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Women will readily accept contraception if services are made available in a culturally appropriate manner

Bangladesh, with an estimated total population of 115 million, is one of the most densely populated countries in the world. Further, despite recent fertility reductions, its annual population growth rate is about 2.17 per cent. Studies conducted in the early 1960s indicate a total fertility rate (TFR) of 7 children per woman (Afzal, 1967; Alauddin and Faruque, 1983). Such high fertility is declining but, according to the report of the latest Bangladesh Fertility Survey (BFS) conducted in 1989, TFR was 5 (Huq and Cleland, 1990), which is still quite high by any standard. Thus, the fertility conditions prevailing in the country should legitimately be the core concern of national policies and programmes.

There have been numerous studies on fertility in Bangladesh, but still little is known about the precise nature of the determinants of fertility. In view of the high rate of population growth vis-a-vis the country's persistently high fertility, a study of the factors contributing to this phenomenon assumes great importance for bringing out the policy implications.

In this study, we examine factors affecting fertility using the most recent information from the 1989 BFS. Bongaarts' proximate determinants model has been applied to quantify the fertility-inhibiting effects of the important determinants of fertility. To study the trends in these effects of the principal proximate determinants and the changes in fertility levels, we applied the model to data obtained from two nationwide fertility surveys, one conducted in 1975 and the other in 1989. An attempt has also been made to arrive at a reasonable estimate of the level of fertility. The change in fertility during the period 1975-1989 has been decomposed into its constituents to assess their relative contributions.

Data

This study utilizes data extracted from the 1989 Bangladesh Fertility Survey (BFS), which was conducted on behalf of the Government of Bangladesh by the National Institute of Population Research and Training (NIPORT) with funding from the World Bank. Data from the 1975 Bangladesh Fertility Survey, conducted as a part of the World Fertility Survey in the 1970s (BFS, 1978), are also used to fulfill the objectives of the study. A total of 11,906 eligible women in the 1989 BFS and 6,515 women in the 1975 BFS were interviewed and these constitute the respondents for the present study. The details of the surveys are available elsewhere (see Huq and Cleland, 1990; BFS, 1978).

The BFS for both 1975 and 1989 involved the use of two basic questionnaires: a questionnaire on households which recorded information on all household members, and a questionnaire on individuals which recorded detailed information on eligible women who were identified from the household questionnaires. The questionnaires on individuals collected information on the respondent's background characteristics, reproductive history, knowledge and practice of family planning, breast-feeding practices, marriage, fertility preferences etc., as well as on her husband's background characteristics. In order to minimize recall biases, the basic methodology applied in this analysis is current status analysis: we used the current status of defined descriptive variables on each individual interviewed at the moment of the survey.

Results and discussion

As most of the variations in fertility can be attributed to the differential impact of marriage, contraception, lactational infecundability and induced abortion (Bongaarts and Potter, 1983), we present a brief overview of only these factors in the subsequent sections.

Age at marriage and proportion marrying

For females, early and universal marriage is customary in Bangladesh. The mean age at first marriage is one of the lowest in the world. During the period 1975-1976, the mean age at first marriage among all ever-

married women in Bangladesh was reported to be 12.3 years (BFS, 1978). Several other studies in Bangladesh have also reported low female age at marriage (Obaidullah, 1966; Sadiq, 1965; Khuda, 1978). Although the average age at marriage has increased over the last two decades, childhood marriages are still prevalent in rural areas (Shaikh, 1984). The 1989 BFS data (table 1) suggest that the mean age at first marriage among ever-married women in Bangladesh is 14.8 years, which is well below the minimum legal age for marriage, i.e. 18 years, established by the Government in 1976. The mean age at first marriage for the cohort currently aged 20 to 24 years is higher than for other age cohorts. This indicates that older cohorts had a lower age at marriage than their younger counterparts. The mean age at marriage has increased by 2.5 years in about 15 years. This is already implied in the trend of female singulate mean age at marriage (SMAM) - rising from 16.3 years in 1975 to 18 years in 1989. Male SMAM also increased over the same period by 1.5 years (from 24 years in 1975 to 25.5 years in 1989). Part of the explanation for this slow rise probably lies in the wide age gap between husbands and wives in Bangladesh, i.e. husbands were about nine years older than their wives in 1961 and about eight years older in 1989 (BFS, 1978; Huq and Cleland, 1990).

Table 1: Percentage of all ever-married women by age at first marriage and current age

Current	BFS 1989		BFS 1975	
	Mean age at first marriage	Per cent married	Mean age at first marriage	Percentage married
<20	14.5	51.0	12.8	58.1
20-24	15.3	88.0	12.7	95.4
25-29	15.2	97.7	12.5	99.0
30-34	14.9	99.7	11.7	99.8
35-39	14.6	99.9	11.9	99.8
40-44	14.1	99.8	11.8	99.9
45-49	13.8	100.0	11.5	100.0
Total	14.8		12.3	
Number	11,905	6,511		
Singulate mean age at marriage		18.0		16.3

It is important to note that, while in 1975 less than 30 per cent of women aged 15-19 were single, nearly half of them were in this category in 1989 (Huq and Cleland, 1990). Further, since there is scope for a considerable further rise in age at marriage in the long run, there obviously would be a corresponding decline in fertility.

Distribution of the respondents by marital status showed that almost all women get married in Bangladesh by the time they are 35 years of age (Huq and Cleland, 1990). The variations in the proportion never married are slight and not substantial above the age of 30. Another important change since 1975 is a decline in the percentage of women who are widows. The proportions widowed in all age groups were consistently lower in 1989 than in 1975. As a result, the proportions of currently married women were higher in 1989 than in 1975 at all ages above 30, the net effect being an increase in fertility at ages 30 and above, offsetting the decrease in fertility at younger ages due to later age at marriage. Declining adult mortality may be responsible for this trend, but a higher probability of remarriage for widows cannot be ruled out.

Current fertility estimate

The current fertility rates can be estimated directly from survey data on the number of births occurring over the 12-month period prior to the survey date. But this method usually leads to an underestimate of current fertility rates owing to common problems of misstatement of the ages or birth-dates of children, and the omission and under-reporting of births. Brass, who examined the BFS 1975 data, also pointed out that some older women might have moved births occurring in the five years before the survey back to the period 5-9 years prior to the survey (Brass, 1978). By and large, the same possibility also holds true for the 1989 BFS. The application of indirect techniques based on the reverse survival method and the Gompertz relational model suggests a TFR in the neighbourhood of 5.5. The limitations of indirect techniques are, however, well documented.

Until further exploration of the data is undertaken, there is no perfect solution to this problem. However, a reasonable method for estimating current fertility is to follow the middle course of averaging the reported births of the five years prior to the survey date (1984-1988). The age-specific fertility rates derived in this way and the implied TFR (5.1) are presented in [table 2](#). Huq and Cleland (1990), after an exhaustive review of the fertility rates in Bangladesh from 1978 to 1988, established as possible estimates of TFR for 1988 a range from 4.6 to 5.4. As a compromise, they suggested 4.9 as the TFR for 1988, which is the mid-point of the possible range. The 1989 Contraceptive Prevalence Survey (CPS) reported a TFR of 5.1 births per woman as the average for the five years prior to the survey date (Mitra and others, 1990). Whatever the level of fertility may have been in the late 1980s, there is ample evidence that during the last one and half decades (1975-1989) fertility in Bangladesh declined at least 20 per cent.

Table 2: Age-specific fertility rates (ASFRs) and age-specific marital fertility rates (ASMFRs) (five-year average)

Current age	ASFRs		ASMFRs	
	1975	1989	1975	1989
15-19	0.1090	0.1822	0.1677	0.3196
20-24	0.2886	0.2599	0.3196	0.3141
25-29	0.2911	0.2254	0.3161	0.2466
30-34	0.2502	0.1692	0.2757	0.1824
35-39	0.1848	0.1141	0.2192	0.1271
40-44	0.1074	0.0555	0.1363	0.0660
45-49	0.0347	0.0176	0.0488	0.0219
Total x 5	6.33	5.12	7.42	6.39

Source: BFS 1975 (1971-1975) and BFS 1989 (1984-1988)

The age-specific marital fertility rates have been derived by dividing the age-specific fertility rates by the proportions of women who were currently married in each age group, with minor adjustments for possible distortion in the proportion married in the 15-19-year-old age group.

The age-specific fertility rates, as presented in [table 2](#), show a broad flat-top distribution. The fertility rate is highest among women aged 25-29; thereafter it declines. However, the marital age-specific fertility rate is highest among women aged 15-19 years. Age-specific fertility rates for all age groups were lower in 1989 than in 1975. The age pattern of fertility has changed considerably during the period 1975-1989; the shift is evident from a fall in mean age at child-bearing from 29.8 years in 1975 to 27.5 years in 1989. This suggests that child-bearing is taking place relatively earlier than previously, presumably because of greater fertility regulation at older ages in 1989.

Contraception

The contraceptive prevalence rate (CPR) in Bangladesh registered a steady rise from 7.7 per cent in 1975 to 31 per cent in 1989 ([table 3](#)). The CPR figures from the 1989 BFS (31 per cent) and the 1989 CPS (31.4 per cent) validate each other. Recently released 1991 CPS figures claim CPR to be over 40 per cent (Mitra and others, 1992). Most of the diffusion in contraceptive practice has taken place during the past decade, which is a reflection of the concerted efforts of the Government in conjunction with non-governmental organizations (NGOs) in the field in recent years. Even so, the agonizing fact remains that there is still heavy reliance on traditional methods, which accounted for as many as 25 per cent of all current users in 1989. Besides, the present acceptors of family planning are predominantly older couples with high parity. The fertility impact of contraception thus remains minimal.

Table 3: Level of current use of contraceptive methods among married women (per cent) for different years and their use-effectiveness

Methods	BFS	CPS	CPS	CPS	CPS	BFS	Use-effect
	1975	1981	1983	1985	1989	1989	
Modern (total)	5.0	11.0	13.8	18.4	24.4	23.4	
—Pill	2.7	3.5	3.3	5.1	9.1	9.6	0.90
—IUD	0.5	0.4	1.0	1.4	1.7	1.4	0.95
—Injection	-	0.4	0.2	0.5	1.1	0.6	0.95

—Condom	0.7	1.6	1.5	1.8	1.9	1.8	0.80
—Vaginal	-	0.3	0.3	0.2	0.2	0.1	0.80
—Tubectomy	0.6	4.0	6.2	7.9	9.0	8.5	0.99
—Vasectomy	0.5	0.8	1.2	1.5	1.4	1.2	0.99
Traditional (total)	2.7	7.6	5.4	6.9	7.1	7.6	
—Withdrawal	0.5	1.8	1.3	0.9	1.2	1.8	0.70
—Safe period	0.9	3.9	2.4	3.8	3.9	4.0	0.70
—Abstinence	1.0	1.2	0.4	0.5	0.5	1.0	0.70
—Others	0.3	0.7	1.4	1.7	1.5	0.8	0.70
All	7.7	18.6	19.1	25.3	31.4	31.0	
Average use-effectiveness	0.837	0.872	0.872	0.875	0.885	0.870	

[Table 3](#) shows that, of the total CPR by method, in 1975, only a little over 14 per cent was accounted for by sterilization. This figure plateaued in recent years, accounting for about one-third of the 1989 CPR. Knowledgeable observers are of the opinion that, while there could be other factors behind such a trend, the demand for sterilization has perhaps effectively been met, and it would be a formidable task to augment the number of new acceptors, except through special efforts. The proportional share of oral pills in CPR was as much as 19 per cent of total use in 1981, which rose to 31 per cent in 1989. Available statistics suggest that much of the total increase in the CPR in Bangladesh between 1975 and 1989 was due to the increased adoption of oral pills and sterilization. Among the traditional methods, the safe period shows an increasing trend and definitely lays claim to being a future research priority so as to ascertain exactly how Bangladeshi couples employ it and what success in preventing pregnancy they may expect from it. The use rate of the other contraceptive methods has been relatively static.

The family planning programme in Bangladesh has been oriented essentially towards females and operated largely through female functionaries in the field. This indicates that, as a proximate determinant of fertility, the potential of contraception for reducing fertility has been only partially realized so far (Duza, 1990). Breast-feeding and post-partum amenorrhea

Like other duration variables, the estimation from retrospective histories of the duration of breast-feeding is a difficult task. Breast-feeding duration may be estimated from the last closed birth interval or from the last open birth interval; each method has its own merits and limitations. The present analysis is limited to open birth interval data. A typical life-table approach has been followed enabling the inclusion of periods of observations of censored as well as non-censored cases in estimating the average breast-feeding duration. The breast-feeding status of mothers whose children subsequently died but who were still breast-feeding on or before the survey date was considered as censored in life-table analysis. The same procedure has also been adopted for estimating the period of amenorrhea.

Table 4: Estimates of selected reproductive measures and derived indices of proximate determinants

A. Reproductive measures	BFS 1975	BFS 1989	%change
TFR (observed)	6.33	5.12	-19.12
TMFR	7.42	6.39	-13.88
CBR	47.00	35.80	-23.83
Proportion of contraceptive use	0.077	0.31	+302.60
Contraceptive use-effectiveness	0.837	0.870	+3.97
Mean duration of breast-feeding	31.0	30.40	-1.94
Mean duration of postpartum amenorrhea	14.60	11.52	-21.10
B. Model indices			
Cm	0.853	0.801	-6.10
Cc	0.930	0.709	-23.80
Ci	0.604	0.666	+10.30
Combined effect of four indices (Cm x Cc x Ca x Ci)	0.479	0.378	-21.10
TF	15.3	15.3	0.0

The results indicate that breast-feeding is almost universal in Bangladesh - more than 97 per cent of the

women breast-fed their last-born child. The average duration of breast-feeding, as indicated by our analysis, is 30.4 months (table 4) which is in good agreement with the result (28.6 months) obtained by Huq and Cleland (1990) from the same set of data through the prevalence/incidence method. The 1989 CPS has also reported an average duration of breast-feeding of 30.6 months for the last open birth interval (Mitra and others, 1990). Available evidence suggests that the average duration of breast-feeding in Bangladesh has long been well above two years - one of the highest in the world. The 1975 BFS estimates of breast-feeding ranges between 29 and 31 months (Shuiab and Islam, 1988), showing that the duration of breast-feeding in Bangladesh has remained virtually unchanged over the last 15 years.

The mean duration of post-partum amenorrhea was estimated to be 11.5 months (table 4) for the country as a whole. This estimate is in close agreement with that obtained by Huq and Cleland (1990) through both the prevalence/incidence method (11.9 months) and the current status method (12.4 months). It has been observed that in the absence of breast-feeding, the average period of amenorrhea is 3.4 months, which is higher than observed in developed societies in Europe (Bongaarts and Potter, 1983).

There is ample evidence to suggest that, unlike for breast-feeding, the duration of amenorrhea is showing a declining trend. The 1975 BFS reported a mean post-partum amenorrhea period of 14.6 months (Singh and Ferry, 1984). Chen and others (1974) found the median post-partum amenorrhea period to be around 17 months for a cohort of births (1969-1971) in Matlab, a rural area in Bangladesh. In another study, Ford and Kim (1987) reported that the median period of amenorrhea in Matlab was 14.7 months during the period 1975-1979. In a recent study which utilizes longitudinal data from Matlab, Salway and others (1992) observed that the median duration of post-partum amenorrhea fluctuated around 13 months for the cohorts of births during the period 1978-1983. Thereafter, a sharp decline occurred, with the duration falling from 13.5 months for the 1982-1983 cohort to 9.4 months for the 1988-1989 cohort. When only women who gave birth in 1989 were considered, the duration of post-partum amenorrhea was found to have fallen even more, to just 8.6 months. Salway and others also observed that the increased use of contraception may be one of the important contributing factors to the declining trend in post-partum amenorrhea in Bangladesh. Fertility-inhibiting effects of the proximate determinants

Bongaarts (1978) showed that in any population the actual level of fertility achieved by a woman is influenced by seven intermediate variables or proximate determinants: marriage, contraception, induced abortion, lactational infecundability, fecundability, spontaneous intrauterine mortality and sterility. These variables together constitute a complete set of proximate determinants through which socio-economic and cultural factors affect fertility (Bongaarts and Potter, 1983). Bongaarts and Potter further demonstrated that most of the variations in fertility are mainly due to the differential impact of the first four of these variables. The survey data enable us to apply the Bongaarts model of proximate determinants of fertility. The model formulates the TFR that is determined by total fecundity (TF), * a hypothetical potential of fecundity that a woman would have in her lifetime, being inhibited by the indices of non-marriage (Cm), contraception (Cc), induced abortion (Ca) and lactational infecundability (Ci). The model can be quantified through the following equation:

$$TFR = C_m \times C_c \times C_a \times C_i \times TF.$$

The detailed exposition of the model is given elsewhere (Bongaarts and Potter, 1983). The summary measures that are needed for the application of the model are presented in the first panel of table 4. Owing to the unavailability of information on the sensitive issue of induced abortion, we have assumed that the overall total induced abortion rate is zero. Empirical observation suggests that, although TFR, TMFR (total marital fertility rate) and TN (total natural fertility rate) vary widely among populations, TF is rather stable at between 13 and 17 births per woman, with the standard value being 15.3. We too chose the value of 15.3 for the present analysis.

* If in a population all women married early and if breast-feeding and post-partum abstinence, contraception and induced abortion are not practised, then the total fecundity rate (TF) is the expected number of children the women will bear during their reproductive life-span.

Since no national-level study on the use-effectiveness of different contraceptive methods has been conducted in Bangladesh, the use-effectiveness of the modern methods has been adopted here from the Matlab project of the International Centre for Diarrhoeal Disease Research, Bangladesh (Kabir and Rob, 1990). The last column of table 3 presents the method-specific use-effectiveness of the modern methods as observed in Matlab. The use-effectiveness of traditional methods is assumed to be 0.70.

The second panel of table 4 presents the estimated values of the indices of the four principal proximate determinants of fertility. Theoretically, the value of each index ranges from 0 to 1. The complement of each

index represents the proportionate reduction in fertility attributed to each determinant of fertility; the smaller the index value, the greater is the fertility-reducing effect of the variable. The index C_m represents the proportion by which TFR is smaller than TMFR as a result of non-marriage. Similarly, the index C_c gives the proportion by which TMFR is smaller than TN through the use of contraception, and the index C_i gives by how much TN is smaller than TF due to the effect of lactational infecundability. Thus, in 1989 (table 4), the marriage pattern reduces the actual fertility level below marital fertility by almost 20 per cent ($C_m=0.801$). Contraception has a stronger effect on marital fertility, accounting for a reduction of just over 29 per cent ($C_c=0.709$) in TN relative to TMFR. Lactational infecundability has the highest fertility-reducing impact, reducing the total fecundity rate (TF) by more than 33 per cent ($C_i=0.666$).

To document changes among the indices over the period 1975-1989, estimates for two time points are compared in table 4. The results indicate that during the 15-year period, an appreciable amount of change has occurred only for contraceptive use. During the period 1975-1989, the index of marriage declined by just over 6 per cent and the index of contraception declined by almost 24 per cent, but the index of lactational infecundability increased by more than 10 per cent. Thus, the decline in TFR (from 6.3 to 5.1) between 1975 and 1989 was caused primarily by the fertility-reducing effect of contraception. The fertility-reducing effect of marriage pattern was offset by a reduction in duration of lactational infecundability. The combined fertility-limiting effect of the three proximate determinants (C_m , C_c , C_i) was 0.479 in 1975 and 0.378 in 1989, indicating a decline of just over 21 per cent in fertility during the period 1975-1989.

Table 5: Magnitude of the total inhibiting effect accounted for by each proximate fertility determinant : Bangladesh, 1975 and 1989

Proximate determinants (index)	Fertility-inhibiting effects			
	Births per woman		Percent	
	1975	1989	1975	1989
Marriage (C_m)	1.72	2.17	21.6	22.8
Contraception (C_c)	0.79	3.37	9.9	35.4
Lactational infecundability (C_i)	5.46	3.98	68.5	41.8
Total: [15.3-TFR (estimated)]	7.97	9.52	100.0	100.0

Note: The total fertility-inhibiting effect is prorated by the logarithm of each index, e.g. effect of marriage : $[TF-TFR \text{ (estimated)}] \times \log C_m \div (\log C_m + \log C_c + \log C_i + \log C_a)$

Table 5 exhibits the magnitude of the total fertility-inhibiting effect being accounted for by each proximate fertility determinant at two points of time, 1975 and 1989. The difference between the total fecundity (TF), taken as 15.3, and the estimated TFR is attributed to the result of the inhibitory effect of each determinant, the total fertility-inhibiting effect is prorated by the proportion of the logarithm of each index to the sum of the logarithm of all indices (Wang and others, 1987). For example, the fertility-inhibiting effect of the marriage variable is obtained as:

$$[TF-TFR \text{ (estimated)}] \times \log C_m \div (\log C_m + \log C_c + \log C_i + \log C_a)$$

The fertility-inhibiting effects of other factors are obtained similarly. The results presented in table 5 indicate that, of a total of almost 8 births being inhibited in 1975, 1.7 births (21.6 per cent) are due to the effect of the marriage variable, 0.8 birth (9.9 per cent) is due to contraception and 5.5 births (68.5 per cent) are due to lactational infecundability. Similarly, in 1989, the three proximate variables (marriage, contraception and lactational infecundability) which inhibited 9.5 births, are distributed as 2.2 births (22.8 per cent), 3.4 births (35.4 per cent) and almost 4 births (41.8 per cent), respectively.

From the foregoing analysis, it may be noted that lactational infecundability has the highest fertility-reducing effect; this may be considered as the single most important determinant of fertility-reduction in Bangladesh. Although in 1975 the proportion of women non-married was the second most important fertility-reducing factor, by 1989 contraception appears to have taken this place and its fertility-inhibiting effect is steadily increasing. Although the impact of the non-marriage component has increased, the rate of change is very slow. The prevailing cultural and social norm in Bangladesh is unlikely to permit a change in the proportion non-married beyond a certain limit and the prospect for an immediate rise in age at marriage for females beyond 22 years does not seem to be very bright. On the other hand, the fertility-reducing effect of lactational infecundability is gradually decreasing. It should be noted that the joint effect of marriage and lactational infecundability did not change much during the 15-year period 1975-1989. This

leads to the conclusion that future reductions in fertility in Bangladesh will depend largely on increased use of effective contraception.

Decomposition of the change in TFR: 1975-1989

A simple decomposition technique developed by Kitagawa (1955) is used here to decompose the TFR into a component due to changing age-specific proportions currently married and a component due to changing marital fertility rates. Each of these two major components is further decomposed by age. The decomposition summarizes simply and succinctly the contributions of nuptiality and marital fertility to overall fertility change. Unlike with the Bongaarts model, this technique utilizes information that is readily available and usually reliable. This decomposition will be followed later in this section by a further decomposition of the proximate determinants proposed by Bongaarts and Potter.

Table 6: Decomposition of TFR due to changes in nuptiality and marital fertility: 1975-1989

Age group	Change due to nuptiality	Change due to marital fertility	Total change	Percentage change
15-19	-.0974	+.4633	+.3659	18.9
20-24	-.1109	-.0329	-.1438	7.4
25-29	-.0141	-.3143	-.3284	16.9
30-34	+.0228	-.4278	-.4050	20.9
35-39	+.0521	-.4050	-.3529	18.2
40-44	+.0253	-.2844	-.2591	13.3
45-49	+.0160	-.1015	-.0855	4.4
Total	-1.1062 (8.8%)	-1.1026 (91.2%)	-1.2088 (100%)	100.0 --

As may be noted from [table 6](#), about 9 per cent of the decline was due to changes in nuptiality and the remaining 81 per cent to changes in marital fertility. When broken down by age, it is revealed that changes in nuptiality at the younger reproductive ages tended to reduce fertility, whereas changes in nuptiality at the older reproductive ages tended to increase it marginally. This occurred because the proportions married declined at the younger ages due to later marriage, but increased slightly at the older reproductive ages, owing probably to lower prevalence of widowhood associated with falling mortality. This is evident from the singulate mean age at marriage which increased from 16.3 to 18 years during the period.

The marital fertility component, when broken down by age, shows that the changes in marital fertility rates at all ages reduced fertility except for the age group 15-19 years ([table 6](#)). The increase in marital fertility for this age group may be attributed at least in part to a fall in very young marriage and adolescent subfecundity. Decreases in the age-specific marital fertility rates at the older ages are due primarily to increased use of contraceptives.

To quantify the contribution made by each of the proximate determinants of fertility to an observed change in fertility between two points in times (in this analysis, 1975 and 1989), Bongaarts and Potter (1983) turned the Bongaarts (1978) model into a decomposition equation. The equation states simply that a given proportional change in the TFR between two points of time equals the sum of the proportional fertility changes due to the different proximate determinants plus an interaction term.

Table 7: Decomposition of the change in TFR between 1975 and 1989

Factor responsible for fertility change	Percentage change in TFR	Distribution of percentage change in TFR	Absolute for change in TFR
Proportion of women married	-6.10	-31.90	-0.39
Contraceptive practice	-23.76	-124.27	-1.50
Duration of post-partum infecundability	+10.26	+53.66	+0.65
Other proximate determinants	+2.42	+12.66	+0.15

Interaction	-1.94	-10.15	-0.12
Total	-19.12	100.0	-1.21

The decomposition results are presented in [table 7](#). It indicates that TFR declined during this period by a little over 19 per cent (or in absolute terms by 1.2 births per woman) from 6.3 births in 1975 to 5.1 in 1989. This total decrease in TFR is found to come from a decline of just over 6 per cent (or 0.39 birth per woman) owing to the marriage pattern, a decline of almost 24 per cent (or 1.5 births per woman) owing to an increase in contraceptive use, a 10.3 per cent (or 0.65 birth per woman) increase due to shortening of the duration of lactational infecundability. The change in TFR due to change in other proximate determinants is in no way negligible. In the second column of [table 7](#), the decomposition results are standardized to add up to 100 per cent. It is evident that contraception played the largest role in the reduction of fertility during the period 1975-1989.

Conclusion and recommendations

In this study an attempt has been made to estimate the fertility-inhibiting effect of the three most important proximate determinants: marriage, contraception and lactational infecundability. The analysis shows that, although the fertility level of Bangladesh is declining, it is still very high (around 5 births per woman). Data on induced abortion are not available and its effect remains essentially unmeasurable. Lactational infecundability plays the most prominent role as a fertility-reducing factor. Contraception is the second most important factor followed by the marriage factor which plays the least role in the reduction of fertility. However, contraception is responsible for the substantial fall in fertility between 1975 and 1989. Our analysis suggests that the fertility-reducing effect of contraception is steadily increasing, whereas the effect of lactational infecundability remains nearly constant.

The fertility-reducing effect of the marriage variable is also increasing but at a very slow rate. In fact, the fertility-inhibiting effect of marriage and lactational infecundability are compensating each other, and during the period 1975-1989 their joint effect remained almost constant (i.e. $C_m \times C_i = 0.53$). Unless the age at marriage continues to rise, the use of contraception will be the dominant factor in any further reduction in fertility. The national goal of attaining replacement level fertility by the year 2005 could be achieved if the rate of use of contraception could be increased to 70 per cent.

Although socio-economic development is desirable and would enhance the status of women, yet it does not seem to be a pre-condition for fertility decline in Bangladesh. The demographic transition unfolding in Bangladesh suggests that women will readily accept contraception if services are made available in a culturally appropriate manner. More importantly, programme managers, administrators and policy makers should work to provide a method mix that meets the varied needs of clients and is financially and programmatically feasible as well. Research in developing countries has confirmed that the provision of clients with a variety of appropriate contraceptive options and a high-quality services programme can help couples to achieve their desired level of fertility, improve contraceptive prevalence and accelerate fertility decline.

Of the four proximate determinants we have presented, the index of contraception may have been underestimated by using the reported contraceptive prevalence and employing a set of method-specific use-effectiveness data obtained from a small experimental area of Bangladesh which may not be representative of the country as a whole. Owing to the increased awareness among couples of the advantages of small family size, a substantial proportion of women with low parity may have been practising contraception, but they are not motivated strongly enough to practise it consistently. Therefore, among the respondents, contraceptive prevalence may be over-reported and contraceptive use elsewhere in Bangladesh may not be as effective as that used in Matlab. As a result, the index of contraception will have a depressing effect on the estimate of the fertility level.

Policy implications that can be drawn from this study as they relate to the achievement of further fertility decline are as follows. There is a need to: (a) campaign for a further increase in the age at marriage of women, especially in rural areas, (b) encourage efforts to increase the quality and the quantity of contraceptive use to achieve higher use-effectiveness that will lead to a greater contribution to fertility decline, (c) provide a method mix that meets the varied needs of couples, (d) increase programme efforts to maintain current performance levels, (e) ensure the commitment of additional resources to maintain current programme momentum and (f) provide more information to women about the low cost and much greater benefits of longer duration breast-feeding in order to encourage full and intensive breast-feeding.

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Costs of Rearing Children in Agricultural Economies: An Alternative Estimation Approach and Findings from Rural Bangladesh

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The keys to fertility decline would appear to lie in structural changes in the economy, the satisfaction of existing demand for family planning services and generation of additional demand

The cost of rearing children is widely viewed by population researchers as a key factor in the determination of societal fertility levels (United Nations, 1973; Easterlin, 1978; Lindert, 1983). Indeed, each of the major perspectives on the "demographic transition" includes shifts in the relationship between costs and benefits of children as a crucial element in the initiation of sustained fertility decline. Lindert (1983) and Lee and Bulatao (1983), for example, point to a "transition in demand" from time-supplying to time-intensive as the key factor underlying changes in fertility behaviour in traditionally high-fertility populations. Other explanations of the demographic transition differ primarily in terms of the supply/demand "threshold" at which fertility is expected to begin to decline (Caldwell, 1976; Simon, 1977; Lindert, 1978 and 1980; Easterlin, 1975; Tabbarah, 1971).

Despite the important role attributed to changes in child costs in the demographic transition, information on the actual costs of child-rearing in developing societies, and in particular on time inputs, is relatively scarce. However, the availability of such information is crucial to the measurement of total child-rearing costs in low-income countries, as time inputs tend to be the most important component of total child care costs in such societies (Lindert, 1983). Thus, unless time spent in child care is properly valued, significant errors in the measurement of the costs of children may result.

This study takes advantage of detailed household time-allocation data gathered in three villages in rural Bangladesh over a one-year period to estimate total and component child-rearing costs in a largely agrarian economy. An alternative method of estimating time cost is proposed. It is argued that owing to labour market imperfections and the flexibility of work hours and child care arrangements in traditional agricultural economies, conventional "opportunity wage" measures of time costs over-estimate the true costs of child-rearing. Instead, it is argued that the reduction in market and non-market income due to the additional hours that must be devoted to child care - taking into account both the compatibility of child care with home production activities and economies of scale in child-rearing - more accurately reflect the real monetary value of child care time. The time costs of child-rearing based upon the proposed method, as well as monetary expenditures on children, are estimated from data gathered for the study.

The data analyzed in this article are unique in that time-allocation information was obtained from sample households on a *daily* basis over a period of slightly more than one year. In addition to being relatively free of respondent recall error, these data provide an opportunity to examine differentials in child care costs among household types, the differences among which are related to the types of socio-economic changes which are expected to occur with economic growth. Thus, the examination of differentials in child costs provide evidence relevant to the question of changing costs of children over the course of the development process.

Methodological issues

The total cost of rearing children has two basic components: time cost and monetary cost. Two methods are commonly used to evaluate child costs. The first method is a direct cost-accounting procedure. This procedure, quite commonly used in the demographic literature, involves a series of specific steps: the identification of all relevant cost components in real terms, distinguishing between fixed and variable costs; valuation of each component using appropriate prices; annualizing the fixed costs using an appropriate discount rate; and adding the monetary value of all cost items to arrive at an estimate of total cost. However, most previous studies have focused on the monetary costs of child-rearing (Lindert, 1980; Espenshade, 1977; Henderson, 1949 and 1950; Sohn, 1970). Among the few studies which have examined

the time costs of child care are those of Gronau (1973) and Ho (1979).

An important shortcoming of the aforementioned method is the difficulty encountered in identifying the specific costs associated with rearing a child. Consumption data are usually gathered on a household basis, and thus do not convey information on the level of consumption of individual members. Even if an acceptable method of disaggregating total consumption could be identified (for example, consumption in proportion to requirements for different goods and services), data are often limited to major household budget items. Since the consumption bundle of children differs from that of adults in most societies, the identification of only important household consumption items may result in the exclusion of commodities which are consumed primarily by children, leading to biased estimates of the material costs of child-rearing.

The second method of measuring child costs is based on consumer demand theory. The starting point under this approach is the definition of a measure of welfare, or utility structure, for the household.¹⁴ Deaton and Muellbauer (1986), for example, estimate the additional income needed to compensate a household for the loss of consumption due to the addition of a child. Although this method is sufficiently flexible to allow for changes in preference patterns, household income and commodity prices due to the addition of a child, the usual practice is to assume constant "effective" prices¹⁵ and a fixed preference structure. Clearly, if prices are held constant, the income required to achieve the original welfare level (that is, before the addition of the marginal child) should be exactly equal to the original income, plus the value of total resources spent on the child. In other words, with constant effective prices, these two methods of measuring child costs should produce identical results.

The consumer demand-based method also has some important drawbacks. First, if child costs are not constant with changing income, compensating variations do not represent the actual costs incurred. Second, if effective prices change due to the addition of a child, which is most likely the case, or if preference patterns are not constant across income classes, compensating variations may provide misleading cost estimates. It should be noted, however, that if the components of child cost can be identified, adding the costs of rearing children remains a valid method of cost accounting, even with changes in effective prices, preference patterns or levels of child costs across income classes.

Another problem with the consumer-demand approach is the assumption of a constant rate of exchange between labour time and income. It is assumed that the market wage rate, utilized as a measure of labour productivity, represents the opportunity cost of "leisure" hours. However, in the presence of significant levels of unemployment or underemployment in the labour force, direct consumption of time may not be considered desirable. In poor economies, households are typically more concerned with the availability of consumption goods and services, and thus the total value of goods and services available to the household may be a better indicator of welfare than a combination of total income and so-called leisure hours.

These considerations lead to an alternative method of calculating child costs. When all hours within a day do not have the same potential productivity, or when the actual level of leisure hours exceeds the desired level, a better estimate of child costs will be the reduction in total household income due to child care hours, plus material consumption by children. The estimation of the income effects of material consumption by children is relatively straightforward: total income is reduced by the amount of consumption. The number of hours devoted to child care, however, affects income in a more complex fashion. For example, a worker may participate in child care activities during a part of the day when no alternative employment opportunities are available, and thus there would be no or little impact on total household income.

The calculations must also take into account the fact that when faced with an increase in the number of hours required for child care activities, a reallocation of tasks among household members will often take place so as to achieve improved compatibility with other activities or economies of scale in child-rearing. Child care can easily be combined with other household activities to reduce its impact on income. The presence of more than one child in the household also enables households to take advantage of the benefits of economies of scale. Thus, the ultimate effect on household income may turn out to be significantly different from the monetary value of the hours devoted to child care.

In order to estimate the effect of an increase in child care hours on income, changes in the time-allocation patterns of adults and older children due to additional hours of child care need to be valued.²¹ The detailed time-allocation data available in this study provide a rare opportunity to undertake such an evaluation.

Data and methods

The data for the study were collected from 66 agricultural households located in three villages in Tangail District in north-central Bangladesh. Although the villages were not selected on a probability basis, the villages are typical villages in rural Bangladesh and there is no reason to suspect that substantially different results would have been obtained had the villages been chosen on a probability basis.

In order to minimize the extent of recall error in the present study, time-use information was collected from all individuals aged six years and above in sample households on a daily basis over a period of 371 days in 1984/85. Previous time-allocation studies have been based primarily on respondent recall data. Evidence from methodological studies suggests that such data, while varying in quality depending upon the length of the recall period and the structure of the interview, tend to underestimate labour time (see Birdsall [1980] for a discussion of the merits of alternative data collection strategies). White (1980), for example, estimates that daily recording improves estimates of labour time by 33 per cent in comparison with information collected on a monthly recall basis. In instances where a particular household member could not be contacted within a given 24-hour period, arrangements were made to interview the worker in the next 24-hour period. Wage employment was distinguished from home-based activities, as were hours devoted to exclusive child care from hours in which child care was combined with other productive activities. Although daily data were gathered for the study, the analyses are based upon monthly averages of hours of work and child care per week.

The 66 agricultural households observed in the study varied with respect to the number and age distribution of children present during the study period. Thus, in order to compare households it was necessary to calculate "equivalent costs" per child of a standard age (i.e. infants under the age of one year). These age-standardized, equivalent costs form the basis of the analysis reported in this article.

In estimating the material costs of child-rearing, childhood food consumption data from a large national survey for rural Bangladesh were used (Ahmad and Hassan, 1983). Age-specific food consumption patterns from the survey were combined with information on the age composition of children in sample households to derive estimates of food expenditures for children. A direct cost-accounting method was used to calculate total food costs for children. Non-food expenditures were estimated by applying food to non-food expenditure ratios taken from a recent expenditure survey of rural Bangladesh to the estimates of household food expenditures obtained as described above (Government of Bangladesh, 1986). Estimates of the total monetary cost of child-rearing were obtained by combining the estimates of food and non-food expenditures.^{3/}

An issue in the use of childhood food consumption data not usually considered in studies of child costs involves the derivation of consumption costs for infants. In traditional societies, most infants obtain a significant proportion of their nutritional requirements through breast-feeding. While breast-feeding does not entail direct monetary costs, there are indirect costs involved, and estimates of the equivalent monetary cost of breast-feeding need to be derived in order to arrive at meaningful estimates of the costs of infant care. In this study, it was assumed that the cost of supplying calories through direct consumption of food is the same as that through breast-feeding, and that all children receive calories in proportion to their requirements. These two assumptions imply that the total cost of food consumption for infants is a fixed proportion of food costs for older children, the fixed proportion being the calorie requirement ratio for the two age groups (Ahmad and Hassan, 1983).

In order to assess variations in child costs across socio-economic groups, five categories of household were defined on the basis of land ownership, which is an important determinant of household socio-economic status in rural Bangladesh. The five land-ownership groups considered were: (a) landless households, (b) marginal farm households (ownership of less than one acre of land [1 acre = 0.4 hectare]), (c) middle-income households (ownership of between one and two acres of land), (d) upper-middle-income households (ownership of between two and four acres of land), and (e) upper income or rich households (ownership of more than four acres of land).

In this study, household income is defined in a broad sense to include non-market or home activities (excluding child care). Thus, the value of activities such as cooking, fetching water, repairing the house and cleaning the yard were evaluated and added to the value of other material outputs produced. To estimate home production income, the (non-market) wage rate observed for hired household help was used.

Results

Time costs of child-rearing

[Table 1](#) shows the mean number of hours per week devoted to market, non-market (home activities

excluding child care) and child care activities by different members of sample households during the one-year study period. An initial observation from these data is that child care would seem to be largely a female activity in rural Bangladesh. Among adults, females supply approximately 90 per cent of the mean weekly hours devoted to child care. Female children aged 10-14 years also allocate significantly more hours per week to child care than do male children of similar ages. Thus, it would appear that gender definitions of the division of household labour begins at an early age in rural Bangladesh.

Table 1: Mean number of hours per week devoted to different activities by household members (for households with at least one child)

Member categories	Total hours	Market hours	Non-market hours (excluding child)	Child care
Adult males	93.4	32.1	59.5	1.5
Adult females	100.1	14.5	70.8	14.8
Male children (age 10-14 years)	45.4	25.3	20.0	0.1
Female children (age 10-14 years)	44.0	13.4	29.6	1.0

Table 2: Hours of child care performed by men, women and children in rural Bangladesh, adjusted for age and number of children (standardized hours per week per child)

Household categories	Hours of child care per child in a week			
	Adult male	Adult female	Children aged 10-14 years male	Children aged 10-14 years female
Landless	1.77	21.39	0.15	1.59
Marginal	0.89	18.72	0.15	1.62
Middle	0.92	19.54	0.29	1.51
Upper-middle	1.85	23.29	0.22	1.09
Rich	1.58	25.90	0.13	1.02

Note: Landless households do not own any agricultural land. Marginal households own less than one acre of agricultural land. Middle-income farmers are defined by land ownership of between one and two acres. Upper-middle households own two to four acres of land and rich households own more than four acres of land.

Data on child care hours disaggregated by household type and corrected for the age distribution of children and economies of scale associated with child care are shown in [table 2](#). In order to compare child care costs across households, account must be taken of between-household variability in the number of children present and their age distribution. To derive comparable per child estimates, reported child care hours were converted to equivalent values for one-child households consisting of an infant under the age of one year, as follows. For the full sample of households, the mean number of hours of child care performed per week by adult female members of the households were 20.5, 14.9, 11.4, 7.1 and 4.0 hours for children less than one year old, one, two, three and four years of age, respectively, in single-child households. These estimates of mean hours of child care for children of different ages were used to convert reported child care hours into comparable per child figures for households with varying numbers and age distributions of children.

The effects of economies of scale in child-rearing were assessed by comparing hours allocated to child care in multiple-child households with an "expected" value in the absence of economies of scale based upon child care hours reported by single-child households with children of the same ages as those in multiple-child households. Comparisons of reported and expected numbers of hours across sample households indicate that the presence of multiple children reduces the number of hours devoted to child care on a per child basis by, on average, about 20 per cent. This economies-of-scale factor was taken into account in converting reported hours of child care into standard hours to facilitate inter-household comparability by adjusting the reported hours devoted to child care by the economies-of-scale factor, depending upon the number of children present in each household. The results of these adjustments are shown in [table 2](#).^{4/}

It will be noted that the number of hours devoted to child care indicated by these data is quite low for all

household members and household types. Even for adult females, the total hours of child care per child is on average only about three hours per day. This is due to the strict definition of joint activities used in this study. Child care tends to be combined with other activities in rural Bangladesh; it is quite common for the combination of activities such as cooking, cleaning and weaving to be carried out along with child care. Since the majority of the time spent in joint activities was reported by workers as having been devoted to non-child-care activity, it has been assumed for estimation purposes that the worker was performing that particular activity alone. The joint activities enable household members to produce market and non-market output during the time when the children are under their supervision. In effect, joint activities serve to subsidize child care costs.

To express child care hours in monetary terms, two different wage rates or productivity measures could be used. Conventional opportunity wage measures assume that the market wage rate reflects the real cost of time to individuals. However, in a poor agrarian economy where the supply of labour exceeds demand by a significant margin for most of the year, it is rarely the case that hours recovered from child care could instead be used to earn market wages. More realistic cost estimates may be obtained by using the wage that a similar worker would be paid for a non-market home activity. As wage rates for non-market activities are typically lower than those for market activities, the former will provide a lower monetary value of the hours spent in child care.

Table 3: Monetary value of time spent on child care, by household category

Household category	Money value of child care hours evaluated at	
	Market wage	Non-market wage
Landless	26.3	22.4
Marginal farmer	23.0	18.5
Middle	23.0	19.4
Upper-middle	28.1	23.9
Rich	29.8	25.3

Note: See [table 2](#) for the definition of household categories. Money values are expressed in Taka; in 1984, \$US1.00 was equal to approximately Taka 28.5.

[Table 3](#) show the estimates of the monetary value of time spent in child care evaluated at market and non-market wage rates, respectively, for different household categories.^{5/} As may be observed, time costs evaluated at the alternative wage rates are quite similar for all household categories owing to the relatively small differences in market and non-market wage rates in rural Bangladesh. Such small differentials are commonly observed in economies characterized by low levels of economic diversity and surplus labour.

With respect to differentials among household types, the time-costs of child care follow a U-shaped pattern, with adult members in the landless, upper-middle-income and rich farm households allocating more hours to child care activities than marginal or middle-income farm households. This probably reflects the fact that labour opportunity costs for landless households are lower than the market wage rates owing to the lack of productive employment in the market. Over the course of the study period, about 37 per cent of workers, most of whom were from lower income households, reported time unemployed. For upper-income households, which employ workers for both household and market work, the market wage may be a reasonably good approximation of opportunity cost.

The costs of child care may be evaluated from a somewhat different perspective by examining the impact of additional child care hours on market and non-market activities. To accomplish this, labour supply equations for different worker and household types were estimated using child care hours as an independent variable in ordinary least squares regression models. Other variables used to explain the number of hours supplied to market and non-market activities were: (a) asset and other non-labour income, (b) market wage rates and (c) the size of residence (area of living space in square feet per capita) used as a proxy for household wealth.^{6/} The results are reported in [table 4](#) (non-significant coefficients are not reported).

Table 4: Effect of child care hours on market and non-market hours of men, women and children (changes due to one-hour change in child care)

Household categories	Impact of one additional child care hour on					
	Mar.-F	Non-Mar.-F	Mar.-M	Non-Mar.-M	Mar.-FC	Non-Mar.-FC

Landless	-0.247 (0.105)	-0.340 (0.135)	-2.273 (1.057)	1.591 (0.239)	*	-0.17 (0.04)
Marginal	-0.719 (0.194)	-0.721 (0.180)	-2.893 (1.135)	1.169 (0.581)	0.41 (0.19)	0.772 (0.244)
Middle	-0.527 (0.120)	-0.513 (0.166)	*	1.764 (0.643)	*	2.796 (0.960)
Upper-middle	-0.717 (0.134)	*	*	0.634 (0.212)	*	3.320 (1.271)
Rich	*	-0.588 (0.207)	*	1.216 (0.375)	*	*

Notes: The statistics reported are the standard error of the estimates. If the estimated coefficient is not significant at the 5 per cent level or better, it is presented as " * " in the table and for estimation of costs, its value is considered to be zero. Mar.-X represents hours of market work by worker type X, where X could be adult male (M), adult female (F), or female children of age in between 10 and 14 years (FC). Non-market-X represents hours of non-market work by worker type X.

From these results, it is evident that increased child care demands reduce both market and non-market activities of women in all household categories, a result which should come as no surprise in view of the relatively large burden of child care borne by women in rural Bangladesh (see [table 1](#)). Market activities of males in landless and marginal farm households also declined significantly as a result of participation in child care activities, implying that market work and child care are not compatible activities for males in such households.

On the other hand, additional hours of child care provided by adult males and female children appear to increase their supply of labour for non-market activities. This is not an unanticipated result given the compatibility and presence of economies of scale among various non-market activities. Increased hours of child care would tend to make participation in other household activities, such as home cleaning and repair, less expensive than would be the undertaking of non-market and child care activities separately.

Table 5: Estimated income reduction due to child care hours, by household categories (in Taka)

Household categories	Value of time spent on child care ^{a/}	Income reduction due to child care hours ^{b/}
Landless	22.4	13.87
Marginal	18.5	25.81
Middle	19.4	11.90
Upper-middle	23.9	11.35
Rich	25.3	11.02

Notes:a/ Time spent on child care is evaluated at the non-market wage rate.

b/ Estimated from tables [2](#) and [4](#).

Using the labour supply coefficients from [table 4](#) and the hours of child care performed by the different types of worker from [table 2](#), it is possible to estimate the impact of one additional (i.e. marginal) hour of child care on total household income. [Table 5](#) shows that the income consequences of child care hours are highest for marginal and landless farm households. This implies that for these households, allocation of additional hours to child care results in direct reductions in income-earning activities. It is interesting to note that, while the direct valuation of time implies increasing time costs of child-rearing with increasing socio-economic status, the relationship is slightly negative in terms of income consequences. In rural Bangladesh, this is due to the small number of hours of market work performed by upper-income households. Increasing income/wealth in low-income settings tends to reduce the time allocated to market activities, and thus the income consequences of additional child care hours.

Monetary cost of child-rearing

To estimate the out-of-pocket cost of child-rearing, food consumption patterns of children for different household categories reported in a recent national survey were used (Ahmad and Hassan, 1983). The nutrition survey reported the mean consumption of different food items for four household-income groups. These correspond approximately to the following groups in this study: poorest group corresponds to the landless and marginal farmer categories, the combination of the second and third income categories corresponds to the middle-income category, and those in the fourth income category to the upper-middle-income and rich household categories in this study. Market prices in the study area were used to value the cost of mean food bundles observed in the national survey to provide local estimates of food expenditures for children. The resulting estimates of the monetary costs of child-rearing are shown in [table 6](#). From these data, it is apparent that the monetary cost of child-rearing increases with increasing socio-economic status of households. This is an expected result; higher income households tend to consume more per capita owing to a positive income effect for consumption goods. In addition, since higher expenditures on children may be expected to improve "child quality", the higher money costs of child-rearing by economically advantaged households may also reflect their preferences for higher quality children.

Table 6: Monetary cost of child-rearing in rural Bangladesh (Taka per week per child)

Household categories	Costs per week per child age 1-3				Food cost per child	Monetary cost per child (1 year)
	Cereal	Veg.	Milk	Total		
Landless	7.84	1.19	1.26	12.53	7.24	8.40
Marginal	7.84	1.19	1.76	12.53	7.24	8.62
Middle	8.47	0.91	1.82	12.95	7.38	9.23
Upper-middle	10.01	1.05	4.13	19.25	10.20	14.38
Rich	10.01	1.05	4.13	19.25	10.20	15.50

Notes: Food cost per child less than one year of age is derived by multiplying the food cost of 1-3-year-old children by the calorie consumption ratios 0.58, 0.58, 0.57, 0.53 and 0.53 for the five household categories, respectively. Monetary cost is derived by inflating the food cost by the factors 1.16, 1.19, 1.25, 1.41 and 1.52 for the five respective household categories. These factors of multiplication represent the total food and non-food expenditure to food expenditure ratios for each of the household categories derived from table 14.17 of the 1986 Statistical Yearbook of Bangladesh (Government of Bangladesh, 1986).

Total child-rearing costs

[Table 7](#) combines the components of child costs to examine total costs. Time costs measured in terms of income reduction owing to child care tend to decline with increasing household income, while the monetary costs tend to increase. Marginal farm households are an "outlier" from this general pattern. A possible explanation is that marginal farmers are required to allocate a large number of hours to market work in order to achieve sufficient rates of return on the small plots of land they own. In fact, the survey data indicate that marginal farm households allocate on average 54 hours per week to market work compared with only 20 hours performed by upper-income households. Increases in child care requirements thus have a proportionally larger income impact on marginal farm households. Total costs of child-rearing are roughly similar for landless and middle-income farmers, being approximately 18 per cent higher than for upper-middle-income and upper-income households.

Table 7: Child cost components and total cost of child-rearing

Household categories	Value of time spent on child care ^{a/}	Including		Cost of rearing children ^{b/}	Total cost for 0-1-year-old ^{c/}
		reduction due to child care hours ^{a/}			
Landless	22.4	13.87		8.40	22.27
Marginal	18.5	25.81		8.62	34.43
Middle	19.4	11.90		9.23	21.13
Upper-middle	23.9	11.35		14.38	25.73
Rich	25.3	11.02		15.50	26.52

Notes: a/ See [table 5](#).

b/ Total food and non-food expenditures (in Taka) on a child less than one year old.

c/ Sum of income reduction due to child care hours and monetary cost of child-rearing.

Noteworthy in these data is the fact that the absolute levels of child costs are extremely low for all household types in Bangladesh. Even for landless farm households, child costs are less than 5 per cent of the total household income. By way of comparison, expenditures on children up to 18 years of age in the United States of America have been estimated at between 13 and 24 per cent of total household income for different income groups at 1981 prices (Espenshade, 1984).

While the low cost of child-rearing in Bangladesh no doubt contributes to the maintenance of traditionally high levels of aggregate fertility, the extent to which costs of children serve as constraints against high fertility would not appear to be uniform across socio-economic classes. Higher child costs for upper-income households should, for example, tend to reduce the demand for children, while at the same time increased income may have a positive effect on the demand for children, especially in settings where the trade-off between child quality and quantity is extremely limited. For marginal farm households, higher relative child costs should imply lower fertility rates given a constant level of benefits from children, and is indeed consistent with the findings of relatively low fertility rates for marginal farmers in Bangladesh reported by Chowdhury (1977).

Discussion

This study has attempted to estimate the costs of rearing children for five categories of household in rural Bangladesh. Time and money costs of child-rearing were estimated from detailed time-allocation data and information on intra-household consumption patterns. An important element of the methodology considered in this study involves the determination of the "true" opportunity cost of child care hours in an economy characterized by significant levels of unemployment and underemployment. Under such circumstances, it is argued that conventional opportunity cost measures based upon market wage rates would tend to over-estimate the costs of children. The study proposes an alternative measure of the time cost of child care - the reduction in household income due to reallocation of time from market and non-market activities to child care.

The findings provide insights into the structural supports for high fertility in traditional agrarian economies, as well as a number of important policy implications. First, the findings reconfirm conventional thinking regarding the low cost of child-rearing in high-fertility societies. Owing to the flexibility of work and child care arrangements, households in the study population are generally able to combine productive non-market and child care activities, effectively subsidizing the costs of child care. The child costs observed in this population are low both on an absolute basis and relative to those observed in more developed economies.

Second, also contributing to the relatively low cost of children in this population is the existence of economies of scale in child-rearing. Owing to both the flexibility of work arrangements and the availability of multiple child care providers within households in the form of underemployed adults and older siblings, the results of this study suggest that the addition of a marginal child into households in which children are already present has a significantly lower impact on the time costs of children than would normally be presumed to be the case. In the villages studied, this economies-of-scale effect is estimated to be on the order of 20 per cent.

Third, some insights into the frequently observed positive correlation between economic status and fertility rates in pre-transitional societies are provided by the findings of this study (Lee and Bulato, 1983; Nag, 1980). While relatively low child care costs were observed for each of the five household categories considered in this study, the highest relative costs were observed for the lowest income households (landless and marginal farm households), while the highest income households had the lowest relative costs. It is estimated that landless households in the population studied in this research allocate the equivalent of approximately 5 per cent of their total household income (defined as the sum of market and non-market income) to child-rearing, as compared with less than 1 per cent among upper-income households. Thus, despite the fact that upper-income households make significantly higher investments in child quality in the form of higher monetary expenditures, the relative unit costs of children in this population are inversely associated with socio-economic status.

With regard to policy implications, this research suggests that formidable barriers stand in the way of substantial changes in fertility behaviour. While economic growth represents an important potential stimulus to changing fertility perceptions and behaviour, growth itself may not imply increasing child costs, at least in the short-run. In traditional societies, the introduction of innovations such as new seed varieties and improved water management practices have increased agricultural production and incomes significantly in a number of settings without resulting in major structural changes. In economies characterized by high levels of underemployment, such innovations are likely to have little effect on the time costs of children, and may in fact have the effect of making children even less costly.

The estimates from this study suggest that, as a result of economic growth in the absence of structural changes, absolute levels of child costs would be expected to increase by on the order of only 15-20 per cent. While this may have some substitution effect on the demand for children, improved incomes among landless and marginal farm households is likely to reduce the relative costs of children, which may well result in offsetting the demand-increasing income effect. Indeed, this phenomenon is an important explanation as to why fertility levels in a number of developing countries have decreased only slightly over the past 30 years or so despite quite impressive rates of economic growth.

Thus, the keys to fertility decline in this population would appear to lie in three areas: structural changes in the economy, the satisfaction of existing demand for family planning services, and the generation of additional demand for fertility regulation. Based upon the data for this study, changes in economic structure would have to accomplish the following before significant changes in fertility behaviour could reasonably be expected: (a) absorption of surplus male labour into market activities, which in general are not compatible with child care to the same extent as non-market activities, and would raise the opportunity cost of child care (and to a lesser extent home-based non-market activities) performed by adult males, (b) emergence of more substantial differentials in market and non-market wage rates, which again would raise the opportunity cost of child-rearing, and (c) generation of non-farm employment opportunities for adult females, which tend to be less compatible with child care. To the extent that home-based (i.e. non-market) activities by adult females remain prevalent, one of the primary structural supports for high fertility will remain in place, despite the significant economic contribution made by females in this population.

In terms of demand for fertility regulation, the Matlab experiment has demonstrated that latent demand for family planning exists in rural settings in Bangladesh not dissimilar in terms of economic structure from the villages studied in this research (Phillips and others, 1982). Thus, the extension and improvement of existing maternal and child health and family planning services to satisfy existing demand for such services in rural Bangladesh are likely to find some degree of success in reducing fertility levels. Over the medium- to longer-term, however, additional demand for fertility regulation will need to be generated. Given the strong structural supports for high fertility in rural Bangladesh, short- to medium-term efforts to generate additional demand might focus initially on child-spacing as a means of improving maternal and child health. Improving the appropriateness and acceptability of such services would enable family planning service-providers to satisfy the growing demand for fertility limitation which inevitably accompanies economic diversification and modernization.

Footnotes

1. In the economic literature, household welfare is defined by the consumption of goods and services per adult equivalent in order to take into account differential patterns of consumption by different age-sex groups. The addition of a child changes the adult equivalent units (AEU) present in the household, which in turn changes the slope of the budget line even without any change in prices of goods and services. The AEU-corrected price is referred to as "effective price".

2. Mincer and Polachek (1974) argue that the reduction of market earnings due to child-rearing is an incomplete measure of family investment on children for two reasons. First, the benefit of market work is the wage the worker receives, plus the specific human capital formed owing to the experience gained. Thus, the corresponding reduction in income cannot take into account the human capital aspect of costs. Second, participation in child care appears to depreciate human capital relevant for income earning. However, in our case neither of these reasons is expected to be important. We have defined income in a broader sense to incorporate both market and non-market income, and there is no reason to believe that participation in non-market activities such as child care will not improve the specific human capital in home production activities. Strict segmentation of tasks along age-sex categories also make these cost components extremely low, if not zero.

3. These procedures implicitly assume that the consumption bundles of children and adults are equally food-intensive. To the extent that the consumption basket of children tends to be more food-intensive than that of adults in most societies, an over-estimation of total material costs will result. However, since the ratio of food to total consumption tends to be quite high in low-income countries, the degree of over-estimation will tend to be quite small.

4. To illustrate these procedures, a household reporting 4.0 hours of child care per week for a 4.3-year-old child would be equivalent to 20.5 hours for a child under one year of age, as can be obtained from the mean hours of child care by age groups. However, if the household has two children ages 1.5 and 2.4 years and reports total hours of child care as being 24, we first need to correct this for economies of scale. Given 20 per cent savings, total hours without economies of scale should be 30 per week. From the estimate of child care hours by age group, these two children require a total of $(14.9 + 11.4 = 26.3)$ hours on average without

the presence of economies of scale. This implies that the household allocates 14 per cent more time to child care compared with the mean level. Thus, for this household, standardized child care hours, expressed in terms of hours of child care required for a child under one year of age will be (20.5 multiplied by 1.1407) 22.8 hours.

5. The market and non-market wage rates were as follows: adult males - Taka 2.03 and 1.96, respectively, per hour of work; adult female members - Tk 0.98 and 0.82 ; male children - Tk 1.78 and 1.47; female children - Tk 0.94 and 0.75 (approximately 28.5 taka = \$US1.00 in 1984). If home activities were performed using hired help, the wages paid to hired workers were used as the opportunity cost of non-market hours. For households with at least one member participating in home-production activities in exchange for a wage, the wage received was used. For all remaining households, the average of non-market wage rates received or paid were used.

6. A possible objection against this methodology might be that the category "child care hours" is not an independent variable, but rather is jointly determined with hours allocated to other activities, given prevailing wage rates and level of household income. However, while the decision to have a child or not is viewed as a matter of consumer choice, decisions regarding time devoted to child care tend not to be as flexible. If a child is present in the household, time must be allocated to child care. In this sense, considering child care hours as an independent variable in predicting total hours of work in market and non-market activities would seem reasonable.

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Client Satisfaction with Sterilization Procedure in Bangladesh

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The findings dispel the misconception that the decline in the number of sterilization cases in the late 1980s was due to growing dissatisfaction among sterilized clients

Since the mid-1960s, sterilization has become tremendously popular in Bangladesh. Currently, it is the leading contraceptive method in the country. The main reasons for its popularity are that it is a one-time method and that, once accepted, relieves couples from continuous worries about protecting against unwanted pregnancies. Further, in a country where the literacy rate is very low and the poverty level is high, the use of such a method makes it easier to get around the difficult problem of sustaining motivation among eligible couples to continue the regular practice of family planning.

The number of sterilization acceptors increased from 48,000 in 1975/76 to 363,000 in 1982/83 - a more than seven-fold increase in seven years - followed by a peak of 552,000 in 1983/84 (Ahmed and others, 1992).

The sharp increase in the number of sterilization acceptors between 1980/81 and 1983/84 can be attributed mainly to (a) an increase in client compensation payments from Taka 96 for a vasectomy and Tk108 for a tubectomy to Tk175 for both types of operation (\$US1.00 = about Tk38), (b) the payment of referral fees to family planning workers, (c) the establishment of sterilization targets for those workers, (d) a decline in sterilization-related deaths, (e) special activities of district-level mobile teams providing sterilization services and (f) government measures for maintaining and improving the quality of services.

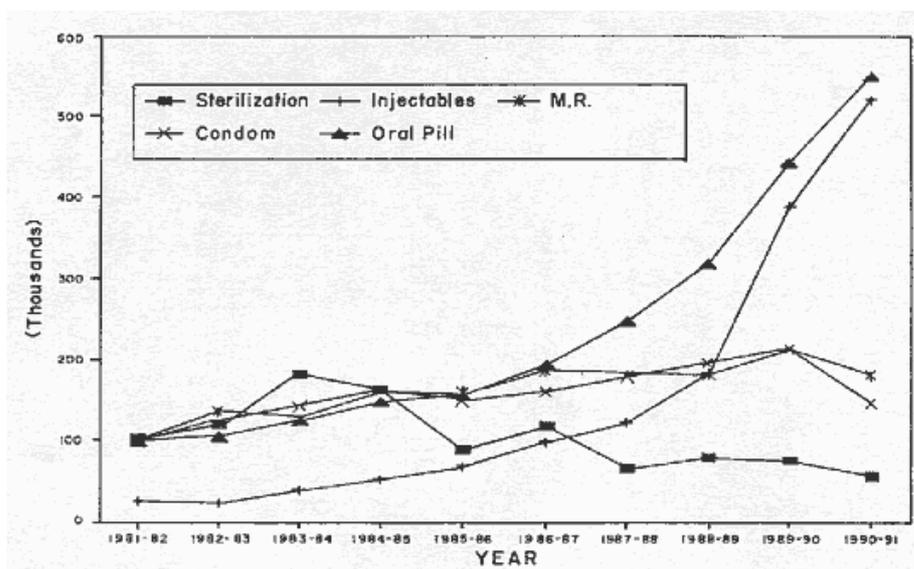
The trend was erratic until 1988/89, when a decline began, as shown in the accompanying figure. There was a marked decrease in the number of sterilization acceptors from 351,000 in 1986/87 to 196,000 in the following year. By 1990/91, the number of sterilizations performed had dropped to 165,000, the lowest number since 1979/80.

While virtually everyone agrees that the increase in the availability and use of temporary methods is a very positive and welcome development in a programme which had previously emphasized permanent methods, the Government of Bangladesh nevertheless views the decline in voluntary sterilization with considerable concern. In both its Third Five-Year Plan (1985-1990) and Fourth Five-Year Plan (1990-1995), the Government set ambitious goals for increasing contraceptive prevalence (Planning Commission, 1990).

The main strategy for promoting contraceptive services during the Third Plan period was to provide couples with a wider range of choices. Emphasis was put on strengthening the distribution system for oral pills with a view to reverse the declining trend in pill use during the pre-implementation period. The programme included provision of adequate facilities in order to maintain a high level of acceptability of IUDs and stressed the need to expand facilities in order to make injectables more widely available. Due importance was also given to increasing the acceptance of sterilization.

In spite of all its efforts, the family planning programme experienced a relatively low level of performance in contraceptive services at the beginning of the Third Plan period. The drop in sterilization was as high as 45 per cent of the previous level and the use of IUDs dropped 15 per cent compared with the previous year (1984/85). However, family planning performance, except for sterilization, greatly improved in subsequent years. During 1987/88, the number of sterilizations performed declined, whereas the use of the IUD and injectable methods exceeded enhanced target levels (Choudhuri, 1989). The acceptors of oral pills and condoms increased by almost 125 per cent and 140 per cent, respectively, over the 1985/86 benchmark level. During the first two years of the Third Plan, sterilizations fell far short of the numbers originally projected for achieving the goals of the national family planning programme (see [figure](#)).

Figure: Contraceptive prevalence by year



Source: Ahmed and others, 1992.

Notes: 1981/82 index = 100. Each method indexed to 100, except for injectables, which method is indexed to 25.

The Government is of the view that injectable and IUD services would be major components in the programme of the future. The Fourth Plan aims at phasing out traditional non-programme methods such as rhythm and abstinence by the end of 1995 and is committed to the promotion of other modern methods. The shift in emphasis of the family planning programme from sterilization to reversible contraceptive methods during the Fourth Plan period is also significant. For example, the relative share of sterilization, as was proposed at the beginning of Third Plan (1985/86), was as high as 40 per cent of the total. This proportion is to be brought down to 33 per cent by the end of the Fourth Plan period (1995), thereby increasing the share of modern reversible methods in the total contraceptive mix.

The decline in sterilization acceptance is a phenomenon that began in the mid-1980s. Many reasons for the decline have been suggested, but the exact nature of the causes of decline has yet to be ascertained. Some knowledgeable observers think that one of the factors causing the decline is the growing dissatisfaction among couples who have already been sterilized. The present study has been designed to throw light on this issue by (a) obtaining data on client perceptions about voluntary surgical contraceptive services and (b) identifying the major factors that are associated with the satisfaction or dissatisfaction of sterilized clients.

Data and methodology

The study is based on a large-scale field survey conducted during the period June to August 1990 in 16 rural *thana* (small administrative units) located in four administrative divisions of the country and four urban *thana* located in Dhaka, Chittagong, Khulna and Rajshahi, all of which are metropolitan cities. In order to make the sample of sterilized clients representative nationally, the ultimate sample size was 1,600, out of which 1,120 were tubectomy cases and 480 were vasectomy cases. The ratio of 70:30 conforms with the average actual distribution of sterilization cases during the previous three years.

Sterilizations in Bangladesh are performed mainly in *thana* health centres (THC) and family welfare clinics (FWC) in rural areas. In urban areas, the clinics and satellite clinics of the Bangladesh Association for Voluntary Sterilization (BAVS) with support from the Association for Voluntary Surgical Contraception (AVSC) and the Bangladesh Family Planning Association (BFPA) are the major centres for sterilization operations. Records of sterilized cases are maintained in these offices; they contain the names and addresses of both the clients and those who referred them for services.

The list of clients for the previous three years was disaggregated according to the sex of the client, with a total of 75 of them (50 tubectomy and 25 vasectomy cases) selected from the list of each rural *thana* and 100 of them (70 tubectomy and 30 vasectomy cases) from each urban *thana* by systematic sampling procedure with a random start; missing cases were replaced by the next available client. Of the 1,600 clients, 1,200 were selected from rural areas and 400 from urban areas. Ultimately, 1,348 sterilized clients (360 males and 988 females) were successfully interviewed; these clients constituted the sample for analysis. The sample included 19 per cent of vasectomy clients who underwent sterilization in 1987, 28 per

cent of those who had it done in 1988, 39 per cent of those who had it alone in 1989 and 14 per cent of those undergoing sterilization in 1990. Similarly, 16 per cent of the tubectomy clients underwent surgery in 1987, 28 per cent in 1988, 34 per cent in 1989 and 22 per cent in 1990. Male enumerators interviewed the vasectomy clients and female enumerators interviewed the tubectomy clients.

Results

Measurement of satisfaction or dissatisfaction

[Table 1](#) shows the distribution of the sterilized clients by selected variables. It reveals that about 90 per cent of the vasectomy clients and 95 per cent of the tubectomy clients were satisfied, whereas about 4 per cent of the vasectomy clients and 2 per cent of the tubectomy clients regretted their decision. However, 6 per cent of the vasectomy clients and 3 per cent of the tubectomy clients felt neither satisfaction nor regret. The satisfaction level in different studies (Rahman and others, 1978; Mitra and others, 1986, 1987) conducted during the 1970s and 1980s ranged from a satisfaction level of 84 per cent to 95 per cent for vasectomy clients and from 88 per cent to 98 per cent for tubectomy clients. Thus, the level of satisfaction obtained in our study was not less than the level found in other studies.

Table 1: Percentage of vasectomy and tubectomy clients by selected variables

	Vasectomy (N = 360)	Tubectomy (N = 988)
(a) Response to question about satisfaction		
Satisfied	89.7	95.2
Regret	4.4	2.4
Neither	5.9	2.4
(b) Correctness of decision		
Correct decision	94.4	95.0
Incorrect decision	5.6	5.0
(c) Recommendation of sterilization to others		
Have already recommended	63.6	64.5
Have not yet recommended	36.4	35.5
(d) Willingness to recommend sterilization		
Would recommend in future	91.7	91.1
Would not recommend in future	8.3	8.9
(e) Status of conjugal relationship		
Improved	13.9	18.3
Unchanged	83.3	78.3
Deteriorated	2.8	3.4
(f) Status of sexual ability		
Improved	14.4	15.5
Unchanged	82.4	81.8
Deteriorated	3.4	2.7
(g) Health status		
Improved	21.9	25.6
Unchanged	65.8	52.6
Deteriorated	12.3	21.8

The [table](#) also shows that almost 95 per cent of the vasectomy and tubectomy clients felt that they had made the correct decision in so far as they felt well about their sterilization operation. About 64 per cent of the male clients and 65 per cent of the female clients reported that they had already recommended sterilization to others although, respectively, about 36 per cent and 35 per cent of them had not yet recommended the procedure to others. Thus, it appears that the satisfaction level was relatively lower compared with those measured directly in panel (a). This indicates that the majority of the sterilized clients, although satisfied with the results, did not feel like discussing the procedure with others. Perhaps they may have come from different social backgrounds. Some of them were highly socialized and did not hesitate to

discuss their sterilization operation with others and to recommend it to them. Yet others were hesitant to discuss the matter with potential clients because of their traditional beliefs.

Panel (e) of the same table gives the distribution of sterilized clients by the status of their conjugal life after the operation. About 97 per cent of males and females reported that their conjugal life either improved or remained unchanged after the operation compared with the time prior to sterilization. The small remaining number of clients reported a deterioration in their conjugal life following sterilization. Only a tiny minority (about 3 per cent) of males and females reported a deterioration in their sexual ability after the operation, but all the others found that their sexual ability either improved or remained unchanged.

The last panel in the table shows the distribution of sterilized clients by their present health status compared with their health prior to undergoing sterilization. About 88 per cent of the vasectomy clients and 78 per cent of the tubectomy clients reported that they experienced either improved or unchanged health after the operation. A little over 12 per cent of the vasectomy clients and nearly 22 per cent of the tubectomy clients felt that their health deteriorated after the sterilization procedure. Although the proportion of clients stating that they experienced a deterioration in health appears to be higher than the proportion of dissatisfied clients measured by indirect measures, the deterioration may have been due to reasons unconnected with sterilization. These include malnutrition and disease, for example. In the opinion of the service providers, of those who perceived that they were suffering from sterilization-related problems, only 13 per cent of them had a real sterilization-related problem. This implies that dissatisfaction because of health-related reasons may be expected to be in the neighbourhood of 13 per cent.

Table 2: Percentage of sterilized clients saying whether they were satisfied with having been sterilized or regretted having been sterilized, by background characteristics

Characteristics	Satisfaction	Regret	Neither	N
Employment status				
—Employed	90.5 (93.3)	3.9 (3.3)	5.6 (3.4)	302 (180)
—Unemployed	28.7 (95.6)	7.3 (2.2)	10.0 (2.2)	58 (808)
Adequacy of household income				
—Adequate	97.4 (94.7)	0.0 (3.4)	2.6 (1.9)	38 (94)
—Inadequate	88.8 (95.2)	4.6 (2.4)	6.6 (2.4)	322 (894)
Household ownership of land				
—Own land	95.4 (95.5)	1.5 (2.6)	3.1 (1.9)	131 (310)
—Do not own land	86.5 (95.1)	6.1 (2.3)	7.4 (2.6)	229 (678)
Knowledge about not having any more children after operation				
—Had knowledge	90.9 (95.3)	3.4 (2.4)	5.7 (2.3)	351 (962)
—Had no knowledge	44.4 (90.4)	44.4 (4.7)	11.2 (4.9)	9 (26)
Ever-use of contraceptives				
—Ever used them	93.0 (94.1)	2.3 (2.7)	4.7 (3.2)	129 (511)
—Never used	3.9 (96.4)	3.9 (2.1)	92.2 (1.5)	231 (477)
Reasons for accepting sterilization				
—No more children	1.9 (95.5)	4.4 (2.3)	93.7 (2.2)	270 (852)
—Compensation money	6.0 (84.3)	5.2 (11.2)	88.8 (4.5)	90 (136)

Note: Figures within parentheses represent tubectomy clients.

[Table 2](#) describes the background characteristics of the sterilized clients whose level of satisfaction or dissatisfaction had been measured directly. The proportion of vasectomy clients reporting satisfaction with their decision was significantly higher ($p < .05$) among those who were employed than among those who were unemployed, but the difference was not statistically significant for the tubectomy clients. The level of income does not appear to be a significant predictor of satisfaction or dissatisfaction. A larger proportion of those who had cultivable land than those who had no land reported that they were satisfied. The difference was statistically significant ($p < .05$); however, this did not hold true for tubectomy clients. There was also a significant difference ($p < .01$) in the level of satisfaction between the proportion of those vasectomy clients who knew that they could not have a child after the operation and those who did not have such knowledge. However, no such statistical association was discerned for the tubectomy clients. Among vasectomy clients, there was a highly significant ($p < .001$) difference in satisfaction status between those who had ever used contraceptives compared with those who had never used them; however, this does not seem to be the case for tubectomy clients. The difference that existed between those tubectomy clients who had a motive for not having more children and those with other motives for sterilization was found to be highly statistically significant ($p < .001$). This finding is in sharp contrast with that for the vasectomy clients. No statistically significant differences were observed with regard to religion, education level or number of living children, among other characteristics.

Reasons for satisfaction or dissatisfaction

Table 3: Distribution of sterilized clients, by reasons for satisfaction/regret

Reasons for satisfaction	Vasectomy	Tubectomy
—No more children	64.1	65.9
—No fear of pregnancy in cohabitation	27.8	30.0
—Other	8.1	4.1
—Total	100.0 (N = 344)	100.0 (N = 964)
Reasons for regret		
—Frequent illness	43.8	12.5
—Deterioration of health	21.3	50.0
—Spouse/others look down upon me	10.1	8.0
—Want more children	8.8	8.7
—Other	25.0	20.8
—Total	100.0 (N = 16)	100.0 (N = 24)

[Table 3](#) shows the distribution of sterilized clients by the reasons for their expression of satisfaction or regret. They described these reasons when they were asked why they were satisfied or dissatisfied with their decision to be sterilized. The dominant reason for satisfaction was that they would not have any more children. The second most important reason was that sterilization freed them from continuous anxiety about becoming pregnant and consequently they gained greater sexual satisfaction. This was true for both vasectomy and tubectomy clients. The other reasons for having undergone sterilization did not seem very important: for example, improved economic condition of the household, better education for existing children, and better health for the mother and other children.

On the other hand, the dominant cause for regret among the vasectomy clients was frequent sickness; among the tubectomy clients, it was deterioration of health following the operation. Fewer than one out of every 10 respondents cited a desire for more children as the cause of their dissatisfaction. Among the "other" category of causes, the main ones for both groups of clients were the death of one of their children and the operation facility being located at inappropriate places and the like.

Table 4: Distribution of sterilized clients expressing satisfaction or regret with having been sterilized, by reported reasons

Reason	Satisfaction	Regret	Neither	N
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Reception at the waiting room				
Proper reception and care	91.0	4.0	5.0	300
	(96.1)	(2.1)	(1.8)	(938)
Poor reception and care	83.1	6.8	10.1	59
	(76.2)	(8.3)	(12.5)	(48)
Satisfaction with facilities received in the clinic				
Satisfied	93.3	2.0	4.7	345
	(96.3)	(1.7)	(2.0)	(963)
Not satisfied	6.6	60.0	33.4	15
	(56.0)	(32.0)	(12.0)	(25)
Sharing of compensation money with others				
Shared	72.9	12.9	14.2	85
	(91.5)	(3.8)	(4.7)	(106)
Not shared	94.9	0.1	5.0	275
	(95.6)	(2.2)	(2.2)	(880)
Clinical and pathological examination				
Carried out	90.2	3.8	6.0	317
	(95.3)	(2.4)	(2.3)	(970)
Not carried out	86.0	9.3	4.7	43
	(91.7)	(0.0)	(8.3)	(12)
Treatment received in the clinic				
Received	76.9	7.6	15.5	278
	(93.9)	(2.8)	(3.3)	(213)
Not received	75.0	25.0	0.0	82
	(70.0)	(13.3)	(16.7)	(30)
Physical complaints after discharge				
Had complaints	75.6	12.2	12.2	82
	(86.7)	(6.4)	(6.9)	(188)
Did not have complaints	93.9	2.2	3.9	278
	(97.2)	(1.5)	(1.3)	(793)
Death of one's child after undergoing sterilization procedure				
Experienced a death	85.2	11.1	3.7	27
	(82.1)	(10.7)	(7.2)	(28)
No such death experienced	90.0	3.9	6.1	333
	(95.6)	(2.2)	(2.2)	(956)

Note: Figures within parentheses denote tubectomy clients.

The reasons for satisfaction or regret were also analyzed indirectly from the clients' responses (table 4). The table shows that the proportion of tubectomy clients satisfied with their decision was significantly higher ($p < .05$) among those who were given a proper reception at the clinic than among those who were not, but the difference was not statistically significant for the vasectomy clients. The "clinical and pathological examination" does not appear to be a significant predictor of satisfaction or regret for vasectomy or tubectomy clients. A larger proportion of those who did not share the compensation money with others were reported to have been satisfied than those who shared it with others. This difference was statistically significant ($p < .01$) for the vasectomy clients. There is a significant difference ($p < .05$) in the proportion of tubectomy clients who were satisfied between those who received treatment in a clinic and those who received treatment elsewhere. However, no such statistical association was discerned for the vasectomy clients. The difference in satisfaction status was highly significant ($p < .01$) for those who received better service in the clinic than those who were not satisfied with the service facilities. This holds true for both the vasectomy and tubectomy clients. The proportion of satisfied tubectomy clients was higher ($p < .05$) among those who did not experience the death of one of their children after the operation than among those who had experienced the death of a child, but this difference was found to be not significant in the case of vasectomy clients.

Voluntarism in the VSC programme

Almost all of the sterilized clients had universal knowledge about family planning methods prior to undergoing the operation. About 98 per cent of the vasectomy clients and 97 per cent of the tubectomy clients knew beforehand that they would not be able to bear any more children following the sterilization procedure. They indicated this by signing the consent form or putting their thumb-print on the form. About 85 per cent of the vasectomy clients and 94 per cent of the tubectomy clients reported that their main motive for undergoing sterilization was so that they would have "no more children" and that compensation payments had facilitated their acceptance of the procedure. In the VSC programme, no sterilized client reported coercion.

Discussion and recommendations

Sterilization is the single most preferred method of contraception in Bangladesh. Because of its effectiveness, it has gained tremendous popularity among eligible couples in recent years. This study was undertaken in the face of certain alarming misconceptions regarding the decline in the number of sterilization acceptors in recent years and a misunderstanding regarding voluntarism in the VSC programme. The voluntary nature of the VSC programme is reflected in the findings; no evidence of coercion emerged from the client survey. The findings dispel the misconception that the decline in the number of sterilization cases in the late 1980s was due to growing dissatisfaction among sterilized clients.

What, then, are the principal causes that have contributed to this decline? During the last decade, both the Government of Bangladesh and non-governmental organizations installed an extensive community-based service-delivery system for pills and condoms (to homes) and injectables (in family welfare centres and satellite clinics). It is not surprising therefore to see that pill and injectable use has increased sharply in the 1980s as a result of adopting the so-called "cafeteria" approach which offers a variety of modern contraceptives. These changes in programme strategy have tended to make inroads on the prevalence of sterilization.

Monetary compensation appears to be particularly important in the Bangladesh context; it is perceived as affording the VSC acceptors a respite from their regular daily work and thus increasing their chances of quickly recovering from the operation. Because the amount of compensation has remained at Tk175 since 1983, inflation had eroded the value substantially (to about half of what it was in 1983). The erosion of the value of these payments was one of the reasons most frequently cited by field-level workers for the decline in the number of sterilizations performed.

Until 1988, field-level workers received a token referral fee of Tk45 for each client referred. This system of referral payments was said to result in an abuse of the system, especially by ad hoc agents. As a result, the Government discontinued per case payments in early 1988. Since the abolition of the referral fee, government and NGO workers have been reluctant to spend money out of their own pocket to bring clients to clinics. Further, the absence of travel funds is also believed to have adversely affected the number of sterilizations performed.

There is ample evidence to suggest that the number of trained physicians available to provide sterilization services is declining (Ahmed and others, 1992). The inability to supply adequate services owing to the lack of trained providers at a time when there is substantial demand for such services plays a major role in the decline in the number of sterilizations performed.

Having identified some of the possible factors that appear to have caused the decline, we raise some issues which need to be addressed at the policy-making level by the Government if Bangladesh is to reach its ambitious population goals during the Fourth Plan period.

— An institutionalized system of in-service training for voluntary sterilization should be developed in order to address the existing demand for good quality voluntary sterilization and the deterioration in the capacity for serving that demand.

— The existing system of client compensation should be retained; moreover, the Government should consider adjusting upward the level of this payment in order to offset, at least partially, the effect of inflation on the value of the payment.

— The Government should consider re-instituting a modest allowance for government field-workers. For each voluntary sterilization case that they refer and accompany to a clinic, they should receive compensation for their reported out-of-pocket expenses.

Before concluding, a few more observations seem in order. Although the Government has shown

considerable commitment to improving the quality of services in its family planning programme, the sterilization-related mortality rate has increased beginning in 1988. The Government views this increase as unacceptable in the face of the recent downward trend in sterilization acceptance. In addition, a significant proportion of the resources of the Association for Voluntary Surgical Contraception and its work in Bangladesh until recently was devoted to the Bangladesh Association for Voluntary Sterilization. It was planned that this support would be phased out by the end of 1992. These factors are expected to have a further far-reaching effect on the acceptance of sterilization.

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Population Ageing and Women in Kerala State, India *

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In this note we examine the ageing of the female population in the State of Kerala, India, in the light of current and future demographic trends as well as the social and economic implications of this process.

Concerning the choice of Kerala, it should be mentioned that in no Indian State is the demographic transition as advanced as in Kerala. The population density in this State is rather high, but its growth rate is now rapidly declining, with a high average age at marriage, a high level of family planning acceptance and fertility control, a moderate decline in mortality and a high degree of population mobility. The population is also fairly well advanced in terms of literacy and educational attainment and is moderately successful in introducing social change.

Table 1: Selected indicators of development of women in Kerala and India, 1961-1991

	Kerala				India			
	1961	1971	1981	1991	1961	1971	1981	1991
Female population	8.5	10.8	12.9	14.7	14.7	21.3	26.4	33.1
Sex ratio (females per thousand males)	1,022	1,016	1,032	1,040	941	932	934	923
Literacy rate								
—Males	64.9	77.1	84.6	94.4	34.4	39.5	—	52.6
—Females	38.9	54.3	65.7	86.9	13.0	18.4	24.8	32.4
Infant mortality rate (per thousand live births)	66	61	37	22	114	138	119	91**
Married couples (per thousand population)	—	151	140	—	—	170	165	—
Child-to-woman ratio* (per thousand women)	700	550	409	—	659	655	546	—
Mean age at marriage (years)								
—Men	26.3	26.7	27.7	—	20.0	22.4	23.4	—
—Women	19.8	21.1	21.9	—	14.5	17.2	18.7	—
Expectation of life at birth (years)								
—Men	46.2	60.5	60.6	66.9	41.9	46.4	54.1	60.6
—Women	50.0	61.1	62.1	72.8	40.6	44.7	54.7	61.7
Proportion of female workers to total female population	19.7	13.5	16.6	28.0	11.9	19.8	19.7	22.7

Source :Women in Kerala, Department of Economics and Statistics, 1981, Government of Kerala and Cencus of India, 1991.

Notes: * = Children in the age group of 0-4 years; ** = 1989.

Table 2: Proportion of women aged 60 and above in the total female population of India and its major States, 1981

States	60-64 %	65-69 %	70+ %	60+ %	Index No.
Andhra Pradesh	2.8	1.5	2.6	6.9	101

Bihar	3.1	1.3	2.4	6.8	100
Gujarat	2.6	1.5	2.3	6.4	94
Haryana	2.4	1.3	2.0	5.7	84
Himachal Pradesh	2.6	1.4	2.7	6.7	99
Jammu & Kashmir	2.1	0.9	2.0	5.0	74
Karnataka	2.8	1.4	2.6	6.8	100
Kerala	2.7	2.1	3.0	7.8	115
Madhya Pradesh	2.8	1.5	2.6	6.9	101
Maharashtra	2.7	1.6	2.4	6.7	99
Orissa	2.7	1.5	2.5	6.7	99
Punjab	2.7	1.6	3.0	7.3	107
Rajasthan	2.8	1.3	2.2	6.3	93
Tamilnadu	2.7	1.5	2.1	6.3	93
Utter Pradesh	2.7	1.4	2.4	6.5	96
West Bengal	2.3	1.3	2.1	5.7	84

Source: Census of India, Social and Cultural Tables, 1981.

Note: Index measures the relative incidence of ageing of women between the various States.

[Table 1](#) provides the main social and demographic indicators for Kerala and India as a whole; it indicates that Kerala's women are way ahead of women nationally in terms of these indicators. Of the various States in India, the overall sex ratio (females per 100 males) in Kerala has been much higher throughout the present century than for any other State or the country as a whole. As a result, in no Indian State is the ageing of the female population as advanced as it is in Kerala. [Table 2](#) shows that Kerala leads all other Indian States in its proportion of women above the age of 60 years. The proportion of elderly women in Kerala is 15 per cent higher than in the country as a whole. However, the distribution of elderly women among the three age-groups, 60-64 years, 65-69 years and 70+ years, is strikingly different in Kerala compared with most of the other States. While the proportion of women aged 60-64 years is 3.1 per cent for India as a whole, it is only 2.7 per cent for Kerala. By contrast, Kerala leads all other Indian States in the proportion of women over 65-69 and 70+.

Trends and projections

Table 3: Population of Kerala aged 60 or more years of age: actual and projected, 1961--2026

Year (1)	Population aged 60 (in millions)			Population aged 60+ (percentage of total)		
	Total (2)	Male (3)	Female (4)	Total (5)	Male (6)	Female (7)
1961	0.9	.4	.5	5.8	5.7	6.0
1971	1.3	.6	.7	6.2	6.0	6.5
1981	1.9	.9	1.0	7.5	6.4	7.6
1986	2.2	1.0	1.2	7.8	7.1	8.6
1991	2.6	1.1	1.5	8.7	7.7	9.7
1996	3.1	1.3	1.7	9.5	8.3	10.7
2001	3.5	1.5	2.0	10.2	8.9	11.5
2006	4.0	1.7	2.2	10.8	9.4	12.2
2011	4.6	2.0	2.6	11.9	11.6	13.2
2016	5.7	2.6	3.1	13.8	12.6	15.0
2021	6.9	3.2	3.7	16.0	14.8	17.1
2026	8.3	3.9	4.4	18.4	17.3	19.5

Source: Census of India, Reports; and Population Projections for Kerala, Bhat and Rajan, CDS.

[Table 3](#) presents a picture of how the population of Kerala has been ageing since 1961 and how it will look until the year 2026. It should be noted that since 1961 the population of elderly women has exceeded that of elderly men. The absolute excess, which was 0.1 million in 1961, is expected to be 0.6 million in 2011,

stabilising at 0.5 million from 2016 onward.

Thus, while the total population of the elderly is estimated to have increased from 0.9 million in 1961 to 2.6 million in 1991, the elderly population is projected to reach 8.3 million in 2026. During the same 35-year period, the number of elderly female women will have increased from 0.5 million to 4.4 million. It is also of significance that, while the percentage of elderly men in the total male population will have increased during this period from less than 6 to over 17, the percentage of elderly women in the total female population will have increased from 6 to about 20. Thus, elderly women will continue to outnumber elderly men in Kerala.

The gender gap in mortality

The estimated and projected expectation of life at birth for selected time periods, namely 1960-1965, 1980-1985, 2000-2005 and 2020-2025, are presented in [table 4](#). Not only has the expectation of life at birth been consistently higher for women in Kerala compared with men, but the gap in recent years has been widening. By contrast, for the country as a whole, the male-female differential has been in favour of men and will remain so into the next century. Whereas in 1960-1965, the expectation of life for women in Kerala was higher by 3.8 years, in the quinquennium of 1980-1985, it was higher by 5.9 years. The expectation of life at birth in Kerala is projected to reach 76.9 years for men and 79.8 years for women during the period 2020-2025. With the projected faster improvement in the expectation of life of men, the difference between men and women with regard to expectation of life at birth is projected to decline from 5.9 years during 1980-1985 to 2.9 years during 2020-2025. For India as a whole also, the projections are that the gender differential will have turned in favour of women by the period 2020-2025, but at a distinctly lower level of life expectancy for both women (68.6 years) and men (67.2 years).

Table 4: Sex differences in estimated and projected expectation of life at birth, Kerala State and India, 1960-1965, 1980-1985, 2000-2005, 2020-2025(years)

Years	Kerala			India		
	Male	Female	Difference	Male	Female	Difference
1960-1965	56.2	60.0*	3.8	44.5	43.0	-1.5
1980-1985	65.6	70.2	5.9	53.0	52.0	-1.0
2000-2005	74.4	78.1	4.3	61.0	60.3	-0.7
2020-2025	76.9	79.8	2.9	67.2	68.6	1.4

Sources: Statistics for Planning, 1986. Bureau of Economics and Statistics, Government of Kerala; Estimates by Bhat and Rajan, unpublished CDS working paper; and *Periodical on Aging*, Department of International Economic and Social Affairs, United Nations, New York, 1985.

Note: * Refers to 1965-1968.

Table 5: Sex ratio in Kerala for the general population and the elderly, 1961-2026

Year	Total Population	Age Group		
		60+	60-74	75+
1961	102	108	107	113
1971	102	109	107	117
1981	103	113	120	131
1991	104	128	122	156
2001	101	131	127	144
2011	101	126	119	148
2021	100	114	108	141
2026	99	111	106	132

Source: Census of India, Population Projections, CDS.

Male predominance in the sex ratio at birth is a global biological phenomenon; however, the sex ratio in India, expressed in the Indian censuses in terms of the number of females per 100 males, is very low. It can be observed from [table 5](#) that the sex ratio among the elderly in Kerala is even more pronounced for all the years projected when compared with the general population. If the elderly are disaggregated, the sex ratio

is particularly high among the very old, i.e. those over 75 years of age. The peak of 156 females for every 100 males over 75 years of age was reached in 1991; thereafter, the ratio is expected to start declining, but at a much slower pace among the younger elderly (60-74 years of age) than among the older elderly (75+ years).

Heavy female concentration among the very old is a likely future trend. In terms of numbers, the elderly in Kerala over the age of 75 years will number 1.97 million in 2026; as many as 1.12 million of that number will be women. The preponderance of women at old ages, particularly among the very old, has important implications for policy makers.

Marital status among elderly women

In view of the fact that in Kerala women not only outnumber men but also outlive them, it is important to know about their likely marital status when they become old, because that could influence the overall level of care and support they receive both from their family and society.

Table 6: Percentage distribution of population by age, sex and marital status in India and Kerala, 1981

Age group		Kerala			India		
		C	W	D/S	C	W	D/S
All ages	Male	37.0	1.1	0.2	42.0	2.4	0.2
	Female	38.7	9.1	1.4	45.8	8.0	0.4
60-64 years	Male	90.8	6.0	1.0	83.4	14.1	0.4
	Female	42.6	52.3	2.2	43.1	56.1	0.5
65-69 years	Male	87.82	8.9	1.0	80.3	17.2	0.4
	Female	33.0	63.0	1.6	40.6	58.6	0.4
70+ years	Male	77.9	19.1	1.1	70.4	27.0	0.4
	Female	16.7	80.7	1.0	21.7	77.6	0.3

Notes: C = currently married; W = widowed; D/S = divorced or separated.

[Table 6](#) gives the percentage of widowed men and women by age both for Kerala and India as a whole. It can be seen that, while only 1 per cent of the total male population in Kerala is widowed, the proportion of the female population widowed is 9 per cent. The corresponding proportions for the country as a whole are 2 per cent and 8 per cent, respectively. The gender gap in the incidence of widowhood in Kerala is thus more than twice that for the country as a whole. While 19 per cent of men aged 70+ in Kerala are widowers, over 80 per cent of the women of that age were widowed in 1981. The corresponding percentages for the country as a whole during that period were 27 and 78, respectively.

With advancing age, the incidence of widowhood obviously accelerates regardless of whether people are living in rural or urban sectors, as can be seen from [table 7](#). In the age group of 70+, over 92 per cent of the rural women in Kerala are widows as compared with almost 80 per cent in India as a whole.

Table 7: Percentage of widowed persons by sex and age group

Age groups	Rural				Urban			
	Kerala		India		Kerala		India	
	Male	Female	Male	Female	Male	Female	Male	Female
60-64	7.37	57.2	17.8	62.0	6.8	63.3	11.0	64.2
65-69	9.96	65.3	21.0	64.0	9.4	70.8	17.5	67.7
70+	21.10	92.3	30.9	79.9	18.9	85.4	27.9	82.4

Source: Census of India, Social and Cultural Tables, 1971.

The differences in the incidence of widowhood arise for several reasons, the most important of which are the following: (a) sex differentials in the age at marriage, (b) women having married men who are significantly older than themselves and therefore belonging to cohorts which are exposed to a higher risk of mortality, (c) the higher expectation of life of women and (d) the significantly higher rate of remarriage among men compared with women.

Age at marriage

[Table 8](#) shows that the age at marriage for both men and women has been consistently higher in Kerala right from the turn of the century than for the country as a whole. The mean age at marriage of women in Kerala was 17.1 years in 1901 when the corresponding figure for India as a whole was 13.2 years. In 1981, the age at marriage for women in Kerala was 21.9 years and that for women in India as a whole was 18.3 years. In terms of age differences between marriage partners, the sex differentials have come down more sharply in India as a whole than in Kerala. While for the whole of India, the sex difference in mean age at marriage has varied between 7.0 years and 4.4 years over the 80-year period. In Kerala, the age difference, although quite high, has fluctuated between a narrower range, namely, 6.8 and 5.3 years. However, the higher age differentials of marriage partners combined with the higher expectation of life of women as compared with men (see [table 4](#)) contribute to the high incidence of female widowhood. Further investigation is needed to determine whether the significantly lower rate of male widowhood can be explained largely in terms of these two factors. In this context, it is relevant to note that, in 1981 for both Kerala and India as a whole, the proportion of those currently married among men was at least twice as high as among women at higher ages (i.e. at 60+). Also, this position was somewhat more pronounced in Kerala than for India as a whole (see [table 6](#)). This strongly suggests that remarriage is possibly more prevalent among men relative to women in Kerala than in the rest of India.

Table 8: Mean age at marriage for men and women 1901-1981

(years)

Year	India			Kerala		
	Men	Women	Difference	Men	Women	Difference
1901	20.2	13.2	6.1	23.2	17.1	7.0
1911	20.5	13.6	6.5	23.8	17.3	6.9
1921	18.4	12.6	5.5	23.3	17.8	5.8
1931	20.2	15.0	6.0	25.6	19.6	5.2
1941	19.8	15.4	6.3	25.6	19.3	4.4
1951	21.4	16.1	6.5	26.3	19.8	5.3
1961	21.3	16.7	6.8	23.8	20.0	4.6
1971	22.7	17.2	5.5	26.3	20.8	5.5
1981	23.3	18.3	5.3	27.2	21.9	5.0

Sources: *Fact Book on Population and Family Planning*, Demographic Research Centre, Trivandrum, 1974; and *Women in India: A Statistical Profile, 1988*. Government of India, New Delhi.

Dependency ratio

There are a number of different ways of looking at the extent to which elderly people become dependent on society. [Table 9](#) presents various dependency ratios. The old-age dependency ratio indicates the number of dependents above the age of 60 per 100 persons of working age, i.e. those between the ages of 15 and 60. The old-age dependency ratio for Kerala in 1981 stood at 13; by 2026, this ratio is projected to go up to 81.

Table 9: Dependency ratios

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total 60+	Total 60+	Females 60+	Total 0-4	(0-14)	(0-14),	Total 60+
	Total (15-59)	Female (15-59)	Male (15-59)	Female (60+)	15-59	Total (15-59)	Total (0-14)
1981	13.0	25.4	13.10	300	62.0	-	-
1991	14.1	27.9	16.9	197	47.0	61.2	30.0
1996	15.1	30.1	17.1	180	44.0	59.2	34.4
2001	16.1	32.2	18.3	161	42.2	58.3	38.2
2006	17.0	34.2	19.4	143	40.8	57.9	41.7
2011	18.7	37.8	21.1	124	38.8	57.6	48.2
2016	22.0	44.4	24.2	105	37.4	59.4	58.7
2021	26.0	52.6	28.2	90	36.4	62.3	71.5

2026 31.0 62.7 33.1 78 37.3 68.2 83.0

Source: Computed from Bhat and Rajan.

1. Population age 60+ ÷ total population (15-59).
2. Population age 60+ ÷ female population (15-59)
3. Female population 60+ ÷ female population (15-59)
4. Children (0-4) ÷ female population (60+).
5. Population (0-14) ÷ total (15-59).
6. Population (0-14) + (60+) ÷ total (15-59)
7. Population (60+) ÷ total (0-14).

If the number of total elderly is compared with only the female population of working age, in order to indicate the burden of day-care that the elderly place on women who normally are the ones who provide care for them, in the year 2026 every 100 women will have to take care of 63 older men and women. Of course, the elderly are not alone in depending on others for care and support. Children also need to be taken care of. In fact, it can be argued that, even when the elderly do not have any economic contribution to make, they still can, and do, partake in providing child care and this is especially so for elderly women.

Economic status of the elderly

The vast majority of the elderly do not have any independent means of support except for those who had a pensionable job during their working life. Those who are involved in agriculture or casual wage labour have access to income only during their working life. Once they cease working, they become totally dependent on their children or relatives for support. As a result, elderly men and women continue to work much beyond what is normally regarded as the working ages.

In 1981, while the work participation rate for men above the age of 60 was as high as 43 per cent, only 7 per cent of the women were engaged in work (table 10). Of course, recorded work participation among women was considerably lower than among men even at younger ages. Thus, for the age group 40-49 years, the work participation of women was only 27 per cent compared with men's 88 per cent in 1981. The drop in women's work participation at age 60+ is considerably more pronounced than for men. This clearly has implications with regard to the considerably higher dependency of elderly women in comparison with elderly men.

Table 10: Work participation by sex and age groups in Kerala, 1981

(per cent)

Age group	Men	Women
All ages	41.01	12.77
40-49	88.09	26.75
60+	43.40	7.03

Source: Census of India, 1981.
Economic support for the elderly

The problems of the elderly have traditionally been taken care of by the family network. The entire responsibility for the care and support of the elderly members still continues to be shouldered by the family irrespective of whether it is a matriarchal or patriarchal family. While the obligations of the family to look after the elderly and respect them still holds true in both India as a whole and Kerala, there are many factors which may make the practice of the ideal increasingly problematic. Thus, it is becoming necessary for the State to take initiatives in the matter of the care of the elderly.

Welfare programmes for the elderly

When the Kerala State Government initiated a pension system for the destitute elderly and widows in 1967, the pensions were restricted to those who had no family to help them or who had been abandoned by their relatives, or whose family income was extremely low. In 1980, a separate scheme was introduced granting pensions to agricultural workers with a family income below a prescribed ceiling; the entire cost of these two schemes is met by the State exchequer. The pension rates have been revised upwards from time to time following escalations in the cost of living. Nonetheless, the rates are very low in real terms and are just about adequate to cover the cost of minimal quantities of basic food items. In 1989-1990, the number of

persons covered under the first scheme was 180,000 and under the second scheme 300,000. Of the pension schemes administered by Kerala State, none is specially addressed to elderly women. Under the scheme for destitute people, there is a special provision made for pensions for widows and divorced or separated women. But the entitlement to a pension under this provision concerns the marital status of the women and their economic position, not their age. As far as the other scheme is concerned, it is quite likely that many elderly women may be left out, not because they are not in need of assistance, but because they do not qualify for it in terms of the occupational norms that had been adopted for the pension scheme. Thus, there is a need to address the problems of elderly women who do not fall either into the category of destitutes or those who had worked in a particular occupation. With the passage of time, their numbers are bound to swell and their economic problems become more acute.

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