

ND-ABB-512-A

EVALUATION OF THE FEMALE EDUCATION SCHOLARSHIP PROGRAM

SUPPORTED BY THE ASIA FOUNDATION

BY

TIN MYAING THEIN PH.D.
TEAM LEADER

AND

DR. M. KABIR

DR. MAHMUDA ISLAM

SEPTEMBER 1988

EDITED BY ELEANORE BOYSE

DECEMBER 1988

~~XD-ABB-512-A~~

15/1 127670

EVALUATION OF THE FEMALE EDUCATION SCHOLARSHIP PROGRAM

SUPPORTED BY THE ASIA FOUNDATION

by

TIN MYAING THEIN Ph.D
Team Leader

and

DR. M. KABIR

DR. MAHMUDA ISLAM

September 1988

Edited by ELEANORE BOYSE

December 1988

EVALUATION OF THE FEMALE EDUCATION SCHOLARSHIP PROGRAM

	<u>Contents</u>	<u>Page</u>
Chapter 1.	Executive Summary	1
Chapter 2.	Introduction and Background	5
2.1	Economic, Political and Social Context of the Project	7
2.2	Purpose of the FESP Project	7
2.3	Purpose of the Evaluation	8
Chapter 3.	Methodology, Constraints and Team Composition	9
Chapter 4.	Findings	11
4.1	Literature Review	13
4.2	Female Secondary Education and the Age at Marriage	13
4.3	Female Secondary Education and Fertility	14
4.4	Female Secondary Education and use of Contraception	19
4.5	The Affect of Education on Fertility:A Multivariate Analysis	20
4.6	Impact on Enrollment	22
4.7	Impact on Social Status	23
4.8	Benefits to the Schools	25
4.9	Selection Criterion Impact	26
4.10	Management Costs	27
Chapter 5.	Conclusions and Recommendations	31
References		35
Annex:	The Affect of Education on Fertility: A Multivariate Analysis	41
CPS	: Contraceptive Prevalence Survey	
BFS	: Bangladesh Fertility Survey	
FUS	: Follow-up Survey	
TAF	: The Asia Foundation	
SGS	: Southern Gonounnayan Samity	
BACE	: Bangladesh Association for Community Education	
FESP	: Female Education Scholarship Project	
USAID:	United States Agency for International Development	
SSC	: Secondary School Certificate	

CHAPTER 1

EXECUTIVE SUMMARY

Objectives of the Female Secondary Education Scholarship Project.

The Female Secondary Education Scholarship Project is a pilot project to test the impact of a female educational intervention on high fertility rates.

The immediate objective of the female scholarship project is to encourage girls to enter and continue secondary school, and to lower fertility by delaying marriage and increasing contraceptive use.

Purpose of the Evaluation

This project is still in its pilot stage. The purpose of the evaluation is to ascertain whether or not this project has had any impact on fertility and education. Specifically, the evaluation is to address four major issues. The first relates to its demographic impact, i.e., delay of age at marriage, increased use of contraceptives and reduced fertility. The second relates to the encouragement of girls' enrollment into secondary school. The third deals with other social aspects, such as encouragement of enrollment in primary schools, reduction of drop-out rates of girls in primary and secondary schools, increased opportunities for female employment and raising the status of women in the family and the community. The fourth deals with the impact of the selection criteria on the program. In addition, certain management issues were to be examined, i.e., cost per student, management costs and comparative cost between projects with selection criteria and without selection criteria. The evaluation team was to consider the evidence and recommend whether AID should discontinue funding the program and phase it out, continue the project with limited support, or continue and expand the project through funding from AID, or in collaboration with other donors.

Study Method

The study had a time limit of six weeks. A team of three evaluators each undertook different aspects of the study. Dr. Kabir was responsible for the demographic analysis, Dr. Islam for the anthropological and sociological analysis, and Dr. Thein was responsible for the sociological analysis, management issues and coordination of the study. Additional technical assistance was provided by the USAID Research and Evaluation Advisor.

Secondary data were used to assess the demographic impact of the program. TAF had previously conducted a Follow-Up Survey (FUS) of all girls who had left the program. This survey was used as the database for the evaluation. As standards for comparison the 1983 and 1985 Contraceptive Prevalence Surveys (CPS) and the Bangladesh Fertility Survey (BFS) were used.

FUS data had two major limitations. The first was the young age of girls who had gone through the program, and could therefore be followed up. The oldest girl was aged 22 years. The second was the relatively small number of girls available for follow up, 1,693, of whom only 623 were married.

For the sociological part, first-hand data were gathered through focus group interviews, field visits, and from project records and reports. Among the groups interviewed were: project staff at TAF and other NGOs; parents from program and non-program (control) areas; girls with and without secondary education; girls in the project area without any schooling; teachers and headmasters. These focus groups were drawn by purposive sample, and data collection was conducted in the field.

Findings

Demographic Impact and Contraceptive Use.

The population literature shows conclusively that fertility decreases are associated with increased education. Studies in Bangladesh also show the same relationship.

According to the 1975 Bangladesh Fertility Survey, educated women tend to marry later than their uneducated cohorts. Women with no schooling married at the average age of 12.8 years, women with some primary schooling at 13.6 years and women with more than primary education married at 14.7 years. The Follow-Up Survey data shows a similar relationship with girls who had completed 10th grade marrying at an average age of 16 years, two years later than those who did not complete 10th grade (13.9 years).

With regard to fertility, the average number of children ever born per woman decreased with the rise in educational level in the 1985 CPS. The average number of children ever born in the FUS was lower among women who completed 10 years of schooling than among less educated women of the same age, but as this data is limited to young women early in their reproductive years, no conclusion about lifetime fertility impact can be drawn from the FUS.

Different surveys in Bangladesh have documented the fact that there is a strong relationship between education and contraceptive use. In both the 1975 BFS data and the 1985 CPS data, this relationship was found. In the FUS, contraceptive prevalence increased with higher levels of education. The married secondary school completers were also more likely to use modern methods of contraception.

A step-wise discriminate functional analysis was conducted on the CPS data to determine the influence of various independent variables on contraceptive use. The results show clearly that female education was the most important variable affecting the use of contraception.

The above suggests that by providing higher education, i.e, secondary and above, a substantial reduction in fertility can be expected.

Impact on Secondary School Enrollment

Provision of scholarships has a positive impact on the enrollment pattern of the schools in the project area. Comparing enrollment patterns before the project was implemented and after shows that female enrollment more than doubled after the program was initiated.

Social Impact

The secondary school scholarship program encourages enrollment of girls in primary schools. The program has been instrumental in keeping girls in both primary and secondary school, thus decreasing the dropout rates. The project has definitely improved the status of women. An SSC-qualified girl is seen as an asset to the family and the community. She has prospects of marriage without dowry or with a reduced dowry. She is reported to get better treatment at the in-law's household and by the husband. She has better possibilities of employment and is regarded as an economic asset, either as an earner or as a potential earner.

Impact of the Selection Criterion

The introduction of a selection criterion was not timed well. If it had been imposed at the beginning of the projects it might have been administered with fewer problems. As such, the projects were not designed with this feature in mind.

After first giving scholarships to all girls in sixth grade, the imposition of the selection criterion produced resentment in the community, particularly among the families of girls who did not receive an award. Since these are often the local community leaders and elites, the backlash is more pronounced. There is also resentment among neighbors, especially those who were not given the award, creating conflict in the neighborhood.

The selection criterion has added considerably to the workload of an already overworked staff. It has added a lengthy process for application, review and selection of awards, adding to the cost of management. On the other hand, it has helped ensure that the awards achieve the desired impact by going only to girls who would not otherwise have been able to attend secondary schools.

The income ceiling of 1,200 taka per month is too low and difficult to verify. Since the scholarship only pays for half of the actual school expenses, poorer families cannot afford to send their daughters to school. Staff feel that a cutoff point of 2,500 or 3,000 taka is more realistic. Families with this much income can afford to pay for the second half of school expenses. Also, this level of income can be more easily verified by observing the family's possessions and consumption.

Management Costs

Currently, 52.6% of the total budget for the program goes into scholarships, 21.4% goes to the project to cover management costs, and 26% goes to TAF to cover direct and indirect costs. However, the economies of scale is important when costing the project, and when a project is managing a full scholarship load, as much as 67% of the budget can go towards scholarships.

Inclusive of all costs, the cost of sending one girl to school for one year varies, but it can be as low as \$44.

Conclusions and Recommendations

This pilot project has been successful in reaching its stated goals of increasing the age at marriage and the use of contraceptives by encouraging more girls to enroll in secondary schools. It has reduced age-specific fertility among young women. While the ultimate effect on their lifetime fertility cannot yet be measured, both the findings of other surveys and the demonstrated increases in contraceptive use suggest that a favorable fertility impact would occur.

The program has brought about a decrease in the number of girls who drop out of secondary school and encouraged enrollment in primary schools. It has given girls such benefits as increased stature, reduced dowry, increased employment opportunities, and better treatment by their in-laws and husbands. It has also produced economic benefits for schools and the community as a whole. The value of female children was increased by this project.

The team strongly recommends that the project be continued. The pilot phase should be terminated and the project should be given full-fledged status. Support should be solicited from other donors, and/or other offices in USAID/Washington as necessary to continue and expand the successful components of the program slowly, in phases, so that NGO and TAF management is not over extended. In addition, the selection criteria should be changed.

In sum, this is an excellent project which has had significant impact on contraceptive use, the girls, their families, the schools and the community.

CHAPTER 2

EVALUATION OF THE FEMALE EDUCATION SCHOLARSHIP PROGRAM.

INTRODUCTION AND BACKGROUND

Bangladesh, for the last two decades, has been making efforts to lower population growth through its national family planning program. It has tried to strengthen the program through increased allocation of resources for family planning activities and mass media campaigns under the assumption that there is a vast latent demand for birth control. Fertility rates in Bangladesh have slowly decreased, but remain high (5.6, 1985 CPS).

There is considerable literature on factors that indirectly contribute to high fertility in Bangladesh. These include low levels of socio-economic development, low literacy and status of women, the perceived economic utility of children, the strong preference for sons, high level of infant mortality and religious and traditional beliefs and values (Cain, 1980, Mcnicoll, 1978, Thein, 1988, Cleland, 1988 and Kabir et al, 1987, Kabir et al, 1988).

The overall level of education is low, particularly among females, who have limited opportunities to work outside the home. The Female Secondary Education Scholarship Program (FESP) is a pilot project designed to determine whether high fertility can be reduced by increasing the level of education among females, and hopefully, increasing both age at marriage and modern contraceptive use.

The first FESP project was started by Dr. M. A. Sattar in 1977 in his native village of Meher Panchagram, Shahrasti Upazila, Chandpur District. USAID provided support to the project in 1982.

The Bangladesh Association for Community Education (BACE) employed staff, both in Dhaka and in Shahrasti, to monitor the disbursement of scholarships to girls attending secondary schools. These staff also monitored girls' attendance at school.

Via Amendment 6 to Cooperative Agreement AID-388-0050-A-00-1018-06 dated August 22, 1984, TAF took over support of the BACE project from USAID as TAF had better field-monitoring facilities. In January 1985, TAF was asked to duplicate the BACE project in one additional area. The Southern Gonounnayan Samity (SGS) was selected to start a program in Gopalganj upazila.

Later in 1985, an external evaluation of BACE, SGS and the program as a whole received a positive review, and expansion was recommended.

All recommendations contained in the evaluation report were implemented. Three additional projects were started, and an eligibility test (selection criterion) was added. Scholarships would be limited to families with taka 1,200 income or less per month. The selection criteria was introduced to reduce the costs of the program and to improve impact by focusing resources exclusively on students who otherwise would have been unable to attend secondary school.

USAID imposed a ceiling of 18,000 students for the program. A USAID consultant recommended that each school conduct a baseline survey of enrollment so that the impact of the program on enrollment could be measured. Out-of-school activities for girls were introduced.

The program offers a monthly stipend to girls attending secondary schools in the project areas. Selection criteria are used to determine which students will receive a scholarship. Scholarships are awarded solely to girls resident in the project areas. The scholarship covers about one half of a girl's annual total educational costs. Academic performances are recorded.

Presently, the program is administered by five organizations. The Bangladesh Association for Community Education has administered 7,383 scholarships in Shahrasti Upazila covering girl students attending grades 6-10. The Southern Gonounnayan Samity (SGS) has administered 10,535 scholarships in Gopalganj and Muksudpur Upazilas, covering girl students attending grades 6-10. The Malerhat Jubo Sangha has administered 215 scholarships in Haimchar Upazila; Bahumukhi Unnayan Sangha has administered 1,013 scholarships in Kalkini Upazila; and the Palli Unnayan Prochesta has administered 939 scholarships in Lohagora Upazila. Presently, the last three projects are for girls attending grades 6 and 7 only. As students graduate from grade 7 into grade 8, the number of classes covered will be increased as will the number of students who qualify for a scholarship.

To date, the total number of girls benefiting from the program is 20,085. This number consists of 13,881 girls who continue to receive education in grades 6 to 10, 4,193 girls who have graduated from grade 10, and 2,011 girls who dropped out of school between grades 6 and 10.

BACE has been in operation since 1982, SGS since 1985, and the remaining three organizations started their programs in 1987.

2.1. ECONOMIC, POLITICAL AND SOCIAL CONTEXT OF THE PROJECT

In Bangladesh, where traditional social systems still persist, early age at marriage for girls is widely practiced, and nearly all women are married by age 25. More educated women, however, do marry later. With dowry demands and heavy wedding expenses, a girl is considered a burden by the family. Parents prefer to get her married at an early age after which her role is mainly confined to motherhood and rearing children.

The low literacy rate among Bangladesh females is the product of historical, economic, cultural and political factors. Female literacy is lower than that of men. According to the 1981 census 23.8 percent of the total population 5 years and above were literate. Of these only 16 percent were female. Females lag far behind in overall literacy. In all stages of education the gap between male and female education is significantly wide. In 1984-85, 82 percent of the total primary age group girls were out of school, whereas the percentage of boys in the same age group was only 27 percent. Trends in the past two years, however, indicate that female literacy, although still behind, has been growing, while male literacy rates have stagnated or even declined.

The purdah system is one of the reasons for the low rate of female participation in secondary education. Other reasons are the distance between home and school and the lack of female attendants at school. This evaluation has found, however, from interviews with parents of children now attending secondary school and parents of children who do not attend school, that a lack of financial resources is the single most important reason why girls do not attend secondary schools.

The poor state of education, especially female education, is closely linked to the socio-economic characteristics of the country. The majority of the families live below the poverty line and are not able to meet the basic necessities of life. Very few can afford to send their children to school. They have to make a choice. With the traditional emphasis on male superiority, preference for education goes to the male child.

2.2 PURPOSE OF THE FESP PROJECT

The immediate objective of the female scholarship project is to encourage girls to enter and continue secondary school and to lower fertility by delaying marriage and increasing contraceptive use.

It was also expected that female participation in secondary education would do the following: change their reproductive norms and behavior; give the recipients a greater say in decision-making in the family; help them exercise more control over fertility decisions; and motivate them to control their family size through their wider knowledge and the use of contraceptives.

2.3. PURPOSE OF THE EVALUATION

USAID believed that the project had been operating for a sufficient length of time to allow an evaluation of this pilot effort with regard to its impact on fertility and education. The purpose of the evaluation was to answer four major questions:

1. Does female secondary education in Bangladesh delay the age of marriage, reduce fertility and increase the use of contraceptives?
2. Does the scholarship project encourage girls' enrollment in secondary schools?
3. Does it lead to parents encouraging their daughters to attend primary schools, reduce drop-out rates of girls in primary and secondary schools, increase opportunities for female employment, and raise the status of women in the family and community?
4. Does the selection criterion have a positive or negative impact on the program?

In addition the following management issues were to be examined:

- a) Management costs per student of projects sending all girls to school verses projects with selection criteria, and the benefits of all girls being provided with scholarships verses the benefits of selecting the poorest girls.
- b) Costs per student per year inclusive of management cost of the two scholarship systems for each year of project operation, and overhead costs as a percentage of program costs.

In answering these questions the evaluation was to determine whether to recommend that USAID:

1. Phase-out the program.
2. Solicit support from other donors and/or other offices in AID/Washington to continue and possibly expand successful components of the program.
3. Continue limited USAID support to the projects as they stand, or with modifications.

The evaluation was also to examine the criteria and procedures used in selecting scholarship recipients.

CHAPTER 3

METHODOLOGY, CONSTRAINTS AND TEAM COMPOSITION

The design of the evaluation was proposed by TAF and modified and agreed upon USAID. The design consisted of the following: 1) a statistical analysis of the demographic impact of education on age at marriage, fertility and contraceptive use; 2) an analysis of sociological changes brought about by the project; and 3) an analysis of management issues.

The statistical analysis compared data from a Follow-Up Survey of project awardees conducted by TAF in 1988, the 1985 CPS data, and the 1975 Bangladesh Fertility Survey data. The BFS data was used as a comparison whenever needed, as certain essential data were missing in the CPS. To measure the contribution of education on fertility vis-a-vis other variables, multiple regression analysis as well as logistic regression analysis was used. It should be noted that these three data sets are not directly comparable due to differences in dates, sample size and selection.

The FUS is part of TAF's routine monitoring of girls who received scholarships from the program, and who left school, either as grade 10 completers, SSC graduates, or as dropouts. Only girls still resident in the upazila could be followed up. In 1988, this was a total of 1,693 girls.

The three major constraints to this analysis were the young age of the scholarship recipients at the time of follow up in the FUS, the relatively small number of girls available to be followed up in the FUS, and the lack of CPS data on age at marriage. To compensate for these constraints, the 1985 CPS data is used to show fertility and contraceptive use patterns, and the 1975 BFS data is used to determine national age at marriage. FUS data is only used to demonstrate that FESP impact appears consistent with CPS and BFS national findings.

The sociological analysis was conducted through field visits, focus group discussions and by collecting data from project records, scholarship application forms, and talking to project staff and people living in the project area. Some 200 parents and girls were interviewed from four sites, BACE and SGS, and two control sites in upazilas adjacent to project sites. Groups interviewed consisted of:

- a) Parents not sending their daughters to school;
- b) Parents sending daughters to some secondary school classes;
- c) Parents sending daughters to some primary school classes, but not to secondary school;
- d) Parents of daughters who had completed secondary school;
- e) Girls between 16 and 24 years who did not receive secondary education;
- f) Girls who completed secondary education.

To gain information on management issues, interviews were conducted with headmasters and teachers in 15 of the 93 schools supported by the project. Project administrators in two project sites, BACE and SGS, and TAF's Population Consultant and program officers were interviewed. Both project and TAF records were examined.

The evaluation was conducted by a team of three professionals, a demographer (Dr. Kabir), a sociologist (Dr. Islam), and a WID specialist (Dr. Thein).

Dr. Thein was also responsible for coordination of the study. Additional technical assistance was provided by the USAID Research and Evaluation Advisor.

The study had a time limit of six weeks.

CHAPTER 4

FINDINGS

4.1. LITERATURE REVIEW

While many researchers state that the relationship between female education and fertility is inverse and that this is found consistently in various studies, others argue that the relationship is not as simple as that.

Caldwell (1979) argues that historically the two variables are closely linked and that female education suppresses fertility. Willis (1973), Gardner (1973), and Ben-Porath (1973) all show that an increase in female education is associated with a decrease in fertility.

Their conclusions have been criticized by others, pointing out that their findings are based on data from the United States and Israel, two developed countries, and that evidence from such developing countries as Taiwan (Schultz, 1973), the Philippines, and Indonesia shows that fertility increases among women with primary education and then decreases as education increases beyond the primary level (Ketkar, 1978). Using this inverted U-shape relationship between female education and fertility, Ketkar examined empirical data from Sierra Leone and found the same U-shaped relationship between the two variables, and further, found that there is an educational threshold after which fertility is indeed depressed. Another researcher concluded that primary education was that threshold (Cochrane, 1979). She explains that while the first five years of schooling has the effect of increasing fertility, only female educational attainment beyond five years has a depressing effect on the fertility of women. She suggested that primary education might increase fertility in the "short run". She inferred that education impacts on fertility through a number of intervening variables and tends to be negative except through other developmental factors (Cochrane, 1981). Thus, in countries with the poorest of conditions and strong traditions, education would most likely increase fertility. Other studies show that the affect of education on fertility varies from society to society (Hermalin and Mason, 1980).

Basically then, while female education is usually associated with a decrease in fertility, the level of impact varies from country to country. In certain cases, a small increase in female education up to the primary level is associated with an increase in marital fertility.

To understand this seemingly inconsistent relationship between female education and fertility, Jain took First Country Reports of the World Fertility Survey data and studied the relationship between these two variables. He also found similar inverted U-shaped relationship between these variables in several developing countries. Several factors are at play here,

including differences in the definition of education and measures of fertility. Jain's findings suggest that there is no increase in demand for children due to increased education at the primary level. Furthermore, the observed increase in fertility did not include the effect of changes in age at marriage associated with increases in female education because the sample only included married women. However, the increase in fertility could indicate the effect of a decrease in breast-feeding usually associated with an increase in female education. If there is no simultaneous increase in use of contraception among primary level educated women, an increase in fertility could occur. Use of contraception, however, is associated with an increase in education.

It is important to remember that findings from various studies show that differences among countries in the average cumulative marital fertility of women decrease with an increase in their educational level. This means that educated women are relatively more homogeneous in their fertility behavior than women with no education. Employment of educated women has been suggested as the reason, since there is an increase in women's potential to participate in economic activities outside the home with an increase in their education. This argument has been rejected however, because women's participation in economic activities varies from country to country, while educated women have similar fertility patterns. This suggests that there is something more to female education that has a universal affect on fertility.

Education first provides literacy and an understanding of numbers. In developing countries where illiteracy rates are high, this enhances the woman's status within her immediate family and community. The ability to read increases her exposure to information and ideas brought through printed material. Thus, there are changes in her general behavior patterns, including such practices as breast-feeding and use of contraception. Furthermore, continued schooling delays her age at marriage. In other words, an increase in female education may decrease fertility even without simultaneous changes in other factors, such as increased opportunities in the paid labor force (Jain 1981).

Researchers in Bangladesh have shown that women who are educated and have at least one of their children in school are more likely to accept contraceptives (Alaudin, 1979). The BFS suggests that women who have higher education adopt a more efficient method of contraception. In Dhaka, a study conducted by R. H. Chaudhury and Nilufer Ahmed (1981) on urban women illustrated an inverse relationship between female education and fertility. Using empirical data, Teel examined the impact of 36 variables on fertility and found that female education had one of the most significant impacts on population growth (Teel and Rague, 1984).

Many studies also established a relationship between education and contraceptive practice (Weinberger, 1987). There is a strong relationship between education and contraceptive use in Bangladesh. Even a few years of schooling usually has a marked effect on contraceptive prevalence. In 1985, 33 percent of women with more than primary education used contraception as against only 26.3 percent of those with some primary education and 21 percent of those with no education (Mittra, 1987). Similar results were also found in the 1975 BFS. The proportion of women using contraceptives is five percentage points higher for women with 1-3 years of education as against those with zero years of schooling. The difference is even larger with more years of schooling. Thirty-three percent of women with more than seven years of education used contraceptives as opposed to only 23 percent of women with 4-6 years of education (BFS, 1978). A significantly strong relationship between different educational levels and contraceptive use was found by Chowdhury (1974).

The social diffusion, or cultural lag hypothesis suggests that educational differentials in contraceptive use can be expected to widen in the early stage of fertility transition because better educated women adopt birth control first (McCarthy, 1982). It is less clear what effect family planning programs will have on the educational differential in contraceptive practices; one hypothesis is that family planning programs might decrease differentials by targeting uneducated segments of the population that would otherwise have no access to birth control information and services.

4.2. FEMALE SECONDARY EDUCATION AND THE AGE AT MARRIAGE

This section compares data from a follow-up survey conducted on scholarship recipients with data from the Bangladesh Fertility Survey. Contraceptive Prevalence Survey data could not be used, as the CPS only covers currently married women.

Data from the 1975 BFS indicates that marriage is almost universal among Bangladeshi women by the time they reach 25 years of age. However, educated women tend to marry later than their uneducated counterparts. Among women aged 45 to 49 years, those with no schooling married, on average, at 12.8 years, those with some primary schooling at 13.6 years, and those with more than primary schooling at 14.7 years. This finding was verified by the 1974 census data.

According to the FUS, girls who dropped out of school after grade 6, married, on average, at age 12.5 years, those who dropped out between grades 6-10 at 13.9 years, and those who completed grade 10, at 16.0 years (see tables 1 and 2).

Both nationally and within the project, there is a clear trend indicating that the age at marriage increases with the number of years of schooling a girl receives. In the FUS study, the age at marriage of girls who complete grade 10 is 3.5 years higher than girls who only complete grade 6.

Table 1 : Mean Age at First Marriage by Level of Education (FUS)

<u>Last class attended</u>	<u>Age at first marriage</u>
6	12.5
7	13.6
8	13.8
9	14.6
10	16.0

Table 2 : Proportion Married by Last Class Attended of Scholarship Recipients (FUS)

<u>Last class attended</u>	<u>Number of girls</u>	<u>Number married</u>	<u>Proportion married</u>
6	41	29	70.7
7	71	54	76.1
8	132	99	75.0
9	118	86	72.8
10	1330	357	26.8
Total	1693	624	36.9

4.3 FEMALE SECONDARY EDUCATION AND FERTILITY

This section compares data from the FUS with the CPS.

Due to the relatively young age of the girls and women studied in the FUS, it is not possible to ascertain the effects that increased education will have on their fertility. However, as shown below, when similar age groups from the FUS are compared with the 1985 CPS, the average number of children born to currently married women declined with the increase in years of schooling.

Table 3: Comparison of Number of Children Ever-Born Per Currently Married Woman: FUS and CPS

Age	FUS		CPS	
	16-19yrs	20-24yrs	16-19yrs	20-24 yrs
6-9 Years School	.648	.818	1.2	1.8
10 years School	.118	.522	1.0	1.6

The difference in number of children born in the two surveys cannot be definitely explained. However, the FUS represents 1988 data, while the CPS represents 1985 data. Also, the sample size of the two surveys differ both in size and selection process, the FUS being a small sample covering an entire target population, whereas the CPS sample is a large, randomly selected representative sample.

Finally, the FUS data is concerned with girls who know that they receive scholarships from an organization dedicated to a reduction in fertility. It is possible that this knowledge has affected their reproductive behavior.

To give an indication of fertility over the years, an analysis of the CPS, below, provides data covering all age groups by years of education. With the exception of age group 45-49, where in 1983 only a minute sample of women with 10 years of education were surveyed, and in 1985 where no women in this age group were studied, women with more than 10 years of education had a consistently and significantly lower fertility. Overall, girls with 10 years of education have 50% fewer births than women with no education.

Table No. 4 : Average Number of Children Ever-born Per Currently Married Woman by Age, 1983 and 1985 CPSs, Bangladesh

Age of women	Completed Years of Schooling									
	No Schooling		1-4 Years		5 Years		6-9 Years		10 Years	
	1983	1985	1983	1985	1983	1985	1983	1985	1983	1985
16-19	1.47	1.15	1.44	1.17	1.35	1.14	1.37	1.18	1.33	1.00
20-24	2.57	1.95	2.53	2.08	2.49	1.94	1.84	1.80	2.00	1.61
25-29	4.03	3.03	4.07	3.11	4.40	3.19	3.42	2.83	2.33	2.40
30-34	5.63	4.03	5.64	4.34	5.57	4.05	4.75	4.16	4.00	3.54
35-39	6.59	4.93	7.06	5.19	7.14	4.91	6.00	4.88	-	3.67
40-44	7.51	5.49	7.84	5.67	6.52	6.18	8.56	6.75	-	4.00
45-49	7.60	5.27	7.94	5.63	8.88	7.11	5.86	7.13	10.00	-
All	4.70	3.59	4.44	3.40	3.97	3.29	3.01	2.88	2.36	2.46

To clarify the above data, table 5 shows the percentage distribution of ever married women by age and years of education studied in the CPS.

Table 5 : Percentage Distribution of Ever-married Women by Age and Years of Schooling, 1983 and 1985 CPSs, Bangladesh

Age of Women	Completed Years of Schooling									
	No Schooling		1-4 Years		5 Years		6-9 Years		10 Years	
	1983	1985	1983	1985	1983	1985	1983	1985	1983	1985
16-19	64.5	66.1	18.0	19.7	9.0	8.7	7.5	7.9	0.9	0.9
20-24	65.2	64.1	19.5	16.1	8.4	10.2	5.0	7.3	1.8	1.7
25-29	68.4	74.9	18.4	15.2	6.4	7.6	4.7	5.2	1.8	1.0
30-34	75.4	73.2	15.6	13.9	5.5	8.4	2.9	3.2	0.4	1.1
35-39	73.4	77.6	19.6	12.7	4.5	6.4	2.1	2.8	-	0.3
40-44	79.5	81.8	15.8	11.6	3.0	5.2	1.4	1.2	-	0.2
45-49	83.5	87.4	12.1	8.2	2.9	3.0	1.3	1.3	0.2	-
Total	70.6	71.7	17.8	14.7	6.3	7.8	4.1	4.9	0.9	0.9

Tables 6 and 7, provide more information from FUS data on average number of children ever born and living by class attended, and average number of births in the last 12 months by last class attended. It can be seen that, generally, women with 10 years of education have fewer children, of which fewer children die.

Table 8, provides CPS data on the proportional number of children dead among children ever born by women's age and years of schooling.

Table 6 : Average Number of Children Ever-born and Living by Last Class Attended (FUS)

<u>Last class attended</u>	<u>Average children born per married woman</u>	<u>Average children born per woman</u>	<u>Average children living per woman</u>	<u>Proportion children dead per woman</u>
6 (n=29)	.344	.243	.219	.099
7 (n=54)	.425	.323	.295	.087
8 (n=99)	.626	.470	.409	.130
9 (n=86)	.744	.542	.508	.063
10 (n=35)	.542	.143	.136	.049

Table 7 : Average Number of Births in the Last Twelve Months by Last Class Attended (FUS)

<u>Last class attended</u>	<u>Number of women</u>	<u>Currently married women</u>	<u>Total births in last 12 months</u>	<u>Birth rate per married woman</u>	<u>Birth rate per woman</u>
6	41	29	8	.28	.20
7	71	54	14	.26	.20
8	132	99	24	.24	.18
9	118	86	39	.36	.26
10	1330	357	86	.24	.06
All	1693	624	163	.26	.10

**Table 8 : Proportion of Children Dead Among Children Ever-born
by Current Age and Years of Schooling (CPS)**

Age of women	Percentage of Women by Years of Schooling									
	No Schooling		1-4 Years		5 Years		6-9 Years		10 Years	
	1983	1985	1983	1985	1983	1985	1983	1985	1983	1985
16-19	.156	.116	.125	.126	.128	.085	.088	.076	.250	-
20-24	.178	.185	.168	.148	.106	.092	.131	.093	.120	.110
25-29	.198	.200	.141	.179	.120	.154	.117	.085	.058	.013
30-34	.223	.231	.204	.202	.158	.165	.112	.163	.099	.150
35-39	.249	.243	.203	.228	.157	.229	.165	.080	-	-
40-44	.254	.282	.227	.24	.148	.194	.147	.146	.429	-
45-49	.276	.253	.239	.249	.193	.191	.164	.288	-	.040
All	.216	.198	.174	.172	.132	.124	.123	.094	.101	.062

4.4. FEMALE SECONDARY EDUCATION AND USE OF CONTRACEPTION

As with the study on fertility, one must take into consideration the young age of the girls interviewed for contraceptive use in the FUS. Table 9 shows a dramatic increase in the use of contraception between girls who completed grade 6 (27.6%) and girls who completed grade 10 (39.7%). However, girls in grades 7 and 8 also had a high use of contraceptives.

Table 9 : Current Use of Contraception by Last Class Attended (FUS)
Percent Using Contraception

<u>Last class attended</u>	<u>Number of married</u>	<u>Modern method</u>	<u>Traditional method</u>	<u>Total</u>
6	29	27.6	10.3	37.9
7	54	42.5	5.6	48.1
8	99	37.3	8.1	45.4
9	86	31.3	11.6	42.9
10	356	39.7	7.9	47.6
Total	624	37.9	8.3	46.2

The CPS data, which covers all age groups, gives a much clearer picture of the effect of education on contraceptive use. Of women with no education, only 17% use contraceptives, while of women with 10 years of education, 57.7% use contraceptives. Table 10 clearly shows this high increase of 40.7 percentage points, which is progressive with the higher educational status achieved.

Table 10: Percentage Distribution of Currently Married Women Aged 25-29 by Current Use and Level of Education (CPS, 1985)

Education of Women	Percentage of Women by Age Grouping		
	Currently Using	Not Using	Pregnant/Other
	1985	1985	1985
None	17.0	61.1	21.9
1-4	22.0	58.3	19.7
5	22.8	65.2	12.0
6-7	29.4	61.8	8.8
8-9	39.4	51.5	9.1
10	57.7	26.9	15.4

4.5 THE AFFECT OF EDUCATION ON FERTILITY : A MULTIVARIATE ANALYSIS ON THE 1985 CPS

The preceding study of CPS data suggests that if 10 years of education is given to a girl she will marry later, have fewer children and use modern contraceptive methods more regularly than uneducated girls and girls with fewer than 10 years of education. However, it is possible that other factors are responsible for these effects, such as socio-economic status. To strengthen the data presented earlier a multivariate analysis was conducted on the CPS data.

The main purpose is to assess the impact of secondary education on fertility, use of contraceptives and age at marriage. For this purpose a step-wise multiple regression analysis of the 1985 CPS was performed.

The results indicate female education is a significant predictor of lower fertility, independent of socio-economic factors such as religion, ownership of land, employment etc. For example, women with 10 years of schooling have - 0.67 fewer children relative to women with no education. The negative sign of the regression coefficient suggests that the higher the level of education, the lower will be the fertility.

The regression coefficients of the education variable suggest that female education is an important predictor of lower infant and child mortality relative to women with no education. In general the higher the level of education the lower will be the proportion dead. For example, for women with 10 years of education there will be 0.08 fewer deaths of their children relative to women with no education. In addition, the proportion of children dead increases with the number of children ever born.

The results of our multivariate regression model indicate a negative and statistically significant affect of female education on fertility and mortality (see annex).

Logistic Regression Analysis

We have so far examined the relationship between education and fertility. In order to examine the net effect of independent variables on the use of contraception, we have used a logistic regression model, because the dependent variable is dichotomous (see annex).

The results of this analysis clearly indicate that education is the most important variable affecting the use of contraception. The probability of contraception use increases with the increase in schooling years. For example, the probability that a woman with no education will use contraception is 0.24, while the probability increases to 0.56 for women with ten years of schooling.

Discriminant Analysis

To reinforce the findings obtained from the logistic regression, a discriminant analysis was also carried out. A discriminant analysis helps to distinguish variables which discriminate between users and non-users.

The positive sign of the discriminant function coefficient of the variable education has a stronger positive affect on the current use of contraception. In order to measure the relative importance of the variables in question and their influence to discriminate between users and non-users, the percentage contribution of each variable is estimated and given in Table 17. Among the four variables the level of education of women is one of the important discriminating variables, which contributes more than 50 percent change in the current use of contraception.

It emerges from this analysis that educational level, and in particular level of female education, is an important determinant of fertility in Bangladesh.

4.6 IMPACT ON ENROLLMENT

Of total nation-wide enrollment in secondary schools, female enrollment was 31.3% in 1984. Between 1974 and 1984, female enrollment as a percentage of total enrollment increased by 7.9 percent.

Table 11 : Primary and Secondary School Enrollment 1947-1984

Year	<u>Primary level</u>			<u>Secondary level</u>		
	Total primary school enrollment (in 000)	Female enrollment (in 000)	Percentage of female primary school enrollment	Total secondary school enrollment (in 000)	Female enrollment (in 000)	Percentage of female secondary school enrollment
1947-48	2661	640	24.1	382	29	7.6
1959-60	3183	843	26.5	532	65	12.2
1967-68	5037	1543	30.6	1210	220	18.2
1972-73	7794	2698	34.6	1833	497	27.1
1973-74	7795	2561	32.9	1822	390	21.4
1974-75	8290	2820	34.0	1960	458	23.4
1980	8219	3297	40.1	2142	607	28.3
1981	8292	3339	40.3	1970	532	27.0
1982	8400	3417	40.7	2129	656	30.8
1983	8450	3438	40.7	2148	672	31.3
1984	8575	3487	40.7	2182	682	31.3

- Sources : i. Rafiqul Huda Chowdhury and Nelufar Raihan Ahmed.
 Female Status in Bangladesh BIDS, 1980, P. 43
 ii. Bambeis, Educational Statistics, 1986.

In the BACE project area, before the project was implemented, 27.3 percent of the secondary school students were female, a similar figure to the national average. By 1984, the percentage had risen to 43.5 percent, more than double the national increase. A similar pattern has been observed in SGS, where enrollment has more than doubled over the past three years. As expected, the provision of scholarships has had a positive affect on the female enrollment pattern in schools in the project areas.

The project has also greatly reduced the drop-out level for female students. In the project area, the drop-out rate for secondary schools has decreased from 15 percent before the program started to 3.5 percent in 1987. The main reason for withdrawing their children from school was, according to parents interviewed during this evaluation, economic.

Table 12. Enrollment of Girl Students and Dropout in Various Years.(FUS)

<u>Year</u>	<u>Number of Girls enrolled</u>	<u>Number of Girls who dropped out</u>	<u>Percentage of drop out</u>
1979	1139	167	14.7
1980	1289	148	11.5
1981	1562	172	11.0
1982	5798	479	8.3
1983	11588	1046	9.0
1984	13104	1337	10.2
1985	14352	1100	7.7
1986	14734	712	4.8
1987	24301	839	3.5

Secondary school scholarships have also encouraged girls' enrollment in primary schools in areas where all girls receive a scholarship, and has reduced the drop-out rate from primary schools. With the possibility of receiving a scholarship for secondary school, parents are far more willing to spend money to send their daughters to primary school. However, in areas where the selection criterion is used no major change in primary school enrollment has been observed. This may be due to parents not being certain that their daughters will meet the criterion when they leave primary school, and therefore be eligible to receive a scholarship, or due to the short time (two years) that the projects have been operating in these areas.

Another added benefit of the program has been the improvement in the project area of daily attendance. Girls must attend school at least 75 percent of the number of school days in any one quarter to continue to qualify for the scholarship. Regular attendance of the girls has encouraged other students to attend regularly, and overall attendance in project area schools is high when compared to attendance in non-project areas. With increased attendance comes improved school work, and peer pressure encourages all students to do as well as scholarship students.

4.7 IMPACT ON SOCIAL STATUS

Increasing employment opportunities:

Education has been invaluable for girls seeking jobs. Educated women are a minority in rural areas, and for respectable white-collar jobs a secondary school certificate is needed. Changing attitudes, partly resulting from depressed economic conditions, have meant that social barriers have been broken, or are breaking down with regard to women's employment outside the household. It is extremely difficult for uneducated women, or women who have only attended primary school to find respectable jobs.

Sixty percent of the girls interviewed in four groups who had graduated from secondary schools in the project area had found employment. In the BACE project area, 53 of the graduates have become family planning field workers; two girls have become high school teachers; 7 have become primary school teachers; and one has become a counselor. In addition, four girls were recruited by the garment factories, one became a CARE field worker and others went into banking.

Although, due to poor economic conditions, employment was more difficult in the SGS area, scholarship girls appeared to be more competitive than their fellow students as they had worked in the cooperative store operated by scholarship holders. The store sells paper goods, stationary and general merchandise. The store is supervised by a teacher, and two girls from each class operate the store at any one time. Currently three schools are operating such stores.

Similarly, by establishing a bank account for each girl, through which scholarship funds are passed, girls have learned about banking and saving. They have developed a savings attitude and experience handling an income of their own, similar to that in a professional setting.

Status of women:

Interviews with female graduates of secondary schools indicated that the status of women improves substantially with increased education. Women get more respect from both their communities and families. They are more independent and more mobile.

Education often replaces the dowry. This is due to the fact that educated women have the ability to take up full time employment and earn an income for the family. To quote one parent of a graduate:

"I could not give education to my elder daughter who was married while in class 3. I had to pay dowry. Thanks to the scholarship, my younger daughter passed the SSC examination and fortunately got a full-time job on completion of secondary education. I received many offers of marriage and could pick and choose. None demanded dowry. Some even wanted to bear my expenses. I could marry my daughter to a household which is socially superior to mine. She visits me more often than my elder daughter and brings me presents. Evidently my younger daughter is happier than my elder daughter to whom I could not give proper education." (The younger daughter continues to be an earning wife.)

Traditions, however, die hard and dowries have not been dispensed with in all cases. Often dowries had to be paid for educated women, but they were usually less than for the uneducated women.

An offshoot of giving girls education is that an educated woman is considered an asset to her family as well as to her community, partly because she is either a wage earner or a potential wage earner. She is reported to get better treatment and more respect from both the community and her family. Interviews have shown that the girls get better treatment at their in-laws' house, as mothers-in-law usually take pride in their educated daughters-in-law.

Interviewed married girls stated that they had better relations with their husbands. They found that their husbands had more respect for them and would allow them bigger roles in family decision making than their uneducated counterparts. Many persons interviewed indicated that their husbands would turn to them for advice. Since Bangladeshi women believe that their role is to help their husband, many feel that they can do a better job if they are literate and educated. In addition, educated women invariably raise their families' standard of living as they are more knowledgeable in the areas of health and hygiene. Most importantly, literate mothers will almost always ensure that their children also become literate.

Education also contributes to women's mobility and contact with the outside world. Women who are used to going to school do not feel as restricted as women who are used to staying at home. They have been able to become more knowledgeable and have a greater understanding of the problems and issues facing the community and the nation. However, their mobility is not yet as free or as extensive as that of men.

4.8 BENEFITS TO THE SCHOOLS

The introduction of the projects has greatly improved the financial status of schools. The project has substantially increased the overall number of students, and thus the amount collected in tuition fees. Non-scholarship students have severe difficulties in paying tuition on a regular basis, and either pay in installments, or just before the end of the school year. Scholarship girls pay their tuition regularly and on time.

The increased and regular level of income has meant that schools are able to buy more equipment and supplies, such as desks, chairs and books. Facilities have also improved with an increased number of separate toilets and ladies common rooms. Guidance given to schools by project field workers has also been a valuable asset.

Increased income for the schools has meant that teachers are paid regularly. This makes the school more attractive to teachers, which has the double benefit of allowing the school to employ more qualified teachers, and retaining a stable faculty.

There seems to be very little change in the curricula as a result of the project, since the curricula is based on government standards. Nevertheless, all schools include discussion on population and the food crisis. Population is included in every subject, especially science and sociology. Population topics are compulsory for grades 6 and 7, but are optional for grades 9 and 10. Human anatomy is taught in grade 9, but does not include human reproduction. Home economics is offered only to female students in class 9, and includes a section on how to control family size. This subject is optional.

4.9 SELECTION CRITERION IMPACT

The introduction by USAID, in 1985, of a selection criterion that limits scholarships to girls from families who earn less than 1,200 taka a month has been extremely problematic and has had a negative impact on the program.

Whereas in the past, TAF had no problems filling the scholarship slots, this past year, the first year that the selection criterion was used in both areas, only 15,404 of the 18,000 slots were filled. In the SGS project alone, a total of 3,364 girls applied, but only 1,267 (38 percent) were awarded scholarships. The low percentage of acceptances was mostly due to the new selection criterion, as field workers could not find enough girls who came from families earning less than 1,200 taka a month. TAF is now collecting data to determine the number of applicants who did not attend secondary school, or who dropped out of school due to the scholarships not being made available.

The selection criterion has also imposed a large administrative burden on project staff. Currently, it is taking the staff two months to review and verify applications. Each applicant and her family must be visited at home and interviewed. Field workers have found it extremely difficult to quantify into taka all income (such as rice produced by a family for their own consumption) and to determine whether a family is eligible. The fact that many families, in a desperate attempt to have their daughters qualify for the scholarship falsify their applications, has meant that the field worker must spend even more time on verification.

Management feels that more field workers are needed to take care of the increased workload due to the imposition of the selection criterion. In addition, field workers expressed a need for more training, particularly in the areas of checking income information provided by guardians, detecting falsification of records in schools, and assessing school conditions.

The establishment of a selection criterion has also caused problems within the communities, as it has antagonized mid-level but influential members of the community, whose daughters had previously qualified for scholarships. For example, the mullahs

in the Shahrasti area did not qualify for low income status, and their daughters therefore could not participate in the program. The mullahs, who had been very supportive of the program, now snub project workers. On the other hand, an absence of any selection criteria would mean that some scholarships would go to girls who would have attended school in any case, reducing the impact of the intervention.

When considering possible changes to the selection criterion, the following alternatives should be reviewed:

The first alternative would be to abolish the taka limit. The main reason for doing this is that the group of girls who can afford to pay for secondary schooling is small.

The second alternative would be to increase the taka limit. The 1,200 taka per month per family is extremely low and only covers the very poor. Since the scholarship does not pay for the entire cost of keeping a student in school, it is difficult to find girls in this income bracket whose families can afford to contribute the needed out-of-pocket expenses to keep their daughters in school.

Offering scholarships to only the poorest means that those families who are able to afford either the tuition or the out-of-pocket expenses, but not both, are excluded from the program, and cannot send their daughters to school.

The selection criterion (income limit) should be raised to between 2,500 and 3,000 taka in cash and kind per month. This level would cover people who are too poor to pay for schooling expenses, and it would be easier to assess the income of the applicant's family.

4.10 MANAGEMENT COSTS

According to the 1987 Annual Report and interviews with TAF management personnel, the FESP grant is for six years and has a total budget of U.S.\$ 2.99 million.

For the current year (1988) the following budgeted costs were approved for each of the five subprojects:

1. For 896 students in the PUP project area, the total budget is 1,071,000 Tk. There are 23 schools involved. The project is in its second year and the selection criterion is used. The project covers only the 6th and 7th grades.
2. For 1,000 students in the BUS area, the total budget is 1,157,625 Tk. There are 83 schools involved. The selection criterion is also used here. The project is in its second year, covering grades 6 and 7.

3. For 208 students in the MJS project area, the total budget is 382,265 Tk. This project is also only two years old, uses the selection criterion and covers only the 6th and 7th grade students as awardees. Eight schools are involved.
4. In the BACE project there are 4,096 students. The total budgeted cost is 4,873,265 Tk. There are 28 schools in the project area, and the selection criterion has just been introduced this year for grade 6 students.
5. In the SGS area, a total of 7,681 awardees are expected, at a total cost of 8,646,207 Tk. SGS has used the selection criterion for one year in grade 6. SGS has been in existence for three years.

To determine the proportion of project costs that are attributable to "management", actual costs were analyzed and are shown below.

FEMALE EDUCATION SCHOLARSHIP PROGRAM
YEAR-WISE EXPENDITURE

<u>PROJECT</u>	<u>YEAR</u>	<u>PERCENTAGE</u>				
		<u>SCHOLARSHIP</u>	<u>OTHER</u>	<u>TOTAL</u>	<u>SCHOLARSHIP</u>	<u>OTHER</u>
BACE	1984-85	2,739,135	478,254	3,217,389	85.1	14.9
	1986	3,024,765	678,460	3,703,225	81.7	18.3
	1987	4,422,735	641,355	5,064,090	87.3	12.7
	1988	4,194,045	679,220	4,873,265	86.0	14.0
		-----	-----	-----	-----	-----
		14,380,€80	2,477,289	16,851,969	85.3	14.7
SGS	1985	1,870,920	298,153	2,169,073	86.3	13.7
	1986	4,810,500	661,997	5,472,497	87.9	12.1
	1987	8,646,075	698,259	9,344,334	92.5	7.5
	1988	7,875,900	770,307	8,646,207	91.1	8.9
		-----	-----	-----	-----	-----
		23,203,395	2,228,716	25,632,111	90.5	9.5
PUP	1987	317,985	201,644	519,629	61.2	38.8
	1988	796,050	274,950	1,071,000	74.3	25.7
		-----	-----	-----	-----	-----
		1,114,035	476,594	1,590,629	70.0	30.0
MJS	1987	83,550	193,993	277,543	30.0	70.0
	1988	204,525	177,740	382,265	53.5	46.5
		-----	-----	-----	-----	-----
		288,075	371,733	659,808	43.7	56.3
BUS	1987	391,500	206,859	598,359	65.4	34.6
	1988	856,845	300,780	1,157,625	74.0	26.0
		-----	-----	-----	-----	-----
		1,248,345	507,639	1,755,984	71.1	28.9

It is very clear from the above that the scale of the program determines what portion of costs go to scholarships and what portion goes to other costs, i.e., management. SGS, with its 7,681 awardees has an overall 90.5% of costs going to scholarships and 9.5% going to management.

MJS only serves 208 awardees, and has scholarship costs of 43.7% of its budget, and management costs of 56.3%.

BACE and SGS, which cover the largest number of students, as they provide scholarships to all grades 6-10, have much lower management costs than the remaining projects, which currently only cover grades 6 and 7. The management costs of these projects will reduce as more grades and more students are covered by the program.

Currently, 52.6% Of the total budget for the program goes into scholarships, 21.4% goes to the project to cover management costs, and 26% goes to TAF to cover direct and indirect costs. However, the economies of scale is important when costing the project, and when a project is managing a full scholarship load as much as 67% can go towards scholarships.

To determine management costs of projects with the selection criterion verses projects without the criterion, a simple calculation has been made. The budget for each project has been divided by the number of students receiving a scholarship during 1988. The result shows that, on average, it costs \$45 per year to provide scholarships to all girls, while it costs \$54 to provide scholarships to girls under the selection criterion. However, it should be noted that the selection criterion has only been in use for two years, and the economics of scale distorts any cost calculation in favor of projects supporting a large number of students.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions can be drawn from the study:

1. The age of marriage increases with the increase in educational level. This conclusion is supported by evidence from the Bangladesh Fertility Survey and the Follow-up Survey of students who have left school after receiving a scholarship. It is also supported by TAF's knowledge of the rural culture. A girl reaching puberty, but not in school, must be kept inside the house. She becomes a burden to the family and is married and sent to her in-laws as soon as possible. A girl attending school has a future, either via employment or reduced dowry. She is an asset to the family. The major constraint to sending girls to school is financial. The project addresses this constraint.
2. Fertility is reduced in girls with higher education. This conclusion is supported by evidence from the Contraceptive Prevalence Survey, 1985. Overall, nationally, girls who graduate from grade 10 have 50% fewer children than girls with no education. The limited evidence available through the FUS suggests that this will hold true for project scholarship recipients as well.
3. Contraceptive use is increased with the number of years of education a girl receives. This conclusion is supported by evidence for the 1985 Contraceptive Prevalence Survey and by the FUS. The CPS shows an overall increase in contraceptive use of 40 percentage points between girls with no education and girls who graduate from grade 10. There is a steady increase in the use of contraceptives with the increased number of school years. The FUS also shows an increase in contraceptive use with the increased number of school years. The percentage increase between girls who left school after grade 6 and girls who graduated from grade 10 is 12.1 percent.
4. Enrollment of girls in secondary schools increases if a scholarship is provided. As a percentage of the total, female enrollment in secondary schools increased by 7.9% nationally during the years 1974 to 1984. More than double this increase occurred in the project areas. Overall, enrollment of girls in the project area has more than doubled since the start of the program. The overriding reason for the increased enrollment in the project areas is the provision of scholarships. Girls who can obtain a scholarship will enroll in school. Girls who cannot obtain a scholarship have to compete with boys in the family for scarce financial resources for education.

5. The drop-out rate of girls in secondary schools who receive a scholarship is greatly reduced. The annual drop-out rate in the project area has decreased from 14.7 percent before the program started to 3.5 percent in 1987.
6. In areas where all girls in secondary school receive a scholarship, enrollment into primary schools has increased and the drop-out rate from primary schools has decreased. This trend has not been observed in areas where the selection criterion is used. However, the selection criterion has only been in use for two years.
7. Educated girls gain increased status. They are treated as an asset by their family; employment opportunities are enhanced; dowry is either reduced or waived; husbands and mother-in-laws provide better treatment to educated wives; educated women appeared to provide better standards of hygiene and care for their children as evidenced by increased child survival.
8. Schools and the academic community benefit from the project as scholarship girls pay school fees regularly and on time, and more girls enroll in school if a scholarship is available. Schools can purchase more and better equipment, and as staff can receive their salaries regularly, better qualified teachers apply for employment in scholarship schools.
9. The impact of the selection criterion on the project is mostly negative. The very poor cannot afford to send their daughters to school, even with a scholarship, while many families with income above taka 1,200 cannot afford to pay full costs. The number of families who earn taka 1,200 or less, and who can afford to send girls to school with a scholarship is less than the number of scholarships available from the project. It is suspected that large numbers of girls did not enroll in school because they did not meet the criterion, and their family could not afford the full costs of education.
10. The comparison of costs with and without the criterion was not meaningful, as the negative impact of the criterion could not be measured financially. However, it was found that the economies of scale plays an important part in management costs. It costs no more to manage 10,000 students than it does to manage 5,000.

RECOMMENDATIONS

The team recommends the following:

1. The pilot phase of the project should be terminated, and the project be given full-fledged status.
2. The project should be continued and expanded in phases (see recommendation for TAF below). Expansion should be slow so that NGO and TAF management is not over-extended.
3. Support should be solicited from other donors, and/or other offices in USAID/Washington to continue and possibly expand the successful components of the program.
4. The selection criterion should be either changed to a higher ceiling of taka 2,500-3,000, or eliminated.
5. Out-of-school activities should be expanded to all projects and all schools. Staff training should be increased.

(TAF is able to expand the program by five new projects each year, and expand ongoing projects to cover two or three upazilas each. TAF would establish a new unit to administer the female scholarship program, very similar to the unit that administers the family planning program. The unit would be headed by a manager, under the direction of the Representative. It would have its own staffing, office space, and administration. See the following page for TAF's budget proposal on expansion of the project.)

PROJECT	YEAR 1 (1990)		YEAR 2 (1991)		YEAR 3 (1992)		YEAR 4 (1993)		YEAR 5 (1994)		TOTAL
	SCH	ADHN	SCH	ADHN	SCH	ADHN	SCH	ADHN	SCH	ADHN	
SGS	\$315,000	\$28,000	\$375,000	\$34,000	\$415,000	\$38,000	\$445,000	\$40,000	\$465,000	\$42,000	\$2,197,000
BACE	\$185,000	\$27,000	\$273,000	\$32,000	\$310,000	\$36,000	\$350,000	\$40,000	\$400,000	\$42,000	\$1,695,000
MJS	\$115,000	\$25,000	\$200,000	\$30,000	\$270,000	\$34,000	\$340,000	\$40,000	\$400,000	\$42,000	\$1,496,000
BUS	\$115,000	\$25,000	\$200,000	\$30,000	\$270,000	\$34,000	\$340,000	\$40,000	\$400,000	\$42,000	\$1,496,000
PUP	\$115,000	\$25,000	\$200,000	\$30,000	\$270,000	\$34,000	\$340,000	\$40,000	\$400,000	\$42,000	\$1,496,000
NEW	\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$240,000	\$34,000	\$300,000	\$40,000	\$976,000
NEW	\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$240,000	\$34,000	\$300,000	\$40,000	\$976,000
NEW	\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$240,000	\$34,000	\$300,000	\$40,000	\$976,000
NEW	\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$240,000	\$34,000	\$300,000	\$40,000	\$976,000
NEW	\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$240,000	\$34,000	\$300,000	\$40,000	\$976,000
NEW			\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$240,000	\$34,000	\$636,000
NEW			\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$240,000	\$34,000	\$636,000
NEW			\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$240,000	\$34,000	\$636,000
NEW			\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$240,000	\$34,000	\$636,000
NEW			\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$240,000	\$34,000	\$636,000
NEW					\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$362,000
NEW					\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$362,000
NEW					\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$362,000
NEW					\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$362,000
NEW					\$30,000	\$10,000	\$100,000	\$24,000	\$170,000	\$28,000	\$362,000
TOTAL	\$995,000	\$180,000	\$1,898,000	\$326,000	\$3,035,000	\$486,000	\$4,365,000	\$630,000	\$5,615,000	\$720,000	\$18,250,000

REFERENCES

1. Ahmed K.S. and Rafiqul Huda Chowdhury, 1981. "Nuptiality in Bangladesh". Population of Bangladesh. Economic and Social Commission for Asia and the Pacific. UNO, New York.
2. Ahmed, Mohiuddin, M. 1986. "Breast-feeding in Bangladesh." Journal of Biosocial Science, Cambridge, U.K.
3. Ather, S.A, 1983. "Evaluation Report of USAID Scholarship Program for Girls in Shahrasti Upazila, Comilla."
4. Ather, S.A, 1984. "Evaluation Report of USAID Scholarship Program for Female Students in Shahrasti Upazila, Comilla."
5. Ather. S.A, 1985. "Young Women's Fertility: TAF/USAID/BACE School Scholarship Program," Shahrasti Upazila, Comilla.
6. Bangladesh Bureau of Statistics, 1986. Statistical Year Book of Bangladesh. Statistics Division, Ministry of Education, Dhaka.
7. Bangladesh Bureau of Statistics, 1984. Bangladesh Population Censuses. Analytical Findings and National Tables: Dhaka.
8. Begum, Ferdousi Sultana, 1985. "Women's Programs and Development Change in Rural Bangladesh in Fertility Impact of Development Programs in Bangladesh." Population and Development Planning Unit. Planning Commission, Dhaka.
9. Billsborrow, Akin I. et al 1981. "The Determinants of Breast-feeding in Sri-Lanka," Demography 18(3) Pp. 287-308.
10. Bultz, W.P. and J. Devanzo, 1981. "Determinants of Breast-feeding and Weaning Patterns in Malaysia." Population Association of America.
11. Caldwell, J. and Peter McDonald, 1981. "Influence of Maternal Education on Infant and Child Mortality." International Population Conference, Manila, Volume 2, Liege, IUSSP.
12. Caldwell, J. 1979. "Education as a Factor in Mortality Decline." Population Studies, Volume 33, No. 3, Pp. 395-413.
13. Cassen Robert, H. 1976. "Population and Development: A Survey World Development," Volume 4, Nos. 10/11, Pp. 785-830.
14. Cleland, John. G. et al, 1984. "The Effects of Nuptiality. Contraception and Breast-feeding on Fertility in Developing Countries." International Family Planning Perspective 10(3) Pg. 86-93.

15. Cleland, John G. and Iqbal H. Shah, 1988. "High Fertility in Bangladesh, Nepal and Pakistan: Motives Vs Means." Paper presented at the IUSSP Seminar on Fertility Transition in Asia : Diversity and Change, Chulalongkorn University, Bangkok, Thailand.
16. Cain, Mead. 1977. "The Economic Activities of Children Village Fertility." Study Report. No. 3, Bangladesh Institute of Development Studies, Dhaka.
17. Cain, Mead. 1980. "Risk, Fertility and Family Planning in a Bangladeshi Village." Studies in Family Planning.
18. Chowdhury, Rafiqul Huda, 1974. "Female Status in Bangladesh." Bangladesh Institute of Development Studies, Dhaka.
19. Chowdhury Rafiqul Huda and Nilufer Raihan Ahmed, 1980. "Female Status in Bangladesh." Bangladesh Institute of Development Studies, Dhaka.
20. Chowdhury, A. 1981. "Infant Deaths, Determinants and Dilemmas." Dhaka: ICDDR,B. Scientific Report No. 46.
21. Chowdhury, A. 1982. "Factors Influencing Infant Survival in Rural Bangladesh." Glimpse 4 (9-10).
22. Cochrance, S.H. 1980. "The Effects of Education on Health." Washington, D.C. World Bank, Staff Working Paper Number 405.
23. Cochrance, Susan Hill, 1979. Fertility and Education : What Do We Really Know? Baltimore. John Hopkins University Press.
24. Dixon, Mueller, Ruth, 1985. "Women's Work in Third World Agriculture." Women Work Development, No. 9. International Labor Office, Geneva.
25. Farah A, and Samuel Preston, 1982. Child Mortality Differentials in Sudan in Demographic Transition in Metropolitan Sudan, Australian National University Press, Canberra.
26. Flegg, A. 1982. "Inequality of Income Illiteracy and Medical Care as Determinants of Infant Mortality." Population Studies 36(3) Pp. 441-458.
27. Huffman, Sandra L. et al, 1980. "Breast-feeding Pattern in Rural Bangladesh." The American Journal of Clinical Nutrition, Volume 33, Pp. 144-154.
28. Huffman, Sandra L. Kathleen Ford, Huber A Allen and Peter Streble, 1985. "Nutrition and Fertility in Bangladesh." Breast-feeding and Post-partum Amenorrhoea. Paper presented at the Annual Meeting of the Population Association of America.

29. Huffman, Sandra L. 1986. "Promotion of Breast-feeding : Can It Really Decrease Fertility?" American Public Health Association, Washington, D.C.
- 30 Jain, A.K. 1981. "The Effect of Female Education on Fertility: A Simple Explanation." Demography 18(4).
- 31 Jain, A.K and Moni Nag, 1985. "Female Primary Education and Fertility Reduction in India." Working Paper No.114. The Population Council, New York.
32. Jain, A.K. and Bongaarts, J. 1981. "Breast-feeding Patterns, Correlates and Fertility Effects." Studies in Family Planning 12(3) Pp. 79-99.
33. Kabir, M. and Mohiuddin Ahmed, 1986. "Working Women and Their Breast-feeding Pattern." Journal of Statistical Studies. Jahangirnagar University, Dhaka.
34. Kabir, M. and M. Moslehuddin, 1987. "Fertility Transition in Bangladesh: Trends and Determinants." Asia Pacific Population Journal. ESCAP, Thailand.
35. Kabir, M. and M. Moslehuddin, 1988. "Female Status as A Determinant of Contraceptive Use in Bangladesh." Paper presented at the Conference on Women's Position and Demographic Change in the Course of Development, Asker Oslo, 15-18 June, 1988.
36. Kabir, M. et al, 1987. "Participation of Women in Co-operative Programs: Economic Activity, Social Change and Family Planning." Journal of Social Action, Volume 37, Delhi, India.
37. Khatun, Rokeya 1984. "Education Policy and Population Control in Bangladesh." Population and Development Planning Unit, Planning Commission, Dhaka.
38. Khatun, Rokeya et al, 1985. "The Fertility Impact of Female Education in Bangladesh." Population and Development Planning Unit, Planning Commission, Dhaka.
39. Khuda, B. and Ashrafuz Aziz Chowdhury 1982. "Breast-feeding in Rural Bangladesh: A Study of Comilla Village." Study of Reproductive Behavior. Working Paper No. 5. Bangladesh Institute of Development Studies, Dhaka.
- 40 Martin, Linda, G. et al, 1985. "Evaluation of the Bangladesh Female Secondary Education Scholarship Program and Related Female Education and Employment Initiative to Reduce Fertility." USAID, Washington, D.C.
41. Mitra and Associates, 1987. "Bangladesh Contraceptive Prevalence Survey," 1985. Final Report, Dhaka.

42. McNicoll, G. and B.W. Arthur, 1980. "An Analytical Survey of Population and Development in Bangladesh." Population and Development Review.
43. Management Information System, 1983. "The 1981 Contraceptive Prevalence Survey Report." Government of Bangladesh. Dhaka.
44. Mahbud, M. 1985. "Women's Development, Income and Fertility in Bangladesh," Planning Commission and CIDA, Dhaka.
45. Matin, Khan, A. 1985. "The Impact of Female Education on Fertility Desires in Bangladesh." Rural Demography Volume 12, Nos. 1 and 2, Dhaka.
46. McCarthy James, 1982. "Differentials in Age at First Marriage." Comparative Studies Series No. 19. World Fertility Survey/International Statistical Institute.
47. Nag, Moni, 1979. "How Modernization Can Also Increase Fertility." Working Paper No. 49. The Population Council, New York.
48. NIPORT, 1978. "Bangladesh Fertility Survey/World Fertility Survey." First Country Report. International Statistical Institute, London.
49. Population Reports, 1981. "Breast-feeding Fertility and Family Planning." Series J, Number 24. Population Information Program. The John Hopkins University.
50. Population Reports 1979. "Age at Marriage and Fertility" Series M, Number 4. Population Information Program, The John Hopkins University.
51. Smith, D.P. 1986. "Breast-feeding, Contraception and Birth Intervals in Developing Countries." Studies in Family Planning 16(3); Pp. 154-163.
52. Shaffer Teresita, C. 1986. Profile of Women in Bangladesh. USAID, Dhaka.
53. Thein Tin Myaing, 1988. "Factors Contributing to the Success of Women in Development Projects in Bangladesh." The United Nations Fund for Population Activities, Dhaka.
54. Ware Helen, 1984. "Effects of Maternal Education, Women's Roles and Child Care on Child Mortality, Population and Development." Supplement to Volume 10. The population Council.
55. Williamson, Nancy E. 1987. "Breast-feeding Women and Family Planning Programs: Special Needs and Opportunities." Asian and Pacific Population Forum 1(5). East West Population Institute.
56. Weinberger, Mary Beth, 1987. "The Relationship Between Women's Education and Fertility: Selected Findings from the World Fertility Surveys." International Family Planning Perspectives 13(2).

Additional references:

1. Alauddin, M. 1979. Rural Development and Family Planning Behavior in Bangladesh Villages. Doctoral Dissertation, University of Michigan.
2. Ather, S. A. 1985. Young Women's Fertility: TAF/USAID/BACE School Scholarship Program, Shahrasti Upazalla, Chandpur District, Final Report,
3. Bangladesh Fertility Survey Report. 1978. Government of People's Republic of Bangladesh. Ministry of Health and Population Control, 1975, Dacca.
4. Ben-Porath, Yoram. 1973. "Economic Analysis of Fertility in Israel: Point and Counterpoint." Journal of Political Economy. 81 (March-April 1973): S202-S233.
5. Caldwell, JC. 1979. "Mass Education As The Major Determinant Of The Timing Of The Onset Of Sustained Fertility Decline." Proceedings of the Expert Group Meeting on Fertility and Mortality Levels and Trends in Africa and Their Policy Implications. Monrovia, Liberia, 26 November to 1 December 1979.
6. Chaudhury, R. H. and N. R. Ahmed. 1981. Female Status in Bangladesh. Bangladesh Institute of Development Studies.
7. Cochrane, Susan Hill. 1979. "Fertility and Education: What Do We Really Know?" Washington, D.C.: World Bank.
8. Cochrane, Susan Hill. 1981. "The Relationship Between Education and Fertility." In Ware H. ed. Women, Education And Modernization of the Family in West Africa. Canberra, Australia, Australian National University, Department of Demography, 1981.:154-78. (Changing African Family Project Series. Monograph No. 7).
9. Gardner, Bruce. 1973. "Economies of the Size of North Carolina Families." Journal of Political Economy, 81(March-April 1973): S99-S122.
10. Hermalin, Albert and William M. Mason. 1980. "A Strategy for the Comparative Analysis of World Fertility Survey Data, with Illustrative Example." The United Nations Program for Comparative Analysis of World Fertility Survey Data. New York: UNFPA.
11. Jain, A.K. 1981. "The Effect of Female Education on Fertility: A Simple Explanation." Demography. 18(4).
12. Jain, A.K., and Moni Nag, 1985. "Female Primary Education and Fertility Reduction in India. Working Paper No. 114. The Population Council, New York.

13. Ketkar, Suhas L. 1978. "Female Education and Fertility: Some Evidence from Sierra Leone." The Journal of Developing Areas 13 (October 1978): 23-33.
14. Martin, Linda and et al. 1985 "Evaluation of the Bangladesh Female Secondary Education Scholarship Program and Related Female Education and Employment Initiatives to Reduce Fertility." Report No: 85-63-032. International Science and Technology Institute, Inc.
15. Schultz, T. Paul, "Explanation of Birth Rate Changes Over Space and Time: A Study of Taiwan." Journal of Political Economy, 81 (March- April,1973): S238-S274.
16. Teel, J. Howard and Rammohan K. Ragade. 1984. "Simulation Modeling: Perspectives Of The Bangladesh Family Planning and Female Education System." Behavioral Science, Volume 29.
17. Willis, Robert J. "A New Approach to the Economic Theory of Fertility Behavior", Journal of Political Economy 81(March-April 1973) S14-S65.

ANNEX

THE AFFECT OF EDUCATION ON FERTILITY : A MULTIVARIATE ANALYSIS ON THE 1985 CPS

The preceding study of CPS data suggests that if 10 years of education is given to a girl she will marry later, have fewer children and use modern contraceptive methods more regularly than uneducated girls and girls with fewer than 10 years of education. However, it is possible that other factors are responsible for these effects, such as socio-economic status. To strengthen the data presented earlier, a multivariate analysis was conducted on the CPS data.

Our main purpose is to assess the impact of secondary education on fertility, use of contraceptives and age at marriage. For this purpose a step-wise multiple regression analysis of the 1985 CPS was performed. This procedure starts with an equation containing no explanatory variables, only a constant term. The first variable included in the equation is the one which has the highest simple correlation with the dependent variable. If the regression coefficient of this variable is significantly different from zero it is retained in the equation, and a search for a second variable is made. The variable that enters the equation as the second variable is one which has the highest correlation with the dependent variable.

The significance of the regression coefficient of the second variable is then tested. If the regression coefficient is significant, a search for a third variable is made in the same way. The procedure is terminated when the last variable entering the equation has insignificant regression coefficient on all the variables are included in the equation. The significance of the regression coefficient of the last variable introduced in the equation is judged by the standard statistics computed from the latest equation.

Variables Included in the Equation

1. **Dependent Variables.** To examine fertility we used the total number of children ever-born (TNCEB) as the dependent variable. To examine mortality we created a variable called proportion dead (PROPDEAD) by selecting women who had at least one birth, then dividing total number of children dead (TNCD) by TNCEB.
2. **Independent Discrete Variables.** When TNCEB is the dependent variable, TNCD is used as a discrete independent variable. When PROPDEAD is the dependent variable TNCEB is used as a continuous variable.
3. **Dummy Variables.**
 - a. **Female Education.**
 - WOM 1 TO 5 : 1-5 years of education
 - WOM 6 TO 9 : 6-9 years
 - WOM 10 : completed 10 years of school.

The excluded category is no schooling, so regression coefficients may be interpreted relative to women with no schooling.

b. Male Education

MAN 1 TO 5, MAN 6 TO 9, MAN 10, again no education group is excluded from the analysis.

c. Marital Status: PMW = 1, if a woman is currently widowed, divorced or separated; PMW = 0 if a woman is currently married.

d. Residence: URBAN = 1, if respondent lives in an urban area; URBAN=0, if respondent lives in rural areas.

e. Electrification: ELEC=1, if respondent has electricity in her own home; ELEC=0, if respondent does not have electricity.

f. Religion: HINDU=1, if respondent is Hindu; HINDU=0, if respondent is Muslim.

g. Employment: EMP=1, if respondent is employed; EMP=0, if respondent is not employed.

h. Land ownership: NO LAND=1, if respondents family does own land; NO LAND=0, if respondent's family does not own land.

In order to separate the effect of education on fertility or proportion dead, we restricted our sample to women between the ages of 16 and 29. The decision to truncate the sample was made on the grounds that women in this age range experienced more equal chances of receiving some education than did women within the larger range of 16-49.

Table 13 shows the step-wise regression analysis for the women 16-29 years. The regression equation for women 16 to 29 with female education is given as follows:

TNCEB=2.915-.0274 TNCD-.6114 PMW-.4404 WOM 6 to 9-.6685 WOM 10-.1381

WOM 1 to 5.

The results indicate female education is a significant predictor of lower fertility, independent of socio-economic factors such as religion, ownership of land, employment, etc. For example, women with 10 years of schooling have - 0.67 fewer children relative to women with no education. The negative sign of the regression coefficient suggests that the higher the level of education, the lower will be the fertility. Similarly Table 12 shows the effect of education on the number of children dead among the children ever-born.

The regression equation can be written as:

$$\text{PROPDEAD} = .0806 + .0329 \text{ TNCEB} + .102 \text{ PMW} - .0399 \text{ WOM 1 to 5} - .0574 \\ \text{6 to 9} - .0816 \text{ WOM 10}.$$

The regression coefficients of the education variable that female education is an important predictor of lower infant and child mortality relative to women with no education. In general, the higher the level of education the lower will be the proportion dead. For example, for women with 10 years of education there will be 0.08 fewer deaths of their children relative to women with no education. In addition, the proportion of children dead increases with the number of children ever born.

The results of our multivariate regression model indicate a negative and statistically significant effect of female education on fertility (TNCEB) and mortality (PROPDEAD).

Logistic Regression Analysis

We have so far examined the relationship between education and fertility. In order to examine the net effect of independent variables on the use of contraception, we have used a logistic regression model because the dependent variable is dichotomous. (see annex)

$$\text{Loge } p/1-p = B_0 + B_1 X_1 + B_2 X_2 + \dots$$

Where P is the probability of contraceptive use (or the event occurring); B_0, B_1, \dots are the regression coefficients, and X_1 to X_n are independent variables. Under this approach, the dependent variable for each observation in our study takes the value of one if the respondent is currently practicing contraception, while a value of 0 is assigned to those individual women who are not currently practicing contraception.

The variables considered for the logistic regression analysis are

TOTKID : a parity variable

- = 0 if no children have been born
- = 1 if a woman has 1 to 3 children
- = 2 if a woman has 4 to 6 children
- = 3 if a woman has 7+ children

EDLEV : Educational attainment variable

- = 0 if a woman has no schooling
- = 1 if a woman has 1-5 years of schooling
- = 2 if a woman has 6-9 years of schooling
- = 3 if a woman has 10 years of education

ELEC = 1 if a woman has electricity in her own home

- = 0 if a woman does not have electricity in her own home

RES = 1 if a woman lives in a rural area
 = 2 if a woman lives in an urban area

The results of the logistic regression are shown in Table 13. The logistic regression line is given by

$$\log_e (p/1-p) = - 2.9542 + .7841 \text{ RES} + .1996 \text{ ELEC} + .4592 \text{ EDLEV} + .2822 \text{ Totkid}$$

From this equation, we will be able to ascertain the net effect of each of the independent variables on current use of contraception. As expected, propensity to use contraception is positively associated with level of education.

The probability of using contraception at different levels of education were also estimated and are shown below.

	None	1-5	6-9	10
EDLEV p(y=1)	.2433	.3372	.4461	.5604

The results of this analysis clearly indicate that education is the most important variable affecting the use of contraception. The probability of use of contraception increases with the increase in schooling years. For example, the probability that a women with no education will use contraception is 0.24 while the probability increases to 0.56 for women with ten years of schooling.

Discriminant Analysis

To reinforce the findings obtained from the logistics regression, a discriminant analysis was also carried out. The discriminant analysis would help to distinguish variables which discriminate between users and non-users. The discriminant function equation is given by

$$\text{Cur use} = - 3.1771 + .9162 \text{ Res} + .2313 \text{ Elec} + 0.5002 \text{ Womed} + .2804 \text{ totkid.}$$

The positive sign of the discriminant function coefficient of the variable education has a stronger positive effect on the current use of contraception. In order to measure the relative importance of the variables in question and their influence to discriminate between users and non-users, the percentage contribution of each variable is estimated and given in Table 17. Among the four variables the level of education of the women is one of the important discriminating variables which contributes more than 50 percent change in the current use of contraception.

It emerges from this analysis that educational level, and in particular level of female education, is an important determinant of fertility in Bangladesh.

Table 13 : Stepwise Multiple Regression Analysis For Total Number of Children Ever-born.

Variable	Unstandardized B	Standardized B	T values
TNCD	-.0274*	-.5454	-44.358
PMW	-.6114*	-.0825	- 6.737
WOM 6 10 9	-.4404*	-.0653	- 5.254
WOM 10	-.6685*	-.0542	- 4.417
WOM 1 to 5	-.1381*	-.0331	- 2.662
Constant	2.9152*	-	99.428
	$R^2 = .33$	* $P < .01$	
	$F = 441.06.$		

Table 14 : Stepwise Multiple Regression Analysis for the Proportion Children Dead.

Variable	Unstandardized B	Standardized B	T values
TNCEB	.0329*	.2152	13.51
PMW	.1020*	.0918	5.80
WOM 1 to 5	-.0399*	-.0695	- 4.34
WOM 6 to 9	-.0574*	-.0587	- 3.66
WOM 10	-.0816*	-.0457	- 2.88
Constant	.0806*	-	9.29
	$R^2 = .063$	* $P < .01$	
	$F = 50.43$		

Table 15 :Duncan-Walker Logistic Regression Analysis.

Variables	Logistic coefficient	Standard error	T value	Standardized coefficient
RES	.7841	.1035	7.574	.2275
ELEC	.1996	.0973	2.051	.0654
EDLEV	.4592	.0421	10.908	.3061
TOTKID	.2822	.0311	9.063	.2579
Constant	-2.9542	.1441	-20.504	

Multivariate likelihood function = -3858.60

Likelihood ratio statistic = 358.489

(Distributed as X^2 with 4 degrees of freedom) prob = .001

Number of observations 6742

Number of cases 1931

Table 16 : Multivariate Discriminant Analysis of

Variable	Coefficient	Standard error	T value	Standardized coefficient
Res	.9162	.1104	8.300	.2658
Elec	.2383	.1013	2.252	.0781
Womed	.5002	.0434	11.521	.3334
Totkid	.2804	.0300	9.347	.2562
Constant	-3.1771			

Table 17 : Discriminant Function Coefficients as Well as Relative Contribution of Individual Variables.

Variables	Standardized coefficients k^i	Mean difference d^i	$k_i d_i$	Percent
RES	.2658	.105	.028	17.6
ELEC	.0781	.105	.008	5.0
WOMED	.3334	.242	.081	50.9
TOTKID	.2564	.165	.042	26.5