	885	887	893	880	731
BANGLADESH	867	851	868	859	854	756

Source: Rabbani, et al "1974 Census Estimates of Fertility Levels in Bangladesh," in Monwar Hussain et al (ed.) Fertility in Bangladesh: Which Way is it Going? Dacca: Bangladesh Fertility Survey, IIFORT, 1979, p.23.

CWR persists to be higher in rural areas than from urban over time, but there is a marked drop in CWR for urban areas from 854 in 1961 to 756 in 1974.

Chowdhury (1977) however, reported areal differences in fertility within the region of Chittagong Division. He reported with BRSEM data that the highest average number of children ever born to women aged 14-45 is in Noakhali district, closely followed by women of Chittagong, and lowest to women of Chittagong Hill Tracts (Table 10). The lowest fertility in the Chittagong Hill Tracts may have been associated with the socio-cultural characteristics and ethnic background of the

TABLE 10

MEAN NUMBER OF CHILDREN EVER BORN TO THE WOMEN
AGED 15-45 OF CHITTAGONG DIVISION BY DISTRICT

District	Children Ever Born
Sylhet	3.68
Comilla	3.69
Noakhali	3.98
Chittagong	3.95
Chittagong Hill Tracts	3.41

Source: Fakhrul Islam Chowdhury, "Fertility Level Differentials in Chittagong," The Bangladesh Development Studies 5(4): 415-435, 1977.

population of the district. Most of the people are tribal in origin and of Buddhist faith. Socio-ethnic difference might have had significant influence on their demographic behaviour.

Similarly Samad (1976) found areal differences in growth rates from his study of 4 rural thanas: Sherpur has the highest growth rate, 3.3, while Gopalpur, has the lowest, 2.2 (Table 11). Except for Gopalpur, all three thanas have higher growth rates than the national average, estimated to be 2.5 by the Planning Commission.

TABLE 11
GROWTH RATE OF 4 DIFFERENT THANAS OF
BANGLADESH, 1976

Thana	Growth Rate
Sherpur, Bogra	3.3
Jhikargacha, Jessore	2.7
Rangunia, Chittagong	2.7
Gopalpur, Tangail	2.2

Source: Abdus Samad, "Demographic Survey for Collection of Baseline Data at Four Concentrated Thanas," Dacca: IBRD, 1976.

Neither Chowdhury (1977) nor Samad (1976) nor Rabbani et al (1979) explained variations in fertility by division, by district, and by thana, respectively. Investigations directed to identify the factors associated with the variation in fertility would be very important.

Migration and Fertility

Khan (1977) found that both desired and actual fertility are higher among the natives than the rural migrants to Chittagong city. The desired family size and actual fertility

for the migrants are 3.79 and 4.00, respectively, and those of the urban natives, 4.78 and 4.06, respectively. The age at marriage for the migrants' wives is also higher than that of the urban natives; the average ages are 17.50 and 14.00 years, respectively. This is the only study that looked into fertility in relation to migration. Further studies are needed to confirm such differences.

Social Class and Fertility

Studies in this area suggest that fertility tends to be comparatively low at the high and low ends of the socio-economic scale. Using BRSEM data Chowdhury (U.K. 1977) reported that the richest and the poorest have lower fertility compared to the middle and lower middle classes. Maloney et al (1980) found that, in general, the rural poor are less fertile than the rural middle class. They also found that rural families with such titles as Chaudhury, Bepari, Mandal, and Mulla (suggesting that they belong to the higher social class) tend to have higher fertility than urban families having such titles. The BFS (1978) reported that families who own such household items as radio or boat (indicators of social class status in Bangladesh society) tend to have higher fertility than those who do not own such items. The differential fertility reported by Stoeckel and Choudhury (1969) is inconsistent with the above findings. With data drawn from 15 villages in Comilla Kotwali Thana they found that fertility is higher in low status groups than in high status groups. Such differences

might have been due to their categorization of people into only two broad classes, high and low. They further reported that in the early years of the family planning program, socioeconomic status did not show any relationship with the practice of family planning.

Cain (1977) reported weak evidence of positive relationship between class and female fertility, but a stronger positive relationship between class and male fertility. Such relationships exist, he suggests, due to class differentials in polygamy, rates of divorce and remarriage. Economic class differentials in postpartum amenorrhea may also explain such a positive relationship between economic class and fertility. The period of temporary sterility due to postpartum amenorrhea is less for the more wealthy.

Social Class and Family Planning

Contraceptive use patterns seem to have correspondence with the fertility patterns of varying classes -- higher and lower social classes use contraceptive methods more frequently than any other social class. The fertility difference may have occurred due to the differential contraceptive practice by social class. Sorcar (1976) reported higher social status for the acceptors than the non-acceptors. In another study, Sorcar (1977) found that the family planning acceptors tend to be more frequent among service holders and traders than among farmers and wage earners. Khan and Choldin (1965) reported with data from 5 villages in Gomilla that the lower class,

landless labourers are overrepresented among the family planning adopters. Ali et al (1977) found in a study of 1000 sterilized cases (500 vasectomy and 500 tubectomy) that the sterilization clients came mostly from the poorer segments of the population; this holds more for vasectomy than for tubectomy. It should be noted that this is a follow-up study of sterilization cases done during the campaign of 1977. Although it is claimed that the majority of the females and most of the males accepted sterilization for the principal reason of not having any more children in the future, it is not clearly understood why the landless, who have lower fertility than the landholders, accept sterilization most. Does this mean that the poorer segments of the population have stronger motivation for fertility control or can any other factors explain this difference in adoption of sterilization? Analyzing the variation in family planning program performance by districts of Bangladesh, Khan (1980) reported that the rate of family planning acceptance at the aggregate district level is more of a reaction to a "stress" situation arising out of economic hardships coupled with program inputs of incentive rather than a "planned response" stimulated by aspirations for improved living conditions. Whether the fear of falling further below subsistence level or the need to cope with immediate economic hardships rather than the prospect of achieving better living standards in the future, stimulates the adoption of contraception at the individual level needs to be studied.

Landownership and Fertility

The literature reviewed here found only one study which is primarily concerned with the land-fertility relationship and a few others which discuss land as one of a number of variables.

These few studies report conflicting findings on the relationship of size of holdings to fertility. Maloney et al (1978) reported that even after controlling for age of the women, those who have more land have larger number of children. Of those who have completed fertility, persons having 5 to 10 acres of land have an average of 8.5 children, compared with 7.0 children for the whole study sample, 6.7 for the landless, and 6.3 for those with $1\frac{1}{2}$ to 1 acre, many of whom struggle for existence. The same authors also found type of land tenure to be related to fertility. Those who both own and lease out land have the most children, and this holds true across all ages.

Arthur and McNicoll (1978) and Chen et al (1976) also noted a positive correlation between fertility and size of landholding. Similarly, Akbar and Halim (1977) found that bigger landowners or more well-to-do villagers tend to have bigger family size. Samad et al (1974), drawing data from a census of 129 villages of a rural thana, reported a significant correlation between CWR and landholding. The BFS (1978) reported that landless labourers have the lowest fertility.

Latif and Chowdhury (1977) reported mixed results for a simple three-variable model relating size of landholding with marital duration and fertility (defined in terms of children ever born). Size of holdings was found significantly and positively related to fertility in a northern Bangladesh village (Thakurgaon in Dinajpur), but no relationship was found in a southern village (Mithakhali in Barisal). The small size of the population studied and the small number of control variables used, however, limit generalizability of these findings.

An analysis of the 1968-1969 "National Impact Survey" data by Cain and Baastiens (1976) showed almost no difference in fertility between families with "adequate" and "inadequate" living conditions of the families with and without agricultural land. Stoeckel and Choudhury (1969) found size of landholdings to be negatively related to actual fertility in the Comilla Kotwali thana; but a later study (Stoeckel and Choudhury, 1973) found lower desired family size and greater approval and knowledge of contraception among those of low landholding status.

Yet in another study conducted 10 years later, Stoeckel and Chowdhury (1979) reported that fertility rates of Bangladeshi women are related to their husband's landholdings. In all age groups, with the exception of women 15-19, women whose husbands have "no land" have lower fertility than women whose husbands own "some" land, irrespective of the quantity (Table 12). Although the differences in TFR are quite small between women

whose husbands own 2.0 to 2.9 acres, the TFR shows a direct relationship with landholding -- with a difference of over 13 percent separating women whose husbands have "no land" from women whose husbands have the highest landholding.

TABLE 12
MEAN MARITAL AGE-SPECIFIC FERTILITY RATES AND MARITAL
TOTAL FERTILITY RATES OF RURAL BANGLADESH WOMEN BY
HUSBAND'S LANDHOLDING, 1968-1970

Age of Women (Years)	Landholding				
	None Rate	1 acre Rate	1 to 1.9 acres Rate	2 to 2.9 acres Rate	3+ acres Rate
15 - 19	.206	.187	.184	.167	.193
20 - 24	.311	.324	.328	.240	.267
25 - 29	.322	.326	.327	.338	.336
30 - 34	.269	.283	.286	.324	.308
35 - 39	.160	.183	.227	.204	.228
40 - 44	.079	.087	.095	.087	.095
45 - 49	.021	.025	.021	.018	.018
Total	1.368 (N=3,654)	1.415 (N=2,655)	1.468 (N=3,895)	1.478 (N=1,071)	1.538 (N=1,814)
TFR	6.0	7.1	7.3	7.4	7.7

Source: Stoeckel, John and Chowdhury, A.K.H. Alauddin, "Fertility and Socio-Economic Status in Rural Bangladesh: Differentials and Linkage." New York: The Population Council Working Paper No. 8, 1979.

Landholding is also found to be related to age at marriage and mortality (Jain, 1978). Data from an intensive study of one small rural locality indicate that with increasing land-

holdings there is a slight increase in age at marriage for females and a slight decrease in age at marriage for males; however, the overall differential in both cases is only one year. He also reported that the child mortality rate for the poor is nearly double the rate for the well-off. However, infant mortality shows comparatively little class difference. McCord (1976), giving figures from a famine year, shows death rates in landless families three to four times higher than those of families with more than 1.2 hectares (Table 13). He commented that overall, there is a bifurcated mortality process

TABLE 13

DEATH RATE BY FAMILY LANDHOLDING IN A FAMINE YEAR,
COMPANIGONJ THANA, NOAKHALI DISTRICT, 1975

Size of Land- holding (Hectares)	Crude Death Rate (per 1,000)	Death Rate of Children Aged 1-4 (per 1,000)
0	35.8	86.5
Less than 0.2	28.4	48.2
0.2 - 1.2	21.5	49.1
More than 1.2	12.2	17.5

Source: Colin McCord, 1976, "What is the Use of a Demonstration Project?" Dacca: The Ford Foundation, Report No.45, Mimeo.

in Bangladesh: lower risks for those who are well-off, much higher risks for those on the margins. With growing impoverishment, this second type of mortality could become more dominant, he further commented.

The most recent study (Alam et al, 1980) showed a positive relationship between size of landholding and fertility. Table 14 shows that the TFR of the landless was the lowest in both 1975-1976 and the 1977-1978 time periods.

TABLE 14

TOTAL FERTILITY RATES PER WOMAN OF AGE 15-44 YEARS FOR
DIFFERENT LANDHOLDING GROUPS: COMPANIGANJ THANA,
BANGLADESH, 1975-1976 AND 1977-1978

Land Per Family in Acres	TFR		Percent Increase Rates 1975-1976 to 1977-1978
	1975-1976	1977-1978	
No Land	5.2	5.3	1.8
.01 - 1.00	5.2	5.5	4.2
1.01- 3.00	5.4	5.7	7.0
3.01+	6.4	7.1	10.7
All	5.4	5.8	6.5

Source: Alam, N., A. Ashraf, and A.H. Khan, "Land, Famine and Fertility." Dacca: Christian Commission for Development in Bangladesh, 1980, mimeo.

Most of the studies reviewed here suggest that landholding is positively related to fertility; one or two, however, contradict. Resolution of the conflicting findings must necessarily await further empirical work with a nationally representative sample. As has been pointed out, the studies reviewed either have small samples or cover only a small geographical area; these factors limit generalizability.

Occupation and Fertility

According to the BFS (1978), women whose husbands are in white collar occupations tend to have lower than average fertility. The main difference appears to be between the population in non-agriculture and agriculture sectors, the latter group showing a higher fertility. Within the agricultural sector, there is little difference between sharecroppers and landowning farmers, and landless labourers have the lowest fertility (Table 15).

TABLE 15

MEAN NUMBER OF CHILDREN EVER-BORN TO ALL EVER-MARRIED
WOMEN BY CURRENT AGE AND HUSBANDS OCCUPATION

Husband's Occupation	Current Age of Wife					All ages
	<20	20-24	25-34	35-44	45+	
White collar	0.8	2.4	4.7	6.6	6.5	3.8
Cultivator-Own land	0.7	2.6	5.0	6.1	6.9	4.3
Cultivator-Other	0.8	2.8	5.2	7.3	7.5	4.4
Landless Labourers	0.7	2.2	4.8	7.1	7.1	3.7

Source: Bangladesh Fertility Survey. BFS 1975 First Report.
Dacca: Government of Bangladesh, 1978, p.20.

Maloney et al (1980) found that cultivators and artisans have the highest fertility because they have the highest dependence on God and purdah. Rural professionals and religious leaders have less frequent coitus but higher fertility. Persons in modern and urban occupations have the most frequent coitus,

but have less purdah, less dependence on God, more contraceptive use, and lower fertility.

Ahmed and Mallick (1978), with data from 4 villages selected from 19 rural thanas in Chittagong district, reported highest fertility among the wives of farmers and labourers, followed by businessmen. Lower fertility was reported for women whose husband's occupation is service-related. Similar findings were reported by Chowdhury and Aziz (1974). Using data drawn from 101 villages of Matlab thana, they reported the highest fertility for the farmers and the lowest for the service and factory workers. The latter occupational group live away from their family for most of the year and this might partly explain the lowest fertility for them.

Occupation and Family Planning

Ratcliffe et al (1968) found that most of the vasectomy clients (62 percent) are day labourers; the next most numerous occupational group consisted of farmers owning some land. Of the three SES indicators (occupation, education, landholding) used in the study by Stoeckel and Choudhury (1973), only occupational status is consistently related to all of the KAP items. Consistently more of the highest status group "Business and Skilled" have knowledge of, favourable attitudes toward, and practice of family planning than the other occupational status groups.

Income and Fertility

Samad et al (1974) reported from a census of four unions in Nowabgonj Thana of Dacca district a significant correlation between income and child-woman ratio. The quality of data, the authors themselves acknowledged, is not satisfactory and the relationship is not controlled for different occupations. Maloney et al (1980) reported similar results. Table 16 shows that the women of the highest income group families have the

TABLE 16
INCOME AND FERTILITY

Annual Income (at 1977 prices)	Mean Number of Children Ever Born			
	Age			
	<24	25-35	35-44	45+
<2000	2.4	3.0	4.5	5.5
2000-3999	2.1	3.4	5.3	6.4
4000-5999	1.8	3.5	5.4	7.2
6000 and more	3.6	3.7	5.9	7.8

Source: Adapted from Maloney et al., Beliefs and Fertility in Bangladesh. Rajshahi: Institute of Bangladesh Studies, 1980, p.346.

highest number of children ever born. This is true for all age groups. Despite the possible relation between income and age, they noted that completed fertility (those aged 45 and above) for the poorest is 5.5 children ever born, rising for those with high income to 7.8.

This clear tendency has also been noted in the BFS (1978); landless labourers have the lowest fertility, and those with some visible assets in the households have higher fertility.

As regards the desire for 'no child', Maloney et al (1980) found that the economically better off rural people more frequently say they have had enough; of those with high income, about half in the age group 24-35 desire no more. We should note that desire to have no more children does not necessarily reflect behaviour. Nevertheless, it may be of interest to see if there are any changes in desired family size over time because of the rural development programs (which tend to affect the better-off first) operating in the country.

Stoeckel and Chowdhury (1979) reported that the TFR of women whose families are "producers" is slightly higher than the TFR of women whose families are "non-producers"; the largest difference, 10 percent, occurs between women whose families are "producers" and "non-producers" of rice.

Income and Family Planning

Sorecar (1977) found that income has an important bearing on the acceptance of family planning: income level is positively related to adoption of family planning. The contraceptive adopters are more likely to be in urban occupations and trades than in farming. Chaudhury (1975) noted in a study of attitudes of some elites towards abortion as a method of family planning, that support for abortion correlates positively with

income. The External Evaluation Unit of the Planning Commission (1979) found a consistent relationship between family income and contraceptive use, with women of higher income status being more likely to be either current or ever users than women of low income status. But this does not hold true for sterilization. Most sterilization clients are likely to be poor, illiterate, and landless labourers (Ratcliffe et al, 1968, Ali et al, 1977, and BAVS, 1978).

Value of Children

The value of children, especially of sons, has become a topic of research for better understanding in relation to human fertility. Empirical findings confirm that the value given to children, especially to sons, and the importance given to having both sons and daughters in a family in order to make a family complete, have a significant bearing on fertility behaviour of people.

Salahuddin (cited in Javillonar et al, 1979) observes: "Girls are made fully conscious that unlike their brothers who are assets to the family, they are only liabilities." Most studies confirm such preference for male children. This is true even for the professional elite, urban middle class, and the rural population (Ahmed 1972). Repetto (1972) reports on the relationship between son preference and fertility in North India, Morocco, and Bangladesh. The most persuasive evidence comes from the study done by Jain (1977). He showed that high fertility, particularly having more sons, is rational. He

presented data from a "typical" agricultural village in Bangladesh and showed that male children are net producers by age 12, compensate for their total consumption by age 15 and additionally compensate for a sister's total consumption by age 22. With the same set of data he further claimed that fathers benefited from many children, because children, especially sons, contribute to household production and alleviate the substantial economic risks confronting households. Surviving sons are necessary to inherit land and to maintain control of land in times of crisis. Large land-owning families receive more benefits from their sons, because the parental household controls the sons' contributions for a longer period of time.

Further empirical data in support of the hypothesis that parental dependency has its root in the productive utility of children and the need for old-age support are provided by Khuda (1977) and Rahman (1978). From an intensive study of a village in Bangladesh, Khuda reported that productivity of both boys and girls at ages 10-12 to be almost equal to adults. Drawing data from the field research area of the Cholera Research Laboratory at Matlab, Rahman reported that children in Matlab begin their economically useful lives as early as age 6. About 29 percent of boys and 78 percent of girls by age 8, over 60 percent of boys and 93 percent of girls by age 10, and almost every boy and every girl by age 12 enter the household labour force.

Rahman (1978) presented further evidence that 96 percent of the women expect financial help from their grown-up children. In about 94 percent of the cases the grown-up children engaged in gainful employment have been regularly or occasionally helping their parents financially. Help from children is the major means of support in old age for as many as 95 percent of the women; this includes 74 percent of the women for whom help from children is the only means of their support. Ninety six percent of the women expect to live with their children even after their children's marriage and, of these, as many as 95 percent wish to spend their entire lives with children.

The rich parents not only have, on the average, more living sons (2.8), as compared to the poor (1.8), they also enjoy greater old-age support than the poor (Jain, 1977). The rich parents have a smaller proportion of sons living away than the poor. The mean age of the sons leaving the families of their parents is much higher among the most wealthy group than among the poorest. Among the large land-owners, over 80 percent of the sons live with their parents, and, when they leave, the mean age is 28.5. Among the landless, only 65 percent of the sons live with their parents, and, when they leave, they do so at an earlier age (22.3 years).

The hypothesis that sons receive preferential care and attention is supported in the comparative death rates of male and female children in study of the impact of the Bangladesh

civil war (1971) on births and deaths in a rural area of Bangladesh by Curlin and others (1976). In Matlab Thana of Comilla district during the 1971 war, the Cholera Research Laboratory reported death rates for females aged 1-4 almost twice as high as those of males of the same age. Having analyzed BFS data, Huda (1980) reported that female children show roughly a 10 percent higher mortality rate than males and the sex differential in mortality remains unchanged even after controlling for the socio-economic status of the family.

Religion, Religiosity and Fertility

A number of studies (Obaidullah, 1966; Chaudhury, 1971; Samad et al, 1974; Chowdhury, 1975; U.K. 1977; BFS, 1978; and Maloney et al, 1980) provided empirical evidence that frequency of coitus as well as fertility differ by religion.

According to Maloney et al (1980), Muslims have a slightly higher frequency of coitus than Hindus. Obaidullah (1966) reported that the Muslims have about 26 percent higher fertility than Hindus in the rural area of Bangladesh during the period of 1961-1962. Stoeckel and Choudhury (1969) collected data from 15 villages of Comilla Kotwali Thana and reported similar findings.

Taking the CWR of ever married women as an index of fertility, Chaudhury (1971) concluded from the 1961 census data that Muslims have higher fertility than Hindus. He suggested that higher fertility of Muslims might possibly be due to:

(1) higher proportion of Muslim women with lengthy conjugal life than Hindus, (2) higher Muslim infant mortality than Hindus, (3) less favourable attitudes of Muslims towards family planning, and (4) less ritual abstinence observed by Muslims.

But according to BFS data, difference in fertility between Muslims and non-Muslims is found to be very small when the duration of marriage is controlled and this holds true for both rural and urban areas (Ahmed, 1979). It is also not borne out by data that higher infant mortality causes fertility among the Muslims to be higher. The BRSEFM (UK, 1977), which was conducted only two years before the BFS, reported that the Muslims have lower infant and child mortality than Hindus.

From a census of 129 villages of Nowabgonj Thana, about 20 miles from Dacca city, Chowdhury (1975) found that Muslims have a higher CWR than non-Muslims. Samad et al (1974) also reported that the CWR for Muslims is 5 percent higher than that for Hindus. Chowdhury (1975) noted that in Nowabgonj Thana, the gross fertility rate for Muslims is 243, for caste Hindus 233, and for Christians 162. He found the total fertility rate (per thousand women) for Muslims is 7025, for Hindus 6810, and for Christians 4885.

Fertility differences between Muslim and non-Muslim women are observed both in the BFS (1978) and the BRSEFM (U.K. 1977). The BRSEFM reported fertility of about 0.4 child higher for Muslims than for Hindus. The BFS (1978) showed that in every age group Muslims have higher fertility than non-Muslims. Upon

completion of fertility (those aged 45 and above) Muslim women have 6.9 children, while Hindu women have 6.1. This is similar to the data (Table 17) reported by Maloney et al (1980). They found 7.4 children for Muslim women and 6.3 children for Hindu. They claimed that Muslims are more fertile than Hindus. The Muslims, on average, have had 5.2 births and the Hindus, 4.8. The difference holds up for all age groups and for both sexes.

TABLE 17
FERTILITY BY RELIGION ACCORDING TO TWO MOST
RECENT STUDIES

Current age	SPS, 1978 ^a		Maloney et al, 1980 ^b	
	Muslim	Non-Muslim	Muslim	Hindu
20 - 24	2.5	2.3	2.6	2.1
25 - 34	4.9	4.5	3.5	3.2
35 - 44	6.9	6.8	5.5	5.1
45 +	6.0	6.1	7.4	6.3

^aData collected in 1975.

^bData collected in 1978.

Muslim women in their 20s and 30s are a little more fertile than Hindu women. In addition, the former seem to bear more children in their later years. Hindus are more frequently educated at higher levels, marry late, and practice contraception more frequently than Muslims. Among those who are aged 40 or more and have practically completed fertility, Muslim women have borne 7.0 children while Hindu women have borne 6.4.

Among men, the difference between Muslims and Hindus is even greater. Muslim men past age 45 have had an average of 7.6 children while Hindu men of that age have had 6.3. More older Muslim men take younger wives. According to Ruzicka and Chowdhury (1978), as the groom's age increases, the age difference between the couple rises dramatically. It reaches, on average, about 20 years when the husband is over 35 years old.

Another way of looking at differential fertility by religion is to estimate religious differentials in the population growth rate. In Bangladesh, however, it is difficult to measure exactly differential population growth rates. The reliability of census data is questionable for this purpose; a nationwide vital registration system is absent; many are ignorant of their age; females tend to be underenumerated; and recurring events, such as flood, famine, or migration, may have dramatic local effects.

Hill (1979) made an intercensal study of population growth in Bangladesh for the periods 1951-1961 and 1961-1974. During 1951-1961, Muslims increased by 2.4 percent, Caste Hindus by 0.5 percent, and Scheduled Caste Hindus decreased by 0.4 percent. Migration is likely to have influenced this pattern. Hill estimated that some 10 to 15 percent of the Hindus must have emigrated during 1951-1961, and another substantial percentage must have emigrated during the period 1961-1974. While emigration of non-Muslims from Bangladesh might have slowed down now, Muslims will increase as a proportion of the population because of their higher birth rates.

Religiosity and Fertility

Muslims rank higher than Hindus on religiosity as measured by 17 items in the study conducted by Maloney et al (1980). Religiosity is found to be associated with higher average fertility. Completed fertility of those aged 45 and above is correlated with prayer, pilgrimage, having a religious preceptor, and dependence on God. They found that dependence on God is related to actual fertility behaviour. Those who depend on God have more children, and this remains true for all age groups and for both sexes. Those who depend on God have an average of 5.3 children ever born, while those who do not depend on God have 3.7. When age is controlled and those aged 45 and above are considered, the difference between the two groups persists: among the males, the former have on average 7.3 children and the latter 7.0; among the females, the number of children in the two groups is 7.2 and 5.6, respectively. Ali (1976) reported that individuals with high religious values are non-adoptors of family planning, express a desire for a larger number of children, and actually have a larger number of children. Also, use of modern contraceptives is positively correlated with dependence on self, and negatively with several measures of religiosity, such as sexual abstinence on holy days, and negative advice to others on matters of family planning (Maloney et al, 1980). There are also studies (Mia, 1968, 1978) which show that modernizing experiences impose modifications on religiosity and religious values which, in turn, affect fertility norms and practices.

Religion and Family Planning

There are differences in contraceptive practice by religion as well. The BFS (1978) found that 7.5 percent of the Muslims and 10.8 percent of the non-Muslims are using contraceptive methods. Moreover, 69.8 percent of Muslims as compared to 63.3 percent of non-Muslims have no intention of using contraceptives. Stoeckel and Choudhury (1973) found in their study in Comilla District that nearly twice as many Hindus compared to Muslims approve of family planning; three times as many Hindus have ever practiced contraception, and over four times as many Hindus are currently contracepting. Their research was conducted, however, on a sample of Muslims from a religiously conservative area. The apparent differences according to religious affiliation, as found by Stoeckel and Choudhury partly disappear when class and education are taken into account. They found no significant difference between Muslim and Hindu unskilled labourers with respect to practice of family planning. Also, among those with higher education, the difference is not significant.

Family Type and Fertility

Research data specifically on the relationship between family structure and fertility are scarce. In our survey of the literature we came across only a couple of studies that considered family type as one of the relevant variables. The findings of these studies are not consistent. Stoeckel and Choudhury (1969) used data from 15 villages of Comilla Kotwali

Thana to examine a hypothesis concerning the relationship between female marital fertility and family type, and found higher fertility in single families than in joint families. But Samad et al (1974) came up with a contrary finding -- i.e., a higher CWR in joint families.

In a post-operative study of tubal ligation acceptors in Dacca, Robert et al (1964) found more acceptors from nuclear families than from joint families. Sixty-five percent of female sterilization acceptors are from nuclear families as opposed to 34 percent from joint families.

Education and Fertility

In most countries, women's education has shown a consistent inverse relationship with fertility. But in Bangladesh evidence of an inverse relationship between women's education and fertility is not conclusive. The 1974 census of Bangladesh reported that women with no schooling had, on average, 3.9 live births, those with primary education, 3.4 live births, and those with secondary or higher education, 2.6 live births. These figures are, however, not standardized either for age or for duration of marriage. The BFS reported that women with no schooling have, on average, 4.2 live births, women with primary education, 3.4 live births, and those with secondary or higher, 2.4 live births. These differences turn out to be negligible when duration of marriage is controlled. After having standardized for duration of marriage, women with primary education are found to have the highest mean parity, while women

TABLE 18

MEAN NUMBER OF CHILDREN EVER BORN TO EVER MARRIED
WOMEN AGED 10-49, BY DURATION OF MARRIAGE AND
EDUCATION OF WIFE : BFS, 1975

Duration of marriage and current place of residence		Education of Wife		
		Uneducated	Primary	Secondary or more
/10	Rural	1.11	1.15	0.94
	Urban	1.48	1.57	1.35
10 - 19	Rural	4.05	4.15	3.92
	Urban	4.32	4.50	3.88
20 +	Rural	6.84	6.81	6.83
	Urban	6.71	7.33	6.66
Observed Mean	Rural	4.16	3.35	2.13
	Urban	4.15	4.00	2.65
Standardised* Mean	Rural	3.93	3.96	3.82
	Urban	4.10	4.39	3.89

Source: Bashir-Ud-Din Ahmed. "Differential Fertility in Bangladesh," Master's Thesis, Jamberra: Australian National University, 1979, p.35.

*The standard population is the BFS national sample of ever married women aged 10-49. The weights were 0.347 for urban and 1.194 for rural.

with secondary or higher education still have the lowest mean parity. Women with above primary level education have smaller families at all ages up to 45 years. This pattern is true for both the rural and urban areas of Bangladesh.

Further, the effect of primary or secondary level education of husbands is not as significant as that of wives in lowering the average fertility. In fact, women whose husbands have primary or secondary education have the highest fertility. Husbands' education is inversely related to fertility only if

they are educated at higher than secondary level (Table 19).

TABLE 19

MEAN NUMBER OF CHILDREN EVER-BORN TO EVER-MARRIED WOMEN,
BY CURRENT AGE AND EDUCATIONAL LEVEL OF WIFE AND HUSBAND

Educational Level	Current Age					Total
	<20	20-24	25-34	35-44	45+	
<u>Wife's</u>						
All Wives	0.7	2.4	4.8	6.9	6.7	4.0
No Schooling	0.7	2.5	4.9	6.9	6.7	4.2
Primary	0.7	2.6	4.7	7.1	6.9	3.4
Higher	0.6	1.9	3.8	6.6	7.6	2.4
<u>Husband's</u>						
All Husbands	0.7	2.4	4.8	6.9	6.8	4.0
No Schooling	0.7	2.3	4.9	6.8	6.7	4.0
Primary	0.7	2.6	4.9	7.2	6.8	4.0
Secondary	0.7	2.7	4.7	7.2	7.2	3.8
Higher	0.7	1.9	4.4	6.6	6.3	2.8

Source: Bangladesh Fertility Survey. First Country Report, 1975. Dacca: Bangladesh Ministry of Health and Population Control, 1978, p.67 and p.70.

The report on the 1974 BRSEFM (U.K. 1977) showed that women who have primary education tend to bear more children than those who have no education. The report also showed that the education of husbands tend to be positively associated with the average fertility of their wives.

From the study by Maloney et al (1980) it appears that fertility is not reduced by primary education; rather, it

increases. The number of children ever born increases with schooling up to class 9 or 10 for males, and class 6 or 8 for females, and this holds true more or less in all age groups. Most probably, those who have no schooling and have lowest fertility are the rural poor while those who have primary education are not of the economically depressed groups and could be rural middle class.

Chowdhury (1977) reported an inverted U shape relationship of fertility to level of education for both sexes in Chittagong Division. The average number of children born to women aged 15-49 is 3.72 for women with no formal schooling, 4.01 for those having 1-5 years of schooling and 3.85 for those with 6-10 years of schooling. Primary education of women does not contribute towards lowering their fertility level while secondary education does.

Drawing data from cross-section of women of Dacca city, Chaudhury (1977) reported an inverse relationship between education of wife and fertility as measured by number of children ever born. This relationship holds true for every age group and also when allowance is made for the effect of duration of marriage, age at marriage, labour force status, husband's income, and exposure to mass media communication. The study also shows a weak but inverse relationship between husband's education and fertility across almost all age groups. Interestingly, at every age level, female education has more depressing effect upon fertility than male education.

In a study of differential fertility among the Chittagong municipality population by migration status Khan (1977) found an inverse relationship between level of education and the rate of fertility among the migrants as well as non-migrants.

Education has also substantial effect on age at marriage in Bangladesh. The BFS (1978) reported a positive relationship between level of education and women's age at first marriage. The mean age at marriage for women rises with levels of education. Women's education have a greater impact upon female age at marriage than men's education on male age of marriage.

While the government of Bangladesh aims to make primary education universal during the 1980s, this, in itself, may not have much immediate effect on fertility. However, as the number of youth proceeding to middle and high school will grow, this increase in numbers with higher education is likely to have a dampening effect on fertility.

Education and Family Planning

Some studies on the actual use of contraceptive devices in Bangladesh tend to confirm the direct relationship between level of education and actual contraceptive use (Alauddin, 1979, Chaudhury, 1977, 1978). Alauddin (1979) found that women's education is the single most important factor determining the knowledge of clinical methods of contraception. The positive relationship between female education and use of

contraception holds true even when allowance is made for the effect of age, parity, wife's labour force participation status, husband's income and exposure to mass media communication (Chaudhury, 1977). Chaudhury (1978) also found that education is the best predictor of fertility behaviour, and even education up to grade 6 or 9 has a significant effect. But Khan and Choldin (1965) reported that education does not seem to be related to family planning adoption. This finding needs to be treated with caution, however, because the authors acknowledge that couples with 3 or more living children are over represented among the adoptors of family planning in this particular study, and also because this is an older study.

Status of Women and Fertility

In Bangladesh, as in some other countries on the sub-continent, the social structure relegates women to a lower status. Devoid of education and confined to domestic role, a woman remains under the support, protection of and, therefore, control of an adult male all her life -- first her father, then her husband, and later her son (Ellickson, 1976 cited in Javillonar et al, 1979). Husband-wife age differences of almost 10 years at marriage places a woman in a subordinate position relative to her husband. The purdah system, regulates many aspects of women's everyday life including physical mobility. While the system offers women little access to opportunities, at the same time it confers upon them status as a

protected group. The joint family structure, usually permits a smooth transition for a woman through the stages of her life and continued security after her husband's death. But it does not give her freedom and authority. In such a social structure, women thus gain some authority and increased status through increasing age and childbearing. Changes in this situation (e.g., weakening of purdah) are of recent origin and are yet to be remarkably felt.

The contributions of Bangladesh women, especially of rural women, as food producers and processors and home industry workers are not insignificant. But, they are largely invisible, unrecognized and considered as a part of their housework roles (Alamgir, 1977). Even those who work in non-household settings acquire a work role as an addition to housework rather than as a substitute.

Policymakers, scientists, and politicians concerned with high rates of population growth are increasingly recognizing that the status of women has significant bearing on fertility behaviour. Unfortunately, we could identify only two empirical studies directly concerned with this issue: one looked into the relationship between the status of women and fertility, and the other between purdah and fertility. In a study of female status and fertility behaviour in a metropolitan urban area of Bangladesh, Chaudhury (1978) confirmed the hypotheses that decision-making power, employment status, and educational status are positively associated with use of contraceptive methods and inversely related to fertility.

Purdah and Fertility

Maloney and his co-authors (1980) examined the extent of purdah, its differential practice by religion and its impact on fertility. They found that men claimed more adherence to purdah than the women themselves professed. Muslim men claimed more purdah than Hindu men. Muslim women claimed more than Hindu women. Those not practicing purdah have noticeably fewer children than those practicing. This holds true for both sexes and for all age groups. Among men and women aged 45 and above, the practice of 'no purdah' is associated with the lowest fertility, 'somewhat purdah' with intermediate, and strict purdah with higher fertility. "Purdah is clearly a part of the bundle of profertility traits prevailing over most of Bangladesh," (p.94) claims Maloney and his co-authors. They also reported a consistent association between the degree of adherence to purdah and desired fertility. Those practicing no purdah more often want no additional children; those practicing somewhat purdah are intermediate and those practicing strict purdah more often want more children.

Purdah and Family Planning

Consistent with the above, Maloney et al (1980) further found purdah to be negatively correlated with ever use of modern contraceptive methods ($r = -.5$), the highest correlated variable among all the religiosity variables. It is also negatively correlated ($r = -.19$) with ever use of all kinds of contraception combined together.

Education negatively relates to observance of purdah and, in turn, to fertility (Maloney et al, 1980). With the increase of literacy and education, the practice of purdah is likely to decrease and have desired influence on fertility norms.

There are evidence that literacy is increasing among females, especially among young girls. Females currently aged 45 and over report only 4.6 percent literacy. The age group 25-44 report 16 percent; the 15-24 age group, 30 percent; and the 10-14 age group 32 percent. These data suggest that higher proportions of younger women are attending school and are becoming literate (Islam, et al, 1979). A similar trend is observed for the nation as a whole across rural and urban areas. According to the 1974 census, the highest literacy rates are among the women aged 15-19 and the lowest among the women aged 35 and over.

Employment, Labor Force Participation and Fertility

Evidence from the BFS data suggested that the working status of wife is inversely related to fertility both for rural and urban women, even when duration of marriage is controlled. The standardized mean parity for rural non-working women is 4.0 and for rural working women 3.8. The standardized mean parity for urban non-working women is 4.2 and that for urban working women is 3.8 (Ahmed, 1979).

The analysis further revealed that fertility varies with work status at all levels of education, but not in the same

direction. Both in rural and urban areas, working women who are either illiterate or have secondary or more education bear fewer children than their counterparts who are not working. Irrespective of place of residence, a working woman having primary level of education has more children than a non-working woman with the same level of education. It should be repeated here that even without controlling for the working status of the women, education is found to have the similar pattern of relationship with fertility. Work experience is found to have a negative effect on fertility at all levels (poor and rich) of economic status. The highest difference in fertility (0.6 child) is observed between the rich non-working and rich working women in the urban area.

From the above findings, Ahmed (1979) concluded that working women, whether in rural or urban areas, whether uneducated or highly educated, whether rich or poor, have lower fertility than their non-working counterparts, provided that duration of marriage is controlled.

In another study conducted by Shaudhury, (1978) work experience is found to have very little or no effect on fertility of currently married women living with their husbands in Dacca, the capital of Bangladesh. The finding is striking -- fertility varies with work status particularly at the lower levels of education, but there is little or no variation in fertility by work status at the higher levels of education. It may be pointed out that the mean parity of the women with higher than primary education is 2.4 and that the variance in

fertility for this group of women may be very small to begin with. As such, it should not be surprising if no variation is found for higher educated women by their work status.

Taking sub-divisions as the unit of analysis and using 1961 census data, Chaudhury (1974) found an inverse relationship between labor force participation in agricultural activities and fertility and a positive but nonsignificant relationship between female labor force participation in non-agricultural activities and fertility. These data suggest that female labor force participation in the traditional sector of the economy, i.e. agricultural work, may contribute to lowering the fertility level. Labor force participation in agriculture is only confined to poorer women. It is plausible to argue that women's employment in agriculture is not the key variable but the socio-economic status which is linked to their lower fertility. Female participation in domestic work is found to be positively related to fertility. Any clear conclusion from the findings of this study cannot be drawn. The positive but nonsignificant relationship between employment in non-agricultural activities and fertility, for example, seems to be inconsistent to theoretical expectation. Further studies in this regard will be useful.

Lactation, Nutrition and Fertility

Chen et al (1974) made use of data drawn from 209 married and presumably fecund women (between the ages of 13 and 44) who were followed-up for two complete calendar years with

bi-weekly interviews and monthly pregnancy tests. They reported lactational amenorrhea to be the prime factor responsible for prolonged birth intervals. In the case of a surviving child the median period of postpartum amenorrhea is 17 months. Lactational amenorrhea accounts for 45 percent of the length of birth intervals. Postpartum sterility is found to have played a significant role in regulating fertility in this essentially non-contracepting population. The study also revealed a seasonal pattern of births which could be associated with a corresponding seasonal pattern of conceptions and this may be due to a seasonal trend in fecundability. The highest conception rates are found in the coolest months of the year.

In another study, Chowdhury (1978) investigated the effect of age on postpartum amenorrhea. Age of women is found to be positively related to both length of postpartum amenorrhea and waiting time for conception. But when the effect of age is eliminated, parity becomes negatively related to the length of both amenorrhea and the menstruating intervals.

Supporting the proposition of seasonal variation in lactational amenorrhea, Huffman et al (1978) reported a higher probability of resuming menstruation during the months of September and December. This season corresponds to the largest annual harvest of rice, suggesting that a nutritional factor may be operating through an increased availability of staple food. But the data of the same study suggested that maternal nutritional status is unlikely to shorten the length of postpartum amenorrhea significantly. Average duration of amenorrhea

differed by less than one month for well-nourished women. Other factors such as changes in infant feeding, supplementation practices, decreased frequency of suckling due to pre-occupation of mothers in harvest may be the determining factors in causing the return of menstruation during this season.

By studying a group of 200 breast-feeding women with children ages 17-25 months, and following them up longitudinally for 1½ years or until the mothers conceived, Huffman et al (1980) reported a seasonal trend in suckling time -- i.e., the women tend to reduce the frequency of suckling during the harvest season. Total suckling time is inversely associated with socio-economic status and with infant nutritional status. No association has been found between nutritional status of the mother and mean suckling time. According to this study, the median duration of breast-feeding is 30 months. Over 75 percent of the women whose most recently born children are living are breast-feeding at 2½ years postpartum.

The BFS (1978) reported that nearly all women breast-feed their children. The overall mean length of breast-feeding is estimated to be 17.1 months. This varies very little by the mother's current age and age at marriage. Similarly no difference in mean length in breast-feeding is observed by birth order. However, women residing in urban areas report mean length of breast-feeding to be 17.5 months as against 19.2 months for women residing in rural areas. No variation in length of breast-feeding is observed by religion or husband's occupation.

Using BFS data, Chowdhury (1979) examined the relationship between nutritional status and children ever born and found a significant relationship between the two. But when controlled for age, the relationship disappeared. Sirageldin and his co-authors (1975) explained that the fertility decline, recorded in the National Impact Survey conducted in 1963-1969 in what was then East Pakistan, was "largely biological." Their argument was based on "reduced infant and child mortality" which act through prolongation of lactation, and thus an extension of amenorrhea, to increase the interval between births. On the basis of a study of birth interval dynamics in a rural population in Bangladesh, Chen et al (1974) cautioned about the anticipation of fertility declines following declines in infant mortality. According to them, "the interaction of maternal nutrition and child feeding practices with the duration of lactational amenorrhea suggests that a nutritional program could possibly shorten the duration of lactational amenorrhea by 50 percent or more. If this were to occur, it would shorten the average live birth interval by about 20 percent producing a corresponding rise in the birth rate unless some other means of fertility control were introduced and accepted" (p.37).

Infant Mortality and Fertility

Scrimshaw (1978) provides an excellent overview of the relationships between infant mortality and fertility. As she points out, "the prevailing assumption is that high fertility

is a necessary biological² and behavioral³ response to high mortality. This assumption is manifested in the theory of demographic transition, which states in the simplest form that mortality declines are eventually followed by fertility declines; in the child replacement hypothesis, which states that parents try to replace children who die; in the child survival hypothesis, which states that couples aim to produce enough children to ensure the survival of some intended number to adulthood; and in the argument that couples will not reduce their fertility until they are convinced infant mortality levels have dropped (p.383).⁴ Even though mortality may sometimes be a response to high fertility instead of a stimulus⁴ to it, in this paper we have surveyed the available evidence to see if infant and child mortality influence fertility in Bangladesh.

One of the most interesting analyses of child survival and child replacement is provided by Chowdhury et al (1976)

²Biological responses to infant mortality are the variations in lactation, postpartum ovulation, and susceptibility to conception among women experiencing child death.

³Behavioral response is a willful replacement of a child in case of a previous child death experience of the mother.

⁴For example, Kwashiorkor, the synergistic effect of malnutrition and infection, has long been described as the disease that affects the elder of the two children when it is replaced at the breast by a younger sibling. The Khanna study reported that birth interval is the greatest influence on mortality in the first year of life. In that population both infant mortality and second-year mortality decline as the birth interval lengthens (Srinshaw, 1978).

for Pakistan and Bangladesh. In an attempt to examine the relationship between infant mortality and fertility, they analyzed birth intervals according to previous child death, excluding child deaths just prior to the birth intervals examined. They found no statistically significant difference in birth intervals between women who had experienced at least one child death and those who had not. They concluded that with moderately high levels of fertility and mortality, as such in Pakistan and Bangladesh, "there is no evidence that child deaths generate a desire to replace children (p.258)."

They, however, provided evidence to the effect that the positive relationship between high fertility and high mortality might work through biological rather than behavioural effects in rural Bangladesh and that the former effects are much more powerful than the latter. The median birth interval for Bangladeshi women whose children died during infancy is 24.1 months. The corresponding interval for women without infant mortality is 37.2 months. Thus, a difference of 13.1 months is attributable to the biological effects of infant death, interruption of lactation, and earlier onset of post-partum ovulation and susceptibility to conception. Behavioral effects, on the other hand, caused at most a difference of only 3.1 months.

Chowdhury et al (1976) also estimated the magnitude of fertility-depressant effect, if any, of low or no infant mortality. It has been shown that keeping all other factors constant, an elimination of all infant deaths would lengthen

the average birth interval by 1.6 months to a total of 37.2 months. This is equivalent to reducing fertility by 4 percent, a modest effect by any standard. When viewed in terms of a population replacing itself in the next generation, the fertility reducing effect of better infant survivorship becomes more complex. The reduced mortality of infants would have dual effect: while fertility would be reduced, survivorship, a central element of net reproduction, would also be improved.

By using longitudinal data drawn from 5263 women of Matlab Thana, Chowdhury, Khan and Chen (1978) demonstrated a positive relationship between the number of children ever born and the number of child deaths. The relationship is, however, not conclusive, because the method employed to examine the influence of mortality on fertility does not exclude the possibility of influence in the reverse order, that is, mortality influenced by fertility.

That high mortality is partly responsible for high fertility in Bangladesh is not supported by the findings of some other studies. Haloney et al (1980) tested the hypothesis that those who have experienced death of children will want a large number of children as a "replacement insurance." The hypothesis is not supported by the data they collected. The percentage of respondents who desire no more children increases with the number of child deaths. The majority of males with two or more sons desire no more children. The majority of males and females with one daughter alive desire no more. There is some

evidence of sex preference, but not much. Maloney and his co-investigators' (1980) finding that there is no evidence that a great number of parents desire many sons as death insurance, seems to be a sweeping one and contradicts the data presented in this paper under the subsection, "Value of Children and Fertility."

A recent analysis (Huda, 1980) of the BFS data examined differentials in child mortality in Bangladesh by individual and community characteristics. At the individual level, child mortality is explained by the socio-economic and demographic characteristics of the child and the mother. The individual variables included are: child's age, sex and birth order, mother's age, education and employment, father's occupation, rural-urban residence, religion and nutritional status of the child. The community level variables which have been considered for measurement of their effects on the aggregate mortality are: transport facilities, level of education, urbanization, agricultural modernization, availability of medical facilities and health service surveillance.

Among the demographic variables, mother's age and parity have a substantial but opposite effect on the survival of the child. Mother's age has an inverse relation to infant mortality when other variables are controlled; on the other hand a positive relationship is noted between parity and mortality. Children born to mothers below 25 years of age are less likely to survive than those borne by older women. Children born to

women with less than 4 births have better survival prospects, and children born to women with a large family size for their age generally experience high mortality. The proportion of children dying among those born to women aged 14-19 births is roughly 50 percent. Similar high mortality is observed among children born to women aged 20-24 with 7 or more births. Female children show roughly 10 percent higher mortality than males, and the differential remains unchanged even after controlling for the socio-economic status of the family.

Children born in urban areas experience slightly lower mortality than those born in rural areas; however, the difference disappears when mother's education and father's occupation are controlled. Both these variables show a strong inverse association with child mortality. A monotonic increase in child mortality is observed as one moves from professionals to landless laborers. Children born to women with less than primary schooling exhibit twice the mortality rate of those born to women with primary or more. Even when the effects of all other variables are controlled, children of women without primary education exhibit 80 percent higher mortality than those borne by women who have completed primary education. Better survival prospects are noted among children born to fathers of white collar occupations. Children of sharecroppers and landless labourers experience over 25 percent higher mortality than those born to professionals, controlling for the effect of other variables. Children of working mothers show slightly higher mortality than those born to non-working

mothers, but the difference is very small. The difference in survivorship by religion is negligible. Muslims show a slightly lower mortality than the Hindus.

At the aggregate level, communities enjoying a high level of health surveillance⁵ show roughly 25 percent lower mortality than those having low level of surveillance. Lower mortality is also found among communities with higher levels of agricultural modernization and among those nearer to medical facilities. Communities with greater agricultural modernization or medical facilities and services experience about 20 percent lower mortality than others. The relationship between transport facilities and mortality is, as expected, also inverse.

Huda's (1980) study demonstrated the utility of analyzing aggregate mortality of the communities by their development and other characteristics. Studies should explore the effect of aggregate variables, including the average child mortality rate in the whole community, on mortality at the individual family or household level. Analysis of causes of death and their differentials by individual and community factors would be particularly useful for policy implications, but such analyses have not been done yet. Such studies should also take into account the landholding status of the family, as a couple of studies indicate differential mortality, especially infant

⁵Health surveillance is a scale based on the frequency of visits of different health personnel -- sanitary inspector, malaria eradication team, health team, vaccination team, and family welfare team -- to the village during the preceding year. The scale is divided into four categories ranging from low to high.

mortality by landholding status. Studies seeking to examine the relationship between infant mortality experience and contraceptive practice should also be undertaken.

There has not been any study done to examine and explain if there is any differential mortality pattern due to differential availability or accessibility of general health care services or maternal and child care facilities and services. It may also be worth exploring if utilization of contraceptive services varies with the extent and variation of utilization of available health facilities.

Rural Development, Modernization and Fertility

The factors that we have identified as having association, either positive or negative, with fertility in the preceding pages relate only to the individual. Here we are attempting to identify some "beyond individual-level" characteristics under the global rubric, "development and modernization" which have already demonstrated or are likely to have potential to contribute to demographic transition. Development and modernization activities cut across many traits and statuses -- psychological as well as socio-economic, of the individual. These, in turn, bear upon the fertility of the individual and of the community.

In recent years, the hypothesis that joint efforts in both rural development and population planning programs rather than in population planning programs alone is likely to reduce fertility significantly has been widely accepted in

Bangladesh and elsewhere. There are several projects which began during the late 70s to test the hypothesis. Many of the projects are yet awaiting evaluation. Some of the studies (Alauddin, 1979; Huda, 1980; External Evaluation of Planning Commission, 1979; Dixon, 1978 cited in Javillonar et al, 1979; Mia, 1978) provide mixed but encouraging data to show that, in general, rural development programs have demographic effects in the desired direction.

Alauddin (1979) examined the relative importance of rural development activities vis-a-vis family planning program inputs in explaining knowledge and practice of contraception in Bangladesh villages. As there was no or very little inter-village difference in actual fertility, he decided to focus on contraceptive-related phenomena, such as (a) knowledge of contraceptive methods, (b) ever practice of contraception, (c) desired family size, and (d) intention to use contraception in the future both at the village as well as at the individual level. He utilized BFS data for the analyses. Development variables that related significantly to knowledge of contraception are education-related factors, such as proportion of families sending their children to school, mean level of education desired for the children, access to educational institutions, and presence of a youth club in the village. Availability of sanitation facilities, which is correlated with the level of education of the village, is found to be significantly associated with knowledge of clinical contraceptive methods.

At the aggregate village level, there is a positive relationship between knowledge of non-clinical method and modern agriculture practices, such as use of new seed varieties, insecticides, and chemical fertilizer. Similarly, village access to health, family planning, and educational institutions, family planning worker's visit to village, and mean level of education desired for children are positively related to knowledge of non-clinical methods. On the other hand, level of employment, measured in terms of proportion of male population engaged in agricultural activities, is negatively related to knowledge of non-clinical methods.

At the individual level, women's own education is the best predictor of knowledge of both clinical and non-clinical methods. Besides individual women's own educational status, village knowledge have strong positive association with individual knowledge of contraception which, in turn, is the strongest predictor of contraceptive practice.

Development and family planning programs have almost equal contributions to the explanation of village-level contraception, with development having a slightly higher contribution than family planning. The combined effects of development and family planning are greater than the effects of either of them separately.

The effects of most of the development variables are indirect through the extension of knowledge. High accessibility to means of transportation, in road or waterways, and

many visits to village by the family planning workers are significantly associated with high level of contraceptive practice. A positive relationship is observed between distance from the village to means of transportation, both road and water: the nearer the village to the means of transportation, the higher the contraceptive practice at the individual level. The villages where the family planning worker visited "many" times during the last year had the highest level of contraceptive practice; no visit or some visits, on the other hand, are associated with lower than average contraceptive practice in the village. Village access to means of transportation and extent of family planning workers' visit to the village seem to have served as facilitating conditions of individual contraceptive practice.

Living number of children is clearly an important predictor of women's desired family size. Desired family size increases as parity increases. Besides parity, village-level knowledge and village-level propensity to educate their children have dampening effects on the desired family size of the women.

Knowledge, both of clinical and non-clinical contraceptive methods, is significantly related to village-level intention to use contraception. Presence of a youth club, by itself, has some influence, but it disappears when other factors are introduced. At the individual level, the highest level of intention is found among the women who had more children than

they desired and the lowest among the women who give non-numeric responses to the question on desired family size.

Consistent with the above, the presence of a youth club and the proportion of families sending their children to school are negatively related to the desired family size. The important factors that affect positively the aggregate intention of the village for future contraception are: knowledge of both clinical and non-clinical contraceptive methods and extent of modern agricultural practices in the village.

Huda (1980) explained inter-village differences in child mortality by selected community-level development characteristics: agricultural modernization, medical facilities, health surveillance, transport facilities, urbanization, living conditions and educational level. Of the 17 percent variance explained, health surveillance alone explains roughly 5 percent, agricultural modernization, 4 percent, and availability of medical facilities and services, 3 percent. From these data it appears that communities enjoying a high level of health surveillance have roughly 25 percent lower infant mortality than those having a lower level of surveillance. Lower mortality is also observed among communities having high levels of agricultural modernization and medical facilities and services. Communities with greater agricultural modernization or nearer to medical facilities and services experience about 20 percent lower mortality than others. The relationship between transport facilities and mortality, as expected, is inverse.

An evaluation study (cited in Government of Bangladesh 1976) has shown that the population growth rate has fallen to 1.4 percent in 71 villages where Swanirvar program has been implemented, while the national population growth rate average stands at 2.8 percent. The effectiveness is shown by the fact that in a number of these villages young men and women have voluntarily decided to delay their marriages. This experience is particularly important because it indicates changing fertility behaviour. Swanirvar has established a strong anti-fertility community norm through a broad-based development program with people's participation and some external technical support. The village cooperative is the main structural unit responsible for production activities and for other community action programs to generate community consciousness.

By adopting a pretest-post test study design for both control and experimental groups in an evaluation study of family planning programs through village development projects, Sanders and others (1976) have documented that as a result of the active involvement of the village leadership and wider participation of the villagers in planning and implementation of village health and family planning, the contraceptive acceptance rate rose from 5 percent in mid-1974 to a significantly higher level of 27 percent by the end of 1975.

To examine the impact of family planning programs incorporated into other development programs (popularly known as integrated population control programs) a number of studies

were considered. A follow-up study of the population control program of the Ministry of Labour was conducted by the External Evaluation Unit of the Planning Commission (1979). It found higher current contraceptive practice among the workers of the mills where a family planning service system has been introduced than among the workers of the mills where there are no such services available. It also reported lower marital fertility rates among the workers of the mills having family planning service components (4.58) than among those of the mills without such services (5.38).

The findings of this study, however, have to be accepted with much caution. The population studied was a select group -- i.e., because of housing and other economic problems, the workers are in most cases likely to be living away from their family. Thus, the differences in fertility as revealed by the study cannot be claimed to have occurred as a result of the family planning programs unless the effects of other socio-demographic and familial variables are taken into account. Multivariate analysis is required to separate out the net effects of family planning services. No such analysis has yet been done in this area.

In another evaluation, the External Evaluation Unit of the Planning Commission (1979) examined the impact of concentrated development programs of four themes on contraception and fertility. Concentrated programs include the population education activities of the Ministry of Information and Broadcasting, mobile population education teams of the Ministry of

Education, population education through Agriculture Assistants of the Ministry of Agriculture, rural mother's clubs of the Ministry of Labour and Social Welfare, rural cooperative and women's functional literacy programs of the Ministry of Local Government and Rural Development.

The preliminary evaluation reported 19 percent of the women are currently practicing family planning methods compared with the national rate of 14 percent, reported by the Planning Commission (1980). The current total marital fertility has been 5.69 for the concentrated areas, measured in terms of live births in the preceeding twelve months. This is lower than the current TFR of 5.85 estimated by the Planning Commission for the nation as a whole.

In still another evaluation of Rural Mothers' Clubs, the External Evaluation Unit of the Planning Commission (1976) reported 19.4 percent current users compared to only 9 percent during the baseline survey. The members of the Mothers' Clubs are reported to have fewer children than other village women, particularly those who are below 30 years.

Cooperative membership is found to be associated with lower fertility or higher contraceptive use. Stoeckel and Choudhury (1969) analyzed data from 15 villages of Jomilla Kotwali Thana and reported cooperative membership to be associated with lower fertility. Schuman (1967) reported higher use of contraceptives among male members of cooperative societies in Jomilla than among non-members. Similarly,

Mia (1978) reported higher contraceptive use among female cooperative members in Joydebpur.

In a follow-up survey of 2,365 oral pill acceptors in its Sulla Integrated Rural Development Project, BRAC (1977) reported that one fourth (26.1 percent) of the eligible married women accepted oral pills. This is much higher than the national acceptors' rate. The reported higher rate of acceptance of pill is claimed to have occurred because of the integration of family planning with overall rural development program.

The validity of the claim by BRAC is to some extent substantiated by the findings of another study. In a case study on women's cooperative under IRDP in a village at Joydebpur near Dacca, Mia (1978) has shown that the cooperative has contributed to raising the status of the women, increasing their geographic mobility for economic gain, improving their decision making capacity to bear upon health and wellbeing of the family members. Consequently, the study showed, the contraceptive acceptance rate has gone up substantially. More studies with coverage of more population groups should be undertaken to confirm such findings.

Dixon (cited in Javillonar et al, 1979) analyzed the population implication of five rural development programs that represented three types of employment generating strategies:

- (a) those based on traditional, routine subsistence activities,
- (b) those based on traditional village cottage industries, and

(c) those based on small industries producing non-traditional products requiring non-traditional mills. She reports that:

None of the program appears to have altered fundamentally the marriage or birth patterns of its workers. Reproductive behaviour remains highly resistant to change (p.103).

Nevertheless, she believes that cooperative programs, such as under IRDP in Bangladesh provide women with direct marketing channels for the products of their farms and household activities. Such programs are expected to enable women to control the income generated by their additional role beyond traditional household activities. Mia's (1978) findings referred to above bear out the plausibility of Dixon's position.

Based on limited evidence it is difficult to draw any firm conclusion on the development-fertility relationship. The available data, however, provide enough evidence that rural development programs, such as cooperatives, mothers' clubs, rural transportation infra-structure, youth organizations, schooling facilities, the availability of health and family planning services in villages, Swanirvar programs, community development programs with the involvement of the local leadership, and people's participation have potential for contributing to fertility reduction.

RELATIVE IMPORTANCE OF DETERMINANTS

Determining the relative importance of the varied elements that influence fertility is as complicated as the task of clearly delineating the elements themselves. It is difficult to precisely rank the factors in order of their influence, to describe the sequence of their effects, and to identify their linkages because of their likely overlap, interaction and multidimensional influences. Social scientists attempt to overcome these problems with modern analytical techniques of regression models including path analysis.

As a preface to discuss the relative importance of the factors affecting fertility in Bangladesh, the following observations are in order:

*

(1) For majority of the studies reviewed, it is difficult to identify the independent as well as the relative effects of various socio-economic factors on fertility. The studies, while looking for their influence on fertility considered the socio-economic factors only in associational terms. Also, no sophisticated multivariate analytic techniques were adopted for rigorous examination of the relationships, let alone ascertaining cause-effect relationship.

We should emphasize, however, that a few studies attempted rigorous analysis employing multivariate analytic techniques and also had nationally representative large samples (Sirageldin et al, 1975, Alauddin, 1979, Ahmed, 1979, Shahidullah, 1979, Huda, 1980. Khan, 1980).

(2) Because of their nature and sample sizes, many of the studies are considered weak in terms of their generalizability. Similarly, many studies are limited in terms of geographic area covered; for example, many of the studies seem to be "Dacca-centered."

(3) Some of the studies analyzed fertility as a secondary objective rather than as a primary one.

(4) Some of the studies were conducted on an ad-hoc basis to meet the immediate program needs and to gather some base-line data.

Thus as a method of determining relative importance of the socio-economic factors identified in the review, we do not have any clear guide from the studies themselves. Along with our best judgement, we considered the following by way of suggesting relative importance of the factors: (1) consistency of results in terms of their influence on fertility; (2) clustering of the socio-economic variables in terms of their effects on fertility; (3) variables that are found important in combination with other variables; and (4) if a given variable influence fertility of a small or of a large segment of the population.

Given the above considerations, the following factors are suggested to be the key factors related to fertility. Their relative importance is in the order they are presented.

Among the intermediate/proximate determinants which are influenced by socio-economic factors and, in turn, influence fertility, the key ones are: age at marriage and proportion married. Marriage is almost universal and proportions married in all age groups at any point in time is the highest in the Indian Subcontinent and one of the highest in the world. Age at marriage is consistently found to be inversely related to fertility while the duration of marriage is positively related to it both in rural and urban areas even though the latter relationship may be complicated by a "catch-up" phenomenon operating among some of the women who marry late. In three path analyses models -- one for rural, one for urban, and the other for the national sample of BFS, Ahmed (1979) found duration of marriage (which is largely a function of age at marriage) to be the most important variable that directly affects the number of children ever born. In all the three models, the path coefficients are positive and of highest magnitude (.831 for rural, .785 for urban, and .835 for Bangladesh as a whole). The other variables in the models are: religion, place of residence, education of both husband and wife, age at marriage and duration of marriage of wife.

Most of the studies reviewed suggest that landownership is positively related to fertility. Fertility is also found to be positively related to tenurial status -- those who own and lease out land have the most children. Interestingly, landholding is inversely related to mortality. The relationship with child mortality is more conspicuous during food crisis.

Confounded with landownership, income and agricultural occupation have positive influence on fertility in the rural area. The richer parents have more children; their sons start domestic work early and contribute more to agricultural production, inherit land, and maintain control of land. Their sons are married at an early age. They enjoy the support of their children through their old age. They have a smaller proportion of sons living away, and the mean age of the sons leaving the parental home is much higher among the rich than the poorest. The landowning farmers are the ones who enjoy higher social status, derive more benefits from rural development, have a higher stake in the prevailing social traditions. They tend to preserve rural conservatism, reflecting more religiosity in traditional sense, and rigidity on purdah. Such families usually give primary education or less to their girls perhaps to make them more sensitive to the appropriate behavior of a high status women, such as adherence to purdah, complete sexual division of labor, and relative freedom from menial work. All of these factors together make a significant impact on the fertility of landowning agricultural groups. The landowning groups add significantly to the total fertility of the country, not only by themselves, but also by acting as reference group for others in terms of profertility behaviour.

Within the agriculture sector, the landless labourers have the lowest fertility and the highest acceptance of permanent contraceptive methods -- i.e., sterilization. The lowest fertility and also the highest acceptance of terminal methods

among the landless and not gainfully employed seem to be for less than desirable reasons - reflecting not a modernization of life through rural and agriculture development but its impoverishment.

Not surprisingly, economic condition and social standing in rural Bangladesh are measured in terms of landholdings (Wood, 1976). In absolute terms, no farms are large, but small variations in landholdings can lead to marked differences in social class which, in turn, contribute to the differences in fertility.

Biological effects of postpartum sterility play a significant role -- more powerful than behavioral effects in regulating fertility in this essentially non-contracepting society. Lactational amenorrhea which is shorter in the urban than in the rural area, is the prime factor responsible for prolonged birth intervals. But high infant mortality in Bangladesh acts in competition with lactational amenorrhea. Infant mortality interrupts lactation, shortens postpartum amenorrhea and increases susceptibility to conception. Reduction of infant mortality by itself may not contribute to reduction of fertility. Reduction of infant mortality along with a maternal nutrition program may, in fact, shorten the duration of lactational amenorrhea and produce a rise in the birth rate. Postpartum sterility is associated with socio-economic status. For the lower socio-economic group in particular, lactational amenorrhea acts as a depressor of fertility.

Education is another key factor related to fertility. It has a clear positive effect on age at marriage (BFS, 1978; Ahmed and Mallick, 1978; and Shahidullah, 1979). Women's education, especially higher than primary level, is strongly associated with low fertility. Men's education by itself is not so significant in its effect on fertility. The higher fertility of women associated with their primary education or less is not in the expected direction, yet it is not a surprise once other factors, (such as income, status, landownership, and benefits derived from children) interacting with primary level (or less) education are taken into consideration. Education interacting with employment outside the home and decision-making power of the women in the family is, of course, inversely related to fertility and positively to use of contraception.

Beyond the individual-level determinants, we have identified some community-level development and modernization variables which have moderating effects on individual socio-economic as well as psychological traits in relation to fertility. While the precise linkage between social structural variables of modernization and individual traits affecting fertility is not yet known, such rural development elements as cooperatives, mothers' clubs, rural transportation systems, youth organizations, increased schooling facilities and the extent of their use, health and family planning services, agricultural modernization, Swanirvar programs, and community development programs with the involvement of the local leadership and people's

participation all seem to compete directly or indirectly with fertility and/or facilitate fertility control behavior of the women.

With the increase of development activities in various fields and their resultant change in women's social status, the need of and demand for family planning shall increase and contraception will then be a significant determinant of fertility. Such trend is already empirically demonstrated by the RSS Mothers' Clubs and IRDP cooperative projects in some villages.

RECOMMENDED AREAS OF ACTION

The following are the recommended areas of intervention aimed at reducing fertility:

1. Delay Age at Marriage: For a far-reaching demographic effect raising the age at marriage and spreading the female age at first marriage over a wider age range are considered critical for Bangladesh fertility in the future. Later marriage and dispersal of the current concentration of marriage from within the age range of 13-19 to a different schedule, say from 18-25 would mean (1) a shorter period of reproductive life exposed to the possibility of pregnancy, and (2) a longer interval between generations. The contribution of delayed marriage to fertility declines in other developing countries is encouraging for Bangladesh. In recent years, delayed marriages have contributed to fertility declines in China, Hongkong, Malaysia, Indonesia, the Philippines, Singapore, Sri Lanka and Tunisia.

2. Female Education: The status of women in the family and in society has profound implications for fertility. Education, especially female education has the most potential to raise and enhance the status of the women, to open up newer opportunities for them, to keep them in school longer, to delay their marriages, to decrease infant mortality, to loosen adherence to purdah, to facilitate use of contraception, to increase participation in various development activities, such

as mother's clubs and cooperative societies, and to accelerate the process of demographic transition. It may have some counter-effects as well: for example, shortened lactation due to shorter duration of breast-feeding of educated mothers. But the counter-effects will be far outweighed by delayed age of marriage, more frequent and effective contraception, and lower infant mortality.

Furthermore, that men's education compared to women's is not so significant in its effect either on fertility or on age at marriage makes it all the more persuasive for increasing investment in female education. The disparity of literacy between males and females is very wide: there are 250 literate males for every 100 literate females aged 5 and over (Islam, 1978). Given our evidence that women's educational status is more influential in fertility regulation than that of men, such disparity between male and female literacy has unfavourable implications for fertility reduction.

Although the parents aspire for the education of all their children because of their greater dependency on sons than daughters both for household production and for old-age security, most of investment, including investment for education (when it can be afforded) is made for sons. According to an estimate by Islam (1978) 84 percent of boys as opposed to 45 percent of girls who are of school age were enrolled in school in 1973-74. This is a strong indication of parental preference for son's education over daughter's.

Parents not only prefer son's education over daughter's but they also aspire to a higher level of education for a son than for a daughter. The BFS rural sample of ever married women were asked to state the level of education they aspire for their sons and daughters. Sixty-two percent of the women were able to state the level of education they aspire for their children; the rest either said they did not know or gave no response to the question. The contrast between their aspirations for sons and daughters is very interesting. In general, the women reported higher levels of educational aspiration for sons than for daughters. The mean level of education aspired by the rural women was 11.3 years for son, as compared to 9.6 years for daughters (Table 20). Over 4 out

TABLE 20

PERCENTAGE DISTRIBUTION OF WOMEN ACCORDING TO THEIR ASPIRATION OF EDUCATION FOR SONS AND DAUGHTERS, BFS RURAL SAMPLE

Level of Education	For Son	For Daughter
Primary	15.0	43.0
High School	39.0	46.0
College and University	46.0	11.0
Total	100.0 (N=3,082) ^a	100.0 (N=3,072) ^a
Mean Level of Education	11.3 Years	9.6 Years
Standard Deviation	2.7 Years	4.2 Years

^aRefers to only those who stated the levels of education they aspire for their sons and daughters and not to the total rural sample. The total rural sample of BFS was 5,023 ever married women aged 10-49.

of 10 women aspired college and university education for their sons, whereas only 1 out of 10 women aspired the same level for their daughters. This pattern is reversed in the case of primary education. Three times as many women aspired only primary level education for their daughters as for their sons.

Data on parental aspirations seem to reflect support for at least primary education of daughters and the present low enrollment of ^{girls} points to the need for increasing their participation at the primary school level. The evidence of women's education at primary or lower level increases fertility and that secondary or higher depresses fertility, however, may suggest secondary rather than primary education for girls. But in order for the girls to go on to secondary education, they need to graduate from primary school and for that increased enrollment at the primary level and continuation until graduation are pre-conditions.

The Government of Bangladesh has planned for universal primary education and has emphasized women's education during 1980-1985. But, given the data that 55 percent of the school age girls do not enroll (1973-1974 estimate) and our understanding of parental preference for son's education, it seems highly unlikely that most of the girls of the school age will be enrolled in school. Sending girls to school involves cost -- in terms of forgone domestic help for the mother, as well as direct costs such as cloths, books, stationeries, etc. In order to encourage parents to send their girls to school, it

is recommended that a kit containing school uniform, a comb, a ribbon, a bar of soap, and a pair of sandals (a so-called "beautification kit") be given each year to those girls who would be enrolling and continuing in the school. Universal primary education, especially for girls will, however, create child-care problems even in the rural area; and pre-school child care services may have to ^{be} developed in the villages. Child care problems will be an indirect pressure on the couples not to have a large family.

It may be worth considering to bring down middle-level education (upto 8th grade) to the primary school from high schools. This will facilitate the continuation of education beyond primary level for girls.

Female teachers at the primary and middle-level schools may also encourage parents to send their daughters to school and retain them longer. Such lower level education should shortly be taken over by female teachers. Increasing number of females working in the fields of education, health, child-care, vocational training and income-generating activities of various sorts would provide visible role models for young girls. Such role models currently are very limited in the countryside.

Along with basic education, the other variables that seem to have bearing on fertility are income-generating activities for women, cooperatives and social welfare activities. Organizing marketable income-generating activities based on locally

available raw materials and technology for the girls right within the school curricula may make the school more attractive. Those who will drop out from school after primary level may continue participating in the income-generating activities. In this way, the girls can generate income for their family as well as have the opportunity for some continuing education. Participation in these activities may also bring about a delay in marriage.

3. Organizing Women and Young Girls: It is implicit in the above recommendation that women and unmarried girls should be organized to participate in such activities as cooperatives and income-generating trades and vocations. But it needs to be emphasized that organizing women and girls into groups in itself is very critical for orienting them to each others concerns and problems, to modern institutions, to development workers, to new ideas, and to various development activities, such as child-care, nutrition, health and family planning.

4. Gear the Program to Reach Younger Wives: Two-thirds of the total children are born to women within their twenties and only one-third after the mother is thirty. The former group of women are likely to know and use contraceptive less than the latter. Knowledge of contraceptive methods is found to be the best predictor of rural women's contraceptive practice (Alauddin, 1979). It is also found that aggregate knowledge at the village level about the means of contraception significantly adds to individual women's knowledge as well. It is

thus desirable to gear the program to stimulate contraceptive interest among the younger wives through increasing their own and village level knowledge about the means of fertility control.

5. More Attention to Middle Class: The Planning Commission set the poorest "survival group" as the immediate target population for fertility control. This may not be appropriate as the evidence suggest that those who belong to middle class, especially rural landed peasantry have the highest fertility. Therefore, the middle class who have higher fertility than the poorest survival group should get more attention as a target population.

Most of the existing projects concerned with women's development tend to leave out from their scope of work the women of landed peasantry who have the highest fertility in the agriculture sector. These women must be organized into groups around activities that they think important for themselves. For example, middle class women can be organized for health care and food preservation activities. Doctors and family welfare visitors can educate these organized groups of women about health care, nutrition, value of breast-feeding, etc. They could even be organized around small scale cottage industries or any other agro-based industry. Of the local institutions, schools enjoy the highest esteem from the community and these activities could be organized as a part of school program. Primary schools may function as a service

center for the community and the Swanirvar Gram Sarker should be responsible for management and administration of all such community services.

6. Organizing Primary Decision Makers: In the prevailing social system, in the rural households, the decision with respect to age at marriage, birth spacing, and family size primarily rests with the husband and/or his living parents. It would be futile to reach and attempt to motivate the wife, who may want to practice contraception for a number of reasons, but would not dare to do so for fear of disapproval or opposition from her husband and parents-in-law (Chen, 1977), especially those belonging to the landed peasantry. Organizing these decision makers and obtaining their active support is still considered very important for family planning activities. Village-level organizations, such as farmer cooperative societies and youth clubs, should make special efforts to incorporate family planning into their programs of other developmental activities.

7. Modernization of Agriculture and Creation of Rural Development Institutions: Agriculture modernization which liberates farmers from traditional farming ideas and practices is likely to counteract high fertility among the landed peasants. Empirical studies have demonstrated that agricultural modernization (in terms of introduction of improved variety seeds, insecticides, chemical fertilizer and irrigation facilities) can influence contraception among farmers by means of increasing

their knowledge of contraceptive methods and by reducing child mortality. Furthermore, the various interrelated social and economic development efforts in the rural area, are likely to contribute to the creation of "psychological modernity" among the people with regard to value of children, family size norms, desirable ages of marriage for women and men, favorable attitude towards birth control and actual family planning practice. There is evidence that structural changes through introduction of development programs, particularly through introduction of modern institutions such as cooperatives and mothers' clubs create such "psychological modernity" (Schuman, 1967; Miller and Inkeles, 1974) among the people for under-developed countries like Bangladesh.

8. Link Contraception with Rural Development Programs: The existing projects, such as Rural Finance Experiment Projects, Rural Mother's Clubs, IRDP Cooperatives and IUCW activities largely attract economically disadvantaged groups of landless laborers, who are unemployed and unskilled. These projects are worth pursuing in their own right to alleviate the impoverished conditions of the poor. And alleviation of impoverished condition is likely to increase fertility in the short run because of the confounding effects of rising education, higher income, better nutrition, and better survival prospect, and shortened postpartum amenorrhea. These projects may not be demographically rewarding unless contraception is closely tied to their activities. This means that the role of family planning will still be greater in the future.

9. Conduct Mass Education Program on the Importance of

Breast-feeding: One of the adverse effects of increasing education for women and introducing other modernizing activities is that a change in breast-feeding patterns is likely to occur. Until the society becomes a fully contracepting society, the importance of postpartum amenorrhea as a natural depressor of fertility, cannot be underemphasized. Moreover, breast-feeding is desirable by the virtue of the fact that there is no substitute for mothers' milk. Education on the importance of breast-feeding can best be imparted through various organized groups of women, as suggested in number 3 and 5.

10. Development of Rural Transportation Infra-structure: The relationship of contraception with access to the transportation system suggests that development of the rural transportation infra-structure is likely to have favourable implications for contraceptive practice. Controlling for the effects of individual's own and village characteristics, village access to road seems to be serving as a facilitating condition for individual contraception. Studies done elsewhere (Fawcett et al, 1967; Parsons, 1974) have demonstrated similar striking effects of geographic proximity to clinics on rates of acceptance of family planning. Transportation infra-structure will facilitate organization, implementation, and supervision of development activities in the rural area by field level workers. One of the complaints most frequently heard is that the field workers perform much lower than they can and that

they are expected to do, and that the supervisors are reluctant to supervise workers in the field. The difficult transportation system may largely be responsible for low performance and lack of supervision.

11. Make the Field Workers Work and Follow-up the Clients: The extent of family planning workers visits to the villages is found to be an important factor associated with individual women's acceptance or non-acceptance of contraception. Where client contact is more frequent, a higher rate of contraceptive usage is found. All the studies reviewed suggest a very low level of client contact by the field workers. Increase in client contact by the field-level workers is most likely to increase the rate of contraceptive practice. Side-effects are frequently reported cause of the low rate of contraceptive acceptance and high rate of discontinuation. A recent study (Proggani, 1979) reported that 40 percent, a significantly sizeable proportion of a study population, did not use any contraception because of the "unhealthful side-effects." Side-effects, if not earnestly attended to, have a negative impact on prospective clients and will continue to do so unless measures are taken to deal with side-effects promptly. Field workers must be given the responsibility of following-up the clients and making arrangements for attending to the side-effects, if there are any.

12. Institutionalize Marriage Registration System: Theoretically, all marriages are supposed to be registered. This law

is rarely observed. It is estimated that every village in Bangladesh has at least one Mosque. Marriage registration could be delegated to the village Mosque/Temple/Church instead of to the Thana centers. The Imams/Brahmins/Priests should be made responsible for registration of all marriages. The government may consider utilizing Imams/Brahmins/Priests as agents for enforcing the law regarding the minimum age at marriage. Until the registration system is made operable, temporary measures must be taken. Parents willing to marry their children, marriage match-makers and the Imam/Brahmin/Priest of the village where the marriage is solemnized, should testify to the effect that the boy and girl to be married have indeed reached the minimum legal age of marriage. Falsification of age should be considered a civil offense and the Imam/Brahmin/Priest, the parents, and the match-maker involved in the marriage should be liable to punishment.

13. Institutionalize Vital Registration System: Without a vital registration system, enforcement of legal age at marriage is next to impossible simply because when the bride and bridegroom were born would not be accurately known and, therefore, their true age would remain unascertained. The Imam's role could be widened to include registration of births and deaths occurring in his village.

14. Popularize Traditional Contraceptive Methods Through Imams: Imams could be made promoters of traditional contraceptive methods, such as withdrawal, rhythm, douche, abstention,

and non-clinical methods, such as condom. It may be noted here that according to BFS rural sample, three-fourths of the ever users of contraception used non-clinical and traditional methods. The amount of knowledge of traditional methods among the villagers was much lower (ranging from 10 to 27 percent) than modern methods (ranging from 29 to 63 percent). The Imams could play a vital role in popularizing the traditional and non-clinical methods in the countryside (pill is sold over the counter in Bangladesh and is considered a non-clinical method. But for the purpose of this paper, it is considered as clinical). Socially and religiously, non-clinical contraceptive methods are more likely to be acceptable than clinical ones (pill, IUD, sterilization, and injection) to the religious leaders as well as to the villagers. It would be less difficult to get them involved in popularizing methods for which they have the least or ^{no} resistance. Once their participation in popularizing traditional and non-clinical methods is secured, it may be easier to involve them in popularizing modern contraceptive methods as well.

15. Partnership with the Villagers: The ultimate fate of the fertility control program depends upon whether it succeeds in making the people in 68,385 villages sympathetic to the program's goals such that they take steps to translate the goals into concrete plans of action and voluntarily implement them (Chen, 1977). Partnership with the Gram Sarker in client recruitment, service delivery and supervision of field-level workers will facilitate achieving the fertility reduction goal.

SUGGESTED AREAS OF FURTHER STUDY

The primary recommendation for future research in Bangladesh is to encourage social scientists to undertake multivariate analyses of fertility that might help refine our current "gross" understanding of socio-economic factors reported to have impact on fertility. Such research may be facilitated by making more computing facilities available.

In substantive terms, we have noted several areas of research:

1. As indicated earlier, a majority of the studies have analyzed fertility only tangentially. Future socio-economic studies of fertility in Bangladesh should concentrate on each of the socio-economic determinants identified and try to understand to what extent the indicators predict fertility once the other variables are held constant.

2. How to bring about a change that touches upon as fundamental a component as marriage pattern is a critical question. It is crucial first to identify clearly the correlates of age at marriage, and then to study what policy measures can be adopted to influence those correlates.

3. In line with the above, action research is considered very important. Provision of income-generating opportunities for unmarried young girls can indirectly reduce fertility by delaying age at marriage. It is important to study the short and long term social, economic and demographic consequences

of income-generating programs, particularly for rural girls with little or no education.

4. A longitudinal study should be undertaken to see if age at marriage, desired and actual family size, etc., are changing toward lower fertility because of development programs. Cross-sectional data, as analyzed by some researchers, do not adequately capture the longitudinal effect of development programs.

5. The absolute size and proportion of the rural poor has increased over the past years. An understanding of what is the impact of growing landlessness on fertility, mortality, and other key demographic factors would have important policy implications. Whether increasing poverty contributes to a decrease in fertility or to an increase in mortality needs to be closely examined. Studies specifically on this issue are lacking.

6. It is equally important, if not more than the former, to study the fertility impacts on the beneficiaries of various development programs. It has been suggested in the analysis that some of the development programs may have pro-fertility effects in the short run; these need to be identified so that their effects could be counterbalanced with rigorous anti-fertility efforts.

7. The modernization experience imposes modifications on religiosity and religious values affecting fertility norms and

practices. Studies should be conducted to identify those modernizing experiences that are likely to contribute towards changing pro-fertility religious values and practices.

8. Women's education is the most important determinant of low fertility, both in rural and urban areas of Bangladesh. Education of women up to primary level only tends to boost fertility. Further studies linking educational differences to varying participatory roles in family and outside, differences in religiosity, extent of contraceptive practice, etc., are necessary to understand more clearly the variations in fertility by level of education. It is also important to study what other factors determine high or low fertility among rural and/or urban population, in what combination and to what extent.

9. To our knowledge, no work has been done in Bangladesh on the extent of dowry system and whether its variations affect fertility. It is important to ascertain what socio-economic factors interact with the dowry system to determine the marriage pattern and spouse relation affecting fertility.

10. By using census, BFS, and BRSM data one might look further into regional variations in fertility, and if possible, identify their correlates. Other studies could be undertaken to analyze aggregate fertility of districts and thanas in relation to ecological factors, local culture, development inputs, and family planning efforts. Such analysis may help

policy-making with regard to differential allocation of resources and efforts.

11. Studies, again, at an aggregate level should look into regional differences in family planning efforts, differential access to family planning information and services, availability of health care and MCH services on contraception and fertility.

12. Analysis of mortality, especially infant and child mortality and their variation by individual and community factors would be particularly useful for comprehensive policy formulation covering socio-economic and preventive as well as promotive health sectors, giving particular attention to lower socio-economic groups.

13. The impact of mothers' clubs on fertility-related factors should be examined in more detail. Studies on the impact of the Swanirvor program and contributions of the local leaders toward long term demographic changes should be conducted in depth.

14. The family plays an important role in fertility; only a few studies have been conducted to examine the effect of family structure on fertility regulation, and they have come up with conflicting findings. Indeed, it is crucial to identify what aspects of family structure are the determinants of pro- or anti-fertility behaviour.

15. Sterilization clients come mostly from the poorer sections of the society. It remains to be answered whether they have stronger motivation for terminal methods or whether there are other factors that explain this behaviour of the poorer section.

16. Making contraceptive services available through field-level workers will continue to be very important in regulating Bangladesh fertility in the future. But studies (Alauddin, 1979; Quddus, 1979; and Mia et al, 1979) show that the extent of client contact by the field-level workers is very low. Despite absolute low level of client contact, higher rates of contraceptive practice is found to be significantly associated with relatively higher frequency of client contact. This suggests that family planning workers have potential for affecting people's decisions about contraception and that this potential is not being fully realized. In-depth studies should look into factors (e.g., personality, family background, training, supervision, reward and punishment system, etc.) associated with their low level of client contact, and study findings should be utilized to improve the operational strategy of the population planning program.

17. The available studies have rarely generated broad policy relevant socio-demographic data. Studies, for instance, dealing with the question of distribution of population across different occupations vis-a-vis manpower planning can help design policies and programs which will have long term demographic consequences in the desired direction. Similarly,

studies seeking to operationalize the concept of integrating population and family planning with other development policies as well as to determine the measures of functional integration for population and development goals are of crucial importance.

18. Some of the findings, for example, demonstrate a positive but insignificant relationship between female labor force participation in non-agricultural activities and fertility, seem to be inconsistent to theoretical expectation. Further studies in this regard will be useful.

19. There has not been any study done to examine and explain if there is any differential mortality pattern due to differential availability or accessibility of general health care services or maternal and child care facilities and services. It may also be worth exploring to see whether utilization of contraceptive services varies with the extent and variation of utilization of general health care facilities.

The substantive areas of research, as identified and recommended above, are in no way claimed to be exhaustive. Out of this review and stock-taking of the available evidence on the relationships of fertility and socio-economic factors in Bangladesh, these emerged as critical areas where data are lacking and where future research inputs are needed.

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