



FCND DP No. **138**

FCND DISCUSSION PAPER NO. 138

**THE FOOD FOR EDUCATION PROGRAM IN BANGLADESH:
AN EVALUATION OF ITS IMPACT ON EDUCATIONAL
ATTAINMENT AND FOOD SECURITY**

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ABSTRACT

The Government of Bangladesh launched the innovative Food for Education (FFE) program in 1993. The FFE program provides a free monthly ration of rice or wheat to poor families if their children attend primary school. The goals of this program are to increase primary school enrollment, promote attendance, reduce dropout rates, and enhance the quality of education. This paper presents the findings of a recent International Food Policy Research Institute (IFPRI) evaluation of the FFE program that demonstrates the extent to which these goals were met.

This evaluation uses primary data collected from multiple surveys covering schools, households, communities, and foodgrain dealers. The authors first examine the performance of the FFE program, showing that it has largely fulfilled its objectives of increasing school enrollment, promoting school attendance, and preventing dropouts. The enrollment increase was greater for girls than for boys. The quality of education, however, remains a problem. Next, they analyze the targeting effectiveness of the program, its impact on food security, and its efficiency in distributing rations. In general, the FFE program targets low-income households. However, there is considerable scope for improving targeting, as a sizable number of poor households remain excluded from the program even while many nonpoor households are included. Furthermore, the evaluation results indicate that the functioning of the current private-dealer-based foodgrain distribution system of the FFE program is not satisfactory.

CONTENTS

Acknowledgments.....	ix
1. Introduction.....	1
2. Overview of the FFE Program.....	3
Origin of the FFE Program.....	3
Expansion of the FFE Program in Relation to Overall Primary Education.....	5
Salient Features of the FFE program.....	7
3. Data Source.....	12
4. Analysis of Program Effects.....	14
School-Level Performance of the FFE program.....	14
General Information on Schools.....	14
School Enrollment.....	16
School Attendance.....	17
Dropout Rates.....	18
Quality of Education.....	18
Household-Level Analysis.....	20
Household Characteristics.....	21
Targeting Effectiveness.....	23
Effects on Food Consumption.....	25
Effects on Nutritional Status.....	26
Impact on Enrollment and School Participation.....	27
FFE Foodgrain Distribution.....	33
5. Conclusions for Policy.....	35
Tables.....	41
References.....	63

TABLES

1 Number of government and nongovernment primary schools, teachers, and students.....	43
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2	Expenditure on education	43
3	Total number of unions, primary schools, students, and beneficiaries under the FFE program	44
4	Coverage by the FFE program.....	44
5	Expenditure on FFE, and distribution foodgrains under the FFE program	44
6	Sources of foodgrains for the public food distribution system.....	45
7	FFE survey locataions and number of primary schools surveyed	45
8	General information, by type of schools.....	46
9	Number of teachers per school, 1992-2000	46
10	Percentage of female teachers per school, 1992-2000.....	47
11	Information about teachers	47
12	Change in envollment rate per school, by type of schools	48
13	Attendance rates, by type of schools.....	48
14	Annual dropout rates, 1999-2000	49
15	Number of students per teacher, 1997-2000	49
16	Use of classroom seating capacity	50
17	Students' achievement test results, by type of schools.....	50
18	Characteristics of respondent households.....	51
19	Characteristics of respondent households, by per capita expenditure quintiles, FFE unions.....	52
20	Characteristics of respondent households, by per capita expenditure quintiles, non-FFE unions.....	53
21	Targeting effectiveness	54
22	Households in FFE unions who fulfill the official targeting criteria	54
23	Average budget share of food items	55
24	Per capita daily calorie consumption	56
25	Per capita daily calories, by per capita expenditure quintiles and type of unions	56
26	Prevalence of malnutrition among preschool children aged 6 to 60 months.....	57
27	BMI of child-bearing-age women, 15-49 years old.....	58
28	Primary-school-age children and percentage of them going to school, village census results.....	59

29	Child enrollment status in 2000, household survey results.....	59
30	Impact of FFE on school enrollment, econometric model results	60
31	Average profitability to dealers of FFE foodgrain distribution	61

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1. INTRODUCTION

Bangladesh has led the world in creating innovative development programs that can be replicated successfully in other developing countries. The Grameen Bank microcredit program for the poor and the Comilla Model for rural development are notable examples. Bangladesh has also implemented the first-ever Food for Education (FFE) program, which may soon be added to the list of successful anti-poverty interventions.

The Government of the People's Republic of Bangladesh (GOB) launched the FFE program in 1993 on a large-scale pilot basis. The program was designed to develop long-term human capital through education by making the transfer of food resources to poor families contingent upon school enrollment of their children in primary school.

Pervasive poverty and undernutrition persist in Bangladesh. About half the country's 130 million people cannot afford an adequate diet. Poverty has kept generations of families from sending their children to school, and without education, their children's future will be a distressing echo of their own. Furthermore, from birth, children from poor families are often deprived of the basic nutritional building blocks that they need to learn easily. Consequently, the pathway out of poverty is restricted for children from poor families.

Many children from poor families in Bangladesh do not attend school, either because their families cannot afford books, other school materials, or clothes, or because the children contribute to their family's livelihood and cannot be spared. Children often

have to work in the fields, sell various products, or care for younger siblings so that their parents can earn an income away from home. Thus, these children bring direct or indirect income into the household—income that can make a difference between one or two meals a day for the family.

The FFE program provides a free monthly ration of foodgrains to poor families if their children attend primary school. Thus, the FFE foodgrain ration becomes an income entitlement enabling a child from a poor family to go to school. The family can consume the grain, thus reducing its food budget, or it can sell the grain and use the cash to meet other expenses. The FFE program provides immediate sustenance for the poor, but perhaps more importantly, it has the potential to empower future generations by educating today's children. Education would equip children from poor families to improve their productivity, thereby expanding their future income-earning opportunities.

This paper describes the main features of the FFE program and evaluates its performance in fulfilling its official objectives, which are to increase school enrollment, promote school attendance, prevent dropout, and improve the quality of education. This study also examines the targeting effectiveness of the program, its impact on food consumption and nutrition, and the efficiency of the foodgrain distribution system. After evaluating program performance, the study presents conclusions for policy.

2. OVERVIEW OF THE FFE PROGRAM

ORIGIN OF THE FFE PROGRAM

From 1989 to 1994, the International Food Policy Research Institute (IFPRI) conducted research on food policy issues in Bangladesh under the Ministry of Food's (MOF) Bangladesh Food Policy Project (BFPP). In 1991, IFPRI conducted a comprehensive study of a targeted food subsidy program known as *Palli* (rural) Rationing (Ahmed 1992). The study found that the GOB was providing subsidies equivalent to US\$60 million per year to run the program. However, about 70 percent of the subsidized foodgrains (mostly rice) was going to those who were not poor, i.e., ineligible to receive the subsidy. The costly program was simply not reaching those most in need. The high cost of subsidy and heavy leakage to the nonpoor motivated the GOB to abolish the program in 1992.

The abolition of *Palli* Rationing knocked the Public Food Distribution System (PFDS) out of balance, as it closed off one of its principal outlets. Before its demise, *Palli* Rationing distributed 20 percent of all public foodgrains. Moreover, the GOB was concerned about the food security of the 6.1 million dispossessed ration-card-holding households that were formerly entitled to subsidized rural rations. The critical question at that time was how government more effectively targets food subsidies to the poor. To answer this question, the MOF asked IFPRI to conduct a systematic review of alternatives to *Palli* Rationing.

To undertake this review, in 1992 the MOF commissioned the Working Group on Targeted Food Interventions (WGTFI), chaired by IFPRI. The working group included IFPRI researchers; representatives of the Food Planning and Monitoring Unit (FPMU), MOF; the GOB's Academy for Planning and Development (APD); the Institute of Nutrition and Food Science (INFS), Dhaka University; the Bangladesh Rural Advancement Committee (BRAC); CARE; and the U.S. Agency for International Development (USAID). The working group introduced the concept of the Food for Education Program in August 1992 in its first draft report, *Options for Targeting Food Interventions in Bangladesh* (WGTFI 1994). Drawing on the WGTFI's suggestions, the GOB launched a large innovative pilot program, Food for Education, in July 1993.

An early assessment of the FFE program by IFPRI in 1994 suggested that it had been successful in increasing primary school enrollment, promoting attendance, and reducing dropout rates. The FFE program had also been cost-effective in transferring income benefits to low-income households through wheat entitlements. Due to effective targeting, the program operated with a low level of leakage (Ahmed and Billah 1994). However, as years passed, the GOB became concerned about the quality of education provided in the FFE-supported schools due to increased enrollment rates and teacher preoccupation with food distribution. In an effort to relieve teachers of the responsibility for food distribution, the GOB assigned this task to private dealers in 1999.

EXPANSION OF THE FFE PROGRAM IN RELATION TO OVERALL PRIMARY EDUCATION

Table 1 shows the trends in primary education in Bangladesh during the 10 years from 1988/89 to 1997/98. Over this period, the number of primary schools increased by 46 percent, teachers employed in primary schools by 30 percent, and students in primary schools by 50 percent. A disaggregated analysis shows that almost the entire expansion in primary education during the period was due to the growth in private-sector schools. The number of nongovernment primary schools increased by 236 percent; teachers by 163 percent; and students by 202 percent from 1988/89 to 1997/98. As a consequence, the percentage of nongovernment primary schools in the total number of primary schools increased from 16 in 1988/89 to 38 in 1997/98. During the same time period, the percentage of teachers in nongovernment primary schools of the total number of teachers increased from 18 to 36; and of students, from 15 to 30. There was a sudden and big surge in the number of nongovernment primary schools, which increased from 13,043 in 1992/93 to 28,640 in 1993/94. This increase was in response to a new government directive that provided incentives to rural communities to build new schools.

Data in Table 1 also indicate that the average number of students per teacher in all primary schools increased from 61 in 1988/89 to 70 in 1997/98. There are more students per teacher in government schools than in nongovernment schools. In 1988/89, government schools had a student/teacher ratio of 65, while in nongovernment schools the ratio was 50. This ratio increased to 77 for government schools and 58 for nongovernment schools in 1997/98.

Table 2 provides information on annual expenditure on the FFE program compared to total expenditure on primary education, expenditure on the entire education system, and total public expenditure in Bangladesh. The share of the FFE program in total expenditure for primary education in the country increased from 4.7 percent in 1993/94 to 19.9 percent in 1997/98. The share of primary education in total expenditure for education at all levels had increased from 47.5 percent in 1988/89 to 52.9 percent in 1993/94, but this share declined to 45.2 percent in 1997/98. Normally, one would expect that the total primary education budget would increase in proportion to the expansion in the FFE program. But in this case, the expansion in the FFE program appears to have been financed to some extent at the expense of non-FFE primary education. In 1997/98, expenditure on the FFE program accounted for about 1.5 percent of total government expenditures (Chowdhury 2000).

Table 3 shows the expansion of the FFE program. In 1993, the program started in 460 unions, one union in each of the 460 rural *thanas* in Bangladesh.¹ The program expanded to 1,247 unions by 2000. From 1993/94 to 1999/00, the number of primary schools covered by the program increased by 262 percent and the number of students in the program schools increased by 245 percent. About 40 percent of the students in FFE schools receive FFE foodgrains. Hence, out of the 5.2 million students enrolled in schools with the FFE program in 2000, 2.1 million students were FFE beneficiaries. About 2

¹ The administrative structure of Bangladesh consists of divisions, *thanas*, and unions, in decreasing order by size. There are five divisions, 64 districts, 489 *thanas* (of which 29 are in four city corporations), and 4,451 unions (all rural). The FFE program is implemented in all 460 rural *thanas*.

million families benefited from the program in 2000. Table 4 provides the share of FFE schools in all primary schools, and program beneficiary students as a share of total students in the primary education system. Currently, the FFE program covers about 27 percent of all primary schools and enrolls about one-third of all primary school students in Bangladesh. FFE beneficiary students account for about 13 percent of all students in primary schools.

In 1993/94, the FFE program started at a cost of Tk 683 million (US\$17 million),² involving distribution of 79,553 metric tons of foodgrains. By 1999/00, the annual cost increased to Tk 3.94 billion (US\$77 million), and the distribution of foodgrains to 285,973 metric tons. The cost of the program in 2000 translates into Tk 5.20 (US\$0.10) per beneficiary student per day. The share of FFE in total PFDS foodgrain distribution was about 6 percent in 1993/94, which increased to 21 percent in 1997/98, and then decreased to 15 percent in 1999/00 (Table 5).

SALIENT FEATURES OF THE FFE PROGRAM

Since its inception in July 1993, the FFE program has been funded by the GOB. The FFE program is one of the foodgrain distribution channels of PFDS. The Primary and Mass Education Division (PMED) makes cash purchases of foodgrains (wheat and rice) from the MOF for distribution in the FFE program. On average, food aid from donor countries accounted for 44 percent; domestic procurement, 39 percent; and GOB

² The official exchange rate for the taka (Tk), the currency of Bangladesh, was Tk 40.25 per US\$1.00 in June 1994. The exchange rate was Tk 51.00 per US\$1.00 in June 2000.

commercial imports, 17 percent of total PFDS foodgrains during the three years from 1997/98 to 1999/2000 (Table 6).

PMED administers the FFE program, and the Project Implementation Unit of PMED implements the program with assistance from the Directorate of Primary Education. At the field (*thana*) level, the *Thana* Nirbahi (executive) Officer and the *Thana* Education Officer execute the program.

The FFE program uses a two-step targeting mechanism. First, two to three unions that are economically backward and have a low literacy rate are selected from each of the 460 rural *thanas*. The program covers all government, registered nongovernment, community (low-cost), and satellite primary schools, and one Ebtedayee Madrasa (religion-based primary school) in these selected unions. Second, within each union, households with primary-school-age children become eligible for FFE benefits if they meet at least one of the following four targeting criteria:

1. A landless or near-landless household that owns less than half an acre of land;
2. The household head's principal occupation is day laborer;
3. The head of household is a female (widowed, separated from husband, divorced, or having a disabled husband); or
4. The household earns its living from low-income professions (such as, fishing, pottery, weaving, blacksmithing, and cobbling).

A household that meets the targeting criteria, but that is covered under the Vulnerable Group Development (VGD) program or the Rural Maintenance Program (RMP) or any other targeted intervention program, is not eligible to receive FFE foodgrains.

If a household is selected to participate in the FFE program, it is entitled to receive a maximum free ration of 20 kilograms of wheat or 16 kilograms of rice per month for sending its children to a primary school. If a household has only one primary school-age child (6-10 years) who attends school, then that household is entitled to receive 15 kilograms of wheat or 12 kilograms of rice per month. To be eligible for 20 kilograms of wheat or 16 kilograms of rice, a household is required to send more than one child, and *all* primary-school-age children, to school. The enrolled children must attend 85 percent of total classes in a month to be eligible for the wheat entitlement in that month. Thus, the total wheat allotment to a school may vary from month to month, depending on the variation in the number of students who meet the attendance requirement.

Based on the targeting criteria, the School Managing Committee (SMC) and the Compulsory Primary Education Ward Committee jointly prepare a list of FFE beneficiary households in every union at the beginning of each year. Due to resource constraints, the total number of beneficiary households is identified so that no more than 40 percent of students receive FFE rations. The beneficiary list is recorded in a registry book. The headmaster of the school, who is a member and secretary of the SMC, is the custodian of this registry book. Each FFE-enlisted household gets a ration card that entitles it to

receive the monthly free foodgrain ration for sending its children to a specific primary school.

To improve educational quality in FFE schools, the GOB imposed a number of additional requirements for the schools to qualify for program participation. Effective from 1998/99, these requirements are:

- Schools are graded by A, B, C, and D classification (A being the highest and D being the lowest) on the basis of certain performance criteria. FFE foodgrain allocation is withheld for the D-grade schools until these schools attain the acceptable performance level.
- At least 10 percent of grade 5 students must qualify for the annual scholarship examination.
- Schools must hold the prescribed annual examination. Students in grades 3, 4, and 5 should obtain at least 40 percent of total points in the previous year's annual examination to receive FFE rations.
- The FFE ration is suspended for any school in which a random inspection reveals less than 60 percent attendance, until the attendance record improves.

By the third day of each month, the headmaster prepares a list of students from beneficiary households who met the 85 percent attendance requirement in the previous month. Based on this list, the SMC calculates the foodgrain requirement for the school

and submits this requirement statement to the *Thana* Education Officer (TEO). After verifying the statement, the TEO forwards it to the *Thana Nirbahi* (executive) Officer (TNO) for clearance. By the tenth day of each month, the TNO issues a foodgrain Delivery Order in favor of one authorized private foodgrain dealer³ for each union, and forwards the order to the *Thana* Controller of Food (TCF), an official of the MOF. On the basis of this delivery order, the TCF issues another delivery order for the dealer and sends it to Officer-in-Charge of the MOF's Local Supply Depot (LSD). The TEO fixes the school foodgrain distribution dates in consultation with the dealer, informs the concerned schools of the date by letters, and forwards copies of the letter to TNO, the union council chairman, and others responsible for the supervision of foodgrain distribution. The authorized dealer receives the monthly supply of foodgrains from the designated LSD, and stores the foodgrain in a selected warehouse at the union growth center. Each dealer receives a cash allowance of Tk 250 per metric ton of foodgrain, plus proceeds from the sales of empty bags that contained the rice or wheat, to cover the foodgrain transport and distribution costs.

Each beneficiary student's parent or guardian holding the FFE ration card picks up the monthly ration on a day specified by the school. Designated officials (chairman of the union council and Assistant TEO) supervise the foodgrain distribution (PMED 2000).

³ From July 1993 to January 1999, SMC had distributed foodgrains to FFE beneficiary households at the school premises once a month. However, the GOB had been concerned that teachers were spending too much of their time in foodgrain distribution and, as a result, that the quality of education in FFE-supported schools had deteriorated. These concerns led to a PMED decision that the SMC would no longer distribute foodgrains. Instead, private dealers were appointed (one dealer per union), who have been responsible for FFE foodgrain distribution since February 1999.

3. DATA SOURCE

This evaluation of the FFE program is based on primary data collected in school, household, community, and foodgrain dealer surveys. IFPRI-FMRSP carried out these surveys in September-October 2000.

The sample includes 600 households in 60 villages in 30 unions in 10 *thanas*, and 110 schools in the same 30 unions from which the household sample was drawn. First, the sampling process randomly selected 10 *thanas* with probability proportional to size (PPS), based on *thana*-level population data from the 1991 census. Second, two FFE unions and one non-FFE union were selected per *thana*. In the two selected FFE unions, the program started in 1993 in one and in 1995/1996 in the other. The non-FFE union was randomly selected from the remaining unions in a sample *thana*. Third, two villages from each union were randomly selected with PPS using village-level population data from the 1991 census. A complete census of the households was carried out in each of the selected villages. Then, 10 households that had at least one primary-school-age child (6 to 12 years old) were randomly selected in each village from the census list of households. Only those schools attended by the children in the sample households were selected for the school survey. Table 7 provides the list of survey locations and the number of schools surveyed in each of these locations. FFE school, FFE and non-FFE household, community, and dealer surveys were conducted in the FFE unions, and non-FFE school, non-FFE household, and community surveys were conducted in the non-FFE unions.

Several questionnaires were used in the surveys. The village census questionnaire collected information on household demography, school enrollment, literacy, and FFE program participation. The household questionnaire collected information on a wide variety of topics, such as household composition, occupation, education, school participation, dwelling characteristics, assets, expenditures, food consumption, anthropometric measurements of women and children, and use of the FFE system. The household survey was administered by a team of male and female interviewers, who completed separate male and female questionnaires for each household. A male interviewer administered the male questionnaire to a male household member, usually the head of household. Similarly, a female interviewer administered the female questionnaire to the wife of the head of household. The school questionnaire collected information on student enrollment, class attendance, dropout rates, teacher qualification, school facilities, school expenditures, and FFE program participation. Administering questionnaires to foodgrain dealers and program-implementing officials captured various operational aspects of the FFE program. A community survey was conducted in all sample villages to collect primary data on union-level and village-level variables.

In addition to the above-mentioned surveys, academic achievement tests, designed to assess the quality of education received by students, were given to 3,369 students enrolled in both FFE and non-FFE schools. These tests were also given to children in the sample households during the household survey to correlate test scores with household characteristics.

4. ANALYSIS OF PROGRAM EFFECTS

SCHOOL-LEVEL PERFORMANCE OF THE FFE PROGRAM

General information on surveyed schools and major findings of the evaluation of school-level performance of the FFE program are presented here. The effects of this program on school enrollment, attendance, dropout, and quality of education have been assessed.

General Information on Schools

Observations during the school survey suggest that, in general, the condition of nongovernment primary school buildings in rural Bangladesh are in much poorer condition than those of government primary schools. About 11 percent of the total sample of nongovernment schools have concrete or tin roofs, brick walls, and cement floors compared to 45 percent of all surveyed government schools.

Table 8 suggests that the average size of FFE schools (in terms of number of students per school) is about 27 percent larger than that of non-FFE schools, because the FFE program entices more children to attend schools. Overall, about half of all students are girls. The proportion of girls to total students is slightly higher in nongovernment FFE schools than in nongovernment non-FFE schools.

Table 8 also shows that average annual school operating expenses per student (excluding teacher salaries) are generally low (around Tk 40 per student a year), or very

low (Tk 27 per student a year) for nongovernment FFE schools.⁴ Both government and nongovernment schools under the FFE program are more intensively inspected than schools that are not in the program. Over 90 percent of the teachers in the FFE program as well as in non-FFE schools receive training. In FFE schools, fewer teachers are engaged in private tutoring compared to non-FFE schools. More teachers in nongovernment schools are engaged in private tutoring compared to government schools, and this is true for both FFE and non-FFE schools.

The number of teachers per school (FFE and non-FFE, government and nongovernment) ranges from 3.9 to 4.8 and these numbers have remained virtually the same since 1992 (Table 9). Female teachers as a percentage of all teachers increased from 1992 to 2000. In 2000, around 29 percent of all teachers in FFE schools and 33 percent in non-FFE schools were female (Table 10).

Table 11 shows that the educational qualifications of teachers in FFE and non-FFE schools are about the same. However, teachers in government schools have higher education levels than nongovernment schoolteachers. About 32 percent of government schoolteachers have a bachelor's degree or above. In contrast, only 9.3 percent of all nongovernment schoolteachers have a bachelor's degree. There is almost no difference in teacher salaries between FFE and non-FFE schools. However, the average salary of a government schoolteacher is about 2.5 times higher than that of a nongovernment

⁴ School operating expenses include the costs of stationery and supplies, repair and maintenance, utilities, and communication. Information on school expenses was not available for non-FFE, nongovernment schools.

schoolteacher. Further, most nongovernment schoolteachers are not paid regularly. In all types of schools, each teacher teaches about four classes per day and five subjects per week.

Table 11 also indicates that, mainly due to much higher salaries, government schoolteachers are better off than nongovernment schoolteachers, as reflected by the relative levels of monthly household expenditures. School salary accounts for about three-fourths of total income of government schoolteachers, while it accounts for only 27 percent of total income of nongovernment schoolteachers. Nongovernment schoolteachers mainly depend on agriculture for their livelihood, and are therefore less likely to devote themselves to teaching full time.

School Enrollment

School survey results show that student enrollment in FFE schools increased by 35 percent per school over the two-year period from the year before the program to the year after the introduction of the program.⁵ Enrollment of girls increased by a remarkable 44 percent, and for boys, the increase was 28 percent. In contrast, per school enrollment in non-FFE government primary schools at the national level increased by only 2.5 percent—0.1 percent for boys and 5.4 percent for girls—over a two-year period from 1992 (the year before the FFE program was introduced) to 1994 (Table 12).

⁵ Half of the sample FFE schools were brought under the FFE program in 1993 and the other half in 1995. The change in enrollment is calculated from 1992 to 1994 for the schools that entered the program in 1993, and from 1994 to 1996 for the schools entering the program in 1995.

Nongovernment schools had a higher increase in enrollment than government schools in the initial year of the introduction of the FFE program.

Table 12 also shows that the per-school rate of increase in enrollment in the surveyed FFE schools declined significantly in the years following the introduction of the program, largely due to capacity constraints in the same schools. Nevertheless, year-to-year increases in the rate of enrollment in the sample schools remained somewhat higher in FFE schools than in non-FFE schools.

A number of studies on the performance of Bangladesh's FFE program also suggests that the FFE program has resulted in increased primary school enrollment (Ahmed and Billah 1994; BIDS 1997; DPC 2000; Khandker 1996; Ravallion and Wodon 1997).

School Attendance

Table 13 shows the percentages of total enrolled students that were present in schools on the day of the survey. As recorded in the attendance register, the overall rate of attendance is 70 percent in FFE schools and only 58 percent in non-FFE schools. In order to check the validity of attendance recorded in the school attendance register, survey enumerators counted all students in each class in surprise visits to schools. The head-count attendance figures were then compared with the figures recorded in the attendance register. Table 13 shows that the difference in attendance between head-count and official record is fairly small. This suggests that the attendance information from school records is quite reliable.

Dropout Rates

The FFE program helps retain children in school. Table 14 provides results of annual dropout rate calculations for FFE and non-FFE schools. About 40 percent of the students in FFE schools are beneficiaries of the FFE program. From 1999 to 2000, only about 6 percent of the FFE beneficiary students dropped out compared to 15 percent of the nonbeneficiary students in FFE schools.

Quality of Education

The quality of education in FFE and non-FFE schools is judged on the basis of student/teacher ratio, use of classroom seating capacity, and students' achievement test results. The following are highlights of major findings.

A large student-teacher ratio is often seen as detrimental to the quality of education. In this regard, by encouraging children to attend school, the FFE program has become a victim of its own success. There are more students per teacher in FFE schools than in non-FFE schools (Table 15). On average, while there were 62 students per teacher in non-FFE schools, FFE schools had 76 students per teacher in 2000. In fact, nongovernment schools with the FFE program had 80 students per teacher, while those without the program had only 41 students per teacher in 2000.

Because of increased enrollment and class attendance rates, classrooms of FFE schools are more crowded than non-FFE school classrooms. Table 16 shows that FFE schools in general utilize about 98 percent of their classroom seating capacity. Indeed,

nongovernment FFE schools exceed the capacity. In contrast, non-FFE schools use about 79 percent of their seating capacity.

For this evaluation of the FFE program, a standard achievement test was administered to students. This test was given to all fourth grade students in FFE and non-FFE schools. Table 17 presents the results of the test. The average test scores are lower in FFE schools (49.3 percent of total points) than in non-FFE schools (53.0 percent of total points), and this difference is statistically significant. Within FFE schools, the average test score of FFE beneficiary students (46.0 percent of total points) is less than that of the nonbeneficiary students (53.3 percent of total points), which brings down the aggregate score in FFE schools. FFE beneficiaries score lower than nonbeneficiaries, probably because of their relatively lower socioeconomic status.

FFE schools have classroom sizes of about 31 percent more students than classrooms in non-FFE schools (Table 16). About 40 percent of the students in FFE classrooms are FFE beneficiaries and the rest are nonbeneficiaries. If a larger class size leads to adverse effects on the quality of education (as measured in terms of students' test achievements), then this should be true for both FFE beneficiary and nonbeneficiary students in the same classroom. Analysis of the achievement test scores shows that, on average, the nonbeneficiary students in FFE schools scored (53.3 percent of total points) about the same as the students in non-FFE schools (53.0 percent of total points), despite a

significantly larger class size in FFE schools (Table 17).⁶ Therefore, it is likely that larger class size in FFE schools does not necessarily cause lower test scores.

Table 17 also shows that the difference in test scores is larger between government and nongovernment schools compared to the difference between FFE and non-FFE schools, with government school students performing better than nongovernment school students. Government primary schools have better facilities, have more qualified teachers, and provide higher incentives to teachers compared to nongovernment primary schools. This indicates that the quality of primary education is directly related to the characteristics of primary school.

HOUSEHOLD-LEVEL ANALYSIS

Most of the comparative analyses that are based on household survey data classify the sample households into five categories, defined as follows.

Households living in FFE unions

A = FFE beneficiary households.

B = Nonbeneficiary households having primary-school-age children who attend FFE schools.

⁶ The FFE program targets children from poor households, most of who would not have attended school without the program. The socioeconomic status of the nonbeneficiary students in FFE schools, therefore, can roughly be compared with that of the students in non-FFE schools. However, several factors need to be controlled for in order to make a sound comparison.

C = Nonbeneficiary households having primary-school-age children who do not attend any school.

Households living in non-FFE unions

D = Households having primary-school-age children who attend school.

E = Households having primary-school-age children who do not attend school.

Household Characteristics

Table 18 presents the characteristics of A, B, C, D, and E household categories. The average sizes of the sample households (5.5 persons in FFE unions and 5.6 persons in non-FFE unions) are slightly larger than the national average rural family size, because the sample purposely included only those households that had at least one primary-school-age child. The 2000 Household Income and Expenditure Survey (HIES) reports the average rural household size of 5.2 persons (BBS 2001).

Average years of schooling of parents are very low in general, and extremely low for mothers and C- and E-category households. Among all adult household members, 54 and 51 percent of the males, and 73 and 71 percent of the females in FFE and non-FFE unions, respectively, never attended school. Indeed, these percentages are very high for the C and E categories that do not send their children to school.

In FFE unions, per capita monthly expenditure (as a proxy for monthly income)⁷ is higher for B-category households than A-category households, but A-category households have higher income than C-category households.⁸ In non-FFE unions, households belonging to D-category have higher income than those belonging to E-category households.

Tables 19 and 20 present the characteristics of households living in FFE and non-FFE unions, respectively, disaggregated by per capita expenditure quintiles.⁹ The first two rows in Table 19 provide results on targeting effectiveness, discussed in the following section.

The results suggest that, for households in the poorest two quintiles (the bottom 40 percent of all households), about 21 percent in FFE unions and 25 percent in non-FFE unions do not send their children to school.

In both FFE and non-FFE unions, educational attainment of parents and other adults is positively correlated with income. Females head a high proportion of the poorest households in FFE and non-FFE unions compared to higher income groups. Since the majority of the poor households are functionally landless (owning less than half an acre

⁷ In this study, per capita expenditures are used as a proxy for income for two reasons. First, expenditures are likely to reflect permanent income and are, hence, a better indicator of consumption behavior (Friedman 1957). Second, data on expenditures are generally more reliable and stable than income data. Because expenditures are intended to proxy for income, the terms “expenditure” and “income” will be used interchangeably.

⁸ Per capita monthly expenditures of FFE beneficiary households (A-category) *include* the income transfer from the FFE program.

⁹ Quintile groups are based on household quintiles ranked by total per capita expenditures.

of land), day laborer is by far their major occupation. This pattern holds for both FFE and non-FFE unions.

Targeting Effectiveness

The household survey was designed to permit an assessment of targeting effectiveness of the FFE program. The results presented in the first two rows in Table 19 indicate that the distribution of FFE beneficiaries among income groups is somewhat progressive. About 63 percent of the households in the poorest quintile are program beneficiaries, compared to about one-third of the households in the richest quintile that receive FFE benefits. However, this pattern also shows evidence of mistargeting, as many households in the higher income groups are included in the program. About 35 percent of all FFE beneficiary households belong to the richest two quintiles (the top 40 percent of households in the income distribution).

The results reported in Table 21 suggest that the average monthly per capita income (expenditure) of B-category households (nonbeneficiary households with children attending an FFE school) is 60 percent higher than that of A-category households (FFE beneficiaries).¹⁰ This income difference between A- and B-category households is statistically significant. This finding implies that the FFE program is effectively targeted to low-income households.

¹⁰ Per capita monthly expenditures of FFE beneficiary households (A-category) *exclude* the income transfer from the FFE program.

However, there are still some households that have primary-school-age children who do not attend any school (C-category households). The household survey reveals that many households in this category are extremely poor, and their children contribute directly or indirectly to household livelihood. As a result, the opportunity cost of attending school for some of these children is higher than their expected income transfers from the FFE program. For other poor households in this category, the net income transfer (that is, net opportunity cost of children to attend school) would not be enough to afford even the bare minimum clothing and supplies needed to send their children to school. As a group, these nonbeneficiaries constitute about 13 percent of all households in FFE unions and are somewhat poorer than the households receiving FFE benefits. The average income of C-category households is 5.3 percent lower than that of B-category households (FFE beneficiaries). However, this difference is not statistically significant.

The FFE program is also designed to target the most “economically backward” unions in each *thana*. A comparison of average incomes between FFE unions and non-FFE unions suggests that FFE unions are poorer than non-FFE unions. The average income of households in FFE unions is 8.3 percent lower than the average income of households in non-FFE unions, and this difference is statistically significant. Hence, the geographic targeting of unions appears to be good.

As described in Section 2, a household is required to meet at least one of four selection criteria to be eligible for the FFE program. Table 22 shows that about 44 percent of B-category households (nonbeneficiaries whose children attend FFE school) meet at least one criterion—owning less than half an acre of land—yet are not in the

program. The results of the analysis also suggest that 21.3 percent of the FFE beneficiary households do not meet any criteria. Nevertheless, 57 percent of these households have incomes less than the average income of the beneficiary households who meet the criteria. These findings suggest that the official targeting criteria need to be improved for better identification of the needy households.

Effects on Food Consumption

Table 23 presents the shares of household expenditures spent on various food items. For the entire sample, rice accounts for about 35 percent of the total food budget. Household budget allocations for various foods across the five household categories indicate similar patterns, except for wheat. Since FFE beneficiaries receive their ration mostly in wheat, the imputed expenditure on wheat for A-category households is higher than that in other groups.

FFE beneficiaries consume 10 percent more calories than do C-category households. One-third of program beneficiary households are calorie deficient, while as high as 60 percent of C-category households consume fewer calories than they require (Table 24).

Table 25 shows the pattern of calorie consumption across income groups. The pattern is very similar between FFE and non-FFE unions. The pattern indicates that calorie consumption is highly responsive to changes in income. For the poorest 20 percent of all households, the average calorie consumption is below requirements. About

two-thirds of the households in the poorest quintile are calorie deficient in both FFE and non-FFE unions.

Effects on Nutritional Status

Within households, some members are at greater nutritional risk than others. It is well documented in various studies that preschool children and women suffer from undernutrition more severely than other household members. Indeed, an IFPRI study in Bangladesh assessing food consumption and nutritional effects of targeted food-based programs finds that preschoolers are at the greatest risk of undernutrition, followed by pregnant and lactating women (Ahmed 1993).

The nutritional status of preschool children (aged 6-60 months) is assessed on the basis of anthropometric data for all preschool children in the sample households relative to a particular growth standard. The standards devised by the U.S. National Center for Health Statistics (NCHS) are used in this study. The levels of nutritional status are expressed in Z-score values.¹¹

Table 26 reports Z-scores for height-for-age, a measure of stunting; weight-for-age, a measure of underweight; and weight-for-height, a measure of wasting. Weight-for-height is a short-term measure (indicating acute undernutrition), while height-for-age indicates long-term nutritional status of children (indicating chronic undernutrition).

¹¹ $Z\text{-score} = (\text{Actual measurement} - 50^{\text{th}} \text{ percentile standard}) / \text{standard deviation of } 50^{\text{th}} \text{ percentile standard}$. Levels of nutritional status in comparison with a reference population can be conveniently expressed in terms of Z-score values. A Z-score value of zero indicates a child who is “normal,” and a Z-score value less than -2 indicates a child who suffers from a nutritional problem.

Weight-for-age can be viewed as a medium-term indicator, which reflects both acute and chronic undernutrition. The results indicate that the average nutritional status of preschoolers of FFE beneficiary households is better than that of preschoolers of C-category of households, but somewhat worse than preschoolers of B-category of households.

Table 27 shows the nutritional status of the other high-risk group, childbearing age women (aged 15-49 years), across the five household categories. The Body Mass Index (BMI) is used as the nutritional status indicator for this group.¹² A BMI of 18.5 is considered normal for adults (James, Ferro-Luzzi, and Waterlow 1988). The results show no noticeable association between nutritional status of women and the household categories.

Impact on Enrollment and School Participation

The data from the census of all households carried out in all 60 sample villages and covering 17,134 households were used to select the sample households and schools and to estimate the level of enrollment and literacy at union level. Table 28 shows that, at the aggregate level, the enrollment rates are higher in FFE unions compared to non-FFE unions. While there are several instances where enrollment rates are much higher in the FFE unions than in the non-FFE unions in the same *thana* (such as in Kalia, Nilphamari, and Chokoria), there are also *thanas* (Modhupur and Baniachong) where enrollment is

¹² BMI is defined as weight (in kilograms)/height² in meters. Pregnant women are excluded from BMI calculation, because weight gain during pregnancy could bias the results.

higher in the non-FFE unions. There is a large difference in school enrollment levels between *thanas*, ranging from a low of less than 70 percent in Baniachong and Sherpur to over 90 percent in Hajigonj.

These findings indicate that there is a substantial scope for increasing primary school enrollment through geographic targeting of the FFE program at the *thana* level. Under ideal geographic targeting, *thanas* with low rates of enrollment should receive a larger share of total FFE resources. However, political constraints may prevent such allocations.

Table 29 presents the difference in school enrollment between children from FFE beneficiary households and nonbeneficiary households, based on the household survey data. These results reflect the situation in 2000—seven years after the implementation of the FFE program. The first column shows the households with primary-school-age children who attend schools as a percentage of all households with primary-school-age children. In the second column, the table shows the similar percentages for individual children going to school. The difference in results between the two columns arises because some households have more than one primary-school-age child. The results show virtually no difference in overall enrollment between FFE and non-FFE unions. Nevertheless, the overall difference between beneficiary and all nonbeneficiary households is about 15 percent and the difference in enrollment between beneficiaries and nonbeneficiaries in the FFE program unions is about 20 percent.

The descriptive statistics presented above do not permit the separation of program effects from the effects of other factors. Therefore, we used an appropriately formulated

multivariate analysis to isolate the effects of income and other factors to capture the true effect of the FFE program on enrollment and assess its impact on the probability of a child's going to school.

The analysis presented here is based on individual observations of 930 primary school-age children from the sample of households in the household survey, regardless of their school attendance status and FFE program participation. In particular, the sample includes all children between 6 and 13 years of age who did not complete primary school.

We employ a regression model to isolate the effect of the FFE program from the effects of other factors on school enrollment. Given that there are several unobservable factors that might have determined program placement at the union and village levels, we have specified a model of analysis, following the basic model structure of Ravallion and Wodon (2000), that considers FFE participation as endogenous.

The schooling of a child i (SC_i) is determined by the participation of the i^{th} child of a household receiving the FFE ration (FFE_i), and a set of other explanatory variables (child, household, and community characteristics) denoted by X , and indexed by $k=1, \dots, K$. The model takes the form

$$SC_i = \alpha + \beta FFE_i + \sum_{k=1}^K \delta_k X_{k,i} + \varepsilon_i, \quad (1)$$

where α is a scalar, β is a parameter of FFE_i , δ is a $K \times 1$ vector of parameters, and ε_i is an error term. Individual program participation FFE_i is instrumented by

$$FFE_i = \gamma FFEV_i + \sum_{k=1}^K \zeta_k X_{k,i} + \mu_i, \quad (2)$$

where FFE_i is equal to one if the child is a resident in a union that has the FFE program, zero otherwise; and μ_i is an error term.

The model is estimated in two stages. In the first stage, we explain program participation using equation (2), and then we use the resulting predicted values of program participation in equation (1) to measure the impact of program participation on the probability of attending school. We used two different approaches to estimate program participation. In the first approach, following the Ravallion and Wodon (2000) model, we use a Tobit specification in the first-stage regression where the dependent variable is zero for nonparticipants and is equal to the amount of grain actually received by participants. In the second approach, we use a simple probit model in the first stage, where the dependent variable is 1 if the household participates in the program, zero otherwise.

The estimation of the second-stage equation, reported in equation (3), is virtually the same in both model specifications, even though the value of the coefficient of the FFE variable will have a different meaning, depending on the specification used in the first stage. To control for the correlation between instruments used in the first stage and the error term in the second stage, we have added to the estimation the predicted value of the residuals from the estimation of the first-stage regression ($FFER_i$) (Ravallion and Wodon 2000; Datt and Ravallion 1994; Rivers and Young 1988), as follows:

$$SC_i = \alpha + \beta FFE_i + \delta FFER_i + \sum_{k=1}^K \delta_k X_{k,i} + \varepsilon_i . \quad (3)$$

The results of the models are reported in Table 30. The first four columns report the results of Model 1, where the first stage is estimated using a Tobit. The last four columns report the results of Model 2, where the first stage is estimated using a probit.

The results of the first-stage regressions of the two models (columns 1 and 2 for Model 1 and columns 5 and 6 for Model 2) are quite similar. Among the four official criteria for FFE beneficiary selection, only one criterion—the household head’s principal occupation is day laborer—is a statistically significant determinant of program participation. The values of “housing” and “other assets” are strongly and negatively correlated with program participation, which indicates that the program is effectively targeted to poorer households.

Columns 3 and 4 for Model 1 and columns 7 and 8 for Model 2 present the results of the probit model on the determinants of school enrollment. The estimated coefficient of the amount of FFE transfer in Model 1 (with the Tobit first-stage specification) imply that, at the sample mean transfer of 70 kilograms of FFE grain over the five-month period of survey recall, the probability of a household’s child’s going to school increases by 7.9 percent. The results of Model 2 (with the probit first-stage specification) show this increase in the probability to be 8.4 percent.^{13, 14}

¹³ This result may be compared with the preceding result of a descriptive analysis that shows about 15 percent higher enrollment for beneficiary households than for nonbeneficiary households.

¹⁴ The result presented here shows a smaller impact of the FFE program on school enrollment than those presented by Ravallion and Wodon (2000). Ravallion and Wodon used the 1995/96 Household Expenditure Survey data set, while the present analysis is based on data collected in 2000. As was pointed out earlier, the impact of the program was much larger at the time of introduction of the FFE program.

The results of the models also show that girls have a higher probability of being enrolled compared to boys. While household size is negatively correlated with school enrollment, the number of siblings of any gender does not appear to affect whether a child goes to school.

All four variables representing the levels of education of male and female household members have a strong and positive impact on child primary school enrollment. On the other hand, the probability of a primary-school-age child's school enrollment decreases if the household head is engaged in own farming activities (which may increase the demand for child labor, as was found by Ravallion and Wodon [2000]). The probability also decreases if the wage rate in the village increases, indicating the effect of an increased opportunity cost of the child's school attendance.

The total value of productive assets has a positive impact on enrollment. This result may be interpreted as follows. An increase in the value of productive assets is likely to increase income of the household as well as the marginal productivity of family labor. While an increase in the marginal productivity of labor is expected to increase the opportunity cost of sending a child to school, the increased income can also be expected to reduce demand for a household's own child labor and to increase demand for the child's education. The regression result in this case probably indicates that the income effect outweighs the substitution effect.

Finally, the results show that the presence of a registered nongovernment school or an nongovernmental organization (NGO) school in the village increases the probability of a child's enrollment.

FFE FOODGRAIN DISTRIBUTION

From July 1993 to January 1999, the School Management Committee (SMC) distributed foodgrains to FFE beneficiary households. However, there were concerns about the quality of education provided in the FFE-supported schools due to teachers' preoccupation with food distribution. These concerns led the GOB to withdraw the responsibility of food distribution from the teachers and assign it to private dealers in 1999, as described in Section 2.

In the present system, each FFE union has one dealer who distributes FFE foodgrains to all beneficiary households. All grain dealers in the 30 sample unions were interviewed for this evaluation. On average, a dealer covers 1,534 FFE card-holding beneficiary households and distributes 21.15 metric tons of foodgrains per month.

The survey collected detailed information from the dealers to estimate costs and returns of their operation. The estimates provided in Table 31 suggest that, on the average, a dealer earns a profit of Tk 2,356 per month from FFE foodgrain distribution. The return on dealer's investment is determined by dividing the profit (or net income) by the operating expenses. Interest on operating expenses is subtracted from profit at this point.¹⁵ The average return on investment is 27.3 percent per year. This is a conservative estimate of return on investment, because it is based on an assumption that the turnover

¹⁵ The bank-lending rate for commercial activities was 14 percent per year in 2000. The dealers are assumed to receive credit at an annual interest of 14 percent, and that they are to repay the loan at the end of every year. The average interest on operating expenses is calculated as follows: first, multiply the amount of annual operating expenses by the interest rate in decimal terms $[(5,709 \times 12) \times 0.14] = 9,591$. So, the profit after interest is $[(2,356 \times 12) - 9,591] = \text{Tk } 18,681$ per year. The return on investment is $[(18,681/68,508) \times 100] = 27.3$ percent per year.

of operating capital requires one year. However, since the dealers lift their quota of foodgrains 12 times per year, the rate of turnover of operating capital should be much quicker than what is assumed in this analysis. Even the conservative estimates of annual return on investment for the dealers are quite high (27.3 percent) compared to the 14 percent interest rate on borrowed capital. Although most dealers complained about high transport costs and labor wages, this analysis suggests that the FFE foodgrain dealership is a profitable enterprise.

Despite the fact that their dealership is profitable, there is evidence that dealers often divert FFE foodgrains to the black market for extra profit. In the household survey, 71 percent of FFE beneficiaries reported that the quantity of FFE foodgrains they actually received from dealers was less than what they were entitled to. Reportedly, a number of dealers sold FFE foodgrains to private traders, sometimes even at the distribution centers. For instance, in two survey unions of Northern Bangladesh, FFE beneficiaries as well as other local people reported that instead of distributing wheat every month, the dealers distributed Tk 120 to Tk 150 to each of the FFE cardholders every three months. (The market value of three months' wheat ration was about Tk 440.) The beneficiaries lodged written complaints to *thana* authorities protesting the dealers' misappropriation of FFE wheat. In another instance, some of the extremely poor participants of FFE in a highly distressed union reported that the dealer had lent money to them at exorbitant interest rates. Subsequently, the dealer took their FFE wheat entitlements because they could not repay the loan with interest.

The average distance of dealers' foodgrain distribution centers from beneficiaries' homes is 5.1 kilometers, ranging from 1.5 to 11.2 kilometers.¹⁶ Most beneficiaries report that the transaction costs are high to collect their FFE rations from distribution centers compared to the old SMC distribution system when foodgrains were distributed at school premises. Most schools are within 1 kilometer from their home.

Mainly due to the reasons mentioned above, the household survey results suggest that 92 percent of the FFE beneficiary households prefer SMC to dealers for foodgrain distribution. The rationale for changing the distribution system from SMC to dealer was to improve the quality of education by eliminating teachers' involvement in foodgrain distribution. However, 82 percent of the FFE participants opined that there has been no improvement in the quality of education with the change.

5. CONCLUSIONS FOR POLICY

Increasing school attendance is an important first step in helping poor households acquire the skills needed to boost their real incomes. The Food for Education program in Bangladesh addresses long-term poverty and development of human resources as well as short-term needs for increased access to food.

The Government of Bangladesh launched the innovative Food for Education program in 1993, which ties income transfers to vulnerable households with primary school enrollment of their children. The goals of this program are to increase primary

¹⁶ IFPRI survey enumerators measured this distance using the Global Positioning System (GPS).

school enrollment, promote attendance, reduce dropout rates, and enhance the quality of education.

IFPRI evaluated the performance of the FFE program to determine the extent to which these goals were met. This evaluation of the FFE program is based on primary data collected from multiple surveys covering schools, households, communities, and foodgrain dealers.

The school survey results suggest that the FFE program has been successful in increasing primary school enrollment, promoting school attendance, and reducing dropout rates. Furthermore, the enrollment increase is greater for girls than for boys.

Since the inception of the program in 1993, the number of teachers per school has remained virtually constant in all schools, while student enrollment has increased significantly in FFE schools. As a result, there are more students per teacher in FFE schools than in non-FFE schools. Moreover, because of increased enrollment and class attendance rates, FFE school classrooms are more crowded than non-FFE school classrooms. Consequently, there have been concerns that a relatively high number of students per teacher and crowded classrooms in FFE schools have caused the quality of education in FFE to deteriorate.

The student academic achievement test scores, on average, are lower in FFE schools than in non-FFE schools. However, further analyses reveal that, within FFE schools, the average test score of FFE beneficiary students is less than that of the nonbeneficiary students, which brings down the aggregate score in FFE schools. In fact, the nonbeneficiary students in FFE schools scored about the same as the students in non-

FFE schools on the average, despite a significantly larger class size in FFE schools. It, then, is likely that larger class size in FFE schools does not necessarily cause lower test scores. Hence, there is a caution against drawing conclusions regarding the success of the FFE program based upon lower achievement test scores in FFE classrooms. Follow-up research on the FFE program could focus further on this important issue.

Students in government schools performed better in the achievement test than students in nongovernment schools, and this is true for both FFE and non-FFE schools. Government primary schools have better facilities, more qualified teachers, and provide better incentives to teachers compared to nongovernment primary schools. This indicates that the quality of primary education is directly related to physical facilities and quality of teachers of primary schools. Therefore, in order to improve the quality of education in FFE schools in general and in nongovernment FFE schools in particular, the program would need complementary financial assistance to improve school facilities, hire better qualified teachers, and provide training as well as adequate monetary incentives to teachers.

The household-level analysis suggests that in general, the FFE program is effectively targeted to low-income households. However, considerable scope exists for improving targeting, as a sizeable number of poor households remain excluded from the program even while many nonpoor households are included. A more accurate, yet low-cost means testing method, such as the indicator-based proxy means tests to predict household income and welfare, needs to be considered to improve targeting (see Ahmed and Bouis 2002, for example).

The village census findings indicate that there is a considerable scope for increasing primary school enrollment through geographic targeting of the FFE program at the *thana* level. Given the large regional disparity in the rates of enrollment and literacy across *thanas*, it is clear that the FFE program could have a much larger impact on enrollment (and consequently on the literacy rates) if larger shares of program resources were targeted to areas with relatively much lower rates of enrollment. Particularly, if the number of schools and teachers cannot be increased immediately due to resource or administrative constraints, then a higher concentration of FFE program resources should be considered for those areas where low rates of enrollment are related to poverty and not lack of school capacity.

The multivariate analysis to isolate the independent effects of participation in the FFE program from changes in other factors suggests that the availability of the FFE program for a household increases the probability of its child going to school by 8.4 percent. While this average impact may seem to be quite small, it is important to note that this represents the situation in 2000—seven years after the introduction of the program.

Recently, the FFE foodgrain distribution system began distributing food through private dealers rather than through the School Management Committee, as was previously done. This evaluation finds that the dealer-based system of FFE foodgrains distribution is far from satisfactory. Individual FFE beneficiaries have difficulty claiming their free and full ration from powerful and profit-minded private dealers, and hence they experience losses in their foodgrain entitlement due to dealer malpractice. Also, a great

deal of time and money is spent on traveling to dealers' distribution centers to collect their FFE ration.

Past IFPRI studies on the public food distribution system in Bangladesh conclude that ration channels that depend on private traders to deliver subsidized food to the poor invariably suffer from heavy leakage (see Ahmed 1992, 2000; Haggblade, Rahman, and Rashid 1993; WGTFI 1994). The private-sector profit motive is valuable when it stimulates competitive cost-cutting and efficient delivery of services. It is a disadvantage, however, when it motivates diversion of subsidized or free foods away from intended beneficiaries.

The FFE program can lower leakage by modifying the distribution system that the program had followed prior to the change to the current dealer-based system. In the modified system, schoolteachers would not be directly involved in foodgrain distribution. Instead, either a local NGO, or a youth club, or even a private dealer would deliver foodgrains to the beneficiaries in the school premises on a set day each month. This system would empower beneficiaries by establishing a sense of group solidarity among recipients, assisting them in clarifying the exact amounts of rations to which they are entitled, and facilitating collective action against pilferage. This system would reduce inconvenience and transaction costs to beneficiaries in collecting their FFE rations. Two past IFPRI studies in Bangladesh—one on the FFE program (Ahmed and Billah 1994) and the other on the Vulnerable Group Development (VGD) program (Ahmed 1993)—suggest that both programs lowered leakage by a similar process of empowering recipients.

Follow-up research on the FFE program could focus further on program extensions aimed at improving the cognitive abilities of children. Two specific issues could be explored in this regard—combining the FFE program with school feeding, and expanding the program to preschool children. Experiences in other countries have shown that undernutrition reduces a child’s ability to concentrate and retain what has been learned (Pollitt 1990) and school feeding, especially a light snack early in the day, has been shown to improve performance in case studies from outside Bangladesh (Grosh 1992). At the same time, a preschool feeding program (such as the National Nutrition Project in Bangladesh) could become a key intervention for improving the cognitive abilities of children. Better-nourished preschool children will be better learners in primary school and beyond.

TABLES

Table 1—Number of government and nongovernment primary schools, teachers, and students

Year	Number of schools			Number of teachers			Number of students		
	Government	Non-government	Total	Government	Non-government	Total	Government	Non-government	Total
									(thousands)
1989/90	37,910	7,429	45,339	154,814	34,402	192,816	10,053	1,721	11,774
1989/90	37,760	8,023	45,783	162,237	37,819	200,056	10,494	1,851	12,345
1990/91	37,659	10,487	48,146	160,744	42,103	202,847	10,722	2,313	13,035
1991/92	38,097	11,867	49,964	158,180	50,091	208,271	11,157	2,560	13,717
1992/93	37,855	13,043	50,898	160,497	54,282	214,779	11,239	2,963	14,202
1993/94	37,528	28,640	66,168	159,538	82,714	242,252	11,266	3,919	15,185
1994/95	37,717	24,900	62,617	161,251	87,532	248,783	11,826	4,603	16,429
1995/96	37,752	23,831	61,583	161,026	88,689	249,715	12,026	5,042	17,068
1996/97	37,348	24,290	61,638	161,597	88,331	249,928	12,248	5,071	17,319
1997/98	41,248	24,987	66,235	160,677	90,313	250,990	12,423	5,206	17,629

Source: Bangladesh Bureau of Statistics (BBS). "Statistical Yearbook of Bangladesh," various issues.

Note: Nongovernment schools include (1) registered nongovernment primary school, (2) high school-attached primary school, (3) experimental school, (4) Ebtadayee Madrasa (EM), (5) high madrasa attached EM, (6) kindergarten school, (7) satellite school, and (8) community school.

Table 2—Expenditure on education

Year	Expenditure on FFE	Total expenditure on primary education	Total expenditure on education	Total public expenditure
				(million taka)
1988/89	...	5,439.3	11,444.6	107,527.9
1989/90	...	6,439.1	13,340.9	123,509.6
1990/91	...	6,163.6	13,544.4	124,978.0
1991/92	...	8,366.5	16,775.3	138,159.1
1992/93	...	10,964.7	21,909.3	151,520.3
1993/94	683.2	14,526.6	27,465.6	182,618.0
1994/95	1,934.6	17,188.5	35,008.4	206,201.2
1995/96	2,674.9	16,713.9	34,270.3	197,468.0
1996/97	3,295.3	17,969.5	37,928.5	235,755.0
1997/98	3,749.8	18,812.9	41,605.9	255,376.0

Source: Chowdhury (2000).

Note: Ellipsis (...) indicates not applicable. The FFE program did not exist prior to 1993/94.

Table 3—Total number of unions, primary schools, students, and beneficiaries under the FFE program

Year	Number of unions under the FFE program	Number of primary schools under the FFE program	Total number of students under FFE program schools	Total number of students benefited under the FFE program	Number of FFE beneficiary families
1993/94	460	4,914	1,504,437	706,519	549,881
1994/95	1,000	12,182	3,619,243	1,628,659	1,416,932
1995/96	1,243	16,159	4,960,813	2,239,805	1,962,496
1996/97	1,243	17,203	5,719,590	2,280,467	2,174,503
1997/98	1,243	17,403	5,739,890	2,295,956	2,182,215
1998/99	1,247	16,117	4,512,760	1,692,245	1,636,260
1999/00	1,247	17,811	5,187,553	2,075,021	2,020,660

Source: Directorate of Primary Education.

Table 4—Coverage by the FFE program

Year	Schools covered by the FFE program as a share of total primary schools	Students in schools under the FFE program as a share of total students enrolled under primary education	FFE beneficiary students as a share of total students under primary education
		(percent)	
1993/1994	7.4	9.9	4.7
1994/1995	19.5	22.0	9.9
1995/1996	26.2	29.1	13.1
1996/1997	27.9	33.0	13.2
1997/1998	26.3	32.6	13.0

Source: Computed from Tables 1 and 3.

Table 5—Expenditure on FFE, and distribution foodgrains under the FFE program

Year	Expenditure on the FFE program (million Taka)	Distribution of foodgrains under the FFE program			Share of the FFE program in total PFDS foodgrain off-take (percent)
		Rice	Wheat	Total	
			(metric tons)		
1993/94	683.18	216	79,337	79,553	6.1
1994/95	1,934.59	6,024	168,462	174,486	12.5
1995/96	2,674.94	3,897	237,273	241,170	13.4
1996/97	3,295.35	209,625	67,760	277,385	19.9
1997/98	3,749.83	71,039	269,624	340,663	21.0
1998/99	3,954.29	59,636	227,026	286,662	13.4
1999/00	3,935.66	112,058	173,915	285,973	15.0

Source: Directorate of Primary Education, Directorate of Food.

Table 6—Sources of foodgrains for the public food distribution system

Year	GOB commercial imports		Domestic procurement		Food aid		Total
	Rice	Wheat	Rice	Wheat	Rice	Wheat	
(thousand metric tons)							
1997/98	92.00	155.00	399.24	217.43	0.00	549.00	1,412.67
1998/99	333.82	429.01	493.15	257.30	58.90	1,174.36	2,746.54
1999/00	0.00	0.00	756.48	210.72	4.52	864.95	1,836.67

Source: Directorate of Food.

Table 7—FFE survey locations and number of primary schools surveyed

District	Thana	FFE union	Non-FFE union	Number of schools surveyed		
				FFE	Non-FFE	Total
Manikgonj	Manikgonj	Dighi	Hatipara	4	1	10
		Krishnapur		5		
Tangail	Modhupur	Sholakuri	Birtara	3	4	10
		Aushnara		3		
Sherpur	Sherpur	Charmocharia	Bajitkhila	3	4	10
		Boliarchar		3		
Cox's Bazar	Chakoria	Pekua	Harbang	3	4	10
		Veola-Manikchar		3		
Chandpur	Hajigonj	Hatila	Daskin Rajargon	4	3	10
		Daskin Gandarbapur		3		
Hobigonj	Baniachong	Daskin-Paschim-	Muradpur	5	3	10
		Baniachong Poliarkandi		2		
Noagaon	Mohadebpu r	Uttar Gram	Roygaon	3	4	12
		Mohadebpur		5		
Nilphamari	Nilphamari	Chapra-Saramjani	Kochukata	3	4	10
		Polashbari		3		
Barisal	Agailjhara	Razihar	Gaila	3	7	15
		Bagdha		5		
Narail	Kalia	Salamabad	Hamidpur	4	6	13
		Khasial		3		
Total				70	40	110

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000," Bangladesh.

Table 8—General information, by type of schools

Information	FFE schools			Non-FFE schools		
	Government	Nongovernment	All	Government	Nongovernment	All
Number of students per school in 2000	350	315	343	286	162	270
Proportion of girls (% of total)	50.0	50.0	50.0	50.0	48.3	49.9
Average operating expenses per student (taka/year)*	43	27	40	41
Inspection made by school inspectors in 1999 (% of schools)	100.0	92.9	98.6	88.6	80.0	87.5
Number of inspections in 1999	5.7	3.4	5.2	5.1	2.4	4.8
Fully follow curriculum (% of schools)	94.6	92.9	94.3	91.4	100.0	92.5
Teachers who received subcluster training (% of schools)	94.3	90.9	93.7	98.1	100.0	98.3
Teachers engaged in private tutoring (% of teachers)	14.3	50.0	21.4	25.7	80.0	32.5

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Note: Ellipsis (...) indicates information was not available.

School operating expenses exclude teacher salaries, and include the costs of stationery and supplies, repair and maintenance, utilities, and communication.

Table 9—Number of teachers per school, 1992-2000

Year	FFE schools			Non-FFE schools		
	Government	Nongovernment	All	Government	Nongovernment	All
1992	4.8	4.1	4.6	4.5	4.0	4.4
1993	4.6	4.1	4.5	4.4	4.0	4.4
1994	4.6	4.1	4.5	4.5	4.0	4.5
1995	4.7	4.1	4.5	4.6	4.0	4.5
1996	4.7	3.9	4.5	4.6	4.0	4.5
1997	4.6	3.9	4.5	4.7	4.0	4.6
1998	4.4	4.0	4.4	4.7	4.0	4.6
1999	4.5	4.0	4.4	4.4	4.0	4.3
2000	4.7	3.9	4.5	4.4	4.0	4.4

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Table 10—Percentage of female teachers per school, 1992-2000

Year	FFE schools			Non-FFE schools	
	Government	Nongovernment	All	Government	Nongovernment
	(percent)				
1992	17.5	27.9	19.6	22.9	...
1993	18.2	27.9	20.0	22.7	...
1994	19.8	29.6	21.6	24.1	...
1995	20.9	27.9	22.5	26.7	...
1996	21.3	29.3	22.9	24.2	...
1997	21.7	29.3	22.9	26.7	...
1998	26.4	28.6	26.3	29.8	...
1999	30.6	30.4	30.5	31.8	...
2000	28.9	29.3	29.2	33.1	...

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Note: Ellipsis (...) indicates information was not available.

Table 11—Information about teachers

Type of Information	FFE schools			Non-FFE schools			All Government	All non-government
	Government	Non-government	All	Government	Non-government	All		
Educational qualifications (percent of teachers)								
S.S.C.	37.4	43.6	38.5	34.2	55.0	36.5	36.2	46.7
H.S.C.	29.8	43.6	32.2	31.0	40.0	32.0	30.2	42.7
B.A./B.A. B.Ed.	27.5	10.9	24.6	28.4	5.0	25.7	27.8	9.3
M.A./M.A. M.Ed	3.8	-	3.2	5.2	-	4.5	4.3	-
Other	1.5	-	1.3	0.6	-	0.6	1.2	-
Number of classes taught per day								
	3.9	4.2	4.0	4.0	4.4	4.1	4.0	4.3
Number of subjects taught								
	5.3	4.9	5.3	5.2	5.1	5.1	5.3	4.9
Monthly salary (taka)								
	4,519	1,279	3,960	4,306	1,300	3,960	4,439	1,285
Receive salary regularly (percent of teachers)								
	95.8	36.4	85.5	99.4	20.0	90.3	97.1	32.0
Monthly household expenditure (taka)								
	7,013	3,996	6,489	6,956	4,265	6,635	6,991	4,072
Source of income (percent of total income)								
School salary	74.8	29.1	66.9	69.0	20.0	63.4	72.7	26.7
Agriculture	12.2	56.4	19.9	18.1	75.0	24.6	14.4	61.3
Small business	1.9	7.3	2.8	1.3	-	1.1	1.7	5.3
Large business	1.1	3.6	1.6	1.3	5.0	1.7	1.2	4.0
Other	3.8	1.8	3.5	7.7	-	6.9	5.3	1.3

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Table 12—Change in enrollment rate per school, by type of schools

Information	FFE schools			Non-FFE schools		
	Government	Non-government	All	Government	Non-government	All
	(percentage change)					
<i>Before FFE to after FFE (over a two-year period)^a</i>						
All students	33.7	43.0	35.2	2.5
Boys	27.1	32.9	28.1	0.1
Girls	41.3	55.3	43.6	5.4
<i>1997 to 1998</i>						
All students	2.0	1.7	2.0	1.2	0.4	0.8
Boys	2.0	1.2	1.6	1.4	0.0	0.7
Girls	2.1	2.3	2.3	1.0	0.9	1.0
<i>1998 to 1999</i>						
All students	1.6	2.7	2.2	1.7	1.1	1.3
Boys	1.0	2.5	1.8	1.3	1.1	1.2
Girls	2.2	2.8	2.6	2.1	1.0	1.6
<i>1999 to 2000</i>						
All students	2.6	2.2	2.4	1.5	1.0	1.2
Boys	3.5	2.7	3.1	1.2	1.0	1.1
Girls	1.7	1.6	1.7	1.8	0.9	1.3

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Note: Ellipsis (...) indicates information was not available.

^a For non-FFE schools, the percentage change in enrollment per school is calculated at the national level from 1992 (the year before FFE) to 1994 (the year after FFE).

Table 13—Attendance rates, by type of schools

Information	FFE schools			Non-FFE schools		
	Government	Non-government	All	Government	Non-government	All
	(percent of enrolled students)					
From headcount	68.8	67.0	68.2	57.2	54.9	56.7
From school register	70.3	68.1	69.9	58.6	54.9	58.2

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Table 14—Annual dropout rates, 1999-2000

	Government schools	Nongovernment schools	All schools
	(dropout rates in percent)		
<i>FFE schools (all students)</i>			
All students	10.4	12.5	10.9
Boys	9.6	13.5	10.5
Girls	11.1	11.6	11.2
<i>FFE schools (FFE beneficiary students)</i>			
All students	5.3	10.1	6.3
Boys	4.5	7.7	5.2
Girls	6.1	12.2	7.4
<i>FFE schools (Non-FFE beneficiary students)</i>			
All students	15.0	14.6	14.9
Boys	13.9	18.3	14.9
Girls	16.2	11.1	14.9
Non-FFE schools			
All students	11.2	8.3	10.8
Boys	10.9	7.5	10.8
Girls	11.4	9.8	11.3

Source: Computed by authors based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Note: Dropout rates are computed using the following formula:

$$\text{Drop-out from class } i \text{ in year } t = \text{enrolled students in class } i \text{ in year } t \\ - \text{promotees from class } i \text{ in year } t + 1 - \text{repeaters in class } i \text{ in year } t + 1,$$

where

$$\text{promotees from class } i, \text{ year } t + 1 = \text{enrolled students in class } i + 1 \text{ in year } t + 1 \\ - \text{new entrants in class } i + 1 \text{ in year } t + 1 \\ - \text{repeaters of class } i + 1 + \text{transfer-out from class } i + 1 \text{ in year } t + 1.$$

Table 15—Number of students per teacher, 1997-2000

Year	FFE schools			Non-FFE schools		
	Government	Nongovernment	All	Government	Nongovernment	All
	(number of students per teacher)					
1997	78	70	76	65	32	62
1998	85	78	83	62	46	60
1999	77	77	77	65	42	63
2000	75	80	76	65	41	62

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Table 16—Use of classroom seating capacity

	FFE schools			Non-FFE schools		
	Government	Nongovernment	All	Government	Nongovernment	All
Average classroom seating capacity (number of seats per classroom)	53.3	37.5	50.1	48.8	37.3	47.4
Actually seated (number of students per classroom)	50.5	43.7	49.1	38.7	29.9	37.6
Capacity utilization (percent of capacity)	94.7	116.5	98.0	79.3	80.2	79.3

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Table 17—Students' achievement test results, by type of schools

	FFE schools					Non-FFE schools		
	Government	Non-government	All Beneficiary	All non-beneficiary	All	Government	Non-government	All
Test scores (percent of total points obtained)	51.0	40.0	46.0	53.3	49.3	53.3	45.7	53.0
<i>Performance category</i>	(percent of all students)							
Poor	31.5	42.7	38.2	26.9	33.0	26.0	41.3	27.1
Fair	38.0	38.6	35.7	41.0	38.1	41.8	36.5	41.4
Good	30.4	18.7	26.1	32.1	28.8	32.2	22.2	31.5
Number of students	2,182	342	1,365	1,159	2,524	782	63	845

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Note: Range of test scores for performance categories: Poor = 0 – 33 percent of total points; Fair = 34 – 66 percent of total points; Good = 67 – 100 percent of total points.

Table 18—Characteristics of respondent households

	FFE unions			Non-FFE unions		
	(A) FFE beneficiary households	(B) Nonbeneficiary households with children attending FFE school	(C) Households with children not attending school	(D) Households with children attending school	(E) Households with children not attending school	All
Household size (persons)	5.4	5.4	6.4	5.5	6.1	5.6
Years of schooling, father	2.2	3.1	0.6	2.3	1.6	2.7
Years of schooling, mother	1.1	1.6	0.7	1.2	0.6	1.6
No schooling, adult male (percent)	49.8	47.9	84.3	53.5	73.7	51.0
No schooling, adult female (percent)	73.0	69.0	80.4	72.5	86.8	71.0
Female-headed household (percent)	14.0	12.7	2.0	12.0	5.3	9.5
Less than 0.5 acre of land owned (percent)	68.1	43.7	60.8	58.5	50.0	53.5
Per capita monthly expenditure (taka) ^a	629.1	973.7	575.9	744.7	617.4	800.4
			(percent)			
<i>Principal occupation of household head</i>						
Farmer	14.5	28.9	29.4	21.5	15.8	21.5
Business/trade	21.7	23.2	21.6	22.3	13.2	18.0
Salaried, service	5.3	5.6	2.0	5.0	7.9	9.0
Salaried, professional	1.5	2.8	0.0	1.8	0.0	3.5
Day laborer	28.5	12.0	29.4	22.8	36.8	21.0
Fisherman	4.4	1.4	3.9	3.3	0.0	2.5
Rickshaw puller	5.8	4.2	7.8	5.5	15.8	7.0
Other	18.3	21.8	5.9	18.0	10.5	17.5

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh

^a Per capita monthly expenditures of FFE beneficiary households include income transfer from FFE program.

Table 19—Characteristics of respondent households, by per capita expenditure quintiles, FFE unions

	Per capita expenditure quintiles					Average
	1	2	3	4	5	
FFE beneficiary households (percent)	62.5	48.8	56.3	58.8	32.5	51.8
Percent of all beneficiaries	24.1	18.9	21.7	22.7	12.6	...
Percent of households with primary-school-age children not going to school	17.5	25.0	7.5	7.5	6.3	12.8
Household size (persons)	5.9	6.0	5.1	5.2	5.4	5.5
Years of schooling, father	0.8	1.8	2.0	2.7	4.4	2.3
Years of schooling, mother	0.4	0.8	0.9	1.2	2.8	1.2
No schooling, adult male (percent)	65.0	58.9	61.3	48.8	33.8	53.5
No schooling, adult female (percent)	85.0	80.0	76.3	73.8	47.5	72.5
Female-headed household (percent)	22.5	5.0	11.3	10.0	11.3	12.0
Less than 0.5 acre of land owned (percent)	78.8	68.8	65.0	50.0	30.0	58.5
Per capita monthly expenditure (taka) ^a	316.60	456.90	571.70	749.10	1,629.00	744.66
<i>Principal occupation of household head</i>						
				(percent)		
Farmer	12.5	15.0	20.0	31.25	28.8	21.5
Business/trade	16.3	28.8	15.0	27.5	23.8	22.3
Salaried, service	2.5	2.5	1.8	2.5	13.8	5.0
Salaried, professional	0.0	0.0	2.5	3.8	2.5	1.8
Day laborer	38.8	22.5	28.8	15.0	8.8	22.8
Fisherman	2.5	6.3	3.8	1.3	2.5	3.3
Rickshaw puller	5.0	7.5	6.3	5.0	3.8	5.5
Other	22.5	17.5	20.0	13.8	16.3	18.0

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Note. Ellipsis (...) indicates not applicable.

^a Per capita monthly expenditures of FFE beneficiary households *include* income transfer from FFE program.

Table 20—Characteristics of respondent households, by per capita expenditure quintiles, non-FFE unions

	Per capita expenditure quintiles					Average
	1	2	3	4	5	
Percent of households with primary-school-age children not going to school	22.0	28.0	28.0	10.0	8.0	19.0
Household size (persons)	5.0	5.8	5.8	6.1	5.4	5.6
Years of schooling, father	0.8	1.2	2.2	4.0	5.4	2.7
Years of schooling, mother	0.1	0.8	0.9	2.2	3.9	1.6
No schooling, adult male (percent)	60.0	62.5	65.0	47.5	20.0	51.0
No schooling, adult female (percent)	95.0	80.0	82.5	62.5	35.0	71.0
Female-headed household (percent)	20.0	12.5	2.5	5.0	7.5	9.5
Less than 0.5 acre of land owned (percent)	77.5	62.5	55.0	37.5	35.0	53.5
Per capita monthly expenditure (taka)	338.30	470.30	611.10	817.0	1,765.2	800.4
<i>Principal occupation of household head</i>						
	(percent)					
Farmer	5.0	12.5	37.5	27.5	25.0	21.5
Business/trade	10.0	12.5	20.0	20.0	27.5	18.0
Salaried, service	0.0	5.0	5.0	20.0	15.0	9.0
Salaried, professional	0.0	0.0	0.0	5.0	12.5	3.5
Day laborer	50.0	30.0	17.5	2.5	5.0	21.0
Fisherman	2.5	2.5	2.5	2.5	2.5	2.5
Rickshaw puller	12.5	10.0	10.0	2.5	0.0	7.0
Other	20.0	27.5	7.5	20.0	12.5	17.5

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Table 21—Targeting effectiveness

	Per capita monthly expenditure	Share of all households
	(taka)	(percent)
<i>FFE unions</i>		
(A) FFE beneficiary households	607.92 ^a	51.8
(B) Nonbeneficiary households with primary-school-age children attending FFE school	973.69	35.5
(C) Households with primary-school-age children not attending school	575.94	12.7
All households	733.69	100.0
<i>Non FFE unions</i>		
(D) Households with primary-school-age children attending school	843.30	81.0
(E) Households with primary-school-age children not attending school	617.40	19.0
All households	800.40	100.0

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

^a Excludes income transfer from FFE program.

Table 22—Households in FFE unions who fulfill the official targeting criteria

Targeting criteria	(A) FFE beneficiary households	(B) Nonbeneficiary households with children attending FFE schools
	(percent of all households)	
Female-headed household	14.0	12.7
Less than 0.5 acres of land owned	68.1	43.7
Day laborer	28.5	12.0
Low-level profession	10.2	5.6

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Note: 21.3 percent of FFE beneficiary households do not meet any of the criteria.

Table 23—Average budget share of food items

Food items and expenditure categories	FFE unions			Non-FFE unions		All
	(A) FFE beneficiary households	(B) Non- beneficiary households with children attending FFE schools	(C) Households with children not attending schools	(D) Households with children attending schools	(E) Households with children not attending schools	
	(percent of total food expenditure)					
Rice	35.21	32.55	41.24	35.01	39.22	35.18
Wheat	4.16	0.92	0.48	0.51	0.31	1.74
Bread/other cereal	0.48	0.62	0.51	0.58	0.41	0.55
Pulses	2.55	2.05	1.96	2.54	2.17	2.34
Oil	2.58	2.65	2.46	2.84	2.42	2.65
Vegetables	13.19	12.51	11.58	11.79	10.77	12.34
Meat	6.39	7.76	5.80	6.61	7.00	6.80
Eggs	1.02	1.25	1.09	1.39	0.95	1.19
Milk	1.67	3.15	2.33	3.11	2.50	2.58
Fruits	5.92	7.39	5.20	6.53	5.30	6.39
Fish	13.89	14.36	15.01	14.74	11.60	14.21
Spices	4.49	4.26	4.51	4.40	4.73	4.42
Sugar	5.18	6.22	4.56	5.43	6.10	5.53
Beverage	2.72	3.21	2.96	3.67	4.31	3.23
Prepared food	0.55	1.09	0.31	0.87	2.21	0.86
Total	100.00	100.00	100.00	100.00	100.00	100.00
Household food expenditure (taka/month)	2,182	2,788	2,363	2,570	2,309	2,452
Household total expenditure (taka/month)	3,372	5,272	3,590	4,569	3,752	4,188
Share of food in total expenditure (percent)	71.00	66.07	70.77	65.95	69.22	68.34

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Table 24—Per capita daily calorie consumption

	Per capita calorie consumption	Calorie deficient households ^a
<i>FFE unions</i>	(kcal/day)	(percent)
(A) FFE beneficiary households	2,376	33.3
(B) Nonbeneficiary households with primary-school-age children attending FFE school	2,651	26.1
(C) Households with primary-school-age children not attending school	2,154	56.9
All households	2,445	33.8
<i>Non-FFE unions</i>		
(D) Households with primary-school-age children attending school	2,480	30.9
(E) Households with primary-school-age children not attending school	2,234	44.7
All households	2,434	33.5

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

^a Calorie deficient households consume fewer calories than the per capita daily requirement of 2,122 kcal.

Table 25—Per capita daily calories, by per capita expenditure quintiles and type of unions

	Per capita expenditure quintiles					Average
	1	2	3	4	5	
<i>Calorie consumption</i>	(kcal per capita per day)					
All households	1,913	2,139	2,456	2,617	3,082	2,441
FFE unions	1,900	2,129	2,473	2,591	3,133	2,445
Non FFE unions	1,932	2,145	2,446	2,520	3,124	2,434
<i>Calorie deficient households</i>	(percent)					
All households	68.3	47.5	23.3	16.7	12.5	33.7
FFE unions	68.8	47.5	23.8	18.9	10.0	33.8
Non FFE unions	67.5	50.0	20.0	20.0	10.0	33.5

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Table 26—Prevalence of malnutrition among preschool children aged 6 to 60 months

	Number of children	Average HAZ	Percent HAZ <-2	Average WAZ	Percent WAZ <-2	Average WHZ	Percent WHZ <-2
FFE unions							
<i>(A) FFE beneficiary households</i>							
Boys and girls	108	-2.19	57	-2.17	61	-1.14	19
Boys	57	-2.21	58	-2.14	63	-1.16	23
Girls	51	-2.17	57	-2.21	59	-1.12	16
<i>(B) Nonbeneficiary households with primary-school-age children attending FFE school</i>							
Boys and girls	66	-1.98	45	-2.10	61	-1.15	18
Boys	32	-1.96	47	-2.10	66	-1.21	22
Girls	34	-2.00	44	-2.10	56	-1.09	15
<i>(C) Households with primary-school-age children not attending school</i>							
Boys and girls	40	-2.59	68	-2.54	75	-1.30	22
Boys	19	-2.83	79	-2.69	89	-1.49	32
Girls	21	-2.37	57	-2.40	62	-1.13	14
<i>All households in FFE unions</i>							
Boys and girls	214	-2.20	56	-2.22	64	-1.17	20
Boys	108	-2.25	58	-2.23	69	-1.23	24
Girls	106	-2.15	53	-2.21	58	-1.11	15
Non-FFE unions							
<i>(D) Households with primary-school-age children attending school</i>							
Boys and girls	85	-1.93	51	-2.04	56	-1.15	20
Boys	48	-1.69	48	-1.84	48	-1.09	10
Girls	37	-2.25	54	-2.30	68	-1.22	32
<i>(E) Households with primary-school-age children not attending school</i>							
Boys and girls	33	-2.22	58	-2.18	58	-1.10	12
Boys	16	-2.19	62	-2.03	62	-0.95	6
Girls	17	-2.25	53	-2.33	53	-1.24	18
<i>All households in non-FFE unions</i>							
Boys and girls	118	-2.01	53	-2.08	57	-1.13	18
Boys	64	-1.81	52	-1.88	52	-1.05	9
Girls	54	-2.25	54	-2.31	63	-1.23	28

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Note: HAZ= height-for-age Z-score; WAZ= weight-for-age Z-score; WHZ= weight-for-height Z-score. A Z-score value of zero indicates a child who is "normal"; a Z-score value of less than negative two indicates a child who suffers from nutritional problem.

Table 27—BMI of child-bearing-age women, 15-49 years old

	Number of women	Average BMI	Percent below 18.5 BMI
FFE unions			
(A) FFE beneficiary households	201	19.3	44
(B) Nonbeneficiary households with primary-school-age children attending FFE school	153	19.0	50
(C) Households with primary-school-age children not attending school	49	19.8	43
All FFE unions	403	19.2	46
Non-FFE unions			
(D) Households with primary-school-age children attending school	175	19.4	43
(E) Households with primary-school-age children not attending school	38	18.2	46
All non-FFE unions	213	19.2	45

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Note: BMI (body mass index) is defined as weight (in kilograms)/height² in meters. An adult person with a BMI value of less than 18.5 indicates that the person is undernourished. Pregnant women are excluded from BMI calculation, because weight gain during pregnancy could bias the results.

Table 28—Primary-school-age children and percentage of them going to school, village census results

<i>Thanas</i> in the Sample	FFE union				Non-FFE union	
	Union 1		Union 2		Union 1	
	Total number of children aged 6-12 years	Percent of children going to primary schools	Total number of children aged 6-12 years	Percent of children going to primary schools	Total number of children aged 6-12 years	Percent of children going to primary schools
Kalia	420	95.2	420	96.2	664	88.1
Agailjhara	627	97.8	467	82.0	711	93.5
Mohadebpur	460	81.7	195	90.8	328	81.1
Nilphamari	538	87.0	746	87.1	726	79.5
Modhupur	325	84.9	576	84.7	310	88.7
Sherpur	578	64.0	262	69.9	407	62.2
Manikganj	290	89.7	230	91.7	287	84.0
Baniachong	913	63.9	643	57.7	666	68.3
Hajigonj	552	97.6	1071	97.2	759	93.5
Chokoria	551	97.5	585	90.8	385	81.8
Total	5,254	85.9	5,195	84.8	5,243	82.1

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Village census," Bangladesh.

Table 29—Child enrollment status in 2000, household survey results

	Household mean	Individual
	(percent)	
FFE Union		
Non-FFE beneficiaries	71.6	68.0
FFE beneficiaries	91.1	88.2
Total	81.4	78.6
Non-FFE Union		
Non-FFE beneficiaries	80.1	78.5
<i>All non-FFE beneficiaries</i>	75.9	73.3
<i>All FFE beneficiaries</i>	91.1	88.2

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Household Survey," Bangladesh.

Table 30—Impact of FFE on school enrollment, econometric model results

Variable name	Model with Tobit first stage				Model with Probit first stage			
	Dependent variable: Quantity of FFE grain received		Dependent variable: Child goes to school		Dependent variable: Participates in FFE		Dependent variable: Child goes to school	
	Coeff. (1)	t test (2)	dF/dX (3)	z test (4)	Coeff. (5)	z test (6)	dF/dX (7)	z test (8)
Dummy: FFE union=1	1.574	6.58**			3.950	5.17**		
Predicted FFE beneficiary household							0.084	1.81+
Residual from FFE beneficiary model							-0.135	4.71**
Predicted amount of FFE transfer			0.113	1.74+				
Residual from FFE model			-0.155	4.23**				
Age of child in years	-0.010	0.78	-0.003	0.62	-0.037	0.99	-0.003	0.67
Dummy: Sex of child, female=1	-0.010	0.16	0.048	1.94+	-0.045	0.26	0.045	1.85+
Number of female younger siblings	-0.193	3.29**	-0.002	0.09	-0.619	3.37**	0.001	0.02
Number of male younger siblings	-0.069	1.22	-0.028	1.13	-0.218	1.22	-0.027	1.07
Number of female older siblings	-0.223	3.70**	-0.024	0.94	-0.660	3.59**	-0.025	0.95
Number of male older siblings	-0.129	2.17*	-0.024	0.97	-0.423	2.31*	-0.020	0.82
Household size	0.012	0.30	-0.036	1.96+	0.087	0.68	-0.038	2.08*
Percent members 19 to 34 years of age	-0.642	2.28*	0.272	2.34*	1.820	2.20*	0.273	2.35*
Percent members 35 to 65 years of age	-0.324	1.04	0.032	0.25	-0.905	0.99	0.025	0.20
Num. males with primary education	0.200	5.52**	0.101	6.58**	0.600	5.44**	0.101	6.57**
Num. males with education above primary	0.152	3.53**	0.062	3.45**	0.289	2.27*	0.062	3.50**
Num. females with primary education	0.240	5.82**	0.092	5.64**	0.758	6.10**	0.092	5.55**
Num. females with education above primary	0.176	3.87**	0.106	4.63**	0.531	3.76**	0.107	4.68**
Dummy: Household head is farmer=1	0.002	0.03	-0.087	1.88+	-0.043	0.15	-0.082	1.80+
Dummy: Household head has business=1	0.166	1.90+	-0.020	0.52	0.419	1.64	-0.018	0.46
Dummy: Household head is salaried=1	0.016	0.12	-0.036	0.57	0.211	0.53	-0.033	0.53
Dummy: Household head is rickshaw puller=1	0.201	0.93	-0.034	0.38	0.392	0.64	-0.044	0.48
Value of housing (10,000 taka)	-0.082	3.91**	-0.006	1.23	-0.227	3.70**	-0.006	1.24
Value of consumable assets (10,000 taka)	0.006	0.07	-0.025	1.12	0.025	0.10	-0.027	1.24
Value of domestic assets (10,000 taka)	-0.104	0.77	0.008	0.23	-0.152	0.41	0.009	0.25
Value of liquid assets (10,000 taka)	-0.079	0.83	-0.008	0.25	-0.170	0.66	-0.008	0.23
Value of productive assets (10,000 taka)	-0.109	2.99**	0.026	2.26*	-0.307	3.04**	0.028	2.36*
Value of others assets (10,000 taka)	-0.529	3.82**	0.005	0.31	-1.352	3.29**	0.005	0.26
Dummy: household head is female =1	0.150	1.29	0.010	0.21	0.305	0.88	0.008	0.16
Dummy: Head daily laborer=1	0.185	2.17*	-0.025	0.69	0.620	2.41*	-0.026	0.72
Dummy: Head low level laborer=1	-0.009	0.05	0.006	0.08	0.107	0.19	0.009	0.12
Dummy: Own land less than 50 decimal=1	0.040	0.68	-0.036	1.48	0.046	0.27	-0.036	1.48
Dummy: Government school=1	0.622	5.62**	-0.174	5.58**	1.531	5.06**	-0.172	5.52**
Dummy: Nongovernment school=1	0.600	4.76**	0.008	0.09	1.626	4.55**	0.008	0.10
Village wage rate	-0.000	0.04	-0.003	1.81+	0.004	0.24	-0.003	1.70+
Village percent people with <=0.5 decimals	-0.549	1.02	-0.348	1.70+	-0.703	0.45	-0.335	1.64
Village percent people with 0.5 to 2 decimals	-0.958	1.32	-0.239	0.97	-1.810	0.92	-0.219	0.89
Village Dummy: Grows two crops=1	0.560	3.38**	-0.009	0.19	1.667	3.09**	-0.003	0.06
Village electrical connections	-0.000	0.58	0.000	0.45	-0.002	1.00	0.000	0.52
Village has government school	-0.018	1.14	0.002	0.48	-0.011	0.22	0.002	0.36
Village has registered nongov. school	0.006	0.20	0.018	2.17*	0.010	0.12	0.018	2.16*
Village has Madrasa school	-0.025	2.35*	0.001	0.28	-0.067	2.24*	0.001	0.40
Village has NGO school	-0.044	2.03*	0.010	2.59**	-0.153	2.29*	0.009	2.53*
Price of rice	0.135	2.02*	0.023	0.96	0.377	1.92+	0.020	0.87
Price of wheat	-0.216	1.99*	0.012	0.31	-0.596	1.88+	0.015	0.40
Price of atta	-0.101	1.20	0.025	1.43	-0.067	0.27	0.023	1.32
Price of onions	0.035	1.95+	-0.011	2.22*	0.121	2.19*	-0.011	2.19*
Price of potatoes	0.031	0.48	-0.030	1.18	0.032	0.15	-0.029	1.16
Price of eggplants	0.128	3.10**	-0.026	2.17*	0.349	2.92**	-0.025	2.09*
Price of mustard oil	-0.000	0.04	0.002	0.65	-0.010	0.63	0.001	0.63
Price of soybean oil	0.011	0.42	-0.013	1.92+	0.046	0.62	-0.013	1.85+

(continued)

Variable name	Model with Tobit first stage				Model with Probit first stage			
	Dependent variable: Quantity of FFE grain received		Dependent variable: Child goes to school		Dependent variable: Participates in FFE		Dependent variable: Child goes to school	
	Coeff. (1)	t test (2)	dF/dX (3)	z test (4)	Coeff. (5)	z test (6)	dF/dX (7)	z test (8)
Price of pulses	0.041	0.81	-0.002	0.18	0.047	0.31	-0.002	0.14
Dummy: Living in <i>thana</i> 2=1	1.337	5.36**	-0.421	2.47*	3.789	5.15**	-0.424	2.49*
Dummy: Living in <i>thana</i> 3=1	1.289	4.97**	-0.614	3.22**	3.155	4.30**	-0.611	3.21**
Dummy: Living in <i>thana</i> 4=1	1.501	4.57**	-0.631	3.24**	3.964	4.21**	-0.631	3.23**
Dummy: Living in <i>thana</i> 5=1	0.948	3.82**	-0.043	0.42	2.966	3.94**	-0.071	0.63
Dummy: Living in <i>thana</i> 6=1	0.518	1.94+	-0.001	0.01	1.559	2.02*	-0.013	0.13
Dummy: Living in <i>thana</i> 7=1	0.798	2.80**	-0.021	0.24	2.189	2.70**	-0.031	0.34
Dummy: Living in <i>thana</i> 8=1	0.907	3.61**	-0.067	0.69	2.825	3.74**	-0.075	0.75
Dummy: Living in <i>thana</i> 9=1	2.302	1.65+	-0.056	0.13	4.477	1.09	-0.047	0.11
Dummy: Living in <i>thana</i> 10=1	1.969	1.34	-0.034	0.08	2.848	0.66	-0.018	0.05
Constant	-5.689	3.38**			-6.212	3.27**		
R-squared	.50		.41		0.56		0.43	

Notes: dF/dX represents the change in probability for an infinitesimal change in each in dependent, continuous variable and, by default, the discrete change in the probability for the dummy variables. The equations have been estimated using the *'dprobit'* command of the Stata statistical software. + significant at the 10% level; * significant at the 5% level; ** significant at the 1% level.

Table 31—Average profitability to dealers of FFE foodgrain distribution

Item	Per metric ton of	Per dealer
	foodgrain distributed (taka)	(taka per month)
Total cost	267	5,643
Foodgrain loading cost	34	719
Foodgrain carrying cost	124	2,613
Foodgrain unloading cost	20	425
Staff salary	52	1,106
Other costs	37	780
Interest charges imputed at 14% per year	3	66
Total operating expenses	270	5,709
Total revenue	381	8,065
Commission	250	5,288
Sales proceeds of sacks	131	2,777
Profit	114	2,356

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: Foodgrain Dealer Survey," Bangladesh.

Note: On the average, a dealer distributed 21.15 metric tons of foodgrains per month.

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