

## Promoting Gender Parity

### Lessons from Yemen:

#### A JICA Technical Cooperation Project in Basic Education

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**Key words:** basic education, gender parity, school management

#### Abstract

Despite remarkable progress supported by international commitment to meeting the MDGs, countries such as Yemen still face great challenges in achieving gender parity in education and in reducing in-country disparities. Strengthening community participatory school management is a key area which JICA has prioritized in its programs for reaching marginalized children and for improving access to and quality of education. One instance of this is a technical cooperation project in Yemen called Broadening Regional Initiative for Developing Girls' Education (BRIDGE) Phase 1 (2005-2008), which piloted a participatory school management model supported by school grants with the objective of eliminating gender disparity in basic education. How successfully has this approach been in such a traditional society? Our analyses of the performance of the project's pilot schools based on analyses of data collected at three points in time – at the initial year and end year of the project and two years after the project's end – suggests the following: Interventions in school management that strongly emphasize girls can be effective in rather quickly improving gender parity regardless of the schools' initial conditions. However, we also observe that the post-project performance of the pilot schools in terms of gender parity is mixed, even though budgets for school grants were allocated by the local government to all pilot schools. We further observe that such variation in performance appears to be significantly correlated to school leaders' perceptions of gender equality, to community participation, and to the number of female teachers employed. These findings point to the importance of continuous long-term guidance to the schools and monitoring of those which implement school improvement programs. Attention should be paid to key factors that might influence school performance, such as those identified in this paper.

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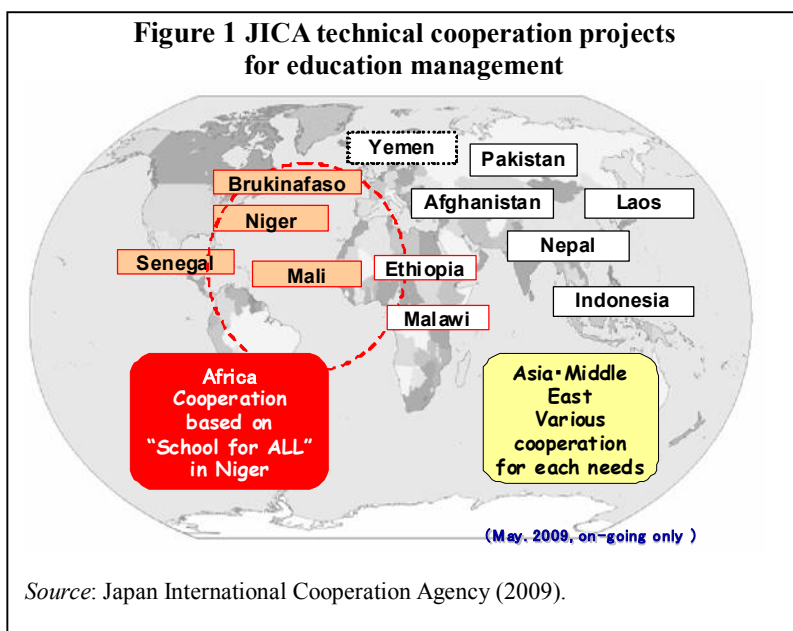
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## Introduction

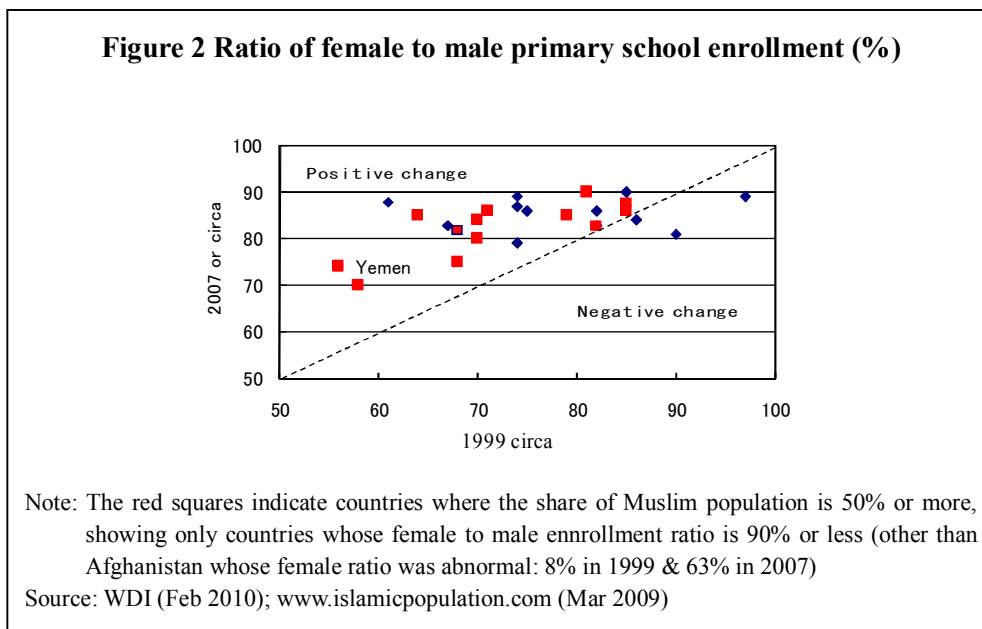
At the 2010 MDG Summit, the Prime Minister of Japan, Mr. Naoto Kan, made a statement to the United Nations General Assembly in which he declared a “Kan Commitment” to achievement of the MDGs. With respect to education, Japan’s concrete promises are stipulated in Japan’s Education Cooperation Policy 2011-2015 which calls for the provision of USD3.5 billion for the education related MDGs. In the education cooperation policy, “answering the needs of marginalized populations” is articulated as a guiding principal, and the “school for all” concept is stressed as an approach wherein schools, communities, and educational administrations work together to meet the needs of the community and ensure quality of education for every child (Kan 2010 and MOFA 2010).

Despite significant progress over the last decade in primary education enrolment, as called for by the Education for All (EFA) campaign, and despite international commitments to MDGs, gender equity in education has not yet been achieved. Disparities among groups have in fact grown, with disadvantaged and hard-to-reach children – particularly girls – often excluded from learning opportunities. The “Kan Commitment” demonstrates that Japan is responding to the challenge of reaching marginalized populations of children and to the goal of achieving gender parity in basic education by facilitating coordination among schools, communities and governments at different levels.

Indeed, since the late 1990’s the Japan International Cooperation Agency (JICA) has given high priority to cooperation that will strengthen community participatory school management (Figure 1), seeing in it an approach that will provide better access to higher quality of basic education for marginalized children in different circumstances, most frequently girls. To facilitate and sustain participatory school management in communities, emphasis has been on technical cooperation for the capacity development of central and local education administrators (JICA 2010a).



As a consequence of this emphasis, various approaches to practical community participatory school management have been developed to meet the particular demands within the particular contexts of each cooperating country. One example is the “BRIDGE model,” developed as part of a technical cooperation project called *Broadening Regional Initiative for Developing Girls’ Education (BRIDGE)* - Phase 1 (2005-2008). This model explicitly addresses the challenge of eliminating gender disparity in basic education in Yemen, a Muslim developing country where gender disparity in net enrolment rate remains one of the widest in the world (Figure 2). Despite some progress, Yemen faces the very real prospect of not reaching the education and gender related MDGs. Sustaining the progress that has been made is also a challenge. This was highlighted in the 2010 *UNESCO Global Monitoring Report on Education for All*, which noted that “the experience of Yemen demonstrates that rapid progress towards gender parity from a low base is possible and that sustained progress requires a strong political commitment to equity” (UNESCO 2010, p.64).



Using data collected from the BRIDGE Phase 1 pilot schools at three points in time – the initial and end years of the project and two years after the end – this paper analyzes the schools’ progress towards gender parity. Based on this analysis, it explains whether and how the pilot schools of the BRIDGE model differ among themselves in increasing and sustaining gender parity in basic education enrollment, and also addresses school-specific factors that could be negative for gender parity. In so doing, the paper draws lessons that can contribute to a Yemeni initiative for expanding and improving the country’s overall school development program as a gender sensitive measure. This study is expected also to serve other countries facing similar challenges in achieving gender parity in basic education.

## 1. School-based management for girls' education in Yemen

School-based management which decentralizes education decision-making by enhancing parental and community involvement in the schools is a strategy being introduced globally by governments who want to improve the quality of their education and increase enrollment (World Bank 2007). In particular, community and parental involvement is considered key for securing the enrollment of girls. Girls are more likely to go to school if there is community support, which may be strengthened by a transformation of parental attitudes through substantial consciousness raising efforts regarding the benefits of educating their daughters (e.g. Stromquist 1997).

The Government of Yemen started institutionalizing and developing its community participation capacity in the late 1990s; for example, through the establishment of a community participation unit in the Ministry of Education, and through the promotion of mother's and father's councils at the schools, with assistance from donors such as GTZ and World Bank (e.g., World Bank 2004). Building on these efforts, BRIDGE 1 attempted in 2005 to develop a school management model which could provide mechanisms and tools to facilitate the participation of parents and community members in the preparation and implementation of school improvement plans (SIP) with the support of school grant funds. These mechanisms and tools incorporate gender sensitization approaches to improving girls' access to education, while the activities included in the SIPs are decided by each school's committee. Recognizing the cultural barriers to and constraints on gender equality, BRIDGE 1 also brought in community religious leaders (Picture 1).

**Picture 1 Example of activity under BRIDGE: A cleric gives lectures to women on the importance of education**



*Source: Japan International Cooperation Agency (2008).*

The key assumption of the model was that the establishment of school-community collaboration through planning and implementation can be effective in increasing girls' enrolment if the importance of girls' education is appropriately advocated through the process, and if the local education officers participate in facilitating and maintaining such a process on the ground. The roles of the local education officers might include providing the necessary training to schools, providing on-site technical and administrative

guidance on the ground as follow up to the training, disseminating good practices and lessons learned among schools and districts by various means including workshops at different levels, preparing newsletters, promoting media campaigns, and advocating for girls' education.

School grants are also piloted in similar though not identical mechanisms by other donors, such as the UNICEF-supported "child friendly school" and the BEDP<sup>1</sup>-supported "whole school development" (World Bank 2010). The Yemeni government is now working towards preparing national guidelines for "whole school development"<sup>2</sup> wherein good practices already identified through various programs with similar intentions will be harmonized and consolidated. JICA, through BRIDGE Phase 2, is taking a leading role in supporting this government initiative and its process to harmonize the facilitation of a nation-wide dissemination of the "whole school development" mechanism. BRIDGE Phase 2 also follows up on Phase 1 pilot schools in the Taiz Governorate as "reference sites" for lessons to be learned in order to consolidate guidelines while testing them in a new governorate (Dhamar) from 2010/11.

Even though a school-based management program with school grants is intended by policy makers to provide comprehensive school improvement for girls as well as for boys, there may be some risk that certain schools will not prioritize the grant funds to improve gender parity and equality. This is particularly a risk when the plans of schools or of school committees with authority to decide how to use the funds have not been carefully checked or monitored in terms of gender-sensitive indicators. Unlike programs that target girls exclusively (e.g. cash or in-kind transfers conditional on girls' attendance), the impact of a school grant program may be less targeted, resulting in a less gender-sensitive policy unless it clearly defines the objective and assures instruction, monitoring, and feedback among key actors at the school and at the local and the central administrative levels. Through various training and awareness activities during Phase 1, the BRIDGE model explicitly addressed girls' education as the priority objective of school improvement plans. Overall, the BRIDGE model is considered to be functional in increasing girls' access to basic education because by the end of the project the total number of female students in the pilot schools had significantly increased, and the self-reported perceptions of gender equality among headmasters were dramatically improved (JICA 2008a p. 2-3). Yet, there is some question whether the priority of gender equality can be sustained among stakeholders and whether progress can be maintained after the cessation of intensive support by foreign actors.

## **2. Research Questions and Data**

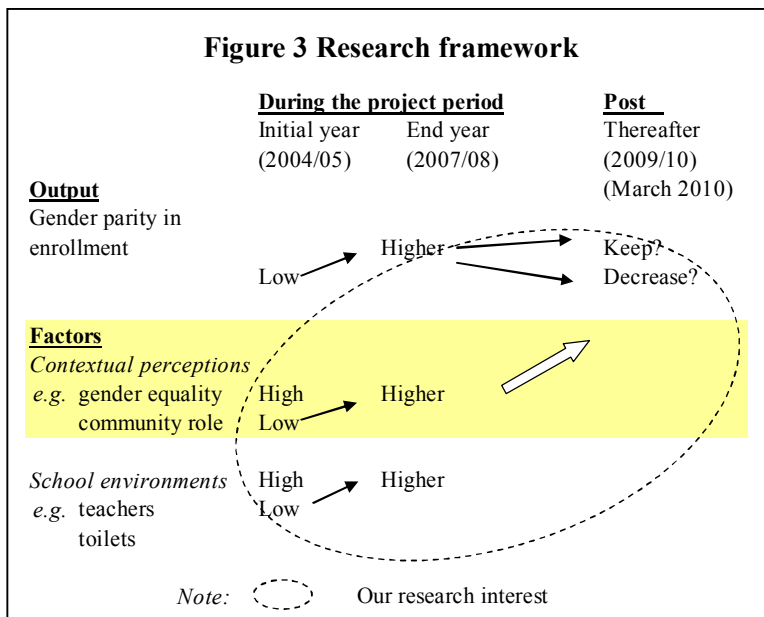
### ***Research question***

As Figure 3 illustrates, *our main research interest* is in the effectiveness and sustainability of the BRIDGE model. Particular attention is paid to the variation in degrees of achievement among pilot schools. The key questions are: To what degree have the achievements of the project been sustained? What factors are related to different performances among basic education schools?

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<sup>1</sup> BEDP -- Basic Education Development Program -- is financed by the World Bank, DFID, the Government of the Netherlands, and KFW.

<sup>2</sup> Based on interviews in Sana'a in October 2010.



The financial sustainability of SIP, the BRIDGE model's main tool, has been ensured to some extent by the promised continuation of governorate budget allocation of school grants to the BRIDGE 1 pilot schools.<sup>3</sup> Yet, it is overly optimistic to assume that continuous SIP funding can sustain the results in favor of girls. Generally speaking, there are various demand- and supply-side factors that affect girls' participation in schools (e.g., UNESCO 2003), and it is very challenging to continue to address these factors comprehensively after the project's intensive technical support and monitoring have ended. This might particularly be the case for schools where the capacity (both in skills and in resources) to manage SIP in a gender sensitive manner is low and the consciousness or willingness to promote gender parity and equality is weak. Given also the fact that the Yemeni government abolished school tuitions in 2006/07, some schools could face shortages of revenues for regular activities and thus be tempted to utilize SIP funds for activities which are not necessarily gender sensitive.

### **Data**

Using data collected for the baseline and endline surveys of BRIDGE 1 and the baseline survey of BRIDGE 2, we prepared school-level panel data for the school years 2004/05, 2007/08, and 2009/10. The panel data cover 47 piloted rural schools for which information over the three series of surveys is available regarding school, head teacher and parental modules.<sup>4</sup> These schools are in six pilot districts of the Taiz Governorate, and were selected according to education indicators (e.g. greater gender disparities in enrolment) and geographic character -- two districts on the coast, two districts in the mountain regions, and two from the center of the country (Sakurai 2007).

<sup>3</sup> On the basis of the overall achievement of Phase 1, the Yemeni government decided to continue allocating its own funds for the Phase 1 target governorate (no Japanese funds) to 59 schools (JICA 2008).

<sup>4</sup> The number of pilot schools in 2007/08 is 59 but the number of the schools for which a complete data set is available for 2004/05 is 51. The number of schools which have data for all three years is 47.

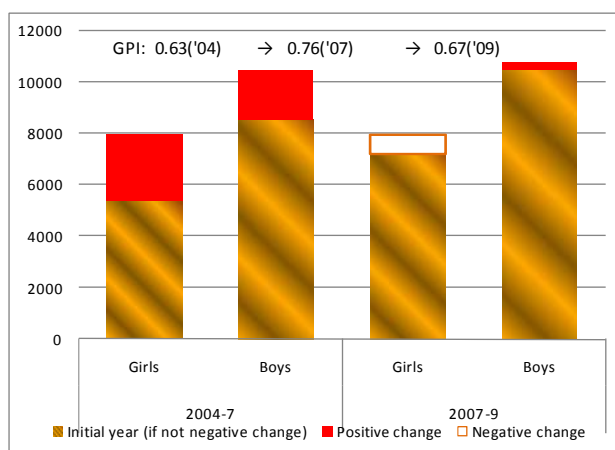
As output variables, we mainly use a proxy gender parity index (GPI) in school enrollment; that is, the female to male student ratio in basic education (grades 1 through 9 in Yemen) and the changes in GPI during the project period and thereafter in terms of percentage change or dummy variables that explain either positive or negative changes.<sup>5</sup> As for explanatory variables (input or process variables), we prepared three categories, which are assumed to be important for improving and sustaining gender parity: (i) gender perception in favour of girls and women among school leaders and parental representatives; (ii) school leaders' perceptions of participatory school-based management and practices and their linkages with local educational administrations; and (iii) school-based activities to improve school quality (supported by SIP) and changes in school environments such as facilities and availability of teachers.

### 3. Results

#### 3.1 Overview of the increase of GPI and the number of students by gender

As a whole, the panel data of the BRIDGE 1 pilot schools confirm great achievement in improving the GPI in basic education during the project period, but they indicate alarming signs thereafter (Figure 4). In aggregate, the GPI increased by 13 percentage points over the three years of the project, from 0.63 in 2004/05 to 0.76 in 2007/08; however, it then decreased to 0.67 by 2009/10. The number of female students also increased during the project, by nearly 50%, but there was a slight decrease between 2007/08 and 2009/10. The decrease in the number of girls enrolled is observed in the lower rather than the upper grades.

**Figure 4 The number of students in BRIDGE pilot schools by gender 2004, 2007, 2009**



Source: Data from BRIDGE 1 and BRIDGE 2.

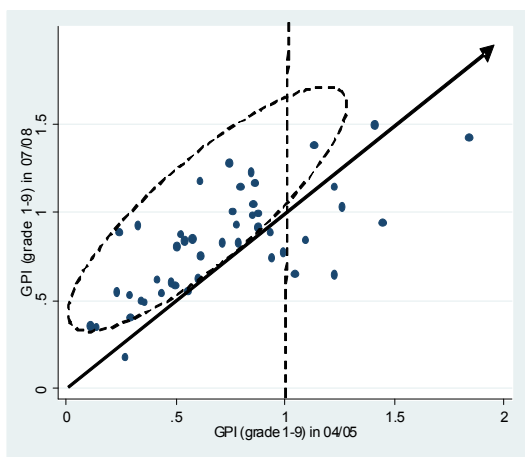
Disaggregated by school, the data also show an improvement in GPI in most of the pilot schools, except for those schools whose GPI was already high in the beginning (Figure

<sup>5</sup> In addition, we also review the increase in female to male student ratios in Grade 1-6, the increase in the share of female students in total students in Grade 1-6 or Grade 1-9, the increase in the growth ratio of female students in Grade 1-6 or Grade 1-9, and the increase in the number of female students in Grade 1-6 or Grade 1-9.

5a).<sup>6</sup> In addition to BRIDGE school-based management interventions, the Yemeni government's 2006/07 policy of abolishing school fees for female students at grades 1 to 6 and for male students at grades 1 to 3 might also have helped the pilot schools increase the number of enrollees, in particular female enrollees (Sakurai & Ogawa 2007).

However, after the project ended, although nearly half of the schools continued to experience GPI improvement, the rest experienced GPI decline in grades 1-9 (or grades 1-6, or 1-3). In those schools, the number of girl students also tended to decline (Figure 5b). Looking only at schools which improved GPI during the project, the declining GPI trend after the end of the project is evident also in Figure 5c. In sum, despite the fact that most schools improved GPI over the course of the project period, the sustainability of the achievement varies from school to school.

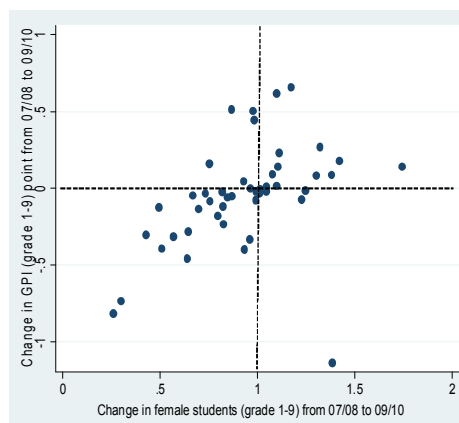
**Figure 5a GPI in 2004/05 and 2007/08**  
(Most schools improved GPI during the project)



(N=46)

Source: Authors' calculations based on the data from BRIDGE 1 and BRIDGE 2.

**Figure 5b Change in the number of female students and GPI after the end of the project**

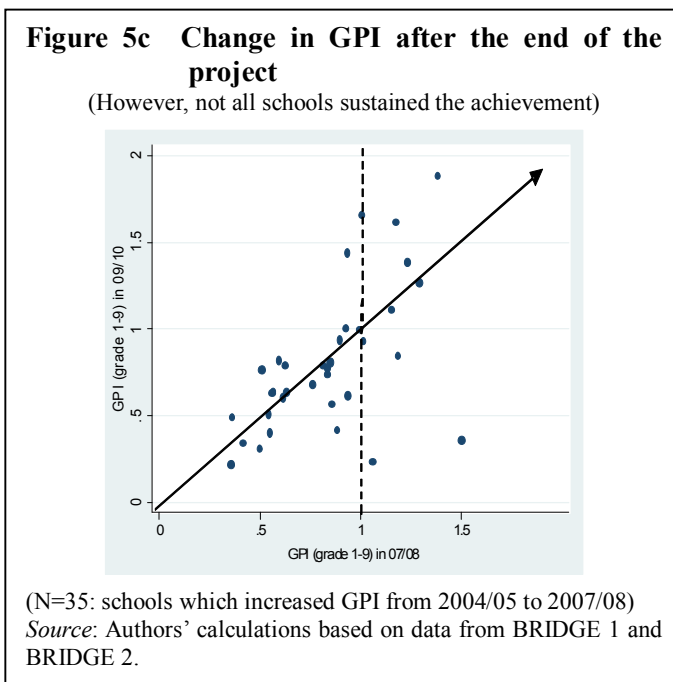


(N=46)

Source: Authors' calculations based on data from BRIDGE 1 and BRIDGE 2.

<sup>6</sup> The majority of the schools with high initial GPIs had been also supported by a girls' education program of the World Food Program (WFP), which targeted girls in poor districts exclusively. According to Sakurai (2007), BRIDGE tended to attract boys to these schools as the BRIDGE project encouraged the involvement of both boys and girls. On the great increase of GPIs during the project for the pilot schools with low bases, we also ran a simple regression model using the Ministry of Education's annual education survey data for all schools (both pilot and non-pilot) which includes data for 2004/05 and 2007/08 in two districts of the Taiz Governorate (namely Magbanah and Mawiya districts). The result shows a significantly positive coefficient of a school being a BRIDGE pilot school based on GPI change over the three school years.





### 3.2 Factors pertinent to differences in the sustainability of BRIDGE performances

To identify factors which relate to the differences in GPI sustainability between 2007/08 and 2009/10 among the BRIDGE pilot schools, we conducted t-tests of the correlations between initial conditions in 2004/05 or 2007/08 and the GPI sustainabilities of the two groups of schools: i.e., those which saw a positive change in GPI and those which did not. The t-tests also assessed whether the same factors are significantly correlated to degree of improvement during the project period. The key results are as follows:

#### (1) Perception of gender equality

In the surveys of the BRIDGE project, head teachers, parents and teachers responded to several statements related to their gender equality perceptions. These statements have a 5- or 3-level Likert scale as follows: fully disagree, somewhat disagree, don't know, somewhat agree, and fully agree; and the order of these scales depends on the statements. For example, for the statement "I support the idea that females have professional careers in society,"<sup>7</sup> "fully disagree" is coded 1 and "fully agree," as 5.

As Table 1 shows, statistically significant difference is observable in head teachers' perceptions of gender equality in the initial year (2004/05) between the two groups of schools, one with and the other without positive GPI improvement after the project

<sup>7</sup> The statements on perception are different in each year's survey. Some statements in 2009/10 are different from the form used for this paper, as below: (i) for "I support the idea that females have professional careers in society" (2004/05 and 2007/08), "Females should have professional careers in society" (2009/10); (ii) for "Females should stay home to get married,," "It's best for females to stay home after getting married"; (iii) for "If I have a son and a daughter, I prefer that my son goes to school rather than my daughter," "If you have both a son and a daughter, do you prefer your son going to school rather than your daughter,," (iv) "Basic skills of reading and writing are enough for females" was asked only in the 2004/05 and 2007/08 surveys.

ended (between 2007/08 and 2009/10).<sup>8</sup> The perception of gender equality was measured by head teachers' responses to the following statements:<sup>9</sup> "I support the idea that females have professional careers in society;" "Females should stay home if they get married;" "Males and females have an equal right to receive education;" and "The basic skills of reading and writing are enough for females' education." In particular, responses to the first two statements – which are related to gender equality beyond education – show greater difference between schools with and those without GPI improvement. As Figure 6 also indicates, schools which are led by head teachers with gender equality-oriented perceptions in the initial year are more likely to further improve the GPI even after the project has ended.<sup>10</sup>

**Table 1 t-test results in gender perceptions (2004, 2007 & 2009), between schools with positive and negative change in GPI after the end of the project (2007-2009)**

Gender perceptions	2004			2007			2009		
	Mean by schools			Mean by schools			Mean by schools		
	negative change	positive change	difference	negative change	positive change	difference	negative change	positive change	difference
"I support an idea that females have professional careers in a society" <sup>1)</sup>	1.05	2.73	-1.68*	4.47	4.73	-0.26	2.90	2.93	-0.03
"Females should stay home if get married" <sup>2)</sup>	1.95	3.07	-1.12*	3.53	3.79	-0.26	2.00	1.73	0.27
"Male and female have an equal right to receive education" <sup>1)</sup>	1.26	1.87	-0.60*	5.00	4.93	0.07	3.00	2.87	0.13
"Basic skills of reading and writing are enough for females' education" <sup>1)3)</sup>	1.30	2.13	-0.83*	3.84	4.21	-0.37	-	-	-

\* p < 0.1.

Note: The data for 2004 and 2007 have 5-scaled answers and those for 2009 have 3-scaled answers ("yes", "do not know" and "no").

- 1) "fully disagree" as 1, "somewhat disagree" as 2, "don't know" as 3, "somewhat agree" as 4 and "fully agree" as 5 ("no" as 1, "do not know" as 2 and "yes" as 3 in 2009)
- 2) "fully agree" as 1, "somewhat agree" as 2, "don't know" as 3, "somewhat disagree" as 4 and "fully disagree" as 5 ("yes" as 1, "do not know" as 2 and "no" as 3 in 2009)
- 3) It was not asked in the survey in 2009.

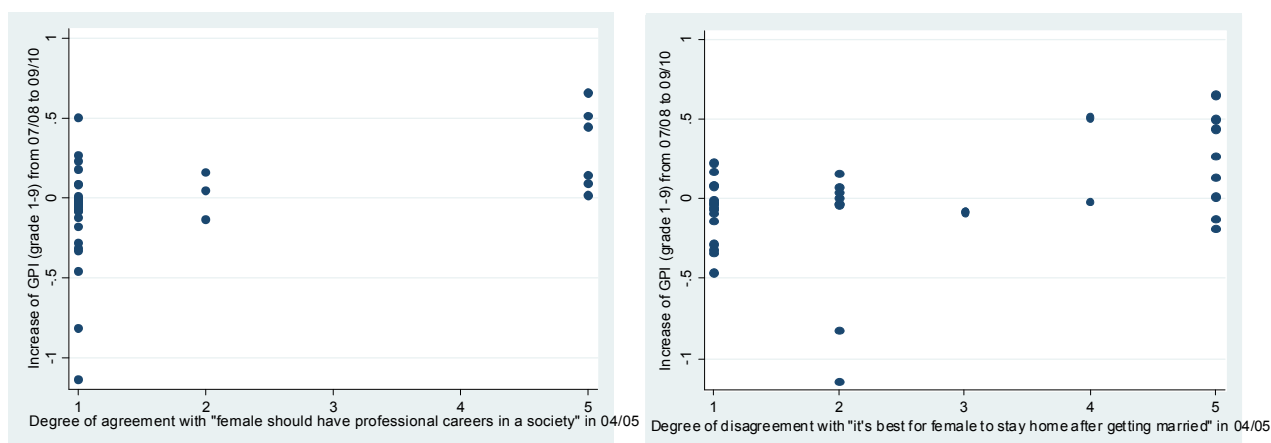
Source: Authors' calculations based on the data from BRIDGE 1 and BRIDGE 2.

<sup>8</sup> The result is the same even after excluding one case, an outlier.

<sup>9</sup> While head teachers' ages and educational qualifications vary, these characteristics are not found to be significantly correlated to favorable or unfavorable degree of perception of gender equality.

<sup>10</sup> Unlike post-project GPI, neither the initial level of GPI nor the changes in GPI during the project period appears to be significantly correlated to head teachers' perceptions of gender.

**Figure 6 School head teachers' perceptions of gender equality in the initial year (2004/05) and the change in GPI after the project ended (from 2007/08 to 2009/10)**  
 (Factors stemming from initial perceptions might not be easy to overcome.)



(N=35)

Source: Authors' calculations based on data from BRIDGE 1 and BRIDGE 2.

Such differences in head teachers' perceptions observed in the initial year seem to have disappeared by 2007/08 or 2009/10. This is mainly because the managers in most of the schools responded favorably to the gender equality concept. The proportion of head teachers who fully agreed with the statement "I support the idea that females have professional careers in society," or who fully *disagreed* with the statement "Females should stay home if they get married," shifted in favor of gender equality over the three years – from 17% to 69% and from 23% to 46%, respectively. Given also that there was less redeployment of head teachers during the project period, it appears that the perception obstacle to gender equality was mitigated during the project. However, our finding of a relationship between the initial perceptions before the project and the GPI changes after the project underscores the complexity of interpreting the head teachers' perceptual changes. It might be difficult to distinguish between real and apparent changes in their perceptions, especially in their responses at the project's end year which may reflect a social desirability bias.<sup>11</sup>

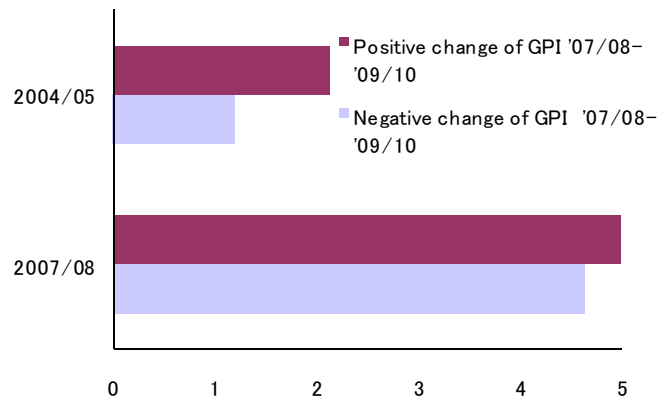
## **(2) Perception and action for improving school management**

Head teachers' perceptions of community participation tend to differ between groups with and those without GPI improvement. As Figure 7 shows, schools that demonstrated declining post-project GPI are more likely to have been led by head teachers who have weaker tendencies to agree on the need for community participation to improve education, either at the project's initial or end year. The proportion of head teachers who fully or somewhat agreed with this statement increased considerably during the project years, from 17% in the initial year to 94% in the end year.<sup>12</sup>

<sup>11</sup> That is, a tendency to couch their responses in a manner that will be viewed favorably by others. In this case, head teachers might tend more to respond in a way favored by other project stakeholders in the endline survey as compared with the baseline survey.

<sup>12</sup> Only two schools changed from "fully disagree" to "somewhat disagree." Even these schools improved their GPI during the project, though they decreased it thereafter

**Figure 7 Head teachers' views of community participation between schools with positive and negative change in GPI after the end of the project**



(N=35 (2004/05), 34 (2007/08))

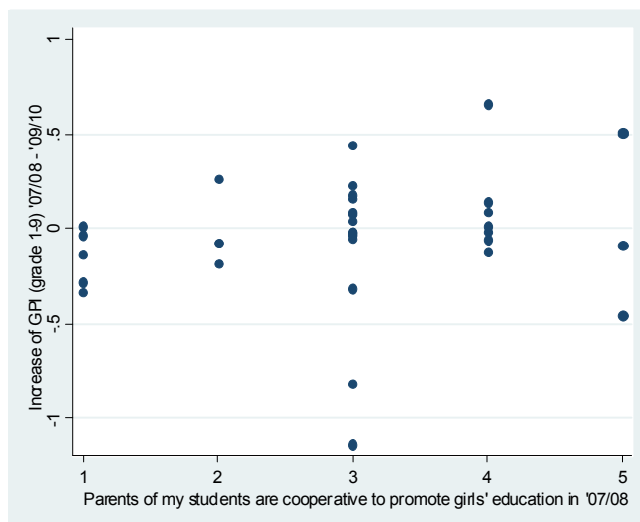
"Community participations is necessary to improve school education"

Note: The difference in mean between the two groups of schools is significant for both years.

Source: Authors' calculations based on data from BRIDGE 1 and BRIDGE 2.

The head teachers' views on parental participation specifically with respect to girls' education also seems to matter. As shown in Figure 8, while overall not a few schools declined in GPI, almost all schools led by head teachers who fully disagreed that "parents of my students are cooperative to promote girls' education" at the end of the project experienced subsequent GPI decreases. Although such responses by head teachers were not the only measures of the levels of parental support, they might serve as indicators that flag the risks of not sustaining GPI due to demand-side factors.<sup>13</sup>

**Figure 8 Head teachers' views on parents**



(N=34)

Source: Authors' calculations based on data from BRIDGE 1 and BRIDGE 2.

<sup>13</sup>Due to limitations of the data on parents' perceptions and other characteristics, this paper could not directly address demand-side factors.

As a part of the mechanism for enhancing linkages between schools and communities, BRIDGE facilitated school activation of fathers’ and mothers’ councils. In particular, the BRIDGE mechanism was intended to ensure that activities proposed by mothers’ councils were incorporated into SIP, thereby encouraging women to participate in school activities. While only a few pilot schools had mothers’ councils before the project, most of them established these councils after the project began. In 2009/10, 94% of the pilot schools had mothers’ councils. The few schools which did not have these councils by the end year of the project failed to sustain GPI afterward. However, variables such as frequency of council meetings and the size of the memberships do not appear to be significantly related to the GPI improvement in schools with mothers’ or fathers’ councils.

With regard to management collaboration within schools, according to the mean t-test, schools which successfully maintained GPI after the project was finished tended in 2007/08 to be led by head teachers whose response was “I always share plans with teachers” as compared with other schools.

On the relationship between schools and local administrators, variations exist also in the degree of communication by school heads with the District Education Office (DEO), measured by the extent to which they discuss school improvement with inspectors. In 2007/08 about 57% of the head teachers responded that they “always” discuss with inspectors, another 17% responded “often” and 23% “sometimes.” As for their purposes for communicating with DEO, results show that in 2007/08 schools sustaining GPI after the project end tended more often to “request DEO to increase the number of female teachers.” They were not always successful, however. According to correlation tests, the pilot schools which requested an increase in female teachers in 2007/08 show positive but not significant correlation with an increase in female teachers by 2009/10 (see Table 2).

**Table 2 t-test results on the degree of collaboration of school heads and relevant stakeholders (2004, 2007 & 2009) between schools with positive and negative change in GPI after the end of the project (2007-2009)**

Type of collaboration	2004			2007			2009		
	Mean by schools		difference	Mean by schools		difference	Mean by schools		difference
	negative change	positive change		negative change	positive change		negative change	positive change	
"I always share an annual plan of my school with my school"	0.60	0.73	-0.13	0.35	0.60	-0.25*	0.70	0.60	0.10
"I discuss how we can improve our school with inspectors" <sup>2)</sup>	4.60	4.53	0.07	4.26	4.47	-0.20	4.42	4.13	0.29
"Request to DEO to increase the number of female teachers" <sup>2)</sup>	3.95	3.93	0.02	3.63	4.47	-0.84*	4.70	4.69	0.01

\* p < 0.1.

Note:

- 1) "always" is coded as 1; otherwise, 0.
- 2) "always" as 5, "often" as 4, "sometimes" as 3, "seldom" as 2, "none" as 1.

Source: Authors’ calculations based on data from BRIDGE 1 and BRIDGE 2.

### ***(3) School improvement activities and enabling school conditions for girls***

The SIP, supported by school grants, was a major tool allowing schools and communities to analyze school- or community-specific obstacles to girls’ participation in education and to take action toward solutions. As anticipated from the general

observation that Yemeni rural families face basic supply-side issues as well as demand-side issues (e.g. World Bank 2010), most of the SIPs of the BRIDGE pilot schools included activities addressing some key supply-side issues – such as “constructing or repairing classrooms” and “contracting with teachers” – in addition to demand-side activities in order to raise people’s awareness of girls’ education. Following is a summary of key findings regarding the impacts of these activities on GPI sustainability.

### ***Community participatory activities***

In raise community awareness of the importance of girls’ education and to promote community participation, various activities were conducted. These included awareness meetings with mothers, and school events for honouring students with the best attendance. While the pilot schools learned from each other and engaged in similar activities, there still were variations in the ways in which specific activities were carried out and in their impact on school performance. For example, half the schools reported that for at least two years during the project they “organized school events” as activities in annual SIPs. Furthermore, the schools which successfully sustained their GPI tended to be more experienced in organizing school events than the failing schools (see Table 3). It is reasonable to assume that a sense of ownership and the confidence of community members in their schools were heightened by school events, given that such events offer opportunities for community members to be present at the school and take a part in its activities.

**Table 3 t-test results on the degree of SIP activities (2005-2007) between schools with positive and negative change of GPI after the end of the project (2007-2009)**

School activities	Frequency of activities 05-07			At least once 05-07 <sup>1)</sup>		
	Mean by schools			Mean by schools		
	negative change	positive change	difference	negative change	positive change	difference
Organizing school events	1.20	1.73	-0.53*	0.75	0.73	0.02
Hiring sewing trainers	0.60	0.80	-0.20	0.35	0.60	-0.25*
Contracting teachers	2.35	2.33	0.02	0.85	0.87	-0.02
Constructing/Repairing toilets	0.85	1.33	-0.48*	0.75	0.60	0.15
Purchasing water tanks/pipes	0.70	0.93	-0.23*	0.65	0.93	-0.28*

\* p < 0.1.

Note: 1) If the school did the activity as a part of annual SIP, the value of the variable is 1; if not, it is 0.

Source: Authors’ calculations based on data from BRIDGE 1 and BRIDGE 2.

As a practical means for attracting girls and their mothers to the school, “hiring a sewing trainer” for a sewing class was carried out by 10% of the schools in the first year of the project. This figure increased to near 50% by the final year. This is positively related to the performance of the schools in maintaining GPI after the project’s end.

### ***Teachers***

During the project years, most of the pilot schools contracted with teachers (either male or female) using school grant money. While most of the schools continued hiring on the

same status (“contract teachers”) after the end of the project, some schools succeeded in converting the status of these teachers (some of whom were female) to that of formal “government employee” whose costs are funded by the government’s “wages and salaries” budget rather than by “school improvement grants.” In fact, the number of government-employed teachers (both male and female) increased at 60% of the pilot schools between 2004/05 and 2009/10. While only 10% of pilot schools had female government-employed teachers in 2004/05, 25% of them had come to have them by 2007/08, and nearly 50% had female teachers in 2009/10.<sup>14</sup>

As expected, the share of female teachers in total government teachers in the project’s initial year, end year, or two years beyond is significantly associated with GPI sustainability (Table 4). The importance of female teachers is reaffirmed, given also that gender-aggregated variables, such as total number of government teachers or student-to-teacher ratio, do not indicate any significant difference.

**Table4 t-test results on the number of teachers and school facilities (2004, 2007 & 2009) among schools with positive and negative changes in GPI after the end of the project (2007-2009)**

Teachers & School Facilities	2004/05			2007/08			2009/10		
	Mean by schools			Mean by schools			Mean by schools		
	negative change	positive change	difference	negative change	positive change	difference	negative change	positive change	difference
Share of female teachers (gov employed)	0.00	0.04	-0.04*	0.02	0.08	-0.06*	0.06	0.11	-0.06*
Share of female teachers (gov employed and contract)	0.01	0.04	-0.03*	0.11	0.13	-0.02	0.06	0.16	-0.09*
Total number of teachers (gov employed and contract)	11.10	12.40	-1.30	14.20	15.47	-1.27	16.75	18.67	-1.92
Student to teacher ratio	38.86	43.93	-5.08	40.04	35.71	4.34	51.20	49.66	1.55
Number of female toilets	3.00	1.50	1.50	1.65	1.88	-0.23	1.50	2.17	-0.67*
Existence of female toilets	0.10	0.13	-0.03	0.85	0.67	0.18	0.89	0.83	0.06
Existence of drinking water facility <sup>1)</sup>	0.10	0.13	-0.03	0.75	0.87	-0.12	0.72	0.53	0.19
Number of classrooms	6.20	7.79	-1.59	9.39	9.43	-0.04	10.00	8.87	1.13

\* p < 0.1.

Note: 1) If the schools had the facility and the condition was not "unavailable", the value of the variable is 1; otherwise, it is 0.

Source: Authors’ calculations based on data from BRIDGE 1 and BRIDGE 2.

In addition to the practice of contracting teachers, SIPs included various activities to improve quality of education, such as teacher training, and radios and teaching materials acquisition. However, these activities do not appear to have affected the schools’ GPI performance. One reason for this may be that most of the pilot schools conducted these activities during the project. No information is available on how these inputs have been utilized differently by schools.

### **School facilities**

“Constructing/repairing toilets” is an activity much in demand. About 70% of the pilot

<sup>14</sup> Although the project endline survey does not indicate whether it is female or male teachers that schools contracted under the project’s SIP funds, project financial data do provide this information. Thus, combing both data bases, we find that the pilot schools which contracted with female teachers in SIPs actually tended to increase their share of females in total teachers from 2004/05 to 2007/08.

schools carried out this activity at least in one project year; some even repeated it in a second year. Consequently the availability of toilets for females, which is often cited as a major constraint to girls' schooling (e.g. MOE 2009), has been improved among the pilot schools. By the end of the project, nearly 80% of the pilot schools had toilets for girls, an almost 70 percentage point improvement. This may well have contributed to GPI improvement over the project years, but it cannot explain the difference in post-project performance, in part because no data is available to differentiate types, usage, and maintenance of these toilets. What we can say from Table 3 is that schools which carried out "constructing/repairing toilets" more than once during the project period tended successfully to maintain their GPI. This implies a need to improve the availability of toilets to keep pace with an increase in the number of children enrolled in school.

"Purchasing water tanks and pipes" is another popular activity. It was carried out by two thirds of the pilot schools, and thus the proportion of schools with drinking water facilities increased from 11% to 80% during the project. The pilot schools which maintained their GPI after the end of the project had a significantly higher tendency to purchase water tanks at least once during the course of the project.

#### **4. Discussion**

This paper has attempted to review the effectiveness and sustainability of the BRIDGE model, which provides a bottom-up participatory school management mechanism and tool explicitly aimed at improving gender parity in basic education in Yemen. Using data collected from BRIDGE Phase 1 pilot schools at three points in time, i.e., at the initial and end years of the project and two years after project completion, this paper examines the extent to which the project's achievements have been sustained with respect to gender parity in enrollment and what factors are related to different performances among schools. The government of Yemen, with technical support provided by BRIDGE Phase II and other donors, is presently consolidating national guidelines for school-based management; thus it is our hope that this paper will contribute to the identification of issues relevant to expansion of the model.

As a whole, the panel data of pilot schools confirm great achievement in improving the GPI in enrollment in basic education over the project period. However, they simultaneously they indicate that in the self-sustaining phase immediately following BRIDGE 1 not all the pilot schools could sustain the GPI despite direct financial support continuously provided to the schools by the Government of Yemen. Disaggregated by school, the data indicate that most of the pilot schools had improved GPI from a very low base over the course of the project, but half of them failed to sustain the achievement after the project's end. Differences in the pilot schools' post-project performances is found to be statistically significantly related to the following factors, among others assessed:

Firstly, they appear to be related to head teachers' perception of gender equality. Between the successful and non-successful groups of schools there is a statistically significant difference in head teachers' perceptions of gender equality in the initial year (2004/05). Head teachers' opinions about gender equality beyond education (such as, "I support the idea that females have professional careers in society") is especially important. However, this difference in gender perception in the initial year is not



significantly correlated to the degree of GPI improvement during the project years when various awareness and monitoring activities took place in all pilot schools and communities.

Secondly, pilot schools' performances are related to head teachers' views of community participation. Schools that demonstrated declining post-project GPI are more likely to have been led by head teachers having weaker tendencies to agree in the project's initial year that "community participation is necessary to improve school education". This is slightly noticeable also in the end year. Moreover, almost all schools with head teachers who had fully disagreed that "parents of my students are cooperative in promoting girls' education" at project's end experienced GPI deterioration thereafter, even though it might have improved during the course of the project. The project also facilitated schools to activate fathers' and mothers' councils as a part of the mechanism for enhancing school-community linkages. Most of the pilot schools established mothers' councils during the project and sustained them afterward; in fact, each target school had an obligation to start at least one activity designed to encourage women's participation in school activities (JICA 2008b). The few exceptional pilot schools which did not yet have a mothers' council by the end of the project did not sustain the GPI thereafter. For these schools, demand-side constraints might be more prominent than for other schools.

Thirdly, performance is also related to the availability of female teachers. Among the school environments which were directly or indirectly improved through the project, the availability of female teachers understandably appears to be very important. Most of the pilot schools contracted with teachers – females wherever possible – using grants for school improvement plans. While only 10% of the pilot schools had female teachers (regular teachers and contract teachers) in 2004/05, nearly a half of them had come to have female teachers by the end of the project. The share of female teachers in total teachers at the project's initial and end years indicates a significant difference between schools which sustained GPI after the end of the project and those which did not. Furthermore, schools sustaining GPI after the end of the project tended significantly more often to "request DEO to increase the number of female teachers" at the project's end year. This indicates the leadership and eagerness of head teachers to solve a key constraint typically perceived by parents.

In sum, our findings suggest that intensive interventions in school-based management with a strong emphasis on girl's education could be effective rather quickly in improving gender parity in schools from a low base, regardless of initial conditions. However, sustaining the achievement after the initial intervention ends is another matter. We have observed that post-project performance of pilot schools in terms of gender parity is mixed, even though the budgets for school grants were allocated by the local government to all the pilot schools. Furthermore, variation in performance appears to be significantly correlated with school leaders' perceptions of gender equality and community participation as well as with the number of female teachers employed. This seems to point to the importance of continuous and long-term guidance to and monitoring of schools undergoing school improvement programs, and at the same time, of attending to key factors that may influence school performance such as the ones identified in this paper.

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