

**FIVDB**

Friends in Village Development Bangladesh

**"It takes a village to put a child through school" -**

***Can community literacy substitute for parental literacy?***

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Aldo Benini  
Wasima Samad Chowdhury  
The FIVDB Research and Monitoring Team

January 2012

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# **"It takes a village to put a child through school" - *Can community literacy substitute for parental literacy?***

Aldo Benini, Wasima Samad Chowdhury, and

Members of the FIVDB Research and Monitoring Team:

Abu Sayem Arif, Arif Azad Khan, Arif Mohammad Shakil, Asim Roy, Humayun Kabir, Majeda Zafrin Juie, Mashiur Rahman Tito, MD Faisal Khaliq, MD Kamrujjaman, Md. Abdus Salam, Mohammad Sarwar Basher, Muhammad Al Amin, Rakshit Bhattacharjee.

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## Preface

FIVDB practices a facilitating approach to development. People are born into, grow and thrive in multiple circles of inclusion and belongingness, from nuclear family to nation, and ultimately to the sphere of all life forms. In this spectrum from intimate to global, we meet the people at a suitable local point, through community institutions. These provide the platforms for outside resources to strengthen processes that are favorable to human growth and social justice.

Some of these institutions have expanded and evolved through our common history. FIVDB has been profoundly marked by a philosophy of learning together and by our experience with one particular type of institution critical to its practice - primary schools. Primary education and the complementary literacy training for adults are our main vehicles of development facilitation. A host of other activities follow in their wake, all of them aimed at greater capacity building.

Our students largely come from very poor families. An estimated 58 percent have two illiterate parents. To this day, almost a quarter of all households in our project area do not include a single literate member. The disadvantages of illiteracy haunt children, families and communities.

Yet, growing literacy, higher incomes and better communications bring new opportunities also for some of the disadvantaged and for the development agencies that work with them. Under the *Jonoshilon* project, FIVDB has expanded educational, income-generation and social organization resources into new communities and has firmed them up in established areas.

Growing numbers have heightened our concern for quality and impact. In the *Jonoshilon* project area, several baseline surveys were conducted, with a view to ensuring subsequent outcome assessments. In one of these survey rounds, a puzzling pattern in primary education emerged. It has challenged our thinking and has occasioned this study. What has come to light concerns not only one sector, but the ways in which several interact in the wider community.

Thus, in education, the chances for a child to complete primary school depend significantly on the literate environment in the village. Almost 70 percent of the study cohort reached that point while the rest dropped out, or never went to school. Strikingly, the chances for a child of literate parents in a low-literacy village are the same as for another in an illiterate home, but surrounded by many literate fellow villagers.

It is plausible that many of these learned to read and write for the first time in an FIVDB adult literacy course. The basic claim of *"It takes a village to put a child through school"*, therefore, is of eminent importance for us. The idea, however, that "community literacy substitutes for parental literacy", would be misleading. FIVDB has always known, and this study reaffirms, that the two complement each other. It gives us a precise measure of how they work together.

Zahin Ahmed  
Executive Director

## **Acknowledgement**

A large number of unnamed subject-matter program staff as well as members of village-based Community Learning Centers were involved in the initial baseline survey.

James Jennings, Dhaka, formerly associated with FIVDB's functional literacy program, and Manzoor Ahmed, Director, Institute of Education & Development, BRAC University, Dhaka, aided the research with advice and professional literature.

The research was supported by FIVDB.

## Summary

Can communities compensate for the shortcomings of families? Specifically, can higher literacy in the village help children of illiterate parents to complete their education?

This question came up in the baseline survey of 98 villages in northeastern Bangladesh to which Friends in Village Development Bangladesh (FIVDB) were expanding a new popular education program known as "Jonoshilon". The initial analysis found a significant positive relationship between the literacy rate of adult women in the village - a *community* indicator - and *individual* school success.

This study extends the analysis to the effects that *parental* as well as *community literacy* has on school success. It combines three types of analysis. They use data on the 9,000+ adolescents enumerated in the 98 villages, who had or had not completed primary school. We enrich this data with case studies of 34 children in various stages of primary schooling.

The first step relies on multi-level regression to estimate the effects of gender as well as of household and village-level factors that plausibly affect school success. Our models predict school completion correctly for 75 percent of the cases. We find that, other socio-economic conditions being equal, the chances to complete primary school are similar for a child of illiterate parents in a high-literacy community and for one of two literate parents in a low-literacy community.

While the statistics strongly suggest that parental and community literacy substitute for each other - in other words, that a village indeed can put a child through school -, they say nothing about the mechanisms through which these effects on school success unfold in real life. The case studies were undertaken to shed light on those. They amalgamate elements collected from the 34 focus children, their parents and teachers as well as from some neighbors and school committee members. They highlight the overlapping spheres of specific, personal support among families, friends and close neighbors and of the wider normative environment that encourages education for all.

The case studies have an optimistic bias. They do not explain why close to a third of the sample adolescents did not complete primary school. But they demonstrate that children - also those of illiterate parents - can find resourceful supporters in their communities. They suggest that the pathways to primary school success may be multiple and diverse.

In the third analysis step, we explore these pathways for the 9,000 adolescents for whom the primary school outcomes are known. This approach uses an altogether different statistical approach, known as Qualitative Comparative Analysis (QCA). Instead of explaining outcomes with additive effects from contributing *variables*, this method identifies distinct sets of *cases* under conditions that make Class V completion highly probable.

We find six pathways to success, as detailed in this table.

**Table 1: Pathways to primary school success**

Group	Pathways			Cases	Completion rate
A	1	Father	Mother	1,664	94%
	2	Father	Wealth	2,136	91%
	3	Father	Community	2,027	92%
B	4	Girl	Mother	1,230	94%
	5	Girl	Wealth	1,209	94%
	6	Mother	Wealth	994	95%
Not on those pathways				5,238	56%
Adolescents 15-19 years in baseline survey					
With complete data				9,041	70%
All				10,601	69%

**Note:** "Father" is short for "has literate father". Similarly for "Mother". "Wealth" stands for high wealth rank, "community" for high village literacy. The groups overlap; a child can be on several pathways. An example of a group NOT on any of those pathways: boys of two illiterate parents.

The results bear out the earlier finding that higher levels of adult literacy in the village promote school success in the next generation. But there is an important qualification. The literate environment works on the child *always* in conjunction with other enablers. These occur at the Ego (gender), relevant individual Alter (literacy of father or mother) and family (wealth rank) levels. These enablers are not available in simple substitution. They affect the child in combination. Notably, for boys of two illiterate parents, greater household wealth and community literacy do not fully compensate.

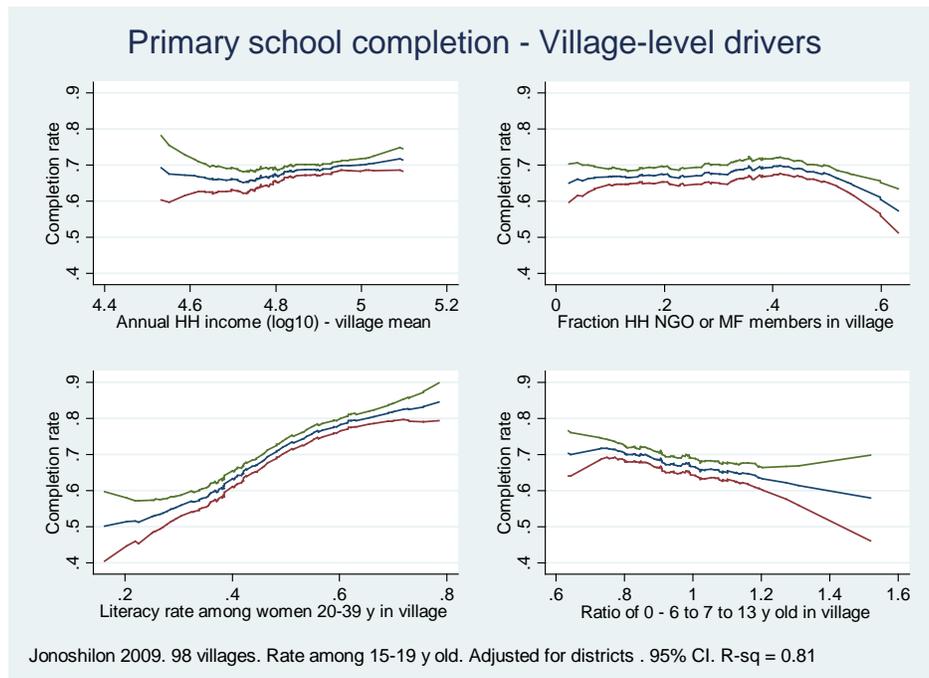
Our results could be read as supporting the fashionable claim that boys lack confidence and self-esteem, are free to loiter and, among the very poor, are sent away to earn. However, the more numerous pathways available to girl students may just as well result from a superior match between school curricula and female socialization. We cannot tell. Hasna, the subject of our in-depth personal case study, is a successful completer. Poor, with parents who had relapsed into illiteracy, her career does not conform to any of the pathways noted above. Yet, with emotional support at home and academic help from friends in her high-literacy village, she succeeded.

Surveys conducted by development NGOs commonly struggle with measurement and data management challenges. This was the case also of the 98-village baseline survey. We do believe, however, that this study probes the data beyond normal baseline usage, if only to ask new and stimulating questions. These concern not only the relationship among institutional spheres such as community development, adult literacy and child education, but also the dynamic across individuals, their immediate social groups and the wider normative environment. In this perspective, *"It takes a village to put a child through school"* offers a small contribution towards the self-reflection of our society of learners.

# Introduction

Friends in Village Development Bangladesh (FIVDB), a development NGO, in 2008 started a large popular education program (FIVDB 2008). Locally, the program is known as "Jonoshilon", a contraction of the Bangla prefix *jono* (popular, public) and the substantive *onushilon* (practice, learning). In 2009-10, we conducted a baseline survey in target communities in the northeastern region of the country. In 98 villages, all households (over 19,000) and household members (over 110,000) were fully enumerated. The data are described and analyzed in Benini (2010a).

**Figure 1: Village-level drivers of the primary school completion rate**



Source: Benini (2010a). Calculated with STATA's *mrunning* procedure (Royston and Cox 2005). HH stands for household, MF for micro-finance.

In the initial analysis, we investigated, among other things, primary school completion patterns, using data on over 9,000 adolescents. For this age group (15 - 19 years), the observed *population-based* completion rate was 69 percent (See sidebar below). Model estimates suggested a strong positive influence of women's literacy in the village on the chances of *everyone's* children to be educated through Class V. This figure illustrates the hypothesis-forming process during the early phase of the data analysis. The procedure estimated non-linear associations between primary school completion and a variety of socio-economic domains. These village-level variables were subsequently re-used in more detailed models of individual school completion.

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## **[Sidebar:] Completion rate, attainment rate**

"Completion rate" does not figure among the education system indicators that UNESCO laid down in a technical document (UNESCO 2002). The rate that we use in this study is defined on the entire population of the 15 - 19 years' old - regardless of whether they ever entered school or not. As such it is population-based.

This usage differs from that of other education research in Bangladesh. Thus the Education Watch report of 2008 (Nath and Chowdhury 2008: 156) uses an institution-based rate:

*Completion rate: This was calculated through reconstructing a cohort of 1000 students and assuming the following:*

- i) promotion and repetition rates are constant throughout the period*
- ii) all students are considered to have same likelihood of promotion and repetition, whether they have never repeated or have repeated once or more*
- iii) the possible number of times a class is repeated is limited to 2 or 3*
- iv) there is no other entrants apart from the original 1000*

*Thus, completion rate is the percentage of students completing the whole cycle of primary education among the students enrolled in class I five years ago.*

More recently, for the population 11 years of age and above, Education Watch reported a 43-percent rate of primary school completion for Sylhet Division. It was 51 percent for the entire Bangladesh (Nath and al. 2011: 7, Table 1.7.). In our sample, however, the rate, following this definition, is much higher. In this age group, 42,262 individuals had at least some primary education. No fewer than 33,884 or 80.2 percent completed Class V. In several of the villages, FIVDB had been operating primary schools since approx. 2000, possibly accounting for some of the difference.

Our interest is in the effects of parental and community literacy on the primary school success of recent age cohorts. We thus consider the completion rate only for the 15 - 19 years' old. As mentioned earlier, their completion rate, regardless of whether they ever entered primary school or not, is 69.1 percent. If the denominator were restricted to those ever having entered primary school, the rate would go up to 85.6 percent.

In keeping with UNESCO definitions, it might be more correct to render our key rate as "*primary school Class V attainment rate*" for the population aged 15 - 19 years (op.cit., 31). However, neither UNESCO nor the literature appear to be using this term, apart from the defect that it is clumsy and could be misunderstood as the rate of those ever entering Class V.

We thus prefer the term "completion rate". The reader may keep in mind that our usage is population-based.

---

### **It takes a village**

The possibility that the village-wide female education level should encourage individuals to complete primary school was fascinating, particularly in the context of adult literacy that this NGO had for decades been working to expand in the region. It implied that once a critical mass of literate women was established in the community, it might overrule, to a point, the effects that individual and household-level factors caused for the education chances of children. One

might liken this situation to some communitarian persuasion that "*it takes a village to put a child through school*".

The hypothesis mimics, somewhat clumsily, the African proverb "It takes a village to raise a child", which inspired Hillary Clinton's book "It takes a village : and other lessons children teach us" (Clinton 1996), which was almost as madly ridiculed by her detractors as it was warmly appreciated by her supporters. While Clinton concludes with an appeal to build communities "worthy of our children", some sobriety may be cast on the polarized beliefs by testing for community effects on child outcomes that operate above individual and household factors, yet are of a similar domain.

In the economy, the effects of the child's household's income might be compared to that of the average household income in the village, assuming that children of poor households in a comparatively wealthy village would benefit from the patronage of better-off neighbors and kin. Similarly, at the intersection of business and civil society, the nutritional status, school enrollment, wage labor status, etc. of a child might be affected by his family's participation in an NGO micro-credit program as well as by the total penetration that such programs have achieved of the surrounding village community.

#### **Household and community effects of education**

In the education of children, parental education has been shown to have an influence on participation as well as achievement (Khandker 1996; Glick and Sahn 2000). Some of its effect is direct, such as through values and cognitive abilities that more educated parents bring to bear on their children's successful schooling. Other effects are indirect, particularly through the greater health effects that mother's education has on the family (Belfield 2008: 8-9; Lindelow 2008). Healthier children learn better in school. For Bangladesh, Basu et al. (2001) found positive effects of the literacy of any household member even on the earning capacity of other non-literate household members.

Both direct and indirect effects may not be limited to one's own children, but may impress on those of neighboring and related families. One would therefore expect significant externalities from parental education. If they exist, they should show up in the positive effect of the village-wide adult education levels on children's outcomes above and beyond the effect of parental levels in the children's own families. The "If" is deliberate; spillover effects from mothers' education into the community have not been consistently found. For example, Chowdhuri (2005), using data from the well-researched Matlab project in Bangladesh, found that health effects on non-targeted individuals were limited within the household.

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#### **[Sidebar:] Education spillover within the extended family**

If the education level of mothers has no noticeable effect on the *health* of children outside the household (see Chowdhury, above), this may be different for *education-to-education* spillovers.

Asadullah (2009), an economist specializing in education in Bangladesh, investigated this question in detail. His study uses a large, if somewhat dated dataset (from 1996, also from the Matlab district), with links from index households to all other households in the same *bari* (extended family homestead). The observations are thus limited to exchanges within extended families; they do not cover other households in the neighborhood, let alone in the wider village community. Yet Asadullah's study is special in the sense that it explicates mechanisms of spillover and then estimates the strength of their respective effects.

Positive effects on the focus child's school completion arrive from three sets of persons in the *bari*: peers, older students, and educated adults:

- Peers are helpful essentially through *lessons swapping* - in other words, they help to do the same things, but better.
- Older students contribute knowledge from the perspective of the child who already knows more; in the author's words, they expand the "*school success-specific*" knowledge among the younger *bari*-mates.
- The contributions of educated adults are not narrowly defined; they can provide immediate *supervision*, but they also help indirectly by expanding the knowledge of the focus child's own parents.

Asadullah found peer effects to be positive and significant. Surprisingly, a role model effect from older children having attained higher school grades was absent. Among adults in the *bari*, the education of males had a strong positive effect. Educated women in the *bari* had a positive effect only if the child's own parents were uneducated.

Effects from outside the extended family cannot be assumed on the basis of these findings. Asadullah included so-called village fixed effects in his models, but there is no indication that he specified a community-level literacy rate. The strength of the study is in illuminating spillover effects in education that are plausibly tied to classes of relevant others - peers, older students, adults other than the focus child's own parents.

Of potential significance for FIVDB is the finding that the presence of other educated women in the *bari* improved the focus child's school completion chances *only if* his own parents were uneducated. With the spread of primary education, this condition in the upcoming generation of parents will be rarer and rarer. Between this trend and that mechanism, the marginal effects of adult literacy investments on the education of other children may vanish. One often hears testimony that literacy training convinced women of the value of girls' education. De facto, the rise of educated parents may obviate this support. Since this finding rests on data from 1996, a re-evaluation in the light of newer evidence may be helpful for adult literacy policy.

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### **A serious data gap: Parents' education**

It is in this rationale that the initial survey analysis included the female adult literacy rate in models of primary school completion. This variable had initially been created, alongside other socio-economic indicators, for a typological analysis of villages; the counterpart male rate was not calculated at the time.

We found that the collective effect of women's education - measured as the literacy rate among women 20 - 39 years' old (the current mothers' generation) - persisted when the models controlled for the gender of the adolescents as well as for several household and village-level variables. There was a serious shortcoming, however. The models did not include the education

of the adolescents' own parents. Failing to account for parental education, one could not be certain that the collective effect of women's literacy was robust.

While the importance of parents' education is easy to appreciate, its omission in our models takes some explaining. The adolescents were members of the households surveyed in the 98 villages; their data were held in a table of 110,000 household member records. Typically, household demographic tables are centered on the household heads; other members are recorded by their kinship or service relationship to him or her. This is the case here, too.

In this scheme, the adolescents are counted as sons and daughters (76 percent in this sample), siblings (10 percent), daughters-in-law (4 percent), wives (4 percent) and other relations of the household head, or themselves are household heads (2 percent). Their mothers are not identified as such. For a large majority of households, one must assume that they are identical to the wives of the household heads.

#### **A proxy measure for parental education**

As a result, parental education was not directly measured, as it would typically be in surveys focused on children, adolescents or students. It can only be imputed by a proxy measure. The imputation is through the education of the *assumed* parents in the member records of the same households. In large data tables, manual inspection is not feasible; imputation needs rules for automatic calculation. Thus, in our case, the male household head is the assumed father of all children and adolescents listed in his household (even if they were listed as, say, grandchildren). His wife or the female head is the assumed mother. Efficient imputation will thus assign male household head education to a new variable "father's education". Similarly, it will assign the education of the first occurrence of "wife" or of the female household head to "mother's education".

While we do not believe that this proxy measure is responsible for measurement error and validity issues invalidating this research, we need to clearly state that we do not have a direct measure of parental education.

## **The organization of this study**

The focus throughout is on the effects that parental and community literacy have on individual children's school completion chances. However, we use different approaches to unlock these associations.

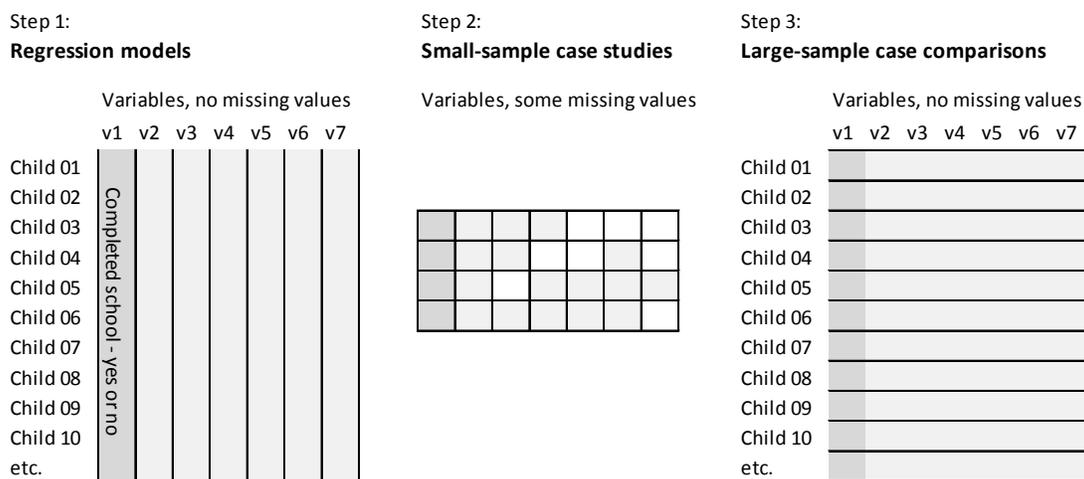
A first line of enquiry relies on multi-level regression models that have grown increasingly popular in education research. The statistical procedure can take into account village and district effects. We estimate these also in an (admittedly unsatisfactory) attempt to control for school quality, for which we have no direct measure. We also control for a number of other socio-economic variables some of which plausibly affect school success, and for which the baseline survey did supply data. Further-reaching issues of model validity - particularly requirements to establish strict causality between literacy and school success - are beyond the reach of this

paper. The survey variables do not offer plausible instruments to rule out confounders. The pivotal element in this part of the study is a set of so-called adjusted predictions of school completion probabilities. These essentially are simulated values of completion rates, given certain values of parental and community literacy, and holding all other covariates constant.

The simulations suggest substitutability between parental and community literacy. They fail to describe how this might work in real life. It is clear that parents, whatever their education, cannot be replaced by arbitrary others. In order to better understand the interplay between household and ambient community, 34 current and former students were visited. Case studies of their local worlds of schooling point to a number of literate persons and practices that give flesh and blood to the statistical ghost of community literacy. From among the 34, one - Hasna Begum in Dumria village, Sunamganj - speaks to us in a personal appearance from the tip of one hundred years of local education history.

Firm conclusions from the case studies are not feasible. They encourage us, however, to look for pathways to school success that do not presume the additive effects of the first round of statistical models. We return to the full set of 9,000+ adolescents for an entirely different statistical approach. Qualitative comparative analysis is a method to identify sets of cases that consistently show a high level of the outcome variable. This approach is not probabilistic; in simplified version its results can be reproduced by NGO monitoring units using simple descriptive statistics. In this case, it identifies six pathways to primary school completion.

**Figure 2: Schematic diagram of the three analysis approaches**



We conclude with reflections on how valid our initial claim is that it takes a village to put a child through school. We draw a parallel from the interplay of "parental literacy and community literacy" to the rapport between "formal research" (such as in a monitoring unit) and "deliberative encounters" between NGO and communities.

## Multi-level regression models

### *Variables*

We estimated a number of primary school completion models with individual, household and village variables as well as with context effects (so-called random intercepts) of their districts, and of the villages nested in the districts. The cases were all the adolescents between 15 and 19 years of age enumerated in the baseline survey. Out of the 10,827 recorded adolescents, for 10,632 the primary school completion status is known. Among these, 69 percent had completed Class V.

Due to missing values, particularly for the imputed mother's literacy, estimated models have between 9,072 (literacy status of both parents included) and 10,467 cases (neither parental literacy variable). Descriptive statistics as well as the complete output for one model are given in the appendix. Here, in keeping with the key question of parents' education's benefits beyond their own households, we present a comparison of models with and without parental literacy status.

Besides father's and mother's literacy, key variables for our argument are the community-level literacy variables. We essentially rely on the literacy rate among women 20-39 years' old, the mothers' generation (see sidebar below). At the village level, male and female literacy rates for this age group are highly correlated; we therefore exclude the male literacy rate from the models. The range of this female literacy rate across the 98 villages is extremely wide - from a low 16 percent to a high 79 percent (mean: 46 percent). In one of the models, the literacy rate of the generation before - women 40-59 years' old - is included as a historical control.

Other domains are considered to the extent that the baseline survey collected reasonably complete and reliable data in the variables speaking to them. The survey had been designed without a distinctive theoretical model at the outset. Several, however, have good face-value plausibility among the factors that affect school success. For example, the (inverse of the) ratio of 0 - 6 to 7 - 13 years' old in the village is a measure of demographic modernization, which, given earnings differentials between unskilled farm and other work in Bangladesh, should go hand in hand with incentives to put children through school. For other variables, e.g. the size of the community, a particular influence on school completion is not apriori assumed. Since our major concern is with the effects of literacy, we can thus treat all other variables as control variables. We will discuss possible reasons for their estimated effects in the following section.

---

## **[Sidebar:] Measuring community literacy**

The baseline survey recorded the literacy of individual household members on an ordinal scale, from "*Illiterate*" through "*Can sign*", "*Can read*" to "*Literate*". The members were rated by the respondents, chiefly the household heads, except for under-school age children, whose literacy status was summarily coded as "n/a". The measure is thus largely self-assessed via the chief respondents. In the data entry, the "n/a" category was conflated with "don't know".

This latter group comprised 19.6 percent of the 110,889 enumerated individuals. 18.2 percent were rated as illiterate, 18.8 percent as able to sign only, 4.5 percent as able to read, but not write, and 38.9 percent as fully literate. We created a dichotomous literacy variable, with "1" for "literate", and "0" for all other survey categories including "n/a or unknown". This latter inclusion is virtually without consequence since we work only with literacy values of groups above primary school age.

In our models, literacy is used on the explanatory side (the dependent variable is primary school completion). We include mother's and father's *imputed* literacy as well as the village-wise literacy rates of women 20 - 39 years of age and (in only one model) also those of 40 - 59 years. We have explained the reason for imputation above (page 15), and its technique in Benini (2010b).

We construct the village literacy rates as the proportion of literate members in the members of particular age-gender groups in the given village enumerated during (= who have survived to) the baseline survey. This appears unproblematic for the generation of the 20 - 39 years' old, but is questionable for the preceding ones. Literacy and life expectancy are likely correlated. Also the denominators become progressively smaller. On the other hand, self-rated literacy at baseline as a measure appears preferable to years of schooling; the latter obscures relapse.

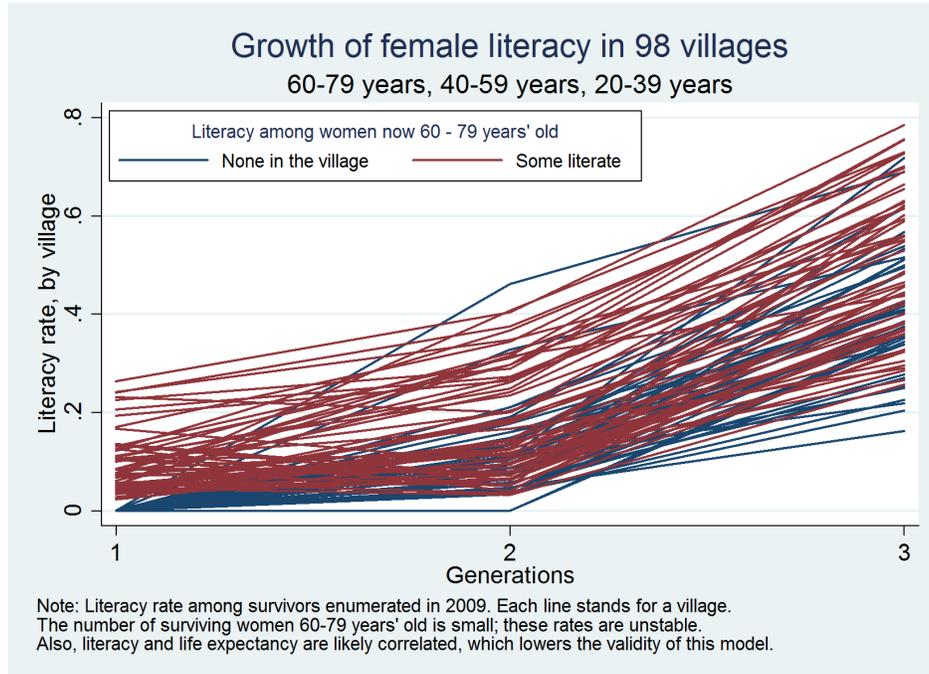
For village literacy rates, we chiefly rely on that in women 20 - 39 years of age. This is the present-day mothers' generation, the women most likely to help students in their families and neighborhoods, and not (or only in small part) the mothers of the sample adolescents. The younger ones among them formed the pool of elder siblings, friends, neighbors and schoolmates available for support while the sample members were in primary school.

We do not use the male literacy rate in the regression or QCA models. For the 20 - 39 years' old, the (Pearson) correlation is 0.87 between the male and female literacy rates (n=98). This creates technical problems if we include both.

However, given the slow build-up of female literacy, it would have been attractive to make more of the literacy in the previous generations. The rank-order correlation between the village literacy rates for women aged 20 - 39 and 40 - 59 years is 0.70. At a minimum, further investigations could experiment with regressing the 20 - 39 year rate on the 40 - 59 year one, in order to use the latter plus the residuals of the former for a deeper understanding of the historical momentum of literacy.

The literacy rate is 6.6 percent among 2,695 women enumerated in the age bracket 60 - 79 years, 15.9 percent for the 7,080 in the 40 - 59 year bracket, and 46.5 percent among the 15,545 between 20 and 39 years of age. The reservations that apply to rates among survivors only have been mentioned; obviously they apply fully to the chart depicting the growth across three generations for each of the 98 villages.

**Figure 3: The evolution of female literacy, by 98 villages**



Among the survivors of the first generation in this set, not a single one was literate in 40 of the 98 sample villages. We have marked the corresponding lines with a different color. Some may be false negatives - fifty years ago, some of the 40 villages may already have started female schooling, but none of those early students survived to our survey. The early momentum is still being felt, at a medium strength. The rank order correlation between generations 1 and 2 is 0.40; between generations 1 and 3 it is 0.42. Many blue lines have crossed into "red territory".

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## ***Estimates***

Five models, distinguished by the inclusion of parental literacy, the literacy rate of the grandmothers' generation, and interaction terms between parental literacy and NGO / microfinance membership were estimated. They were specified as logistic regressions (primary school complete or not) with nested random intercepts for villages and districts.

**Table 2: Comparison of primary school completion models**

Dependent variable:		Model no.:				
		I.	II.	III.	IV.	V.
<b>Adolescent completed primary school education</b>		All models use the literacy rate of women 20 - 39 years' old in the village. These additional literacy variables distinguish the models:				
Independent variables:			Mother	Both parents	Mother + women 40- 59 years' old in village	Both parents + Mother*NGO member + Father*NGO member
Fixed effects:	Individual level:					
	Adolescent is male	-0.697	-0.644	-0.644	-0.643	-0.645
	Household level:					
	Mother is literate		1.413	1.052	1.406	1.011
	Father is literate			0.951		0.863
	Mother is literate * HH is NGO or MF member					0.154
	Father is literate * HH is NGO or MF member					0.282
	Annual household income (log10) (Taka)	1.954	1.763	1.575	1.768	1.582
	HH is member of NGO or MF organiz.	-0.137	-0.107	-0.068	-0.107	-0.144
Legend:	Significance levels are marked by shading:	p<0.05		p<0.01		p<0.001

[cont. next page]

[cont. from previous page:]		Model no.:				
		I.	II.	III.	IV.	V.
<b>Independent variables:</b>			Mother	Both parents	Mother + women 40- 59 years' old in village	Both parents + Mother*NGO member + Father*NGO member
<b>Village level:</b>						
	Literacy rate among women 20-39 years' old	4.479	4.171	3.838	3.563	3.876
	Literacy rate among women 40-59 years' old				1.088	
	Village population (log10)	-0.323	-0.360	-0.341	-0.413	-0.343
	Mean annual HH income (log10) (Taka)	-0.939	-0.875	-0.805	-0.726	-0.809
	Fraction HH which are NGO or MF members	2.930	2.726	2.578	2.641	2.593
	Fraction HH NGO or MF members (squared)	-4.385	-3.978	-3.805	-3.775	-3.826
	Wage earners per 100 HH	0.006	0.009	0.010	0.009	0.009
	Ratio of 0 - 6 years' to 7 to 13 years' old	-0.601	-0.646	-0.860	-0.606	-0.856
	Constant	-4.665	-4.035	-3.344	-4.532	-3.353
<b>Random intercepts:</b>	<b>District</b>					
	(Standard deviation of random effect)	0.003	0.003	0.003	0.004	0.003
	<b>Village</b>					
	(Standard deviation of random effect)	0.294	0.292	0.293	0.285	0.292
<b>Statistics:</b>	N	10,467	9,388	9,072	9,388	9,072
	ll	-5606.809	-4822.291	-4520.026	-4820.982	-4517.072
	chi2	892.572	1004.765	1089.364	1010.650	1098.273
	AIC	11239.617	9672.583	9070.052	9671.964	9068.144
<b>Legend:</b>	Significance levels are marked by shading:	p<0.05		p<0.01		p<0.001

### **Individual and household controls**

At the individual level, data was available only on gender. In all models, girls did better, consistently with other studies on gender and primary schooling in Bangladesh in recent years<sup>1</sup>. At the household level, the effects of annual household income and of participation in some NGO or microfinance program were estimated. As one might expect, the income effect on children's primary school completion is positive and statistically highly significant. Participation of the household in NGO/microfinance programs has a negative effect on school completion when parental literacy is not considered. Once these latter variables are included, the effect reduces to less than half. This suggests that there are interactive effects of microfinance and borrower's education on child outcomes. This is in fact so. When we interact microfinance participation with parental literacy, the negative effect of participation returns, but the positive effect of the father's literacy more than offsets it. This suggests that among microfinance participants a tendency to withdraw children from primary school is counteracted by more educated fathers.

### **The strange case of micro-finance**

Several village-level variables were included, out of a general interest in the effects of community context. In larger villages, chances to complete primary school seem lower, but this population size effect is not, or only weakly, significant across models. Two economic indicators - mean household income and the proportion of household with wage employment - show no significant effect. NGO/microfinance participation rates in the village display a puzzling non-linear effect on primary school completion: initially, higher participation rates produce better completion chances, but further up the effect decreases, and at the maximum rate (63 percent of the households in the village) it is nearly zero. But this effect is at best weakly significant; the inclusion of the parental literacy reduces it further, again suggesting that microcredit and parents' education interact in significant and, for us, opaque ways on children's outcomes<sup>2</sup>. Nevertheless, this non-linear relationship is worth watching in future surveys; it may well be that higher microcredit participation stands for a commercial environment in which the returns to child labor are higher, and those to primary education relatively lower, particularly for poorer households (Shafiq 2007).

### **Fewer infants, better students?**

Demographic modernization improves primary school completion chances. We measured this indicator by the inverse of the ratio of 0 - 6 to 7 - 13 years' old in the village. The effect is statistically significant when the parental literacy variables are included. But it also illustrates a

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<sup>1</sup> See CAMPE's Education Watch 2008 report (Nath and Chowdhury 2008: 85) and various findings in the World Bank's (2008) "Poverty Assessment for Bangladesh", e.g., p. 82, Table 8-2.

<sup>2</sup> The participation rate varies widely among the 98 sample villages, from a low 2 percent of households to the high 63 percent. The [population-weighted] mean is 30.0 percent. The conjoint "NGO/microfinance" is somewhat misleading. It takes account of the fact that villagers tend to lump the Grameen Bank together with microfinance NGOs. Also, self-assessed NGO membership mostly, but not always, means that the household is a borrower and/or saver with any of those organizations.

difficulty of working with broad-brush concepts for which only one indicator is available from the baseline survey. It is plausible that, in communities in which households "on average" expend fewer resources on infants and thus can invest more in their children of primary school age, school completion outcomes "on average" will be better. Yet, such a context effect is hardly meaningful unless the model includes also household-level composition variables (Meng and Ryan 2010). These are absent in our models, both theoretically and data-wise.

#### **What about the grandparents' generation?**

We estimated a model (Model no. IV.) that includes, as a separate and additional variable, the literacy rate among women aged 40 through 59. This was done in an attempt to explore the historical depth of literacy in the village and its possible effects on present-day school completion. The effect is positive, but small and statistically insignificant. At best, this has minor exploratory value; the same unmeasured factors that, from the history of the village, may affect the mothers' generation would likely affect this one as well (e.g., if a village is close to the city, it was close already at the time when the grandparents went to school). Thus, even if the effect were strong, it would be difficult to interpret as either generational or historic effect.

## **The effects of literacy on school completion**

### ***School completion rates - observed and predicted***

Among the 9,072 adolescents with complete data, the majority (56 percent) had parents who both had assessed themselves as illiterate. In 7 percent of the cases, only the mother was literate, and in 19 percent only the father. Adolescents living with two literate parents were less than a fifth (18 percent). The adolescents lived in villages with widely different adult literacy rates, as described above for their mothers' generation.

The effects of both parental and community literacy on school completion are strong and strongly statistically significant. This holds for all models that include these variables. A puzzling nuance arises - and was discussed above - from the interaction between parental (particularly fathers') literacy with the household's membership in NGOs or microcredit providers.

These effects are those of the *observed* literacy. For our purposes, this is not a satisfactory approach because literacy is correlated with other socio-economic factors, notably income. To illustrate, the mean annual household income for adolescents with two illiterate parents was Tk. 90,198, while for those with two literate parents it almost doubled, to Tk. 166,880. In order to find valid comparisons, we *adjust* school completion probabilities for those other variables. Technically, these predictions are obtained by setting the explanatory variables to their respective means.

#### **Filtering out influences not due to literacy**

The following table gives the observed completion rate plus various raw and adjusted predictions. The unadjusted predicted rates are based on probabilities calculated from the

observed values in all explanatory variables, including the context effects of the village and district. The adjusted estimates use the same coefficients, but with all variables set to their means (and the district and village effects to zero), except for parental literacy. As a result, the expectation to complete primary school is now somewhat higher for children of illiterate parents (63.3 percent instead of 58.6 percent) - chiefly because this group in reality includes many of the poorest households, which are, for the adjusted predictions, treated as having the same average incomes as the other groups. Conversely, for adolescents with two literate parents, many of them in richer-than-average households, the predicted rate drops.

**Table 3: Primary school completion rates of adolescents as a function of parental literacy**

Parental literacy	Observed	Unadjusted	Predicted	
			Adjusted for other variables, village and district effects	Adjusted, except for literacy rate of women in the village
Neither	57.3%	58.6%	63.3%	60.8%
Only mother	80.7%	83.9%	83.2%	83.7%
Only father	80.8%	83.8%	81.7%	82.5%
Both parents	93.6%	95.4%	92.7%	94.3%
Total	70.0%	76.4%	76.2%	76.2%

The predicted rates in the rightmost column are the most interesting for our purposes. They are calculated as the previous adjusted predictions, except that they use the *observed* literacy rate of the mothers' generation (women 20 - 39 years' old) in each of the 98 villages. This adjustment lets us see how school completion varies with parental as well as community-level literacy, while all other observed factors are held constant. Not surprisingly, the rates at the extremes move out a bit further from the fully adjusted predictions, but not as far as in the unadjusted ones.

At the household level, we take literacy into account for fathers and mothers separately. For village level-rates, the model estimates use the female literacy rate only. Aggregated to the village, male and female literacy are highly correlated<sup>3</sup>; including both variables would cause estimation problems. At the household, father's and mother's literacy combinations are more variable<sup>4</sup>, and thus both need to be considered in model estimates.

#### **Children with two illiterate parents drop out disproportionately**

Overall, our model overestimates the school completion rate. Instead of the observed 70 percent completers, it predicts an overall rate of 76 percent. The discrepancy is largest for adolescents with two illiterate parents, but the reasons for this are not clear. Statistically, the

<sup>3</sup> Spearman's rho = 0.87; N = 98.

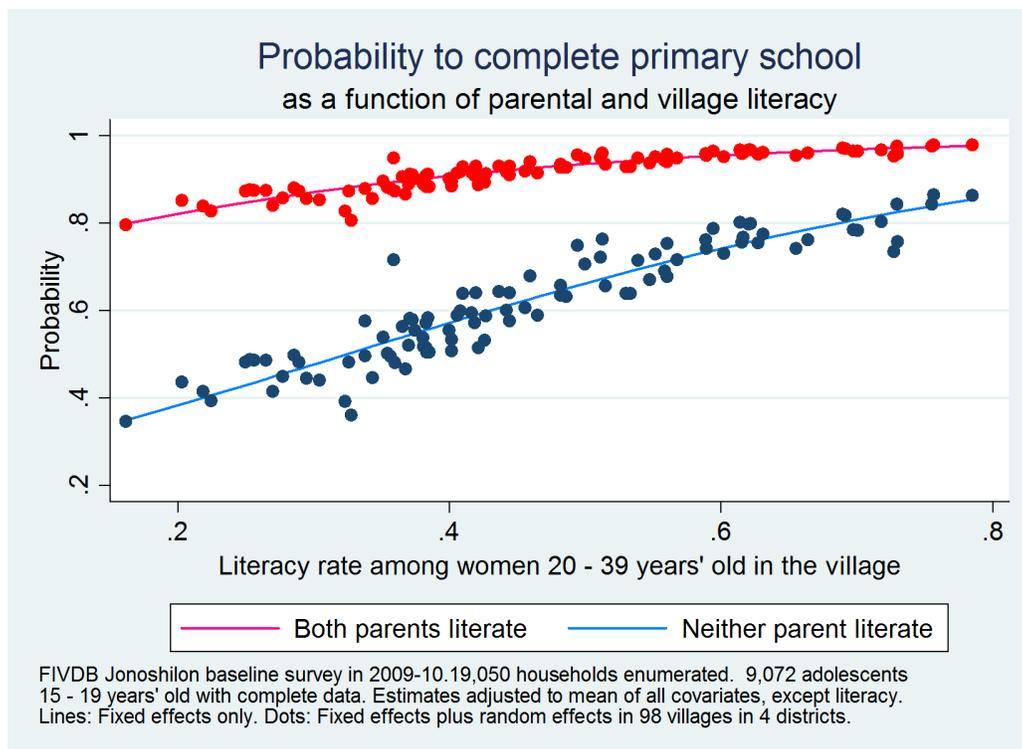
<sup>4</sup> Cramér's V = 0.43; N = 9,072, the number of adolescents, the effective sample.

consequence is an elevated number of false positives, meaning cases for which the predicted completion probability is higher than 50 percent, but which in actual fact did not finish Class V. The model predicts the outcome correctly only for three quarters (75.4 percent) of the cases.

### **Community literacy and individual school completion**

With the help of the adjusted probabilities, we are finally in a position to compare scenarios with differing parental literacy and for villages of varying literacy rates. Figure 2 displays probabilities of completing primary school over the entire range, across 98 villages, of the literacy rates among women aged 20 - 39 years. For maximum contrast, we visualize completion chances for adolescents with two literate parents vs. those with none. The adjustment means that the effects of all other factors such as the gender of the child, household income, microfinance participation in the village, etc. are filtered out.

**Figure 4: Adjusted probabilities to complete primary school**



Looking at the blue and red lines, the gap is particularly wide for children living in villages with a low female literacy rate. Households with two literate parents in low-literacy communities have a roughly 40 percent better chance to see their children complete primary school than those with illiterate parents. This difference narrows down to about 15 percent at the high end of the village literacy rate, but this is simply so because it gets harder and harder to raise probabilities as they approach 100 percent. More importantly, one notices that completion chances are very similar for *children of illiterate parents in high-literacy villages* and for *those of two literate parents in low-literacy villages*. For both, the adjusted probabilities are around 80 percent.

### **Can literate parents and literate communities replace each other?**

This raises the practical question whether in the real world parental and community literacy can be substituted for each other as far as their effects on children's education are concerned. And how will this substitution happen practically? What will make this child of illiterate parents, yet surrounded by many literate adults in the village, continue to the end of Class V? Will a recent improvement in the adult literacy rate, as a result of FIVDB's literacy training, have beneficial effects on children outside the trainee households, or does the literate environment produce its effect only in the long run? The vision that "It takes a village to put a child through school" - or more radically "to raise a child" - implies substitutability between family and community effects.

How such substitutions might work - for example, do literate neighbors exert greater social pressure to keep one's child in school? - our models and data cannot tell. The mechanisms would have to be identified by deeper studies of households, communities and schools. Plausible candidates are social pressure, in more literate communities, on parents to complete their children's education and greater participation in school management.

### **Surprisingly small context effects - why?**

In the graph, there are clouds of dots clustering around the lines of adjusted probabilities. Each dot marks a village; the distance between the line and the dot expresses the local context effect on school completion. It is obvious that the clouds of red and blue dots do not intersect. In other words, compared to the effect of parental literacy (which is what keeps the blue and red lines apart) these local context effects seem small. In the model estimates, village and district context effects account for less than 5 percent of the total predictor variance.

This raises a number of difficult questions. Are the context effects a statistical artifact? For technical reasons, the model chosen forces them to follow a normal distribution. This means that most district and village contexts are assumed to have a relatively indifferent effect on school completion while a few discourage it significantly, and some encourage it. Such a model may not be adequate, particularly not in a situation in which an NGO is recruiting village communities into a new program. Communities willing to cooperate may be from distinct backgrounds, some readily accessible and known from previous cooperation, others from neglected areas added primarily because other agencies have not yet preempted program extension there. If so, the context effects on various outcomes, including primary school completion, would be likely to follow a distribution with several peaks<sup>5</sup>.

The other possibility is equally suspicious. It basically says that those village indicators which we did measure already tell the whole story, and there is little left in the local context to raise or depress the chances of completing primary school. In other words, the observed variables such as village population size, average household income, adult literacy rate, etc. are chiefly

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<sup>5</sup> An attempt to test for this possibility (using a so-called fixed-effects model for the villages) failed because of estimation problems: four of the seven village-level indicators - including the female literacy rate - were dropped because of collinearity.

responsible for the local context, and there is little of importance that we have not yet observed and included in the model. Thus the residual village and district effects should be minor.

### **Missing in our models: School quality**

That *may* be the case, but it is not convincing for any one believing in the importance of local context. Primary school completion is likely to depend heavily also on the *quality of schools* (Boissiere 2004), an area in which FIVDB has built much of its expertise and reputation. The baseline survey did not visit schools and therefore cannot differentiate school quality as a village-level property. As a significant, yet unobserved factor, the quality of a school should express itself, in our statistical model, through larger village (or even district) effects than the very modest ones estimated. Even if school quality were known and expressed quantitatively, attempts to reflect it validly in statistical models would be daunting. Many villages have more than one primary school; schools in the same village may be operated by different providers (government, NGOs). School choice itself may be determined by household and student variables, some of them unknown. Some children attend school in neighboring villages.

### **Reality check**

Before proceeding to the case study section, a reality check is in order. Parental literacy is correlated with other household attributes that predict children's education outcomes. Similarly village literacy rates go hand in hand with mean village incomes and with the proportion of households with wage employment. Therefore the observed primary school completion rates in high- and low-literacy villages will be farther apart than the graph of adjusted probabilities suggests. In real life, children in low-literacy communities struggle with greater adversity, and those in high-literacy ones tend to enjoy advantages beyond the literate environment. The following table crosses children of literate / illiterate parents with villages in the highest and lowest quartile female literacy rates and compares these four groups for observed vs. predicted (with adjustment for non-literacy variables) rates.

**Table 4: Adolescents' primary school completion rates, by parents' and village literacy**

		Lowest and highest village quartiles, by adult female literacy rate	
Parents literate		24 lowest villages	24 highest villages
		Observed	43.9%
Predicted	None	47.5%	78.1%
N		1,651	1,014
Both	Observed	88.9%	96.1%
	Predicted	87.1%	96.6%
	N	271	719

Note: Predictions are the means of predicted completion probabilities, adjusted for all covariates (other than literacy), and without the village and district random effects.

The predictions for the group rates come close to the observed values, except for the 1,661 adolescents of illiterate parents living in the 24 villages with the lowest adult literacy rates. For this group, they are too high. The reasons for the over-estimation are not fully understood, but one of the plausible ones is that its households have incomes on average about 20 percent lower than the sample mean, to which the predictions were adjusted. In villages where children grow up in illiterate households as well as among mostly illiterate neighbors, the odds against their school success may be greater than the linear additions of effects in our model predict. There is, in a manner of speaking, not enough literacy in home and village to put children through school.

These apparent deviations from an additive pattern of effects reinforce the need to explore a different approach to this data. We will begin it through case studies of 34 students.

## **Mechanisms: Personal support and community norms**

### ***Insights from case studies***

With the expansion of primary education in Bangladesh, familial and community institutions have followed suit in their normative and behavioral response. Some of this can be observed in the Jonoshilon communities. We went back to some of them for case studies. These, we hoped, would contribute insights connecting anecdotal evidence and statistical representativeness. In fact, as often with qualitative approaches, they pose more fresh questions than they answer old ones. This is the impression with which one comes away from dissecting reports on 34 students that FIVDB monitors met in an effort to shed light onto the ways community and parental literacy cooperate.

### **Moving outward from the nuclear family**

To start with the obvious: It is no surprise that families who send their children to school should support them in their academic endeavors and demonstrate this support also to outsiders. The majority of the interviewed families volunteered in some detail how parents and elder siblings helped students with homework, relieved them from chores and saw to it that the children ate well.

As we move outward from the nuclear family to the *bari* embracing other relatives, then to the neighborhood and the wider village community, the spheres of targeted support and of normative expectations separate. More than half of the case reports refer to perceptions of community norms, benefits of education, or simply the growing numbers of children going to school. Yet, they leave it open how much public expectations influenced the primary school completion of the child in point.

### **Specific support nearby ..**

Examples of specific supportive behavior are more telling even if they are not to be considered exhaustive of all the help that the students received. In 14 of the 34 cases, specific actors outside the nuclear family were described as helpful in the schooling of the child. Extended family members, notably aunts, grandparents and cousins, ranked first. Among neighbors, retired teachers, boarding college students, parents arranging study groups in their homes, members of school management committees, even a newly arrived educated woman opening a private coaching center, encouraged and supported. Sometimes they, on behalf of the parents, would speak with the teachers. Small-scale private philanthropy was not unheard of. Better-off individuals occasionally made in-kind gifts such as of notebooks and school uniforms or gave money for education-related expenses. A local advocate was said to give out small scholarships.

The normative climate is less centered on the immediate neighborhood. Only one case mentioned neighbors reporting on truant students. Teachers might justify the expulsion of particular difficult students with a history of poor attendance and disruptive behavior, but there was no evidence of early feedback to parents. Teachers were not portrayed as going out of their way beyond the normal call of duty although some of the interviewed students expressed affection for them. Although this did not come up in the interviews, the new Class V public examinations, started in 2009, are putting pressure on school administrations to show high pass rates, possibly militating against weaker students and repeaters. Institutionally, schools have responded by arranging extra tuition, sometimes across the board.

### **.. and a positive normative climate in the background**

The cultural climate favors the completion of primary school education and beyond. Some of the 34 case write-ups echo the additional encouragement from FIVDB literacy classes and other NGO programs. Relatives abroad enquire about children's school progress. Women fieldworkers in NGOs are walking success stories used to justify girls' education. Elite persons, including

members of parliament, are remembered for their pro-education statements, particularly when they are endorsed with awards for students or grants for school projects.

### **An optimistic bias**

All those references, when taken together, may express an ongoing powerful dynamic. But they do not explain why almost one third of the adolescents in our baseline villages had not completed Class V. Why, if those mechanisms mattered, were they not effective in preventing or reversing failure? There may be growing positive incentives to invest in education, but, for now, the social sanctions against school failure are far from being universal.

Closer to our hypothesis, the 34 case studies include 14 with the relevant combination "illiterate parents - [relatively, in this sample] high community literacy." Eight out of the 14 had received specific help for their schooling from outside their nuclear family. For none of the five students from illiterate parents in low-literacy villages was such specific help reported.

That, at best, is an indication that community literacy is part of a supportive environment. The sample is far too small, and the definitions of "receiving help" too fuzzy, in order to arrive at more solid conclusions. For such, we shall presently return to all our 9,000+ cases. Before that, we want to meet one of our case study students and her community on closer terms.

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## ***[Case study:] Strong tradition, ambivalent individuals***

### **One hundred years of formal education: Dumria village**

Dumria, a 130-household village in Sunamganj District, offers an ideal setting if one wishes to discern the challenges of a young student through the lens of her family situation embedded in the local community<sup>6</sup>.

#### **Dense institutions**

The village, as a result of a hundred years of schooling and of continuously growing appreciation for education, boasts an impressive diversity of establishments. The government operates a primary school as well as a highschool. Various civil-society and religious groups are in charge of a registered primary school, a madrasa (providing also highschool education), as well as four or five koranic schools ("maktab"). FIVDB runs one of its primary schools in an underserved corner of the village. Besides, it provides compensatory education, under the "Shikkhon" program, to late primary education entrants.

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<sup>6</sup> "Dumria" is the English transliteration, as used by the Bangladesh Bureau of Statistics, of ডুংরিয়া  
"Dungria" would be more faithful to the original Bangla spelling.



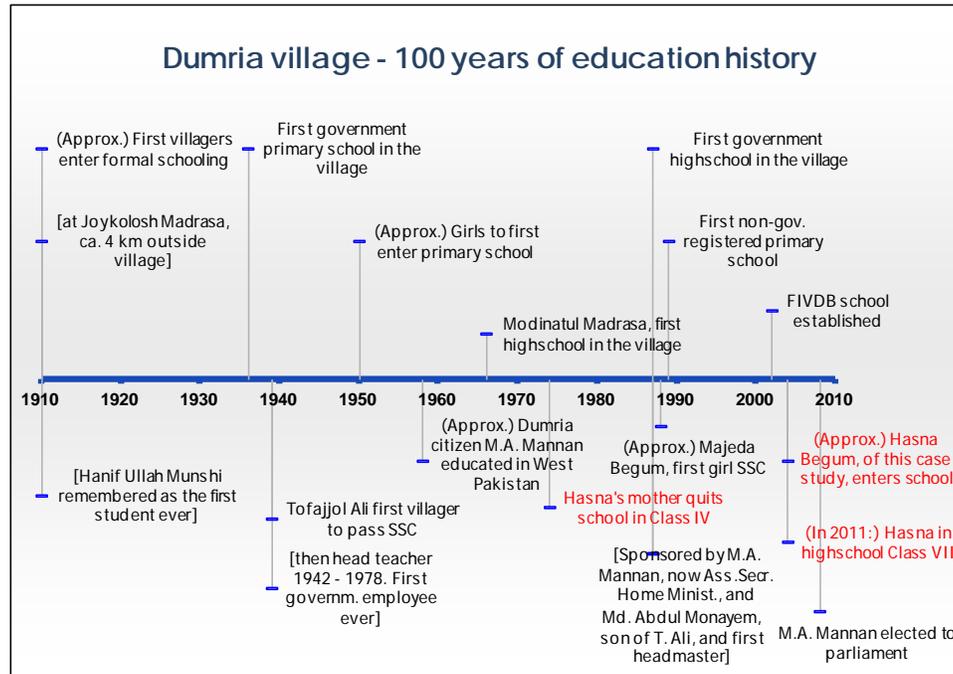
**Dumria Government Highschool may not be architecturally outstanding from the lot of similarly built establishments elsewhere. But it is noteworthy for the fact that its headmaster was the son of a long-serving headmaster of the first government primary school in the village. Dynasties of leading teachers are not unheard off; some are revered for generations, by alumni who feel their lives were forever changed. The initiative to set up this school came from this and other elite persons, but majorly also from A.M. Mannan, then Assistant Secretary, Home Ministry, and currently Member of Parliament for a Sunamganj constituency embracing Dumria.**

The high density is not entirely surprising; with 50 percent households rated rich or middle-class, Dumria is one of the best-off villages in this otherwise poor district. The results speak for themselves: with 66 percent literate women in the 20 - 39 year age bracket, Dumria is far ahead of all the other sample villages in Sunamganj. The rate for the survivors of the generation before, women now 40 to 59 years' old, is 26 percent. This is far lower, but still in the fourth rank among 32 villages. It is proof of an early, if slow momentum on which the recent expansion of literacy could build. It took fifty years, from 1938 to 1988, from the first male Senior Secondary (SSC) graduate to the first female.

### **Milestones of history**

The milestones of local education history, as collected from head teachers, the FIVDB school committee chairman, and some elders, have been laid out in this chart, together with schooling dates for Ms Hasna Begum, the focus person of this case. Hasna is a 13-year old student of Class VII, Dumria Government High School. As often in historical narratives, key events are anchored to pioneering individuals remembered by their names.

Figure 5: Education in Dumria - Historical timeline



## A member of this student generation: Hasna Begum

Hasna is the daughter of Mr. Suruj Miah, a 70-year old farmer, and of Mrs. Angura Begum, a 45-year old housewife. Members of three generations live in this household of eight; an elder brother and his wife had their first child. Although both of Hasna's parents attended some years of primary school, they nowadays consider themselves illiterate, for lack of any reading and writing practice for years. Hasna's two brothers and elder sister dropped out of primary school. Hasna was the first in the family to complete primary school. She did so in the FIVDB school.

In the baseline survey, the family was ranked "poor", but not "ultra-poor". Nevertheless, they continuously struggle to afford the expenses that the schooling of Hasna and of her younger sister Jhuma, a Class-III primary student, entail.

### Learning strategies

Hasna's parents cannot help her with school work. That Hasna is in highschool at all is not least due to her friendship with, and long-lasting help from, two college students in the neighborhood, Farjana and Sharmin. Sharmin is the daughter of Hazi Tarif Miah, the current FIVDB School Management Committee chairman and a former chairman of the committee at the highschool where Hasna is studying.

While Sharmin's father is influential in the schools - there is no indication that he personally intervened in Hasna's favor -, Farjana has been key on the academic side. She sat with Hasna regularly while Hasna was in primary class 3 to 5, and is doing so less frequently nowadays. Her help was most valuable for the mathematics and science homework. She remembers Hasna asking her repeatedly: "How much need I learn?" That meant "How long in the evenings should I

go on trying to memorize questions and answers?" Farjana helped her set a routine. Hasna is now supervising the homework of her sister in the same spirit of finding a balance between the expected effort for school and the burdens of being poor, tired and often distracted by others.



**Hasna doing homework by a window of her family home. Often one would see her together with her younger sister Jhuma, whom she guides in Class-III studies.**

There were other vague signals in our interview with Hasna that suggested an absence of purpose in the way Hasna thought of her education. While she says that she wants to go to college like her friends, she is not sure why she is studying. Neither were we capable of listening to her inner aspirations for her life and the way she amplifies them with the school experience.

### **A critical father**

Her father is more outspoken about his ambivalent attitude towards education. He recognizes that the value of education has grown apace with service employment. All the families in the village are sending their children to school, or at least say so. Shorter distances between home and school have made this much easier than in his youthful days. His Exhibit A for the benefits of education, however, is the local Member of Parliament, a son of Dumria, whose education was the gateway to his current powerful position.

Suruj Miah admires his MP, who is known to hail from a humble farming family. With equally intense feelings, he is critical of the mass of educated people. He sees them as manipulative and dishonest, open to illegal activity, particularly bribe-taking and bribe-giving. They no longer show respect for elders. Education has debased the social value of farm work. He has been a farmer all his life, and he resents the diminished appreciation of his profession.

### **Educators disagree**

Surprisingly, perhaps, some of these perceptions are echoed in statements by the educated. The headmaster of one of the schools we visited felt that the poor regularly fell prey to

machinations of more powerful members of society who were literate. Many illiterate farmers had been swindled out of their land because they could not understand the transactions and could not read the documents. This sense of victimization, on top of a general striving for dignity, were motivating poor and illiterate parents to let their children have as much education as possible. And for all, poor and rich, education was the prerequisite to employment. As a result, even among the illiterate poor, a competitive spirit has taken hold to have the more highly educated children.

This rationale, imputed to poor, illiterate parents, was vehemently opposed by a headmistress, also of a primary school. She put her finger squarely on government stipends; these were by far the strongest motivator for poor parents to enroll their children. Few of these parents would ever show up at teacher-parent conferences. Their children were lagging behind because they came to school irregularly. Her colleagues tried to mitigate this sweeping judgment by pointing out their efforts to make school more attractive pedagogically, through story-telling learning, games and jokes.

## **Fluid boundaries**

We may take these sundry elements to illuminate two aspects of Hasna's and other poor students' plight. These points are interpretations; it is difficult to say where exactly they do justice to what people shared with us, and where we unduly exceed their evaluations:

- **Literacy is fluid:** The education careers of other family members, starting with the parents', are diverse; they make it impossible to rate a household simply as a literate or illiterate reference group for the child (such as Hasna) in point. This applies to the parents as well. The baseline data collectors recorded many of them as illiterate. Functionally, this may be correct. But Hasna's parents reveal a more complex situation. Their earlier exposure to school imbued them with some of the motivational elements that we tend to ascribe chiefly to literate parents. While still illiterate, Suruj Miah and Angura Begum sacrifice for their daughters' education. Benefitting from this family support, Hasna herself has reached out to literate members beyond, to help her navigate school. Community and family literacy form a moving ensemble, held together by bonds of friendship and force of example.
- **The social value of education is not unquestioned:** The ambivalence regarding the value of education can be felt at all levels. Hasna herself is like a tool in search of a job, someone not yet clear why she is making this heavy effort. This may be part adolescence, part status uncertainty in the hard-to-employ or early-to-be-married-off. Her father accepts the necessity to educate his children, in the knowledge that the educated are as much foe as friend of the poor. Most sadly, perhaps, there is no unity of doctrine among the educators. As in most organized social welfare of modern times, the education gatekeepers in Dumria cannot agree what makes the poor tick, and what makes them the proverbial "deserving poor". Education may be seen as a necessity, but investments in it and encounters with the educated remain problematic.



**Hasna visiting with Sharmin, one of two neighborhood friends who have helped her navigate school, particularly in the last years of primary. Sharmin's home environment - plastered walls, curtains - gives away the rich family. Friendships beyond one's own extended family and across the lines of social class are enablers for poor students to succeed in school.**

Dumria is not an average village in Sunamganj. The 78-percent primary school completion rate in our sample is well above the district mean of 60 percent. This one figure obscures the gap between social groups. - 91 percent in the rich and middle-class households, 52 percent or less, had we surveyed the migrated ones, among the poor and ultra-poor. Little can be generalized from one community, but its rich education history sets down markers for which one can usefully watch out in other villages and towns.

Hasna, herself poor, was - we are led to think - just barely hanging on. We now know she did complete, and continue beyond, primary school. Her literate friends made a difference.

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### ***Pathways to school success***

We thus go back to the full data set, with over 9,000 adolescents who did or did not complete primary education. At first, we apply a set-theoretical procedure (Ragin 2000; Longest and Vaisey 2008) in order to identify combinations of parental and community literacy that promote primary school *involvement*. If we find them, we will compare the *completion* rates for the groups so defined. We also consider the wealth rank that FIVDB fieldworkers gave the household at baseline time.

### From 34 case studies to 9,000 case comparisons

This method is different from the previously employed regression models. It does not predict outcomes on the basis of additive effects, but identifies combinations of high and low values among the variables that are associated with primary school involvement. We emphasize "involvement" in the first place, in order to use also the information on those adolescents who were in school for some time.

This table summarizes the combinations most consistently affiliated with primary school involvement.

**Table 5: Pathways to primary school completion**

Group	Pathway
A	The <b>father is literate</b> , and at least one of the following conditions applies:
1	The <b>mother is literate</b> .
2	The <b>wealth rank</b> of the household is <b>high</b> .
3	The <b>literacy rate</b> of the village is <b>high</b> .
B	For both literate and illiterate fathers: One of the following combinations holds:
	The child is a <b>girl</b> , AND
4	the <b>mother is literate</b> , OR
5	for both literate and illiterate mothers: the <b>wealth rank is high</b> AND the <b>village literacy rate is high</b> .
	For both boys and girls:
6	the <b>mother is literate</b> , AND the <b>wealth rank is high</b> , AND the <b>village literacy rate is high</b> .

It is obvious from this case-based analysis that the substitution between community and parental literacy is mediated by additional conditions. When both parents are illiterate, primary education success comes more easily for girls of wealthier families, in villages that already are highly literate. For boys, neither wealth nor high community literacy compensates for the illiteracy of parents.

We then calculate completion rates for the adolescents in these six pathways and for those outside<sup>7</sup>. The six pathways each lead to completion at rates between 91 and 95 percent, as opposed to the children outside, of whom about 56 percent complete Class V. The point, however, is the diversity of causal pathways to school success. One is surprised to learn, for

<sup>7</sup> The table in the Summary section (page 7) already carried the group-by-group rates; methodological background and additional statistics can be found in the appendix.

example, that for the success of children with literate fathers, gender does not matter. It is a factor, however, when fathers are illiterate.

### **Diversity, yes - but do we really understand the causes of success?**

This talk about "causes" is nevertheless not satisfactory. The 34 case studies, in which some of us came to know the children, their parents and teachers, let us understand who specifically from outside the nuclear families had supported the students. Most of these supporters were members of the extended families; some were neighbors. This sociological precision is lost again in the jumble of statistics when the community factors are abridged to a collective literacy rate.

One could, theoretically, try to proxy for neighborhood. The *baris* were numbered on maps that local Community Learning Center volunteers drew up to facilitate the baseline survey. The numbering was usually consecutive, as much as possible in the two dimensions. For the most part, one should therefore expect that dwellings with house numbers close to that of the adolescent in point were inhabited by kin and neighbors most likely to have interacted with him/her during primary school age. Hence one could proceed to calculating educational rates for male and female adults of parenting or schoolmate age groups. These might provide better model results. Yet, even if they did, they would tell us little about how exactly the literacy of these groups improved the focus child's primary school success. We have therefore not gone to these modeling extremes.

---

### **[Sidebar:] A different process model of school success**

Primary education gaps are such an important as well as persistent issue in Bangladesh that it is no surprise that a considerable body of literature has grown around it. Much of it is reviewed and expanded in the new volume *"Education in Bangladesh. Overcoming Hurdles to Equity with Quality"*, edited by M. Ahmed (2011) of BRAC University. This research is inspired by the Consortium for Research on Educational Access, Transitions and Equity (CREATE) framework developed at the University of Sussex, Great Britain. The strength of this approach is in the elaboration of separate causal streams moving children who never enrolled, completers, repeaters and drop-outs. Empirical research has been carried out in Bangladesh and in sub-Saharan Africa.

The processes that take over once the child is inside the educational system and which determine her school success are worked out in detail. As far as they are classroom-based, they are outside the perspective of our study. Key concepts such as "silent exclusion" - the child officially figures in the class register, but is not engaged in learning -, multiple grade repetition and, as a result, low age-grade congruence cannot be addressed with our data.

The sample of the CREATE study in Bangladesh is almost as large as ours (9,045 children). It was surveyed twice, in 2007 and 2009. The sample members were 4 - 15 years of age in 2007, and 6 - 17 in the second wave. This age structure is another reason why the study cannot be compared to ours. Most of the sample members were too young to complete primary education by 2007.

Of pertinent interest, however, is the chapter on the development of school drop-out (Sabates, Hossain et al. 2011). A key finding is that drop-out has precursors - notably student absenteeism, grade repetition, and over-age - that set this group apart from those staying enrolled (ibid., p. 78).

Apart from those behavioral factors, household characteristics such as poverty and parental education affect continued enrollment in the expected directions (p.79).

School factors are less developed; in the CREATE study they are limited to distance and per capita expenditure. Neither has a statistically significant effect on dropping-out (ibid.). The structure of the sample - Sabates et al. had only 282 drop-outs from 18 school catchment areas in their multivariate model - may have been a further reason why school quality did not enter their estimation of effects on drop-out. This remains an important unanswered question in their study as well as in ours and thus an item for future research agendas.

---

## Consequences

### **Literate communities promote every child's success in school**

Literate communities reinforce every one's children's chances to succeed in school. This is what the estimated effects of parental and of village literacy strongly suggest. To that extent, the communitarian claim that "it takes a village to put a child through school" is borne out by observation. Yet, prudence is advised. Our own calculations have attached important qualifiers to such a sweeping claim. Also, this study observes school success only as far as primary school completion goes. This is a very incomplete measure in the eyes of societal aspirations.

Moreover, the question that may interest NGO practitioners the most is about practical policies. Should investments primarily go to school expansion and school quality improvements? Will support for community-level education efforts such as for FIVDB's Community Learning Centers create an environment in which more children will complete primary school?

In this equation, there is a particularly important, if little known parameter: the effect of adult literacy training. FIVDB has been conducting courses for close to thirty years, with tens of thousands of adults, including thousands of the fathers and mothers of the children who read in its schools. The statistics from this study say that nine out of ten children of two *literate* parents will complete primary school. They will do so regardless of household wealth or village literacy. But exactly *how much* literacy do the parents need in order to bring this about? To what degree does the new adult literacy create these resources in the families of current and future primary students?

Similar questions can be asked about investments in other programs. Trivially, households with improved earnings find it easier to continue the education of children. Much harder to untangle, progress moves in tandems, with health and wealth, study and work, home and public square supporting each other, leaving minor scope for single advances.

### **A call to humility ..**

Thus, after dissecting the data on 9,000 adolescents - a sample size of which most researchers can only dream - this study may have found out a point or two of novelty about primary education. For example, the identification of different pathways to Class V completion is likely to add to the stock of useful sector knowledge.

All the same, one should beware of far-reaching claims. Research in education outcomes, in line with other subjects of program evaluation, faces high standards. It must control for selection bias (Khandker, Koolwal et al. 2009). In the context of our "It takes a village to put a child through school", one would need to demonstrate that the child's school success, his parents' literacy and the community's literacy rate are not determined by any unmeasured common factor.

For example, the village might have had the benefit of several generations of outstanding teachers serving the local school. These teachers greatly help the current children as they and their predecessors earlier did for the children's parents and other residents. What we perceive in this scenario as the effect of today's literate parents may have resulted from a longer-standing dynamic that sets this village apart from others. As we have seen, the history of Dumria is a case in point.

A similar cautionary note is due regarding the superior completion performance of girls over boys. This is consistently so - in the raw data (75 vs. 63 percent), in the regression coefficient as well as in the QCA-revealed pathways. Male drop-out has been explained with motivational and social factors, such as the looser discipline allowed boys (GRM International 2010: 94-100, who find poverty to rarely be the main cause). However, virtually all of those are non-school variables. The possibility that primary school curricula are not sufficiently attractive to boys has not come up. Since we have no measured variation of "boy friendliness" of the schools in our sample population, our finding confirms the well-known, but adds nothing new to explaining it.

### **.. and a call to boldness**

NGO baseline surveys are not made to detect such historical or pedagogical dynamics. Yet NGOs, being "close to the people", are in a privileged position to gauge the complexities of local development. They do so with mixtures of conversational, physical, financial and clerical devices. Often the learning is slow and frustrated by stove-piped projects that do not talk across their narrow boundaries. Still, at the interface of fieldstaff and grassroots organizations, information is exchanged in amounts that create finely-grained local knowledge. It can *potentially* inform organizational knowledge if properly stimulated and harnessed. This is what FIVDB workers continuously signal from their contacts with Community Learning Center and school management committees. It may be impossible - to repeat a complaint of this study - to derive a school quality measure from a baseline survey, but villagers know the history of their schools quite well, perhaps in a timeline of revered teachers (Basher and Shipar 2010).

What is lacking is not so much research skills as the courage to re-think and to reach out. None of the statistics in the key summary of this study - Table 1 - is beyond a thirty-minute effort by the monitoring and quality assurance associates wielding the usual spreadsheets. Tables and rates can all be calculated with the techniques extant. Yet, before the 94-percent completion rate for children of literate parents pops up on the screen, curiosity to know the difference has to burn. And, once we believe we have found out something of common interest, it takes a similar dose of curiosity to validate findings with the communities about whom they speak. To

illustrate: It has been impossible, beyond one or two small experiments, to discuss with Community Learning Center members the educational status of their villages compared to neighboring ones. Local enthusiasm, FIVDB's vast baseline data and effective summary formats notwithstanding, the coordination burden was prohibitive.

**Strengthening the multipliers**

Such is the irony also of this present study. It sprang from an unintended discovery in the Jonoshilon baseline survey. To illuminate a relationship that seemed puzzling, FIVDB researchers met with a number of those "statistical units" - individuals enumerated in the survey such as students and their parents. These meetings provided additional insight. At no time, however, was the central theme - the effects of parental and community literacy on school success - opened for inquiry by the concerned communities themselves.

It should, therefore, be obvious that there is a parallel between the subject of this study and the process of knowledge creation in FIVDB. For "parental literacy", put "research and statistics". For "community literacy", think "deliberative encounters". The former are focused in nuclear families and in NGO offices; the latter are far-flung and open-ended. This table gives examples, but there could obviously be more that would fit in.

**Table 6: Parallels between parental/community literacy and NGO modes of functioning**

Degree of control	Location	
	In the community	In FIVDB
<b>Focused, centralized</b>	Parental literacy, formal schooling, literacy classes	Research and statistics, program monitoring
<b>Far-flung, open-ended</b>	Community literacy, literacy campaigns, post-literacy events	Deliberative encounters, on-the-job staff training

In both spheres - centralized or far-flung -, the twin components amplify each other. At the NGO level, a balance between research and deliberation is needed. It leads to better policies, informed accountability and credibility among donors. In the villages, children are in the care of parents, teachers and other literate or illiterate persons. These cannot simply be substituted for each other to produce the same school success. But, as this study hopefully has demonstrated, there are mediators and multipliers among them. These our work can strengthen.

# Appendix

## Descriptive statistics

Unedited STATA output

Variables				
variable name	storage type	display format	value label	variable label
EducComplPrim-y	byte	%8.0g		Completed at least Primary Class V
IsMale	byte	%8.0g		Is male
MotherBlvdLit-e	byte	%8.0g		Mother is literate
FatherBlvdLit-e	byte	%8.0g		Father is literate
HHIncAnnLog10	float	%9.0g		Annual HH income (log10)
HHNGOmemb	byte	%8.0g		HH member of at least one NGO or MF organization
v_log10pop	float	%9.0g		Village population (log10)
v_incannlog10	float	%9.0g		Annual HH income (log10) - village mean
v_NGOmemb	float	%8.0g		Fraction HH NGO or MF members in village
v_NGOmembSq	float	%9.0g		Fraction HH NGO or MF members in village (squared)
v_WageEmployD-s	float	%9.0g		Wage earners per 100 HH in village
v_FemaleL~39old	float	%9.0g		Literacy rate among women 20-39 y in village
v_MaleLiteRat-d	float	%9.0g		Literacy rate among men 20-39 y in village
v_FemaleL~59old	float	%9.0g		Literacy rate among women 40-59 y in village
v_Ratio06To71-s	float	%9.0g		Ratio of 0 - 6 to 7 to 13 y old in village
DistrictEnc	long	%12.0g		District (encoded)
VillageCodeEnc	long	%19.0g		Village code (Encoded)
age15to19	byte	%8.0g		Is between 15 and 19 years' old [Filter]

### Population of interest

Adolescents 15-19 years' old in household member table

Is between 15 and 19 years' old	Freq.	Percent	Cum.
0	100,062	90.24	90.24
1	10,827	9.76	100.00
Total	110,889	100.00	

Effective sample

InSample Model III.	Freq.	Percent	Cum.
0	101,817	91.82	91.82
1	9,072	8.18	100.00
Total	110,889	100.00	

### Individual-level variables

. summ EducComplPrimary IsMale if age15to19

Variable	Obs	Mean	Std. Dev.	Min	Max
EducComplP~y	10632	.6904628	.4623246	0	1
IsMale	10827	.5100212	.4999227	0	1

### Household-level variables

. summ MotherBlvdLiterate FatherBlvdLiterate HHI ncAnnLog10 HHNGOmemb if age15to19

Variable	Obs	Mean	Std. Dev.	Min	Max
MotherBlvd~e	9706	.248403	.432109	0	1
FatherBlvd~e	10459	.3893298	.4876216	0	1
HHI ncAnnL~10	10728	4.892816	3.150778	3.5563	6.7782
HHNGOmemb	10754	.3068626	.4612133	0	1

. \* [Compared to all households in baseline survey:]

. summ MotherBlvdLiterate FatherBlvdLiterate HHI ncAnnLog10 HHNGOmemb if hhcodetag

Variable	Obs	Mean	Std. Dev.	Min	Max
MotherBlvd~e	17310	.3057192	.4607247	0	1
FatherBlvd~e	18168	.369771	.4827559	0	1
HHI ncAnnL~10	18784	4.793182	3.163846	3.4771	6.9823
HHNGOmemb	18851	.3033261	.4597071	0	1

### Village-level variables

summ v\_log10pop v\_incannlog10 v\_NGOmemb v\_NGOmembSq v\_WageEmpl oyDens  
v\_FemaleLiteRate2039old v\_MaleLiteRate2039old v\_FemaleLiteRate4059old  
v\_Ratio06To713olds if age15to19

Variable	Obs	Mean	Std. Dev.	Min	Max
v_log10pop	10827	3.121916	.2513149	2.562293	3.670339
v_incannl~10	10827	4.806623	1.091237	4.532613	5.096971
v_NGOmemb	10827	.2957307	.1432395	.0232558	.6320755
v_NGOmembSq	10827	.1079723	.0896851	.0005408	.3995194
v_WageEmpl~s	10827	12.29293	6.487903	9.009009	38.51351
v_Fema~39old	10827	.4703349	.1484678	.1621622	.7851239
v_MaleL~d	10827	.5714537	.1559194	.0897436	.8729282
v_Fema~59old	10827	.1598917	.0980295	0	.4615385
v_Ratio06T~s	10827	.961909	.1333135	.6363636	1.519231

. \* [Compare to villages, one record per village:]

. summ v\_log10pop v\_incannlog10 v\_NGOmemb v\_NGOmembSq v\_WageEmpl oyDens  
v\_FemaleLiteRate2039old v\_MaleLiteRate2039old v\_FemaleLiteRate4059old  
v\_Ratio06To713olds if villagetag

Variable	Obs	Mean	Std. Dev.	Min	Max
v_log10pop	98	2.988548	.2300011	2.562293	3.670339
v_incannl~10	98	4.799246	1.119941	4.532613	5.096971
v_NGOmemb	98	.299746	.1491654	.0232558	.6320755
v_NGOmembSq	98	.1118709	.0942137	.0005408	.3995194
v_WageEmpl~s	98	11.96523	6.734969	9.009009	38.51351
v_Fema~39old	98	.4623036	.1467088	.1621622	.7851239
v_MaleL~d	98	.5593996	.1595104	.0897436	.8729282
v_Fema~59old	98	.150003	.1052614	0	.4615385
v_Ratio06T~s	98	.9628276	.1489992	.6363636	1.519231



variables are not primarily modeled as effects (from observed values of variables and parameter estimates). Rather, sets of cases defined by the degrees to which relevant attributes are present are investigated for mutual inclusion. The attributes may be crisp (yes/no) or fuzzy (known by degree; "more or less"). The analysis aims at finding combinations of (levels of) attributes for which the set of conforming cases displays a high degree of the outcome attributes of interest (consistency). The acceptable solutions are then evaluated also for how common they are in the sample of cases (coverage).

Ragin (2000) pioneered the method, but researchers have been able to use it more widely since Longest and Vaisey (2008) provided a convenient implementation in STATA. What follows is, for the most part, partial output from the one model that we report in tables in the summary and in the main body. We assume that the interested reader will familiarize with notation and syntax in Longest and Vaisey, op.cit. However, those not concerned with STATA may find the definitions, sample size and primary school completion rates for all subgroups further below.

The model that we report combines five explanatory variables; there are  $2^5 = 32$  subgroups with mutually exclusive membership. These form part of none, one or several of six solution sets - combinations of attributes for which the conforming adolescents in the baseline survey showed high school completion rates. These solution sets overlap; the combined coverage measure takes this into account.

The paramount objective of the method, however, is to identify the diverse pathways that lead from causal attributes to the outcome of interest.

### Transformation of variables

The STATA procedure *fuzzy* recommends the use of variables named with one capital letter. We created those in a file reduced to adolescents 15 - 19 years' old and with known primary education status (n = 10,601).

#### *Outcome variable: Primary school participation*

We use the information that about 12 percent of the sample adolescents had had some primary school education even if they did not finish school. We distinguish this level (from "none") because it might influence the identification of causal paths. Accordingly, we reduce this distribution to three levels:

```
. tabulate EducLevel Enc
```

Education level	Freq.	Percent	Cum.
00- None	2,028	19.13	19.13
01- Some primary	1,232	11.62	30.75
02- Primary compl.	2,617	24.69	55.44
03- Some secondary	3,770	35.56	91.00
04- SSC	424	4.00	95.00
05- HSC	468	4.41	99.42
06- Graduate	58	0.55	99.96
07- MA	3	0.03	99.99
08- MBBS	1	0.01	100.00
Total	10,601	100.00	

. where:

EducLevel Enc:

- 1 00-None
- 2 01-Some primary
- 3 02-Primary compl.
- 4 03-Some secondary
- 5 04-SSC
- 6 05-HSC
- 7 06-Graduate
- 8 07-MA
- 9 08-MBBS

. gen EducThreeLevels = EducLevel Enc

. replace EducThreeLevels = 3 if inrange(EducLevel Enc, 4, 9)  
(4724 real changes made)

. tab EducThreeLevels, missing

EducThreeLe vels	Freq.	Percent	Cum.
1	2,028	19.13	19.13
2	1,232	11.62	30.75
3	7,341	69.25	100.00
Total	10,601	100.00	

. label define EducThreeLevels 1 "None" 2 "Some primary" 3 "Primary completed or higher"

.. setgen D = stdrank(EducThreeLevels)

. ren stdrankEducThreeLevels D

where the intermediate level ("some primary") is assigned the fuzzy degree 0.28:

. tab D

rank of (EducThreeL evels)	Freq.	Percent	Cum.
0	2,028	19.13	19.13
.2755007	1,232	11.62	30.75
1	7,341	69.25	100.00
Total	10,601	100.00	

### Gender

The sample is almost perfectly gender-balanced:

. gen G = IsMale

. label var G "Is male"

. summ G

Variable	Obs	Mean	Std. Dev.	Min	Max
G	10601	.5052354	.4999962	0	1

### Parental literacy

. tab FatherBlvdLiterate MotherBlvdLiterate

Father is literate	Mother is literate		Total
	0	1	
0	5,137	641	5,778
1	1,708	1,689	3,397
Total	6,845	2,330	9,175

. clonevar M = MotherBlvdLiterate

(1098 missing values generated)

```
. clonevar F = FatherBldLiterate
(360 missing values generated)
```

### Household wealth rank

The household wealth rank, as observed by FIVDB interviewers at baseline, was reversed (so that rich → 1; ultra-poor → 0), with poor and middle-class households assigned intermediate values according to a ranking function that used the distribution of the four wealth levels.

```
. setgen W= stdrank(EconStatusAscend)
. ren stdrankEconStatusAscend W
. tab W
```

rank of (EconStatus Ascend)	Freq.	Percent	Cum.
0	1,032	9.87	9.87
.2993183	4,544	43.45	53.32
.7379355	3,627	34.68	88.00
1	1,255	12.00	100.00
Total	10,458	100.00	

### Village literacy rate

We use the literacy rate among women in the age group 20 - 39 years. The attribution problems were discussed in Benini (2010a, 2010b).

The original distribution was

```
. summ v_FemaleLiterRate2039old
```

Variable	Obs	Mean	Std. Dev.	Min	Max
v_Fema~39old	10601	.4700744	.1483168	.1621622	.7851239

and, with one observation per village only:

```
. summ v_FemaleLiterRate2039old if villagetagNew
```

Variable	Obs	Mean	Std. Dev.	Min	Max
v_Fema~39old	98	.4623036	.1467088	.1621622	.7851239

The rate is then transformed by rank, in order to stretch it to the range [0, 1]:

```
. setgen L = stdrank(v_FemaleLiterRate2039old)
```

```
. ren stdrankv_FemaleLiterRate2039old L
. summ L
```

Variable	Obs	Mean	Std. Dev.	Min	Max
L	10601	.5007822	.2901099	0	1

## Output

### Recap of variables used

```
. des D W G L M F
```

variable name	storage type	display format	value label	variable label
D	float	%9.0g		rank of (EducThreeLevels)
W	float	%9.0g		rank of (EconStatusAscend)
G	float	%9.0g		Is male
L	float	%9.0g		rank of (v_FemaleLiterRate2039old)
M	byte	%8.0g		Mother is literate
F	byte	%8.0g		Father is literate

*Pattern of missingness*

```
. mvpatterns D W G L M F
```

```
variables with no mv's: D G L
```

Variable	type	obs	mv	variable label
W	float	10458	143	rank of (EconStatusAscend)
M	byte	9503	1098	Mother is literate
F	byte	10241	360	Father is literate

Patterns of missing values

_pattern	_mv	_freq
+++	0	9041
+.+	1	1059
++.	1	327
.++	1	134
+. .	2	31
. . +	2	7
. + .	2	1
. . .	3	1

Missingness in mother's literacy is not at random. The poorer the household, the more often there was no "wife" recorded who could be imputed as the adolescent's likely mother.

```
. gen byte M_miss = (M==.)
```

```
. table EconStatusAscend, c(mean M_miss) row
```

Wealth rank (by FIVDB staff) - ascending	mean(M_miss)
Ultra-poor	.137597
Poor	.117077
Middle class	.087124
Rich	.079681
Total	.104226

We have not run tests for the robustness of results to non-MAR in this variable.

*QCA command syntax used*

```
. fuzzy D W G L M F, matx(coincid suffnec) standard settest(yvv yvn) sigonly  
greater(col1) conval(.800) common reduce
```

*Coincidence Matrix*

	D	W	G	L	M	F
D	1.000					
W	0.842	1.000				
G	0.670	0.526	1.000			
L	0.822	0.692	0.496	1.000		
M	1.237	0.833	0.719	0.848	1.000	
F	0.940	0.640	0.526	0.622	0.978	1.000

*Sufficiency and Necessity Matrix*

	D	W	G	L	M	F
D	1.000	0.585	0.469	0.561	0.317	0.449
W	0.826	1.000	0.511	0.668	0.305	0.440
G	0.685	0.529	1.000	0.489	0.236	0.352
L	0.831	0.701	0.497	1.000	0.304	0.426
M	0.915	0.623	0.465	0.592	1.000	0.723
F	0.890	0.617	0.478	0.570	0.497	1.000

*Consistency tests*

Two tests were run, in the standard way recommended by Longest et al., op.cit. "Common sets" denote combinations of attributes that passed both tests:

**Y-CONSISTENCY vs N-CONSISTENCY**

[Output omitted]

**Y-Consistency vs. Set Value [0.800]**

[Output omitted]

**Common Sets**

wgLMf  
WgLMf WgLMF WGlMF WGLMF WGLmF WGLMF WGLMF

20 Solutions Entered as True

*Reduction*

The reduction phase is the third in the QCA procedure. It uses a logic algorithm to reduce the common sets that have passed the tests to a so-called minimum configuration. These are taken, by followers of QCA, as causal paths.

The re-translation of these codes into ordinary English language was done in the two tables in the summary and main body. The summary of coverage and consistency for the six final sets are then combined, taking into account the overlap. However, the statistics that we present there are derived from the table of all 32 combinations of two levels in each of five attributes in the following Boolean truth table (next page).

**Minimum Configuration Reduction Set**  
WgL WLM gM MF LF WF

**Final Reduction Set**

Coverage Set	Raw Coverage	Unique Coverage	Solution Consistency
W*g*L	0.214	0.087	0.905
W*L*M	0.149	0.014	0.958
g*M	0.176	0.027	0.947
M*F	0.237	0.019	0.946
L*F	0.268	0.030	0.931
W*F	0.288	0.039	0.927

Total Coverage = 0.541  
Solution Consistency = 0.899

**Table 7: Truth table for the fuzzy primary school involvement model**

Sequence number	Symbol of combination	Adolescents in baseline survey	Completed Class V	Completion rate	Higher wealth rank (W)	Gender of child (Capital G = boy)	High village literacy (L)	Literate mother (M)	Literate father (F)	Pathway 1	Pathway 2	Pathway 3	Pathway 4	Pathway 5	Pathway 6	Not in any pathway
1	WGLMF	383	362	95%	Yes	Yes	Yes	Yes	Yes	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE
2	WGLMf	82	69	84%	Yes	Yes	Yes	Yes	No	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
3	WGLmF	266	231	87%	Yes	Yes	Yes	No	Yes	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
4	WGLmf	446	341	76%	Yes	Yes	Yes	No	No	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
5	WGIMF	178	154	87%	Yes	Yes	No	Yes	Yes	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
6	WGIMf	67	50	75%	Yes	Yes	No	Yes	No	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
7	WGLmF	209	161	77%	Yes	Yes	No	No	Yes	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
8	WGLmf	637	336	53%	Yes	Yes	No	No	No	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
9	WgLMF	433	426	98%	Yes	No	Yes	Yes	Yes	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
10	WgLMf	96	90	94%	Yes	No	Yes	Yes	No	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
11	WgLmF	265	251	95%	Yes	No	Yes	No	Yes	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
12	WgLmf	415	367	88%	Yes	No	Yes	No	No	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
13	WglMF	203	193	95%	Yes	No	No	Yes	Yes	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
14	WglMf	52	48	92%	Yes	No	No	Yes	No	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
15	WglmF	199	171	86%	Yes	No	No	No	Yes	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
16	Wglmf	469	342	73%	Yes	No	No	No	No	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
17	wGLMF	141	126	89%	No	Yes	Yes	Yes	Yes	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
18	wGLMf	94	76	81%	No	Yes	Yes	Yes	No	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
19	wGLmF	183	151	83%	No	Yes	Yes	No	Yes	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
20	wGLmf	640	375	59%	No	Yes	Yes	No	No	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
21	wGIMF	62	50	81%	No	Yes	No	Yes	Yes	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
22	wGIMf	63	33	52%	No	Yes	No	Yes	No	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
23	wGImF	177	108	61%	No	Yes	No	No	Yes	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
24	wGImf	914	315	34%	No	Yes	No	No	No	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
25	wgLMF	166	159	96%	No	No	Yes	Yes	Yes	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE
26	wgLMf	85	71	84%	No	No	Yes	Yes	No	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
27	wgLmF	190	156	82%	No	No	Yes	No	Yes	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
28	wgLmf	595	410	69%	No	No	Yes	No	No	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
29	wglMF	98	88	90%	No	No	No	Yes	Yes	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
30	wglMf	97	76	78%	No	No	No	Yes	No	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
31	wglmF	193	133	69%	No	No	No	No	Yes	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
32	wglmf	943	425	45%	No	No	No	No	No	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
<b>Total</b>		<b>9,041</b>	<b>6,344</b>	<b>70%</b>						<b>1,664</b>	<b>2,136</b>	<b>2,027</b>	<b>1,230</b>	<b>1,209</b>	<b>994</b>	<b>5,238</b>

For example, constellation no. 4, abbreviated as WGLmf, is about adolescent from wealthier households (W) who are boys (G) and who live in high-literacy villages, and whose mothers and fathers both are illiterate (m, f). There are 446 such cases in the sample, of whom 76 percent completed primary school.

*Pathways to education success, incl. post-primary*

Some readers may wonder which attribute combinations persist when the scale of education attained by the sample adolescents distinguishes also between completed primary and subsequent levels, as in the table further above. These attainments are truncated by age, i.e.

many have not yet finished their education by the earlier of baseline survey data or age 19. A QCA model under these circumstances has limited validity; we give results only summarily.

The more highly educated ones come from three sets: 1. Children of two literate parents; 2. Girls of better-off families, either 2.1. with literate mothers, or 2.2 with literate fathers in highly literate villages. Somehow ambient literacy "compensates" for the absent literate mother.

In STATA output:

Coverage Set	Raw Coverage	Unique Coverage	Solution Consistency
W*g*L*F	0.165	0.067	0.900
W*g*M	0.153	0.030	0.834
M*F	0.274	0.151	0.677

Total Coverage = 0.371  
Solution Consistency = 0.71

The result reflects that fact that the inclusion of post-primary steps depresses the fuzzy level of completed primary below the *bestfit* level of 0.5, as now in

. table EducLevelEnc, c(mean E freq) [E: fuzzified education levels, incl. post-primary]

Education level	mean(E)	Freq.
00- None	0	2,028
01- Some primary	.1700308	1,232
02- Primary compl.	.3707818	2,617
03- Some secondary	.7039065	3,770
04- SSC	.9226516	424
05- HSC	.9691754	468
06- Graduate	.9966098	58
07- MA	.9997914	3
08- MBBS	1	1

With decreasing post-primary participation of poorer children, higher wealth comes to occupy two out of three remaining pathways.

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## About the authors

**Aldo Benini** has a dual career in rural development, with a focus on Bangladesh and another on organizations of the poor, and in humanitarian action. In the latter capacity, he has worked for the International Committee of the Red Cross and for the Global Landmine Survey. He has a Ph.D. in sociology from the University of Bielefeld, Germany, based on field research in community development in West Africa. He has known FIVDB since 1980. At present, he is a monitoring consultant for the Jonoshilon project.

Benini is a citizen of Switzerland and an independent researcher based in Washington DC. He can be contacted at [aldobenini@gmail.com](mailto:aldobenini@gmail.com). Several of his publications are available at <http://aldobenini.org>.

**Wasima Samad Chowdhury** is the Coordinator of the Policy Planning and Research Unit of FIVDB. She has been working in the development research field since 1996. She has an M.A. in economics from Shahjalal University of Science and Technology, Sylhet, Bangladesh as well as an MA in development Studies (specializing in poverty, population and social development) from the Institute of Social Studies, The Hague, The Netherlands. She can be contacted at [wasima25@gmail.com](mailto:wasima25@gmail.com).

The following FIVDB Research and Monitoring Associates contributed to this study: **Abu Sayem Arif, Arif Azad Khan, Arif Mohammad Shakil, Asim Roy, Humayun Kabir, Majeda Zafrin Juie, Mashiur Rahman Tito, MD Faisal Khaliq, MD Kamrujjaman, Md. Abdus Salam, Mohammad Sarwar Basher, Muhammad Al Amin, Rakshit Bhattacharjee.**

A report by



Friends in Village Development Bangladesh (FIVDB)  
Khadimnagar, Sylhet  
P.O Box 70, Sylhet 3100  
Bangladesh

Tel: +88 (0821) 2870466, 2871221, 2870020

Fax: +88 (0821) 2870021.

Website: <http://www.fivdb.net>.