



Does Extra Tuition Matter in Reducing Primary School Dropout in Bangladesh?

An Impact Evaluation of ESP (Education Support Program) of the CDIP
(Centre for Development Innovation and Practices)

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Executive Summary

To attain a higher growth trajectory, Bangladesh needs to invest heavily on the human capital for her citizen especially addressing the issue of quality education for children in the primary level. Over the years many different strategies have been followed involving government, NGOs and private sectors to increase the primary school attendance and also to improve the quality of primary education.

Centre for Development Innovation and Practices (CDIP) initiated the Education Support Program (ESP) in 2005. The program provided supplementary after-school tuition to pre-primary, Grade 1 and Grade 2 students belonging predominantly to poor and illiterate households. The primary objectives of the CDIP's ESP have been:

- To reduce the primary school dropout rate in its geographic areas of operation;
- To improve class performance (i.e. test scores) of grade 1 and 2 students from poor and illiterate households; and
- To strengthen the educational foundation of the students belonging to poor and illiterate households at the entry level.

CDIP initially started with 50 learning centers (LCs) and then expanded its program in the subsequent year. Currently it operates 1,750 LCs adjacent to Government run/supported primary schools in 10 districts. CDIP has planned to extend this program further in other parts of the country. For further expansion of the ESP, it is important for CDIP to explore whether this supplementary tutoring has been achieving its intended goals. In this context, CDIP requested ERG (Economic Research Group) to carry out an independent evaluation study on its ESP. ERG agreed to carry out an objective evaluation of the CDIP Education Support Program (ESP). The objectives / scope of the evaluation study set by ERG are:

- To estimate the effect of the program on primary school dropout rates; and
- To estimate the short term and long term effect of the ESP on students' class performance.

Initial field visits by the researchers revealed that dropout from primary schools usually occurs in grades 4 and 5. Therefore the evaluation of the program required tracing the students in grades 1 and 2 to grades 4 and/or 5. Thus we set the students who were in class 2 in 2008 as our sampling population. Out of this population we would randomly select one group of students who attended the CDIP LCs in 2008 and another group who didn't. Since the students attending one particular LC received the treatment in a group, we would first randomly select the LCs and then select all the grade two students attending that LC as the treatment group. Students attending any particular LC came from the same school. Our control students would be selected from these schools – from students who were in class two in 2008 and didn't participate in the CIDP's ESP. This would be a clustered sample and in deciding the sample size we have to take care of any intra-class correlation that may exist within any LC/school.

A multistage stratified sampling design was followed. In the first stage we selected 21 unions (unions that had the highest number of learning centers in 2008) out of the 33. Then in the second stage we randomly selected 159 centers out of the ones that had students from grade 2. Our sample would consist of 1900 students, 950 in each group.

It may be noted that it was not possible to follow this sampling strategy in the field. CDIP could not provide the name of the students who attended the LCs in 2008 for many LCs and for some the list of incomplete. Initially we had data on 2147 students of whom 1078 students attended 144 different CDIP learning centers in 2008. However, the schools could provide the marks for 2007 when the students were in class 1 for only 1215 students. Therefore, we use only this subsample for our analysis.

The study found that after-hour tuitions offered to students did manage to retain students through grade 5 once they received the interventions during grade 2. Because of selection of schools, the benchmark dropout rates were lower than national average. Yet the intervention lowered the dropout rates significantly. While it is possible that such interventions can have a higher average

treatment effect in the population and scaling up of the program can further give opportunity to understand this.

However, the education support program did not exhibit any significant (statistically or point-wise) impact on test scores. This partly may be because of lack of a proper control group to compare the treatment group with. The control group chose to receive similar treatments from other sources (e.g. private tutors). There were lots of ‘good’ and privileged students who definitely biased the impact downward. It is difficult to make a proper evaluation ex-post. Even after carefully selecting a sample our study was seriously constrained by availability of data. Since primary schools in Bangladesh face serious resource constraint, such programs with proper selection would lower the dropout-rates further among the primary school students of the country.

1 CDIP's Education Support Program (ESP): an introduction

1.1 Introduction

CDIP (Centre for Development Innovation and Practices), a Bangladeshi NGO initiated the ESP (Education Support Program) in 2005 with 50 learning centers (LCs) in Brahmanbaria and Gazipur districts to provide supplementary after-school tuition to pre-primary, Grade 1 and Grade 2 students belonging predominantly to poor and illiterate households (usually two hours each day). The (stated) specific objectives of the CDIP's ES Program have been:

- To reduce the primary school dropout rate in its geographic areas of operation;
- To improve class performance (i.e. test scores) of grade 1 and 2 students from poor and illiterate households; and
- To strengthen the educational foundation of the students belonging to poor and illiterate households at the entry level.

The idea of the *Education Support Program* emerged from the field level experience of CDIP working with the poor households over the years since 1995. CDIP was established in 1995 with the objectives of improving the quality of life of the rural poor by offering them financial as well as non-financial services. CDIP initiated its activities offering micro-credit (ranging Tk. 5,000 to Tk. 29,000) and micro-enterprise loan (Tk. 30,000 to Tk. 500,000) to its members belonging to the poor households to generate rural employment. It may be mentioned to its credit that CDIP does not take any financial assistance from external sources to carry-out its development activities.

While working with micro-credit program with its poor members for improving their lives, CDIP observed the limitation of micro-credit program in poverty reduction without other supplementary assistance programs like education support to the poor households as poverty transmits over generations as the poor illiterate households cannot educate their children. CDIP observed that around 75 percent children of its members drop out in grade 1 and 2 from the primary schools due to:

- Inability of illiterate parents to assist their children to prepare their school assignments,
- General lack of educational environment at the household level of poor and illiterate families, and
- Deficiencies of teaching in oversize classes in Government run/funded primary schools.

As a result children of poor households go to school unprepared, get punishment for not preparing homework, fall behind in class performance, lose interest in schooling, and ultimately dropped out. In this context CDIP initiated its ES Program in 2005 to assist the children of its members who are poor and mostly illiterate.

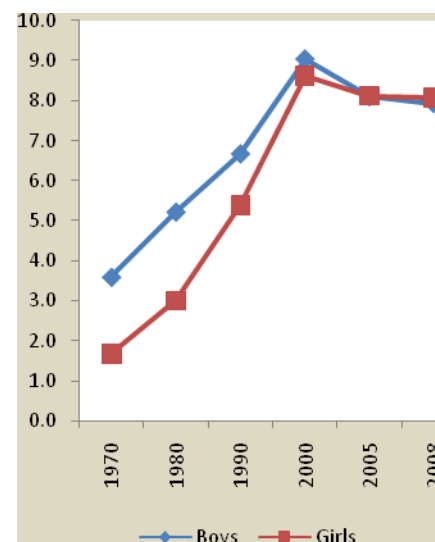
1.2 Macro Context of Primary and Early Childhood Education

Bangladesh has made increasing access to primary schools over the years and has already eliminated gender gap in primary education (see Figure 1). However, Bangladesh has been facing challenges in reducing primary school dropout, making access to primary school equitable, and improving the quality of primary education.

Access to primary education has increased steadily since 1990s. Government run and supported primary schools enroll 85 percent of primary school children and is complemented by Government supported Ibtedayee Madrasas and non-formal primary school run by NGOs mainly supported by external donors.

Though the Constitution of Bangladesh, framed in 1972, made it obligatory for the state to introduce compulsory free primary education for all children, it enacted compulsory primary education law only in 1990 and the compulsory primary education program was extended nationwide in 1993. Since then Government introduced incentives to all children to attend primary school through distribution of free textbooks. Cash stipend of Tk. 100 per child was introduced in 2002 which replaced ‘food for education’ in the form of a monthly grain ration targeted to poor children initiated in 1993.

Figure 1: Enrolments to Primary Schools by Gender, million students.



Source: BANBEIS website.

Successive governments have been implementing a sub-sectoral program PEDP (Primary Education Development Program) with multi-donor assistance led by the World Bank to increase access and quality of primary education. As of today, PEDP phases I (2004-07) and II (2007-10) were already completed and PDEP phase III (2011-15) is currently being implemented by the Ministry of Primary and Mass Education. PEDP goals are aimed at achieving 'Education for All' goal by 2015, adopted in the *World Education Forum* in Dakar, Senegal in 2000 named as 'Dakar Framework', to which Bangladesh is a signatory. It recognizes that early childhood development and pre-school education have a strong positive influence on preparedness for primary school and class performance and achievement of children. Children from poor households, specially the first generation learners (i.e. parents of whom are mostly illiterate), benefit most from early childhood education programs. The Government of Bangladesh recognizes the value of pre-school education program and encourages NGOs and community organizations to set up pre-school education programs.

Government's efforts have produced mixed results so far. While there has been a significant achievement in terms of access and gender equity in primary education, there remain major challenges in terms of attaining primary school completion rate and access to primary education with equity and quality. Current net enrolment rate is about 92 percent and five-year primary school completion rate is only about 50 percent (PC 2011). A large portion of children complete primary schooling without learning functional level of literacy, and numeracy skills due to low average attendance of class by enrolled students, crowded classrooms, lack of adequate learning materials, untrained and unenthusiastic teachers, and short contact hours in schools mostly operate in two shifts, thus remain virtually deprived of quality primary education. This experience of primary schooling system indicates that an effective access to primary education must fulfill three elements:

- Enrollment,
- Completion without dropout, and
- Acquiring knowledge and competencies for primary level of education.

Education Policy 2010 made a provision to extend primary education and provide universal access up to Grade 8 by 2018. This would make the primary school enrollment continuation and

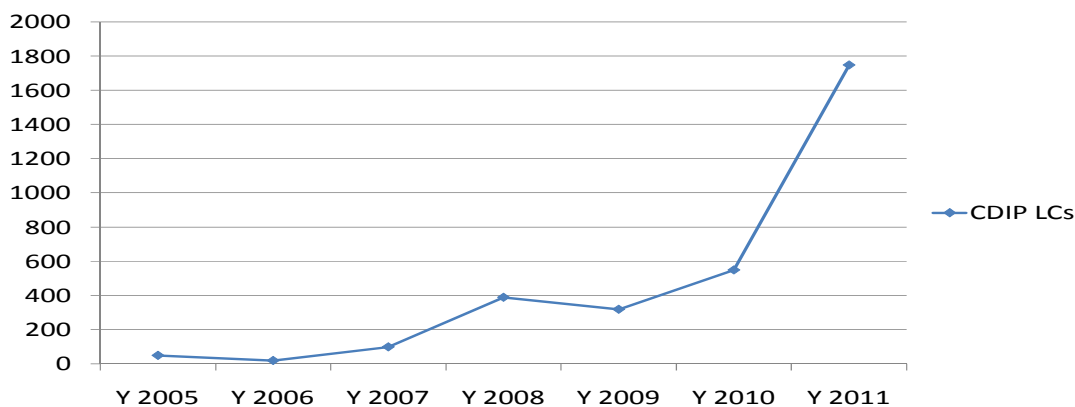
completion of 8 years primary education, and quality of primary school graduates much more challenging as current enrollment ratio in junior schools is only about 45 percent.

Inequity has been a major challenge towards effective access to primary schooling in Bangladesh. Rural children do not have effective access to primary education in terms of school and related infrastructure and quality of teachers. On the other hand, within the rural community children from poor households are the ones who either do not come to school or are very poor achievers as their illiterate parents neither can help or guide them, nor can afford private tuition for their children at home. Moreover, as poor households lack food security, they send their children to school without a proper breakfast, resulting malnutrition and underperformance in school.

1.3 CDIP's Education Support Program: its evolution and outreach

CDIP initiated its ES Program in 2005 for its members after about ten year of its establishment as an NGO in 1995 with micro-credit and micro-enterprise loan programs. ES Program began its journey with 30 Learning Centers (LCs) in three upazilas of Brahmanbaria district and 20 LCs in one Upazila of Gazipur district (CDIP 2011). As there has been demand for the education service LCs has been providing, CDIP expanded its LCs in successive years and by 2011 it opened 1,750 in 41 Upazilas of ten districts of greater Comilla, Noakhali and Dhaka (Figure 2, and Table 1, Appendix 2).

Figure 2: Year-wise cumulative number of CDIP LCs established



CDIP made a long jump in its ES Program expansion in 2011 by increasing number of LCs to 1750 from 550 in 2010. However, expansion program of LCs were not always steady, as number of LCs reduced to 25 in 2011 from 40 in 2008 in some CDIP branches of Brammanbaria, Comilla and Noakhali districts. Currently, 41,250 students of pre-primary, grade 1 and 2 students are enrolled in 1,750 LCs, under 70 CDIP branches in these districts, out of which 52.4 percent are girls (Table 1). Of the total students, number of Grade 1 students is the highest (42.6 percent) followed by grade 2 students (30.9 percent) and pre-primary (26.4 percent). Each of the LC has a female teacher numbering 1750 female teachers in total.

Table 1: Grade & Gender wise number of students at CDIP LCs in 2011

No. of LCs	No. of teachers		Pre-primary	Grade 1	Grade 2	Total
1750	1759	Girls	5681	9117	5811	21609
		Boys	5198	8474	5969	19641
		Total	10879	17591	12780	41250

Source: Education Program, CDIP

ESP is centered on LCs established by the CDIP in the neighborhood of rural primary schools. There is more than one LCs drawing students from single primary school. An LC is a multi-grade education service provider run by a single female teacher selected locally from the village. LCs admit pre-primary, grade 1 and grade 2 students of age between 3 to 7 years. In some cases Ibtedayee Madrasha students of similar grade and age are also get admitted in LCs. Recommended teacher-student ratio is 1:25 however this varies by LCs. Village communities provide free of cost room space or open yard to carry out LC activities. There are two options for school timing- afternoon shift (3-5pm) or morning shift (9-11am). Most of the LCs runs on afternoon shift. LCs work six days a week from Saturday to Thursday. LCs follow mainstream primary school curriculum and books supplied by the NCTB (National Curriculum and Text Book Board) in preparing students in three subjects which are Bengali, English and Mathematics. No standard book is followed for pre-school students as NCTB do not supply books for pre-school students.

An LC is run by a single female teacher who is most vital for its successful operation. Female teachers are selected from the local communities. They are mostly SSC pass with few exceptions (in which cases they usually have higher degrees but seldom with levels of education less than SSC). CDIP approaches potential young girls to organize LCs in their communities. It is the responsibility of the female teacher to find out a room space and to select prospective students according to the CDIP criteria. CDIP provide the teachers training, BDT 500.00 per month as honorarium, a blackboard, a box of writing-chalks, a duster and a plastic mat for the students. The teacher is allowed to take BDT 20.00 per month from each student.

CDIP supervise and monitor the ES Program through its DGM (Education Program) assisted by Manager (Education Program) centrally from Dhaka and by three monitoring officers assisted by 70 Field officers at the field level, one each at every CDIP Branch (Figure 2). Each field officer supervises 25 LCs on average in a CDIP Branch. Moreover, a Guardian Committee is formed for community ownership for running each LC representing one parent for each child. Guardian Committees are mostly the mothers of participating students. Guardian committees meet monthly and monitor the smooth function of LCs and help to collect the monthly tuition fees from the students.

1.4 CDIP's Education Support Program: Performance Evaluation Study

CDIP begun its innovative program called Education Support Program (ESP) for providing supplementary tuition to pre-primary and grade 1 and 2 primary school students with 50 LCs in three upazilas of Brammanbaria and in one upazila of Gazipur since 2005. The goal of this program has been to improve the class performance of the targeted students and to reduce the number of drop-outs from primary schools. CDIP expanded its program in the subsequent years in other districts and currently operates 1,750 LCs adjacent to Government run/supported primary schools in 10 districts. CDIP has planned to extend this program further in other parts of the country. For further expansion of the ES Program, it is important for CDIP to explore whether this supplementary tutoring has been achieving its intended goals. In this context, CDIP requested ERG (Economic Research Group) to carry out an independent evaluation study on its ES Program. ERG agreed to carry out an objective evaluation of the CDIP Education Support Program (ESP). The objectives / scope of the evaluation study set by ERG are:

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- To estimate the effect of the program on primary school dropout rates; and
- To estimate the short term and long term effect of the ESP on students' class performance.

1.5 A Brief Account of Findings

The effect of the ESP on primary school dropout rate is statistically significant. The dropout rate in the treatment group is 2.81% and in control group is 6.55%. That means it is

$$(1 - 2.81/6.55)\% = 57\%$$

lower in the treatment group compared to the control group. It may be noted that the dropout rates in the treatment and control groups were low in the sample.

However, using the DID (Difference in Difference) estimation method we find that the ESP did not have any significant effect on test scores. Only the score in Bengali in grade 2 improved and the improvement is marginal. The treatment group in grade 2 did not perform better in the school final compared to the control group. This is true for grade 3, 4 and 5 (for grade 5 we compared scores in the first term exam) as well.

The paper proceeds as follows. The next section describes the sampling plan, methodology and econometric model used for estimation. Section 3 illustrates the data and the findings of our research. Section 4 analyses the probable causes and implications of our findings. Finally section 5 draws concluding remarks.

2 Methodology

The CDIP program provides supplementary tutoring to students in pre-school and grades 1 and 2. Initial field visits by the researchers revealed that dropout from primary schools usually occurs in grades 4 and 5. Therefore the evaluation of the program required tracing the students in grades 1 and 2 to grades 4 and/or 5. Thus we set the students who were in class 2 in 2008 as our sampling population. Out of this population we would randomly select one group of students who attended the CDIP LCs in 2008 and another group who did not. Since the students attending one particular LC received the treatment in a group, we would first randomly select the LCs and then select all the grade two students attending that LC as the treatment group. Students

attending any particular LC came from the same school. Our control students will be selected from these schools – from students who were in class two in 2008 and did not participate in the CIDP’s ESP. This would be a clustered sample and in deciding the sample size we have to take care of any intra-class correlation that may exist within any LC/school.

2.1 Sampling

In 2010 CDIP collected data on test scores of their students in first and second term exams in the primary schools. Based on the 1421 grade 2 students who attended some 233 CDIP LCs in 2010 we calculated our sample size. In 2010 the grade 2 students who attended the CDIP LCs scored on average 55.89 (out of 100) in the first term exam with a standard deviation of 1809. The intra-class correlation was 0.32.

Our calculation (using the data collected by CDIP) showed that we would require around a total of 1,900 observations (950 in each of treatment and control groups) selected from 159 learning centers and the associated primary schools. CDIP had 304 learning centers in 2008 operating in 33 unions of 8 Upazilas in Bangladesh. Of these 304 centers, only 262 had students from grade 2. And the average number of grade 2 students was 8.

A multistage stratified sampling design was followed. In the first stage we selected 21 unions (unions that had the highest number of learning centers in 2008) out of the 33. Then in the second stage we randomly selected 159 centers out of the ones that had students from grade 2. The treatment group consisted of all the grade 2 students from the selected centers. Then in the third stage we randomly selected same number of students as the treatment students of grade 2 students from the primary schools who did not participate in the ESP. They constituted the control group. The treatment students were selected based on their ranking in grade 1 final exam, i.e., those who had the nearest class ranking to the control students in 2008 were selected.

It should be noted that it was not possible to follow this sampling strategy in the field. CDIP could provide the name of the students who attended the LCs in 2008 for many LCs and for some the list of incomplete.

2.2 Data

Data was collected on 2147 students, of whom 1078 students attended 144 different CDIP learning centers in 2008. However, the schools could provide the marks for 2007 when the

students were in class 1 for only 1215 students. Therefore, we used this subsample for our analysis. We conducted three sets of surveys to collect following data:

1. **Performance** of the treatment and control students in grade one (2007), grade two (2008), grade three (2009), grade four (2010), and grade five (2011-upto first term). This information was collected from the primary schools.
2. **Background** of students in both treatment and control groups, socio economic conditions, and household information were collected from household key informants.
3. **School information** was collected from the schools.

2.3 Identification

For both the treatment and the control groups the performance of the students in grade one can be viewed as the pre-treatment observations. Then their performance in the final exam of grade two, grade three and grade four can be viewed as the post-treatment observations. What we were trying to estimate is the “*average treatment effect on the treated*”. In estimating the treatment effect, we were estimating the treatment effect controlling other extraneous variables such as, background information and school information.

2.4 Analytical Framework

The effect of the education support program was estimated on two outcomes – performance in the year-end exam and dropout rates. First we estimate the average treatment effect (ATT) of the program on test scores. For this we estimate the following regression equation:

$$y_{ijt} = \alpha + \beta D_{ijt} + v_i + \epsilon_j + \mu_{ijt} \quad (1)$$

where y_{ijt} is the test score of student i in year t who participated in the CDIP learning center j in 2008, D_{ijt} is an indicator for participating in the CDIP’s ESP. $D_{ijt} = 1$ if student i went to the CDIP learning center j in year t and $D_{ijt} = 0$ if he/she did not, v_i is the student fixed effect and ϵ_j is the CDIP center fixed effect and β measures the average effect of the program on the treated. It was expected $\beta > 0$. In the pre – treatment period in 2007, $D_{ijt} = 0$ for both treatment and control students. In 2008, when all the students were in class two, $D_{ijt} = 1$ for the treatment group and is 0 for the control group. Standard errors are clustered at the CDIP center level.

Two methods were used to estimate the above regression equation - OLS and propensity score using kernel-based matching. In order to see if the program had any long run effect on test scores we estimate similar regression equations for students test score in class three, four and five. The results are shown in Appendix Table 4. Besides, we also use the quintile regression method to see if the program had heterogeneous effects on different groups of students.

In order to estimate the effect of the program on the primary school dropout rate we estimate the following regression:

$$x_{ij} = \theta + \delta D_{ij} + v_i + \varepsilon_j + \mu_{ij} \quad (2)$$

where x_{ij} is an indicator for student i from CDIP center j . $x_{ij} = 1$ if student is still at school in 2011 and 0 otherwise. $D_{ij} = 1$ for the students who went to the CDIP learning centers in 2008 group and is 0 for those who did not. Here the parameter δ estimates the effect of the program on primary school dropout rate and is expected to be negative. Since x_{ij} is an indicator variable we would use logit/probit estimation method. Here we estimate the probability of drop out as a function of the right hand side variables in equation (2).

3 Findings

3.1 Data

Table 1 (Appendix 1) shows the summary statistics for the students and households in the sample. The treatment and the control groups do not have any significant differences in most of the observable characteristics. This has important implications for the evaluation since our samples were selected after the program was introduced to the program schools. The similarities between the students from control and treatment groups based on the observed characteristics suggest that the two groups are comparable for the purpose of this study.

Panel A of Table 1 (Appendix 1) shows that the average household had 5.3 members. The mean age of the household head was 38.11 years and the mean age of the spouse was 31.6 years in 2008. In the treatment households the average age of the household head was 38.3 years and that of the spouse was 31.7 years. The respective figures for the control group are 38.0 and 31.6.

There is no significant difference in the ages of the household heads and their spouses across the treatment-control groups.

The occupational distribution of households is also similar across the treatment and control groups. In the treatment group 37% of the household heads are farmers, 20% are businessmen and 9% are service holders. In the control group the respective shares are 35%, 22% and 9%. Of the treatment group, 13% of the household heads live outside the households and 8.9% of them live abroad. In the control group, 16% of the households live outside the households and 10.4% of them live abroad.

On average the household head in the treatment group has 4.59 years of education and that in the control group has 4.85 years. The male household head is the father of the student in 96.67% of the treatment households and 98.31% of the control households. The spouse of the household head has on average 4.1 years of schooling in the treatment group and 4.6 years in the control group. There is no significant difference in the household head's levels of education across the treatment and the control groups. However, the difference in the household head's and spouse's level of education is significant at 5%. While 96.67% of the treatment households are Muslims, the share in the control group is 95.6%.

Panel B of Appendix Table 1 shows the students' characteristics. On average the treatment student was 7.8 years old and the control student was 7.7 years old in 2008. Among the treatment students 43.4% are boys and 56.6% are girls and the respective shares among the control students are 44.19% and 55.81%.

On average students in the treatment group scored 66.6 in Bengali, 66.8 in English and 70.06 in Math while they were in class one, while students in the control group scored 68.0, 69.0 and 70.3 respectively. There is no significant difference in the marks obtained by treatment and control students in different subjects in the pre-treatment period.

In 2008 the treatment students received 56.0 in Bengali, 56.9 in English and 63.05 in Mathematics, while the control students received 54.3, 57.3 and 61.8 in the three subjects respectively. The differences in marks obtained in 2008 and in 2007 are shown in Panel B of Table 1 (Appendix 1). On average the treatment group received 27.24 marks less in 2008 than in 2007, while the difference for the control group is 31.17

The marks obtained in different subjects in 2009 and 2010 are presented in Table 1 (Appendix 1). There is no significant difference in these marks between treatment and control groups implying that the benefit of the additional tutoring, if there was any, did not prevail in the following years.

3.2 Results

3.2.1 Effect on primary school dropout rate

Table 4 (Appendix 1) shows the results of logit and probit regression estimation of equation (2). Column 1 shows that the estimated coefficient for D_{it} is -0.88 and it is statistically significant at 5% level. Column 2 shows the average marginal effects. Results show that participation in the ESP reduces the probability of dropout by 0.039. Columns 5 and 6 of Table 4 (Appendix 1) show similar results for the probit model. According to the probit estimation method the ESP reduces the probability of primary school drop out by 0.038. The probit estimates are also statistically significant at 5%. These results imply that out of 1000 students, the treatment group would have 39 less dropouts compared to the control group. It may be noted that the rate of drop out was very low in our sample for both the control and treatment groups (6.6% and 2.8% respectively). If the dropout rate for control group is considered as the benchmark figure then a decline in the dropout rate of 3.9 percentage point would amount to a substantial decline.

3.2.2 The effect on test scores

The estimates of regression equation (1) are presented in Table 2 (Appendix 1). For the regression we use normalized test scores. Column 1 shows that the ESP improved the test scores of the treatment students by 0.72 standard deviation. However this estimate is not statistically significant. Column 3, 4 and 5 show the results of the same regression equation for Bengali, English and Math. The ESP improved the test score in Bengali, English and Math by 0.11, -0.009 and 0.062 standard deviation. Of these three, only the effect on Bengali test score is statistically significant. These results are presented in figures 3 and 4.



Figure 3: Total Marks Obtained by treatment and Control Groups

Column 9, 10, 11 and 12 show the results of similar estimates obtained by propensity score matching. The point estimates are similar to those produced by the OLS method. The ESP program has no significant effect on total test scores. However the score in Bengali improved significantly – by 0.11 standard deviation. This translates into a difference of 2.57 marks out of 100.

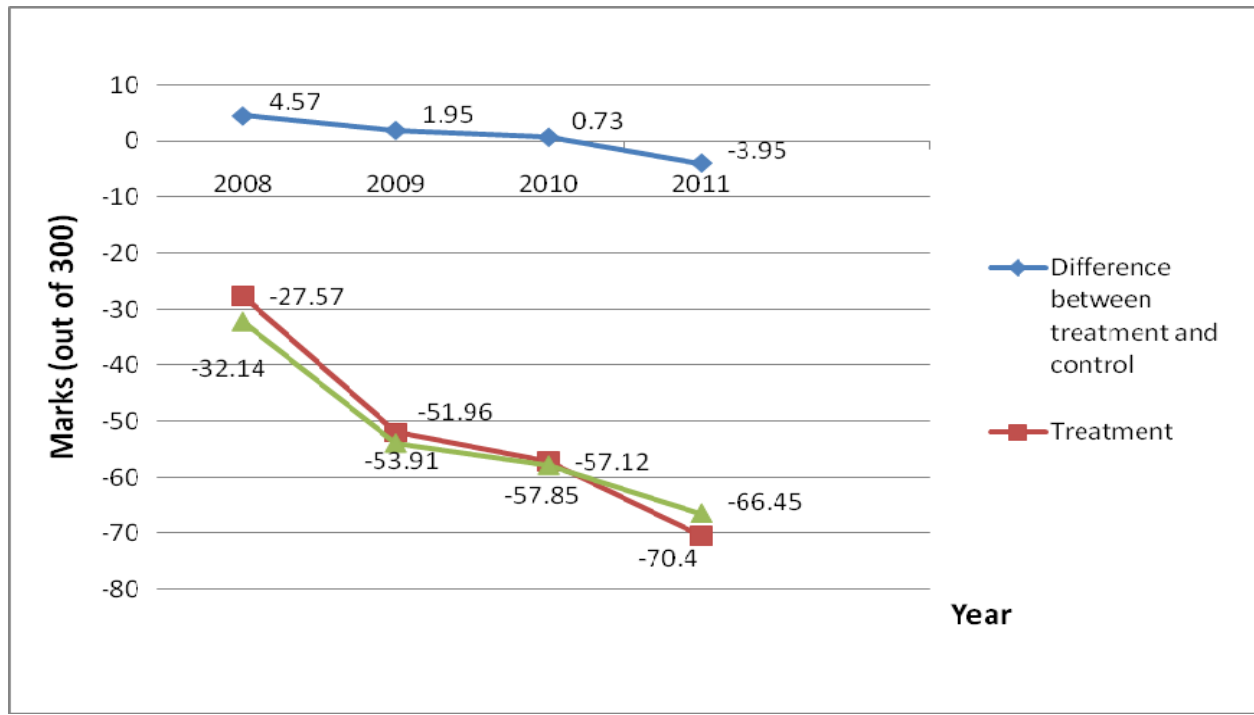


Figure 4: Difference in Total Marks between Pre and Post Treatment year

Panels A, B and C of Table 3 (Appendix 1) show the results for test scores in class three, four and five respectively. None of the coefficient is statistically significant implying that the ESP had no significant effect on test scores after the students left the program. Figure 3 shows the difference in total marks obtained by the treatment and control groups in years 2007 – 2011 and Figure 4 shows the difference in the test scores in the pre (2007) and post (2008 – 2011) treatment periods for these two groups.

3.2.3 Robustness

In order to check the robustness of the regression result we run the same regression adding a few covariates. We use the household head and the spouse's age, years of education and the student's gender as additional covariates in equation (1). Columns (5-8) of Table 2 and 3 (Appendix 1) show these regression results. The point estimates remain almost the same even after adding these covariates. It is also notable that none of these additional regressors has any significant effect on the test scores in class two.

However, the effects of the covariates on test score in class three, four and five are mixed. The effect of gender of the student is negative in most of the cases (though they are not always statistically significant). This means that girls on average scored lower in the exams. This could be due to the fact that on average the girls in the sample received fewer hours of additional tutoring help.

Columns 3 and 4 of Table 4 (Appendix 1) show the results for the logit regression model while columns 7 and 8 show the results for the probit regression model with these additional covariates. Adding these covariates does not change the point estimates much. Both the logit and the probit models show that the ESP reduces the probability of primary school dropout by 0.04 and both are statistically significant. Moreover the gender of the student has a significant effect on the probability of drop out. On average a girl is 0.022 less likely to drop out than a boy.

3.2.4 Heterogeneous Effect:

Our estimates show that on average the ESP has no significant effect on the test scores of its participants. However, one may argue that the program affected different groups of students in a different way. It could be that the program was most effective for the weaker students. In grade 1 the bottom 25% of the students scored less than 158, the bottom 50% scored less than 212 and the bottom 75% scored less than 252. We do not find any significant effect of the ESP on the test scores of these three groups of students (stratified by scores obtained in grade1). We ran the same regression stratified by household head's years of education in order to see if the program had differentiated effects for the children with different levels of parental education. However, in this case too, we did not find any statistically significant effect of the program on test scores.

4 Result Analysis

In this study we looked at class performance as measured by test scores for students who attended CDIP learning centers and compared such performances against students who did not attend the same learning centers. The learning centers provided almost 12 hours of extra tuition per week outside the school hours based on the same curriculum followed by the general primary schools (either government run or supported). The working assumption of the program was that this would allow the students from the poor and uneducated families to perform better than they were doing before and motivate them to remain in the classroom.

The research team chose two groups of household (one received the treatment i.e. attended the CDIP LCs and other one did not). Since this was done after the program was rolled out for a number of years it was a great challenge to carry out such sampling. We identified as much as we could the students who attended the LCs in 2008 so we could follow the same students over time and see whether they dropped out at the later stage or not. This also allowed us to look at the test scores at the later grades and subject to standardization we could compare the two groups and see whether the treatment group did better compared to the control group.

It was found that treatment group's performance (on average) was very similar to the control group. Only in Bengali, the treatment group fared better than the control group otherwise there was no statistical difference in the performance of the two groups. However, for all scores (at different grades) the point estimates were also very small. There was some statistically significant difference in dropping out which we could associate with attending the learning centers. However, the point estimates were small.

There were many reasons which could bias the results toward null. Measurement error in the treatment assignment is a possible candidate and the field work to identify the right students was truly difficult. CDIP should perhaps want to enrich their data keeping capacity. Students in the control group may also receive similar treatments (i.e. attended commercial tutoring and/or support from the households) which diluted the impact(s) of the program (if any). In fact our data shows that only 19.78% of the treated students received additional tutoring (in addition to the CDIP LCs) while the fraction for control students who received additional help was 27.89%. This would certainly bias the results. The correlation between getting additional tutoring help and attending the CDIP LCs is negative (-.09).

One should also note that in the earlier periods the learning centers were targeted toward the children of the members in the CDIP's regular micro-credit programs hence the treatment and the control groups were unlikely to be similar in terms of the unobserved characteristics. Our field visits also revealed that the many students attending the learning centers were better students in their respective classes who would probably continue to strive even in the absence of the program. From the evaluation purpose we did the best we could to address these issues, yet because of many different limitations it was not possible to do follow a proper evaluation protocol and construct a counterfactual which would give us an appropriately identified

treatment effect on the treated students. We strongly suggest that CDIP involve a research team to evaluate the education support program through an experimental setting during the scaling up phases.

5 Conclusion

To attain a higher growth trajectory, Bangladesh needs to invest heavily on the human capital for her citizen especially addressing the issue of quality education for children in the primary level. Lack of proper education has received its due attention and over the years many different strategies have been followed (involving government, NGOs and private sectors) to increase the primary school attendance. While this goal has been achieved so far (along with gender parity), the quality of education has remained a cause of concern. CDIP's Education Support Program addressed this issue because students with low performance in the class were perceived to further deter students from continuing with their studies.

This study found that after-hour tuitions offered to students did manage to retain students through grade 5 once they received the interventions during grade 1 and 2. Because of selection of schools, the benchmark drop-out rates were lower than national average. Yet the intervention lowered the drop-rates significantly. While it is possible that such interventions can have a higher average treatment effect in the population and scaling up of the program can further give opportunity to understand this.

However, the education support program did not exhibit any significant (statistically or point-wise) impact on test scores. This partly may be because of lack of a proper control group to compare the treatment group with. The control group chose to receive similar treatments from other sources (e.g. private tutors). There were lots of 'good' and privileged students who definitely biased the impact downward. It is difficult to make a proper evaluation ex-post. Even after carefully selecting a sample the study was seriously constrained by availability of data. Since primary schools in Bangladesh face serious resource constraint, such programs with proper selection would lower the dropout-rates further among the primary school students of the country.

References:

1. CDIP, 2011, Arresting Primary School Dropout: a study on an experimental initiative of CDIP
2. Planning Commission, 2011, Sixth Five Year Plan FY 2011-2015: Accelerated Growth and Poverty Reduction, GoB
3. Planning Commission, 2008, Moving Ahead: National Strategy for Accelerated Poverty Reduction II (FY 2009-11), GoB
4. WB, 2011, Bangladesh: Projects, Programs and Results, <http://www.worldbank.org.bd>

6 Appendix 1

Table 1: Treatment Control Balance

		<u>Panel A: Household Level Characteristics</u>							
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Age of Household Head	Age of HH Head's Spouse	HH Heads Years of Education	Spouse's Years of Education	Male HH Head%	Male HH Father of the student	Occupation	Religion Muslim%
All	Mean	38.11	31.61	4.72	4.3	96.59	97.5	Farmers 36%	95.99
	Std Dev	7.72	6.61	3.9	3.34			Business man 21%	
	N	1,200	1,157	1,158	1,111	1,201	1159	1197	1,201
Treatment	Mean	38.25	31.68	4.59	4.1	95.48	96.67	Farmers 37%	96.4
	Std Dev	8.1	7.03	3.9	3.3			Business man 20%	
	N	596	571	566	538	604	589	595	611
Control	Mean	37.99	31.56	4.85	4.6	97.68	98.31	Farmers 35%	95.58
	Std Dev	7.28	6.16	3.9	3.3			Business man 22%	
	N	604	586	592	573	597	570	602	604

Panel B: Student Characteristics

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
						Grade 1				Grade 2		
		Age	% girl	Dropout rate%	Total	Bengali	English	Math	Total	Bengali	English	Math
All	Mean	10.72	56.21	4.69	204.66	67.29	67.38	70.15	174.80	55.15	57.42	62.40
	Std Dev	0.79			56.52	21.45	21.64	22.22	53.87	20.38	20.79	21.41
	N	1198	1215	1215	1215	1215	1214	1215	1186	1168	1168	1187
Treatment	Mean	10.77	56.62	2.81	203.33	66.63	66.77	70.06	175.76	56.02	56.94	63.05
	Std Dev	0.82			57.284	21.51	21.96	22.36	54.18	20.70	20.81	21.45
	N	596	604	604	604	605	604	604	584	584	584	583
Control	Mean	10.67	55.81	6.55	205.97	67.95	67.98	70.24	173.83	54.27	57.90	61.76
	Std Dev	0.75			55.77	21.38	21.31	22.09	53.59	20.03	20.79	21.37
		602	611	611	611	610	610	610	584	584	584	584

		Panel B: Student Characteristics – Marks Obtained in Exams (continued)											
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		Grade 3				Grade 4				Grade 5			
		Total	Bengali	English	Math	Total	Bengali	English	Math	Total	Bengali	English	Math
All	Mean	151.72	51.24	48.17	52.20	147.16	51.504	47.22	48.24	136.17	48.55	42.96	44.69
	Std Dev	54.58	19.94	20.05	22.73	52.87	18.39	19.42	23.61	49.65	16.74	17.87	23.63
	N	1093	1095	1294	1096	986	794	969	973	991	1008	1009	994
Treatment	Mean	151.37	50.91	48.31	52.08	146.21	51.30	47.42	47.10	132.9	47.45	41.64	43.71
	Std Dev	55.21	19.60	20.11	24.25	53.14	17.64	19.31	25.55	48.29	16.09	16.748	23.63
	N	543	545	543	545	485	489	486	488	504	504	512	504
Control	Mean	152.06	51.56	48.03	52.31	148.1	51.70	47.02	49.38	139.52	49.69	44.31	45.70
	Std Dev	53.99	20.28	19.99	21.14	52.63	19.13	19.56	21.45	50.85	17.33	18.87	23.61
	N	550	550	551	551	483	483	483	485	487	496	497	490

Table 2: The effect of the ESP on test scores^a

		Dependent variable – difference in test score in class 2											
		OLS estimates								ATTk estimates			
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		Total	Bengali	English	Math	Total	Bengali	English	Math	Total	Bengali	English	Math
Treat		0.72 (.06)	0.114* (.058)	-0.009 (0.059)	0.062 (0.068)	055 (.0629)	.11** (.058)	-.024 (.061)	.0421 (.074)	0.056 (.061)	0.112** (0.056)	-0.021 (0.063)	0.039 (0.056)
Father's education						.0068 (.006)	.002 (.0076)	.0002 (.005)	.012 (.007)				
Mother's education						-.008 (.006)	-.009 (.006)	-.006 (.005)	-.002 (.006)				
Father's age						-.003 (.008)	-.008 (.009)	.004 (.008)	-.006 (.008)				
Mother's age						.004 (.008)	-.014 (.009)	-.011 (.009)	.006 (.009)				
Sex of the student						-.065 (.072)	-.054 (.07)	-.053 (.06)	-.042 (.07)				
No of observations		1,168	1,169	1,169	1,169	1,060	1,061	1,061	1,061	1,215	1,215	1,215	1,215

^a The tests scores are normalized. Standard errors are in the parentheses. *** significant at 1%, ** significant at 5%, * significant at 10%.

Table 3: The effect of the ESP on test scores^a – long run effects

Panel A	Dependent variable – difference in test score in class 3											
	OLS estimates								ATTK estimates			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total	Bengali	English	Math	Total	Bengali	English	Math	Total	Bengali	English	Math
Treat	.013 (.059)	.0001 (.046)	.040 (.063)	-.002 (.063)	-.002 (.063)	.004 (.052)	.030 (.068)	-.031 (.066)	-0.016 (0.066)	-0.005 (0.067)	0.022 (0.068)	-0.048 (0.066)
Father's education					.0007 (.007)	-.0004 (.007)	-.0001 (.007)	.002 (.007)				
Mother's education					-.009 (.006)	-.014** (.006)	-.008 (.006)	-.00002 (.006)				
Father's age					-.015 (.009)	-.019** (.009)	-.006 (.009)	-.013 (.009)				
Mother's age					.021* (.011)	.023** (.011)	.004 (.009)	.025** (.01)				
Sex of the student					-.136* (.069)	-.085 (.077)	-.070 (.064)	-.172** (.064)				
No of observations	1093	1095	1094	1096	995	996	996	997	1215	1215	1215	1215

^a The tests scores are normalized.

Standard errors are in the parentheses. *** significant at 1%, ** significant at 5%, * significant at 10%

Table 3 (continued)

Panel C	Dependent variable – difference in test score ^a in class 4											
	OLS estimates								ATTK estimates			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Total	Bengali	English	Math	Total	Bengali	English	Math	Total	Bengali	English	Math	
Treat	.042 (.065)	.049 (.061)	.086 (.061)	-.047 (.072)	.046 (.071)	.037 (.062)	.077 (.064)	-.027 (.079)	0.042 (0.061)	0.033 (0.076)	0.088 (0.075)	-0.043 (0.068)
Father's education					-.0003 (.008)	-.008 (.008)	-.0009 (.007)	.007 (.009)				
Mother's education					-.013** (.006)	-.014** (.006)	-.009 (.006)	-.01 (.007)				
Father's age					-.018** (.009)	-.024** (.01)	-.007 (.009)	-.013* (.007)				
Mother's age					.02 (.01)	.03** (.011)	-.002 (.01)	.021** (.009)				
Sex of the student					-.054 (.08)	-.057 (.076)	.035 (.07)	-.116 (.076)				
No of observations	968	973	969	972	879	883	880	882	1215	1215	1215	1215

^a The tests scores are normalized.

Standard errors are in the parentheses. *** significant at 1%, ** significant at 5%, * significant at 10%

Table 3 (continued)

Panel D	Dependent variable – difference in test score ^a in class 5											
	OLS estimates								ATTK estimates			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total	Bengali	English	Math	Total	Bengali	English	Math	Total	Bengali	English	Math
Treat	-.026 (.057)	-.011 (.056)	-.017 (.058)	-.046 (.059)	.014 (.060)	.0147 (.060)	.0062 (.058)	-.005 (.061)	-0.015 (0.061)	-0.002 (0.064)	-0.010 (0.070)	-0.035 (0.072)
Father's education					.005 (.006)	.000 (.007)	.006 (.006)	.007 (.007)				
Mother's education					.005 (.006)	.0001 (.006)	-.001 (.006)	.010 (.007)				
Father's age					-.026** (.008)	-.022** (.008)	-.018** (.009)	-.021** (.008)				
Mother's age					.021** (.009)	.021** (.009)	.006 (.010)	.024 (.009)				
Sex of the student					-.032 (.071)	-.005** (.067)	.007 (.07)	-.087 (.073)				
No of observations	991	1007	1009	993	889	915	917	901	1215	1215	1215	1215

^aThe tests scores are normalized.

Standard errors are in the parentheses. *** significant at 1%, ** significant at 5%, * significant at 10%

Table 4: the effect of the ESP on primary school dropout rate

Dependent variable – probability of dropout

	Logit regression model				Probit regression model			
	Coefficient	Average Marginal effects	Coefficient	Average Marginal effects	Coefficient	Average Marginal effects	Coefficient	Average Marginal effects
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treat	.88** (.318)	-.039** (.018)	-.98** (.36)	-.04** (.020)	.398** (.145)	-.038** (.017)	-.44** (.16)	-.04** (.019)
Father's education			-.043 (.04)	-.0018 (.001)			-.018 (.017)	-.0017 (.001)
Mother's education			-.028 (.036)	-.0012 (.0014)			-.011 (.015)	-.001 (.001)
Father's age			-.002 (.020)	-.00011 (.0008)			-.0016 (.009)	-.00014 (.0008)
Mother's age			-.02 (.024)	-.00089 (.001)			-.009 (.011)	-.0008 (.001)
Sex of the student			-.54** (.26)	-.023** (.010)			-.25** (.108)	-.0229** (.009)
No of observations	1215	1215	1100	1100	1215	1215	1100	1100

Standard errors are in the parentheses. *** significant at 1%, ** significant at 5%, * significant at 10%.

7. Appendix 2

Table 1: Year-wise number of CDIP LCs established

Sl no.	Branch	Region	Upazila	Zila	2005	2006	2007	2008	2009	2010	2011
1	Bholachang	Solimgonj	Nabinagar	B.Baria	05						25
2	Solimgonj	do	Nabinagar	B.Baria	05						25
3	Chargach	Kuti	Kasba	B.Baria	20	20	20	40	30	25	25
4	Mawna	Mawna	Sreepur	Gazipur	20					25	25
5	kuti	Kuti	Kasba	B. Baria			20	40	30	25	25
6	Nimsher	Moynamoti	Burichang	Comilla			20	40	30	25	25
7	Mohonpur	do	Burichang	Comilla			20	40	30	25	25
8	Moynamoti	do	Burichang	Comilla				40	80	50	25
9	Vorosherbazar	do	Burichang	Comilla				40	30	25	25
10	Sahebabad	Kuti	B. para	Comilla				40	30	25	25
11	Darkhar	do	Akhawra	B. Baria			20	40	30	25	25
12	Barera	do	Debiddar	Comilla						25	25
13	Zamiderhat	Bazra	Begomgonj	Noakhali				40			25
14	Laxmipur (S)	Laxmipur	Laxmipur Sadar	Laxmipur				30	30	25	25
15	Mandari	do	Laxmipur Sadar	Laxmipur						25	25
16	Daserhat	Maijdi	Laxmipur Sadar	Laxmipur						25	25
17	Bazra	Bazra	Sonaimuri	Noakhali						25	25
18	Khilabazar	Laksum	Monohorgonj	Comilla						25	25
19	Rampur	Hajigonj	Hajigonj	Chandpur						25	25
20	S. Vangura	Solimgonj	Muradnagar	Comilla						25	25
21	Sonargaon	Sonargaon	Sonargaon	Narayangonj						25	25
22	Araihajar	do	Araihajar	Narayangonj						25	25
23	Tongibari	Tongibari	Tongibari	Munshigonj						25	25
24	Nayarhat	Ashulia	Dhamrai	Dhaka						25	25
25	Kasimpur	do	Kaliakoir	Gazipur							25
26	Boardbazar	do	Tongi	Gazipur							25
27	Pubail	do	Sreepur	Gazipur							25
28	Ashulia	do	Ashulia	Dhaka							25
29	Modonpur	Sonargaon	Madanpur	Narayangonj							25
30	Modongonj	do	Madanpur/	Narayangonj							25
31	Bhaberchar	Sonargaon	Gojaria	Munshigonj							25
32	Nabigonj	do	N. Bandar	Narayangonj							25
33	Jaina	Mawna	Sreepur	Gazipur							25
34	Gazipur Sadar	do	Gazipur Sadar	Gazipur							25
35	Rajabari	do	Sreepur	Gazipur							25
36	Porabari	do	Gazipur Sadar	Gazipur							25
37	Srinagar	Tongibari	Srinagar	Munshigonj							25
38	Sirajdikhan	do	Sirajdikhan	Munshigonj							25
39	Abdullapur	do	Abdullapur	Munshigonj							25
40	Munshigonj (S)	do	Munshigonj Sadar	Munshigonj							25
41	Naopara	do	Lowhojonj	Munshigonj							25
42	Bitghar	Kuti	Nabinagar	B. Baria							25
43	Rupasdi	Solimgonj	Bancharampur	B. Baria							25
44	Srikail	do	Muradnagar	Comilla							25
45	Hyderabad	do	Muradnagar	Comilla							25
46	Chapapur	Moynamoti	Comilla Sadar	Comilla							25

47	Madhaiya	do	Chjandina	Comilla							25
48	Raipur	Laxmipur	Raipur	Laxmipur							25
49	Haidargonj	do	Haidargonj	Laxmipur							25
50	Ramgonj	do	Ramgonj	Laxmipur							25
51	Faridgonj	do	Faridgonj	Laxmipur							25
52	Dagonbhuiyan	Bazra	Feni Sadar	Feni							25
53	Nadona	do	Feni Sadar	Feni							25
54	Kankirhat	do	Feni Sadar	Feni							25
55	Chatkhil	do	Feni Sadar	Feni							25
56	Laksham	Laksham	Laksham	Comilla							25
57	Nagolkot	do	Nagolkot	Comilla							25
58	Mudarffargonj	do	Laksham	Comilla							25
59	Bagmara	do	Laksham	Comilla							25
60	Bipulasher	do	Laksham	Comilla							25
61	Maijdi	Maijdi	Noakhali Sadar	Noakhali							25
62	Khaliferhat	do	Noakhali Sadar	Noakhali							25
63	Chandragonj	do	Noakhali Sadar	Noakhali							25
64	Banglabazar	do	Noakhali Sadar	Noakhali							25
65	Sonapur	do	Noakhali Sadar	Noakhali							25
66	Hajigonj	Hajigonj	Chandpur Sadar	Chandpur							25
67	Shaharasti	do	Chandpur Sadar	Chandpur							25
68	Waruk	do	Chandpur Sadar	Chandpur							25
69	Rahimanagar	do	Chandpur Sadar	Chandpur							25
70	Mahamaya	do	Chandpur Sadar	Chandpur							25
Total number of LCs					50	20	100	390	320	550	1750

Source: Education Program, CDIP