

IMPROVING NUTRITION FOR BANGLADESH



RESEARCH PAPER



GIRLS' SECONDARY SCHOOLING: COSTS AND BENEFITS OF PROVIDING GIRLS WITH GREATER EDUCATIONAL OPPORTUNITIES – CHILD NUTRITION AND LABOR MARKET OUTCOMES

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Girls' Secondary Schooling: Costs and Benefits of Providing Girls with Greater Educational Opportunities - Child Nutrition and Labor Market Outcomes

Bangladesh Nutrition

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Background

Bangladesh has been successful at attaining almost full enrolment at the primary school level. However, both enrolment and completion at later stages (lower and higher secondary school levels) remain an issue. While enrolment at the primary level has reached around 90 percent in recent years, enrolment at the lower secondary level is only about two-thirds and at the upper secondary level is about one-third for age-appropriate cohorts (as suggested by official education statistics, see Rabbani 2016). Given the demand for more complex skill-sets in a changing global economy, the low attainment at the later grades of school certainly calls for special attention (Frey and Osborne 2013).

Girls' education requires special attention. Women's labor force participation remains low in Bangladesh; women are often driven to very specific occupations (such as sewing line operations in the ready-made garment sector, the largest private sector manufacturing employer in Bangladesh). The returns to schooling in these sectors remain unsurprisingly low (about 1.4% from an estimate by the author). Bangladesh also continues to have one of the lowest global age-levels for first marriage for girls. Despite the legal age of marriage mandated to be at least 18, a recent study shows that about two-thirds of women marry at an age below the legal limit (Plan Bangladesh 2013). Marrying early commonly leads to childbirth at an early age and dropping out of school. Low schooling, especially among mothers, is strongly associated with nutritional deficiency for their children, resulting in low height-for-age for the children, a status commonly known as stunting (Headey, et al. 2015).

Despite the importance of the role of female education in labor market outcomes and inter-generational human capital investment, there is a dearth of strategies known to be effective to increase female education participation at post-primary levels. In this short note, I will first take stock of interventions that have been tried to improve girls' post-primary enrolment at formal schools. Next, I will carry out my own cost-benefit analysis for the female stipend program, which is commonly believed to have played a role in increasing girls' school enrolment. I will explicitly delineate my assumptions in the cost-benefit analyses and will show some sensitivity analyses. I will conclude with a short discussion.

Interventions Promoting Female Education at the Secondary Level

It may be useful to start by discussing the reasons for low female school participation. The labor market in Bangladesh remains largely informal, with most people sharing work with other family members or neighbors, with generally low remuneration. Although the RMG sector offers a great number of job opportunities to women in Bangladesh, most of these usually remain employed as

sewing line operators with low returns to schooling (Macchiavello, et al. 2015). The scope for promotion within the RMG sector is limited, contributing to lower average pay for women in this sector. However, even these otherwise low paying job opportunities have been found to be associated with higher school participation by girls (see Heath and Mobarak 2015).

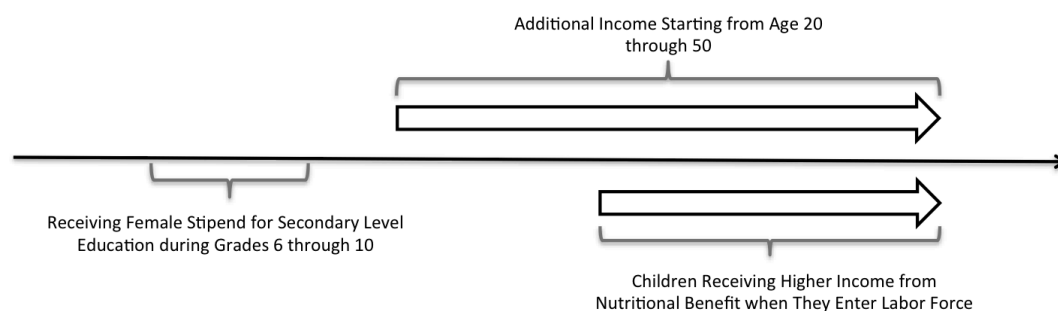
Schooling at the secondary level takes place when girls usually reach puberty; hence the decision to invest in human capital competes with marriage. Child marriage is unfortunately very common in Bangladesh, with about two-thirds of women usually married before 18. This is often associated with girls dropping out of school. There is a clear “youth premium” for girls in the marriage market, which leads to an adverse incentive for households to “marry off” daughters at an earlier age. Foregone earnings for girls of this age can be ignored as a cost in this analysis, as data shows that only 2.8% of girls between 11 and 16 work for a living (see BBS 2011). A bride’s family often has to pay a dowry to the groom’s family, and in conjunction with the fact of low labor market returns from schooling this creates a stable equilibrium of girls not continuing education at secondary levels. Additionally and as importantly, there is a sense of cultural and societal insecurity around unmarried young girls in Bangladesh, which lead families to find it more lucrative to discontinue schooling and marry off their daughters at an early age.

Easier access to schools can help foster enrolment of girls at the secondary level. Providing access to education by building schools can certainly improve enrolment and test scores, and this has been found to be more effective for girls, supporting the hypothesis that girls face more prohibitive barriers and thus a higher cost to attend schools, reducing further the relative returns from school (see Burde and Linden [2013] for results from a village based school experiment in Afghanistan). However, the evidence is so far confined to primary levels of schooling. Nevertheless, building schools to increase enrolment of girls at the secondary level may still be pertinent.

This paper focuses on other approaches. One intervention aimed at providing access to education for girls at the secondary level comes from India where the targeted beneficiaries were provided with bicycles with the assumption that transport may be a deterrent factor for school participation. The results are compelling and, as we will see, relevant for our analysis. The bicycles increased enrolment by 30 percent or about 5.2 percentage points and increased the number of girls appearing at the secondary school completion exam by 9.5 percent (see Muralidharan and Prakash 2013). The results suggested that there were non-linear effects of the program for participants living too close to or too far away from the school, suggesting limitations to effectiveness.

The bicycle program is a special case of a conditional kind transfer (CKT). Most of the educational encouragement programs are of conditional cash transfer (CCT). Such programs have a long tradition of being very effective in a wide variety of contexts (see De Janvry and Sadoulet 2006). In Asia, CCT-type programs have shown to increase enrolment by 30 percentage points in Cambodia (see Filmer and Schady 2008). Baird, McIntosh and Özler (2011), using an experiment in Malawi, showed that CCT can reduce drop-out by as much as 40 percent and the effect is larger than an unconditional cash transfer (with some positive impacts on learning as well). In Pakistan, a school-based female stipend program led to a 9 percent increase in enrolment (Chaudhury and Parajuli 2010).

In Bangladesh, conditional kind transfer (CKT) such as providing food for education programs showed promise from early on and the introduction of CCT in the form of female school stipend programs in the early 1990s further suggested that such programs can help increase girls' enrolment in the secondary level and lower drop-out rates (see Ravallion and Wodon [2000] for an evaluation of the food for education program). Unfortunately, there has not been any rigorous evaluation of the female stipend program. The best evidence suggests that the female stipend program can increase girls' enrolment at the secondary level by as much as 8 percent (see Khandker, Pitt and Fuwa 2003). We will use this as our benchmark to assess the cost-benefit of the female stipend program.



Benefit Cost Analyses

Unit Cost of Female Stipend Program

Currently, the government of Bangladesh offers 100 taka monthly or 1,200 taka annually to school-aged girls as incentive to enroll. We use these numbers as the unit cost of the program. We also consider the administrative and possible deadweight cost of the program. Because of the stipend program additional students can reduce quality as measured by test scores and crowd out participation by non-beneficiaries such as boys (see Fuwa 2001). Hence, we make an adjustment to allow a top-up of 50 percent over the allotted stipend. We simulate the female stipend intervention

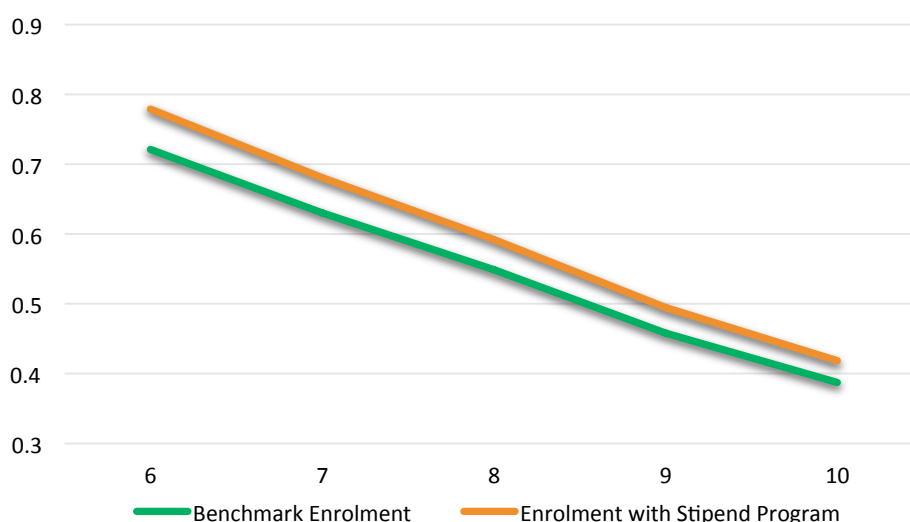
over a period of five years between sixth and tenth grade (see **Error! Reference source not found.**). The present value of the program then amounts to 4,162.74 taka if discounted at a rate of 10%.

Additional Years of Schooling because of the Program

We measure the benchmark enrolment for the rural population by grade from the Household Income and Expenditure Survey, 2000 (the latest data available for a nationally representative sample). We use the treatment effects estimated by Khandker, Pitt and Fuwa (2003) to measure the augmented enrolment which may be the result of the program. Both the benchmark enrolment rates and the simulated enrolment rates are presented in [Exhibit 1](#).

We use the additional enrolment cumulatively to measure the additional year of schooling by taking into consideration the probability of drop-out at any current grade as non-zero. The total number of additional year of schooling amounts to 0.061 years for a single beneficiary who receives a stipend continuously between sixth and tenth grades (five years).

Exhibit 1: The Enrolment Effect of Female Stipend Program



Notes: The benchmark female enrolments at the secondary levels are from Household Income and Expenditure Survey (2010). The effect of female stipend program is from (Khandker, Pitt and Fuwa 2003).

Additional Income Benefit of the Stipend Program

We use the average income from the latest Labor Force Survey (13,305 taka monthly in 2016 value). Using the additional year of 0.061 and returns to schooling of 13%, we find that expected benefits for a unique beneficiary will be about 1,260 taka annually. We use an annual real growth rate of four percent over the evaluation period to measure the total accrued benefits from the program. The

return to schooling estimate is taken from (Asadullah 2006), the same one used by Zaman's Copenhagen Consensus Paper (see Ahsanuzzaman 2016).

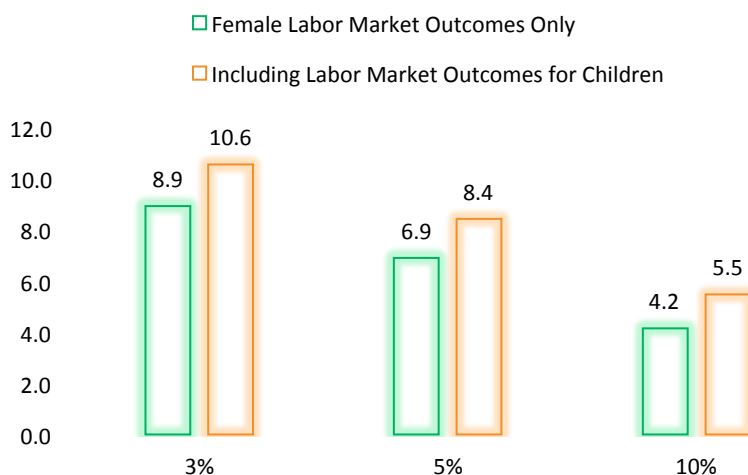
Additional Benefit of Avoiding Childhood Stunting

A simple analysis using the latest Demographic and Health Survey (2014) reveals that each additional year of schooling of the mother reduces the probability of stunting in her children by about 0.028. We use an estimate of 59.4 percent as the labor market benefit of avoiding being stunted and a fertility rate of two children per woman to measure the future labor market benefit of additional years of schooling because of the stipend program (see Hoddinott, et al. 2013). We assume that the children will start working at the age of 20 and discount the future cash streams accordingly. We limit our analysis to thirty years after receiving the stipend (see **Error! Reference source not found.**).

Benefit Cost Ratios

We measure two different sets of benefit-cost ratios. The first set of benefit-cost ratios includes only benefits that would accrue to the women receiving additional schooling as a result of the female stipend program. The discount rate of 10 percent suggests that the benefit cost ratio will be about 6.2. The benefit cost ratios would rise to as much as 13.4 and 10.3 for discount rates of 3 percent and 5 percent, respectively.

Exhibit 2: Benefit Cost Ratios for Female Secondary School Stipend Program



Notes: A 4 percent growth in real per capita income is assumed for the calculations. A thirty-year horizon was used for all the considerations. See **Error! Reference source not found.** for further clarifications.

There are additional benefits from the program from the lower stunting among the children of the women who accrue additional schooling from the stipend program. The results suggest, at the 10 percent discount rate, that the benefit cost ratios will increase to 8.2. The lower discount rates

suggest a higher benefit cost ratio of 15.8 if future benefits are discounted at 3 percent and 12.6 at 5 percent discount rate.

Discussion

In this short note, I have carried my own assessments of the benefits of increasing female education participation at the secondary level. While there is limited information of the impact of the female stipend in the context of Bangladesh, there is some international evidence that conditional cash transfer programs such as the female stipend program can have a reasonable impact on girls' school enrolment and years of schooling. The results are also comparable to other programs such as the "Bicycle Program" carried out in India (Muralidharan and Prakash 2013).

My estimates of benefit-cost ratios are generally higher than Zaman's estimates (Ahsanuzzaman 2016). This may be because of the somewhat strong assumption that the existing system can partially absorb the additional students (Schurmann 2009). The quality of education remains an important issue, which was highlighted in Copenhagen Consensus Center's working paper on education (Rabbani 2016). However, investing additionally in infrastructure and quality may also increase the benefits of secondary school participation and have a scale effect on both sides of the equation. Without further understanding of the incremental benefits and costs of such interventions, it is difficult to comment on returns on the marginal investments. However, it is safe to assume that annually about 4.6 million girls can benefit from such a stipend program that can further contribute to the economic development of the country.

The estimates suggest that under reasonable assumptions, the net benefit from investing in female schooling is generally positive and the figures can potentially compete with other types of investments. Given low secondary school participation by girls, such a program has the potential to reach a large population and contribute to overall human capital development.

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