

# Achieving Education for All in Yemen: Assessment of Current Status

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## I. Introduction

Historically speaking, in June 2002, the Government of Yemen was invited by the international donor community to participate in the Education for All: Fast Track Initiative (EFA FTI). Since then, it has completed two FTI requirements – Poverty Reduction Strategy Paper (PRSP) and National Basic Education Development Strategy (BEDS). The PRSP was prepared with the support of the IMF and the World Bank, while the BEDS was prepared with the support of the German Technical Cooperation (GTZ). The strategy to preparing the BEDS was to involve the education sector, from teachers, local education officials, and academia to top-level government officials, in a participatory manner. Further, many stakeholders were able to review the strategy at the first National Education Conference held in October 2002.

Based on the two documents, the Government prepared the FTI Country Proposal, with technical support from the World Bank, in order to receive additional funds from the international donor community. The proposal was successfully endorsed by the donor community in March 2003. In November 2003, the international donor community approved the FTI Catalytic Fund to Yemen. Presently, the donor community at the local level has also increased its financial support to the education sector and the Government is committed more than ever to achieve the FTI target by 2015<sup>1</sup>.

The purpose of this study is to assess the current education status in Yemen from various aspects - access, quality, efficiency, equity and public finance. The study also reviews school construction costs in comparison to the costs incurred by organizations from different industries. Finally, using a simulation model, the study will investigate the financial requirements, government financial envelope, and the financing gaps to

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attain the FTI target by 2015. This study will focus on Grades 1 to 6 (the primary cycle) of basic education (Grades 1 to 9).

## II. A Framework for Assessment (Assessment Indicators)

In the EFA FTI, an indicative framework was introduced to accomplish the high quality of universal primary education. This framework is focused on two parameters, namely - a) domestic commitment to resource mobilization; and b) quality and efficiency of service delivery. Bruns, Mingat and Rakotomalala (2003) found that the following indicators are common in successful EFA countries:

- Government spending on education;
- Spending on primary education;
- Teacher salary;
- Pupil-teacher ratio;
- Non-salary recurrent spending; and
- Average repetition rates.

These indicators are currently adapted to monitor and evaluate the status of educational development in the FTI participating countries.

Generally, when education is being assessed in developing countries, the following five areas become the foci of the assessment: 1) access (coverage); 2) quality; 3) efficiency; 4) equity; and 5) cost and financing aspects. First, access is measured by the number of students enrolled in the cycle, and by access ratios such as gross and net enrollment rates. Intake rate, commonly known as access rate in Grade 1, is also an important indicator. Second, quality in developing countries is often measured using student achievement, teacher qualification, and allocation to non-teacher items. Third, team efficiency describes the relationship between inputs and outputs - the efficiency of education can be examined internally (e.g., students flow, drop-out, repetition rates) and externally (e.g., economic returns to investing education and employment in labor market). Fourth, issues of equity are focused on gender, location, and class. Finally, the essential components of the study include assessment of public spending on the education sector, particularly among the different levels of education, as well as unit cost analysis. In addition, this study not only investigates whether public spending targets the poor but it also assesses school construction costs.

### **III. Assessing Basic Education Development (Focused on Grades 1-6 of Basic Education)**

#### **III.1. Access**

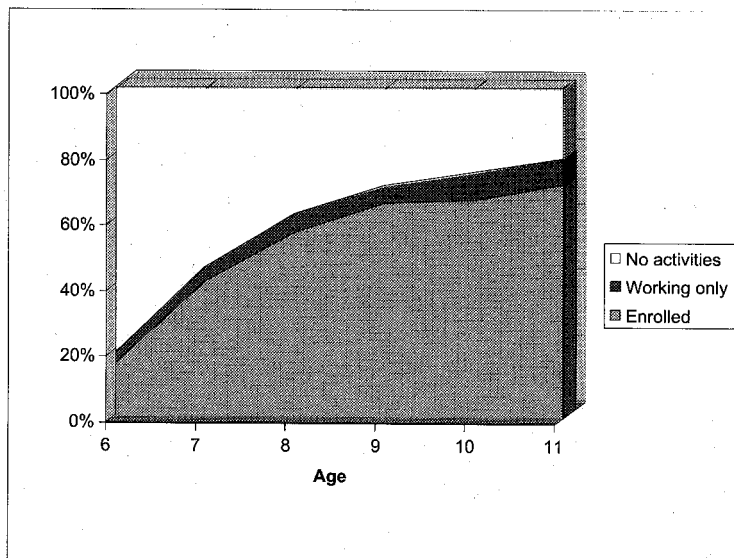
Education attainment in Yemen has shown a slight improvement in the past five years even though the level of attainment is still low. There were about 2.6 million children attending Grades 1 to 6 in Yemen in 2001, while nearly 50 percent of primary-school age children were out of school (from the 1991 school census and projected population). Figure 1 shows that the enrollment rate for younger ages is extremely low: only 20 percent of 6 year olds are enrolled in school, and this increases to nearly 70 percent by the age of 11. This would explain the phenomenon of low attainment as the result of late-year school entry although the official age for Grade 1 entrance is 6.

The gross enrollment rate (GER) at the primary level (Grades 1 to 6) has improved over the past five years from 61 percent in 1997 to 67 percent in 2001 (see Table 1). The GER for females has also improved during the same period. However, gender disparity is pronounced—the GER for females was 52 percent in 2001 compared to 81 percent for males, and the proportion of female-to-male students in primary education was less than 40 percent. Moreover, the net enrollment rate (NER) has been about 50 percent in the past five years. The proportion of repeaters among primary school students has declined from 10.6 percent in 1999 to 6.9 percent in 2001. This is partially due to the introduction of automatic promotion from Grades 1 to 3, which was implemented in the mid-1990s. The average proportion of repeaters for lower primary education has declined from 6 percent between 1991 and 1996 to 4 percent between 1997 and 2001.

According to the 1999 National Poverty Survey, only 45 percent of rural primary age children (aged between 6 and 11 years) were reported to be currently enrolled in formal schooling compared to 71 percent of enrolled urban children. Rural female students are the most disadvantaged (30 percent) compared to urban female students (71 percent). However, the youth (aged between 15 and 24) literacy rate has improved from 61 percent in 1997 to 66 percent in 2001 but the rate for females remains 36 percent lower than that for males. The 1999 National Poverty Survey also indicates that the youth literacy rate for rural females is only 27 percent compared to urban females at 82 percent.

The access rate in Grade 1 has increased from 69 percent in 1999 to 73 percent in 2001, largely due to the construction of new classrooms, allowing many out-of-school boys and urban girls to enroll at an older age. A regression analysis of the 1999 National Poverty Survey indicates that there is a strong positive correlation between school availability (distance to education) and student attendance. To increase the access rate to 100 percent in Grade 1—targeting the age group of 6 and 7 year olds—the BEDS suggested that one or two classes be built in villages farther away (2 km away) from the main school so that pupils in Grades 1 and 2 will be more likely to attend. This should also raise parent's awareness of the importance of enrolling children in the first grade at the legal age of 6. In addition, to make it easier and safer for small children to attend first grade, teams of older pupils could be formed to be responsible for younger pupils on their way to and from school (findings from the 1999 National Poverty Survey) .

**Figure 1: Distribution of enrollment by primary school age, 1999**



Source: National Poverty Survey (1999)

**Table 1. Grade-specific Enrollment in Yemen, 2001**

	1997	1998	1999	2000	2001
<b>Overall primary education</b>					
Gross primary enrollment ratio (%)	61.1	61.1	62.7	64.6	66.9
Male	78.3	78.0	79.5	79.8	81.2
Female	42.9	43.2	44.9	48.5	51.6
Net primary enrollment ratio (%) *	49.5	49.5	50.9	51.0	51.4
Male	62.7	62.6	63.9	61.2	61.3
Female	35.5	35.8	37.2	40.3	41.1
% repeaters among primary school students	--	--	10.6	8.4	6.9
Male	--	--	11.6	9.1	7.7
Female	--	--	8.7	7.0	5.5
Ratio of girls to boys in primary education (%)	34.2	34.5	35.0	36.5	37.6
Youth literacy rate (% ages 15-24) *	61.1	62.4	63.6	64.9	66.3
Male	80.9	81.6	82.3	82.9	83.7
Female	39.3	41.5	43.7	45.9	48.2
Dropout rate	7.5	7.4	4.6	4.4	5.5
Male	7.9	7.9	5.4	5.2	6.4
Female	6.7	6.6	3.3	3.3	4.6
Primary completion rate	42.9	43.7	46.1	49.6	51.2
Male	59.3	60.4	63.9	67.1	68.3
Female	25.5	26.1	27.5	31.8	33.4

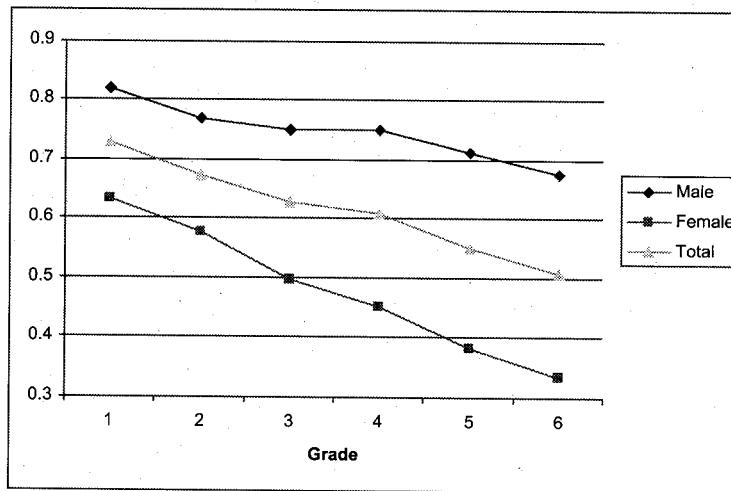
Source: Estimated by the author based on the data taken from the Ministry of Education and Central Statistics Office.

Notes: \* indicates Millennium Development Goal (MDG); Youth literacy rates are taken from the World Bank's SIMA database. The school-age population figures are Government projections.

### III.2. Efficiency

Primary education suffers from poor internal efficiency as illustrated in the grade-specific enrollment rates, while the proportion of repeaters among primary students has decreased (Table 1 and Figure 2).<sup>2</sup> In 2001, the first-grade access rate was estimated at 73 percent but the access rate declined dramatically to 51 percent by the end of the primary cycle. In other words, based on the cohort reconstruction analysis, of 100 pupils who gain access to Grade 1, only 70 will continue until Grade 6. This points towards the low level of retention and reinforces the concept that low internal efficiency is due to relatively high dropout and repetition rates (see Table 1). Accordingly, instead of taking 6 years to complete primary education, students take, on average, 8.6 years, with an even longer period for female students. Factors that may explain this difference include scattered distribution of the population, insufficient number of schools available for girls, and, in many cases, the considerable distance of schools from the population agglomerations.

Figure 2. Grade-specific Enrollment in Yemen, 2001



Source: School Census, MOE

### III.3. Equity

Gender and geographical disparities are evident in access to education in Yemen. The trend in grade-specific enrollment is similar for male and female students but, as Figure 2 illustrates, males have higher access rates in each grade than females—19 percent higher in Grade 1 and 34 percent higher in Grade 6. The primary school retention rate for female students is only 33 percent compared to 68 percent for male students. Moreover, boys and urban children enjoy greater educational opportunities and higher enrollment rates; the enrollment rate in urban areas is higher than in rural areas where about 70 percent of the population lives. Access disparities also exist among governorates—there is an undersupply of teachers in rural areas, especially female teachers, and this creates a problem in many rural areas where the importance of female teachers is paramount for bringing more girls into school. To decrease the urban/rural and male/female gaps, more classes will be built in rural areas, and for females. Some schools will work two shifts—one for girls and the other for boys—and increase the number of female teachers. Awareness must be raised in the Yemeni society as a whole on the importance of education for females. Implementation of the poverty reduction strategy, with an equally important focus on girls' education, and priorities on reducing gender disparities among regions, will help to reinforce this awareness.

### **III.4. Quality**

The quality of primary education is poor in Yemen largely due to low teacher qualification, and shortage of teaching and learning materials. For instance, the poor quality of primary education reflects to some extent the low qualification of teachers, especially in rural areas. The 2000/01 Education Survey estimates that 40 percent of teaching staff hold secondary school certificates or better, while 60 percent have completed only basic education, with one or two years of additional training. Ultimately, this is reflected in the low quality of educational achievement and outcomes. While primary school curricula and textbooks have been updated recently and in-service teacher training is being expanded, primary education still faces serious difficulties, including inadequate school buildings, and shortage of teaching and learning materials.

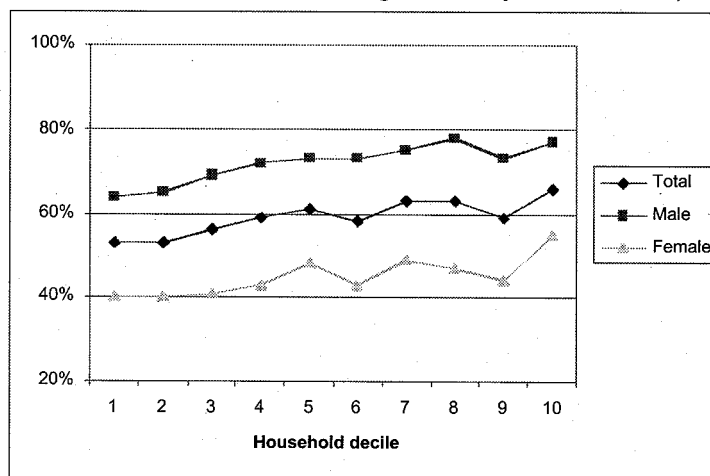
On the one hand, automatic promotion in Grades 1 to 3 introduced since the mid-1990s has reduced the proportion of repeaters among primary students in the past three years; on the other hand, the implications on quality need to be carefully assessed. An analysis of Grades 4 to 6 student achievement in four subject areas—life skills, science, math, and, Arabic language—shows that the majority of pupils have difficulty in (i) relating what they have learned in the classroom to what they observe in their environment; (ii) explaining and interpreting the meaning of phenomena due to the lack of experimentation in school; (iii) mental calculation to estimate the resolution of problems; and (iv) reading and interpreting tables and graphs. Since most students have limited reading and writing skills, they could not solve problems or answer questions on many assessments (World Bank, 1999).

### **III. 5. Possible Reasons from the Supply and Demand Side Perspectives**

Low access, internal inefficiency, and inadequate quality of primary education are explained by demand and supply side factors. Although children from better-off families tend to have greater access to school, particularly in urban areas and for secondary education, the gap between the poor and the rich is not as large for basic school-aged children. Based on the 1998 Household Budget Survey, 53 percent of children aged 6 to 11 in the poorest income decile were enrolled in schools compared to 66 percent in the richest decile (see Figure 3). The gender disparity in enrollment,

however, is consistent among all deciles.

**Figure 3. Enrollment Rate of Age 6 to 11 by Income Decile, 1998**



Source: Household Budget Survey (1998)

On the supply side, the following factors have contributed to the poor quality and access of primary education (Yemen EFA FTI Country Proposal, 2003):

- Lack of schools with latrines for girls;
- Difficulty in transportation (lack of physical access to school, particularly long walking distances to school);
- Lack of teachers - difficulties with deployment of teachers, especially female teachers, to rural areas;<sup>3</sup>
- Lack of in-service teacher training;
- Costly provision of textbooks and shortage of instructional materials;
- Inadequate proportion of female teachers and administrators; and
- Incomplete schools (schools do not offer Grades 1 to 6)<sup>4</sup>—with 6% of the students in these types of schools.

Studies [World Bank (1999, 2002), MOE (2003)] confirm that building schools with latrines for girls and deploying female teachers to rural areas will improve female students' enrollment.

On the demand side, while public primary education is free in Yemen, households are required to pay community participation and school activity fees of YR150 per



year.<sup>5</sup> In the 1999 National Poverty Monitoring Survey, households cited “difficulty in paying school expenses” as the main reason for either never sending children to school or withdrawing them early. Education services do not reach a large number of children, especially rural girls, regardless of family welfare. The main impediments to low enrollment for rural girls include the following: poverty, work to support family, cannot afford school expenses, and family’s attitudes toward girls’ schooling. Even for younger girls (aged 6 to 11), family’s attitude has been a major constraint, especially in rural areas.

#### **IV. Assessment of Public Financing on Basic Education (Grades 1-6 Focused)**

##### **IV.1. Education Expenditure Pattern**

The Government is devoting sizeable resources to the education sector. While GDP and total public expenditure on education have increased simultaneously, the share of education expenditure as a percentage of GDP has increased from 5 percent in 1996 to nearly 7 percent in 2002 (see Table 2). This trend reflects the rise in teachers’ salaries and increased investment expenditure. However, within the education sector, the proportion of expenditure devoted to primary education has declined from 46 percent in 1996 to 44 percent in 2000. A similar trend is observed in the upper grades of basic education and in secondary education (Grades 7-12) whose share have also decreased from 42 percent to 40 percent during the same period. Conversely, the share of tertiary education has increased 4 percentage points, demonstrating an increased demand for tertiary education.

The share of GDP and budget expenditure allocated to education in Yemen is high compared to most developing countries. Efficiency, however, is low as enrollment and completion rates are lower than those in comparable countries. Figure 4 shows the index of education efficiency. Yemen spent 7 percent of the public expenditure on education as a percentage of its GNP and its index of educational development is estimated as 15 — at this point in time, the dot representing Yemen is far from the frontier line that links one of the most efficient public resources users among the selected countries (those whose coverage is maximum given what they spend). This means that Yemen is not performing as well in comparison to other selected

**Table 2: Distribution of Public Spending on Education by Economic Purposes (nominal, billion YR)**

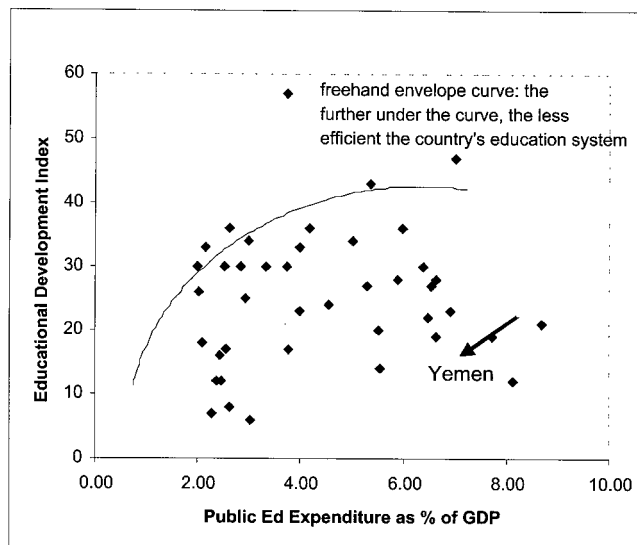
	1996 (actual)	1997 (actual)	1998 (actual)	1999 (actual)	2000 (actual)	2001 (prog.)	2002 (budget)
<b>GDP (market prices)</b>	743	897	858	1,163	1,484	1,565	1,762
<b>Total Government Expenditure (TGE)</b>	168	303	295	337	475	527	581
<b>Recurrent</b>	<b>118</b>	<b>244</b>	<b>232</b>	<b>267</b>	<b>382</b>	<b>406</b>	<b>462</b>
Salaries & Wages	74	82	94	119	141	162	186
Goods & Services	44	162	138	148	142	244	276
<b>Investment</b>	<b>50</b>	<b>59</b>	<b>63</b>	<b>70</b>	<b>93</b>	<b>121</b>	<b>119</b>
<b>Total Education Expenditure (TEE)</b>	37	46	57	67	91	105	117
<b>Recurrent</b>	<b>33</b>	<b>37</b>	<b>45</b>	<b>59</b>	<b>79</b>	<b>87</b>	<b>97</b>
Salaries & Wages	n.a.	28	34	47	61	68	77
Goods & Services (G & S)	n.a.	9	11	12	18	19	20
<b>Investment</b>	<b>4</b>	<b>9</b>	<b>12</b>	<b>8</b>	<b>12</b>	<b>18</b>	<b>20</b>
<b>Primary Education Expenditure (PEE)</b>	17	20	25	30	40	48	56
<b>Recurrent</b>	<b>15</b>	<b>18</b>	<b>23</b>	<b>27</b>	<b>36</b>	<b>42</b>	<b>48</b>
Salaries & Wages	12	15	18	22	29	33	36
Goods & Services (G & S)	3	3	5	5	7	9	12
<b>Investment</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>8</b>
<b>TEE as % of GDP</b>	<b>5.0%</b>	<b>5.1%</b>	<b>6.6%</b>	<b>5.8%</b>	<b>6.1%</b>	<b>6.7%</b>	<b>6.6%</b>
<b>TEE as % of TGE</b>	<b>22.0%</b>	<b>15.2%</b>	<b>19.3%</b>	<b>19.9%</b>	<b>19.2%</b>	<b>19.9%</b>	<b>20.1%</b>
<b>Recurrent TEE as % of recurrent TGE</b>	<b>28.0%</b>	<b>15.2%</b>	<b>19.4%</b>	<b>22.1%</b>	<b>20.7%</b>	<b>21.4%</b>	<b>21.0%</b>
<b>G &amp; S as % of Recurrent TEE</b>	<b>n.a.</b>	<b>24.3%</b>	<b>24.4%</b>	<b>20.3%</b>	<b>22.8%</b>	<b>21.8%</b>	<b>20.6%</b>
<b>PEE as % of GDP</b>	<b>2.3%</b>	<b>2.2%</b>	<b>2.9%</b>	<b>2.6%</b>	<b>2.7%</b>	<b>3.1%</b>	<b>3.2%</b>
<b>PEE as % of TEE</b>	<b>45.9%</b>	<b>43.5%</b>	<b>43.9%</b>	<b>44.8%</b>	<b>44.0%</b>	<b>45.7%</b>	<b>47.9%</b>
<b>Recurrent PEE as % of recurrent TEE</b>	<b>45.5%</b>	<b>48.6%</b>	<b>51.1%</b>	<b>45.8%</b>	<b>45.6%</b>	<b>48.3%</b>	<b>49.5%</b>
<b>G &amp; S as % of Recurrent PEE</b>	<b>20.0%</b>	<b>16.7%</b>	<b>21.7%</b>	<b>18.5%</b>	<b>19.4%</b>	<b>21.4%</b>	<b>25.0%</b>

Source: MOF, MOE,

Note: Goods and Services includes the operation and maintenance (O&M) and foreign training

developing countries in terms of education performance linked with the share of public spending on education as a percentage of GDP.

Table 2 above illustrates that the share of non-salary items in recurrent expenditure on education has been declining from 24 percent in 1997 to 21 percent in the 2002 budget. In primary education, the share of non-wage expenditure was even lower—about 20 percent between 1996 and 2001—although it increased to 25 percent in the 2002 budget. This trend exemplifies the constraints to enhancing the quality of education. In addition to reduced spending on non-salary items, shortcomings in management of operation and maintenance (O&M), the investment program, and sub-sector planning and information have contributed to inefficiencies in primary education. Primary education suffers from low internal competence of financial spending. This is apparent from the presence of 4,157 male and female teachers who

**Figure 4. Index of Educational Efficiency in Selected Countries**

Source: World Bank estimate (2004)

do not teach any period, according to the General Report of the 2000/2001 Education Survey.

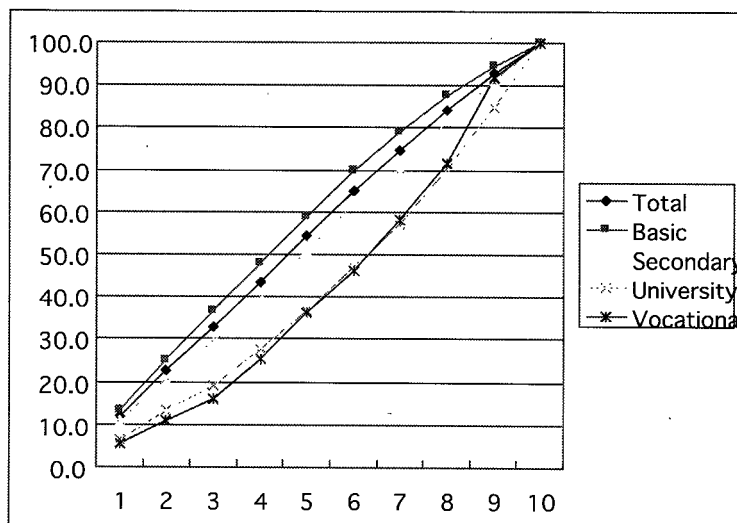
## IV.2. Unit Cost Analysis

The government has been spending a large share of national expenditure on basic education sub-sector and the local donor partners' contributions have increased significantly in the past five years. However, as a result of the high increase in school-age population, all government resources will be directed to meet the social requirements for education by building additional classrooms with more attention paid to improving the quality of basic education or decreasing the gap between girls and boys and between urban and rural areas. The unit cost (cost spent per student) in basic education (Grades 1-9) was \$98, \$109, and \$118, in 2000, 2001, and 2002, respectively. With additional external funds from sources such as FTI Catalytic Fund, BEEP2, and other donor funds, the unit costs will increase about US\$143, \$151, and \$156 in 2004, 2005, and 2006, respectively. This is expected to provide benefits to approximately 4,476,000, 4,876,000, and 5,320,000 children in 2004, 2005, and 2006, respectively.

### IV.3. Benefit-Incidence Analysis

The overall public spending on education in Yemen is equally distributed across household deciles (see Figure 5). The poorest 10 percent of households gained 12 percent of the total public education subsidies, while the richest 10 percent of households gained 7 percent of the subsidies. Public spending on basic education is also targeted to the poorer deciles. The poorest 10 percent of households gained 13.3 percent of the total public education subsidies and this share gradually declined in the richer deciles, while the richest 10 percent of households received only 5.3 percent. On the other hand, public education spending on university and vocational education favored the richer households. For instance, in university spending, the poorest decile benefited by 6.5 percent as opposed to the richest decile, which benefited by 15.1 percent. According to Yuki (2003), public subsidies reach out more to the poor in rural areas: the poorest decile received 10.5 percent of the total subsidies in rural areas compared to 9.0 percent in urban areas. The findings of the pro-poor can be explained by the following: 1) wealthy students attend private institutions; and 2) public spending on scholarships abroad is not included in the analysis. However, due to limitations of the data, these explanations cannot be confirmed (Yuki, 2003).

Figure 5: Benefit Incidence Analysis



Source: Yuki (2003)

Public spending on basic education in Yemen favors the poorest households even in comparison with other countries. For instance, the incidence of public expenditure on primary education in Cambodia and Mexico also targets the poor although it would seem that the incidence of Yemen is better off. Only Costa Rica has reached out to the poor better than Yemen (see Table 3).

**Table 3: Incidence of Public Expenditure on Primary Education**

Country	Poorest Quintile	Quintile 2	Quintile 3	Quintile 4	Richest Quintile
<b>Yemen (1998)*</b>	<b>25</b>	<b>23</b>	<b>22</b>	<b>18</b>	<b>12</b>
Bangladesh (2000)	22	23	22	19	14
Cambodia (1996)	21	22	21	20	17
Costa Rica (2001)	28	27	21	15	9
Ecuador (1998)	24	23	22	20	11
Ghana (1992)	22	24	22	19	14
Indonesia (1998)	25	24	21	18	13
Jamaica (1998)	25	24	21	19	12
Mexico (1996)	21	22	23	19	14
Vietnam (1998)	26	22	20	27	13

Source: Filmer (2003)

Note: \* Yemen is Basic education, and the indicators are taken from Yuki (2003).

## **V. Assessing School Construction Costs and Cost-Effectiveness Approach**

### **V.1. Background of School Construction and Rehabilitation**

In the past six years, World Bank supported school construction in Yemen through three projects: Social Fund for Development (1st and 2nd Phase - SFD); Public Works Project (1st and 2nd Phase - PWP); and Basic Education Expansion Project (BEEP). In these projects, the average unit cost of schools per new classroom ranges from US\$ 10,044 to US\$12,171 and the average unit cost per M<sup>2</sup> (gross area) is between US\$133 and US\$183. However, the unit costs for construction and rehabilitation works are not comparable because on average, the cost data is mixed with construction costs of new buildings and rehabilitation costs of existing buildings in the same schools.

When I examine other school construction in Yemen, the unit cost of classroom varies from US\$5,000 (UNICEF) to US\$26,000 (Japan). The unit cost of classrooms built by the Ministry of Education is between US\$14,000 and US\$16,000. The difference in costs depends on school design, type of construction, and administrative

procedures. Among the IDA projects, the unit costs reflect relatively different situations for each project<sup>6</sup>, while the materials used and types of contracts vary with each project. As such, it is difficult to compare the unit cost of one project to another. However, when compared to other developing countries, the unit cost in Yemen is very high—US\$3,100 in India, US\$3,900 in Bangladesh; US\$4,700 in Mauritania; US\$7,500 in Guinea; US\$8,200 in Brazil; and US\$10,000 in Mexico.

## V.2. Comparison of Unit Costs in Rural New Schools Building

A comparison of unit costs among the three World Bank projects can only be relevant if it addresses operations in common governorates and areas. This comparison shows that the lowest average unit cost per M2 (gross area) was in Amran with US\$115.1 and the highest was in Sana'a governorate with US\$176.2. These minimum and maximum unit costs are 20.2 percent under and 22.0 percent over the average unit cost for all new schools. However, this comparison does not take into account the distance and access factors which can increase costs up to 52 percent for remote areas and areas that have difficult access.

From a cost-effectiveness perspective, the average unit cost per M2 for new schools decreased by 7.4 percent in the past six years of implementation with different rates for each project (see Table 4). The evolution of the SFD costs shows a regular decrease until 2001. The costs of the PWP projects show a steady increase over its last

**Table 4: Unit costs for new schools /M2 by year (US\$)**

Project	1997	1998	1999	2000	2001	2002	2003*	Average	Increase
SFD	167.33	167.37	146.12	140.27	130.08	143.57	200.68	141.52	-14.20
PWP	171.93	138.47	127.08	131.74	140.02	148.60	152.37	143.12	-11.37
BEEP	--	--	--	--	135.68	154.73	162.10	157.74	19.48
Average	171.80	154.38	136.78	136.05	134.48	146.89	159.15	144.83	-7.36

Source: World Bank (2003)

four years of implementation (19 percent) while the BEEP project costs increased by 19.5 percent between 2001 and 2003. The main reason of the increase in BEEP is that under the project, the government has been building schools in very rural areas where the costs have become much higher.

## **VI. Assessment of Financial Requirement to Achieve the EFA Target and the Resource Envelop**

### **VI.1. Projection Model**

The resource gap for external financing to support the BEDS is estimated using a country-specific simulation model. This analysis focuses on the government's financial envelope and requirements between 2005 and 2010 and the model includes: i) estimates of the Government's resource envelope for Grades 1 to 6, linked with the macroeconomic framework as well as estimates of donor funding (it is assumed that current levels of donor funding for basic education will continue until 2010) ; ii) recurrent financial requirements for EFA based on assumptions, including student-teacher ratio, teacher remuneration as a percentage of GDP per capita, and number of students enrolled in publicly financed primary schools; and iii) financial requirements - both recurrent and capital investments to achieve BEEP target based on the unit cost of furnishing classrooms to accommodate more students and teachers (see Annex). The unit cost of classroom construction is based on actual costs attained in the BEEP, in which a low-cost standard design for schools and community participation for school construction was introduced.

### **VI.2. Simulation Results of Status Quo (Scenario 1)**

Based on the status-quo expenditure projection, the domestic financial envelope for primary education is estimated at US\$2.1 billion between 2005 and 2010 (or US\$345 million per year), which can be broken down into US\$1.8 billion (or US\$293 million per year) for recurrent expenditure and US\$311 million (or US\$52 million per year) for capital expenditure (see Table 5). Correspondingly, based on the status-quo assumption, the financial requirements for EFA is estimated at US\$4.4 billion between 2005 and 2010 (or US\$738 million peryear) with a recurrent expenditure of US\$3.4 billion (or US\$561 million per year) and a capital expenditure of US\$1.1 billion (or US\$177 million per year). The financing gap is simply the subtraction of the EFA requirement from the domestic resource envelope for primary education, which is estimated at US\$2.4 billion between 2005 and 2010 (or US\$396 per year) with a recurrent expenditure of US\$1.6 billion (or US\$268 million per year) and a capital expenditure of US\$751 million (or US\$128 million per year).

Table 5: Financing Gap Estimates for Grade 1 -6 of Basic Education (US\$ million)

	BEDS Requirement			Resource Envelop *			Financing Gap		
	Recurrent	Capital	Total	Recurrent	Capital	Total	Recurrent	Capital	Total
<b>SCENARIO 1:</b>									
<b>Status quo</b>									
Cumulative 2005-10	3,371	1,062	4,433	1,760	311	2,071	-1,611	-751	-2,362
Annual	561	177	738	293	52	345	-268	-128	-396
<b>SCENARIO 2: *</b>									
<b>Realistic Reform Scenario</b>									
Cumulative 2005-10	2,797	484	3,281	2,344	311	2,655	-453	-173	-626
Annual	466	81	547	391	52	443	-75	-29	-104
<b>SCENARIO 3: *</b>									
<b>Cautionary Scenario</b>									
Cumulative 2005-10	3,195	658	3,853	2,344	311	2,655	-851	-347	-1,198
Annual	532	110	642	391	52	443	-141	-58	-199

Note: \* Projected donor financing of US\$ 27.5 million per year is factored in the resource envelop.

### VI.3. Simulation Results of Reform Scenario (Scenario 2)

If the Government were to fully implement the BEDS efficiency measures, such as increasing student-teacher ratios from 25 in 2000 to 35 in 2015, and decrease the proportion of repeaters from 7 to 3 percent by 2015 (see Annex), 32 percent fewer teachers and classrooms would be required compared to the status quo of Grades 1 to 6 of the basic education system. The reform scenario projects requirements of an additional 36,000 primary teachers and 40,000 primary classrooms while it assumes 20 percent of classes operating double shifts between 2005 and 2010. The policy changes presented in this reform are due to large efficiency gains brought on by improvements in student/teacher ratios and by introducing automatic promotion to reduce the number and the cost of repeaters. At the same time, non-teacher items—quality improvement—are factored in, combined with improved resource mobilization based on the following assumptions: i) an increased share of education spending on primary education; ii) an increased amount for promoting female education and operation/maintenance; and iii) an increased share of public recurrent spending on education as a percent of public spending. If the reform were to be fully implemented, the financial requirements for EFA are estimated at US\$3.3 billion between 2005 and 2010, or US\$547 million per year (see Table 5). The Government's financial envelope for primary education is estimated at US\$2.7 billion between 2005 and 2010 or an average of US\$443 million per year. Thus, the financing gap would be estimated at US\$626 million between 2005 and 2010 or US\$104 million per year—an annual US\$75



million for recurrent and US\$29 million for capital expenditures.<sup>7</sup> This reform scenario is a very indicative financing gap estimate; thus, the financing gap could be wider depending on the pace of reform implementation.

#### **VI.4. Simulation Results of Cautionary Scenario (Scenario 3)**

This scenario assumes that if the BEDS were implemented slowly and the target indicators were not accomplished (e.g., the proportion of repeaters were 7 percent, and student-teacher ratio were 30), the financing gap for primary education would be estimated at US\$1.2 billion between 2005 and 2010 or US\$199 million per year—an annual US\$141 million for recurrent and US\$58 million for capital expenditure (see Table 5).

#### **VI.5. Elimination of School Fees**

The Ministry of Education plans to eliminate school fees for students in Grades 1 to 6 in basic education schools. The implication of this policy would be very minimal to the government financial expenditure because the total amount of the school fee would be less than 1 percent of the basic education recurrent expenditure. On the other hand, the implication for poor students would be large since school fee is one of the major factors contributing to many school-aged pupils staying out of schools.

### **VII. Summary**

In Yemen, the share of public expenditures on education has increased from 5 percent in 1996 to 7 percent in 2002. At the same time, the returns on investment in terms of access, coverage, and efficiency have improved slightly. However, there are still many areas, such as quality and equity issues, that need improvement.

The international community and the government have set MDG goals to achieve gender equity in education by 2005 and universal primary completion by 2015; however, by assessing the current status of lower level of basic education in Yemen, the study found that it is not easy to accomplish these targets on time. From the financial side, the government of Yemen has already stretched its financial allocation to education sector and the sector cannot expect further financial allocation. Although the PRSP targets the increment of education allocation to 9.6 percent of GDP by 2005,

such a high level of allocation is not realistic in the long run.

The government has just started to implement its Basic Education Development Strategy (BEDS) with support from the donor community. As mentioned above, there is still room for improvement where high quality of basic education for all children is concerned. The most important policy actions need to focus on how public resources get spent effectively and efficiently. Equity issues on disadvantaged students, such as rural girls, should be given government priority.

## Notes

- 1 One of the key targets for the FTI is to accomplish universal primary education, specifically to achieve 100 percent of completion rate in Grade 6 of the basic education in case of Yemen.
- 2 Grade-specific enrollment ratio is calculated for each grade (and not for the primary cycle as a whole). It is the number of non-repeating students enrolled in that grade, divided by the number of children in the age cohort. Since the school-level statistics do not provide the number of graduates from the primary cycle, the grade-specific enrollment rate in grade 6 is one way to measure the target of EFA.
- 3 Twenty-one % of teachers in primary education in Yemen are female in 2001—46% in urban areas, only 8% in rural areas.
- 4 In 2001, 10 percent of the basic education schools (grades 1-9) are incomplete and 6 percent of the basic education students are enrolled in such schools.
- 5 The community participation fee is YR150 a year. In 1998, MOE exempted poor girls from this fee but implementation of this policy varies and depends on the school administrator.
- 6 It is because (i) the school annexes are not the same for each project and the PWP usually provides less facilities than the two other projects; (ii) the distribution of the construction works between rural and urban areas is different for each project with 100% in rural areas for the BEEP (94% for the PWP and 86% for the SFD) where the construction is more expensive due to the difficult access to many sites; (iii) the different lengths and periods of implementation with the BEEP spending 89% of its total expenditure in 2002 and 2003, just after an important increase of the construction materials on the Yemeni market; and (iv) the differences between the three projects in materials used for the construction. (World Bank, 2003).
- 7 Based on the assumption of the improvement of resource mobilization by 2010, the recurrent resource envelop for primary education is feasible since the share of the recurrent envelop as a percentage of GDP in 2010 is lower than in 2001.

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## Annex

## The Simulation Model

Table A.1: Simulation Model in Yemen and the 2015 Target Parameters: Three Scenarios

	Base year data (Grades 1-6)	Target for 2015 under alternative simulation scenarios		
		Scenario 1 Status Quo	Scenario 2 Realistic Reform Scenario	Scenario 3 Cautionary Scenario
Yemen	2001	2015	2015	2015
GDP (millions of YR), 2000 & annual growth rate, 2001-2015	1,564,690	3.3%	4.7%	4.7%
GDP per capita (YR)	86,976			
Exchange rate (YR/US\$)	168.7			
Total population (thousands), 2000 and annual growth rate, 2001-2015	17,990	3.0%	3.0%	3.0%
School age population (in thousands), 2001 and annual growth rate, 2001-2015	3,953	3.7%	3.7%	3.7%
Total public domestic revenue, excl. grants (millions of YR)	550,771			
Public domestic revenue (excl. grants) as % of GDP	35.2%	30% *	30% *	30% *
Recurrent spending on education as share of government revenue	15.8%	15.8%	20.0%	20.0%
Public spending on primary education as % of total public spending on education	48.0%	48.0%	50.0%	50.0%
Total public recurrent spending on education (millions of YR)	87,000			
Total recurrent spending on education as % of GDP	5.6%			
Total domestic public resources for primary education (millions of YR)	41,720			
Number of pupils enrolled in primary education (6 years)	2,643,512			
Repeaters as a % of total primary school enrollments	7%	7%	3%	7%
Target year for intake rate				
Completion rate (%)	51%	100%	100%	100%
Intake rate (%)	73%	100%	100%	100%
Target year for intake rate to reach 100%	2010			
Gross enrollment ratio (%) (memo item)	67%	107%	103%	107%
Share of pupils in private schools (%)	1.4%	1.4%	5.3%	5.3%
Number of pupils in public primary education	2,606,503			
Number of pupils in private primary schools	37,009			
Number of teachers in public primary schools (grade 1 to 6)	104,335			
Attrition rate of teachers (% per annum)	1.6%	1.6%	1.6%	1.6%
Number of certified teachers	41,734			
Number of uncertified teachers	62,601			

(Table continues on the following page.)

		Target for 2015 under alternative simulation scenarios		
		Scenario 1	Scenario 2	Scenario 3
Yemen	Base year data	Status Quo	Realistic Reform Scenario	Cautionary Scenario
	2001	2015	2015	2015
Pupil-teacher ratio in public primary education (average grade 1 to 6)	25	25	35	30
Section-teacher ratio in public primary education (average grade 1 to 6)	0.9	0.9	1.0	1.0
Average annual teacher remuneration as a multiple of per capita GDP	3.2	3.2	3.5	3.5
Total teacher remuneration (million YR)	29,204			
HIV/AIDS (% increase to the teacher remuneration bill)	0.0%	0.0%	0.0%	0.0%
Spending on inputs other than teacher salaries (% of teacher salary bill)	30%	30%	36%	36%
Public subsidy for private schools (million of YR)	0			
Public subsidy per pupil in private schools (YR)	0			
Maternal and double orphans as % of population				
Subsidies per maternal and double orphan (US\$)	0			
Cost per furnished classroom, incl. Latrines (thousands of YR)	2,186	2,186	2,186	2,186
Number of teachers per classroom *	1.45	1.2	1.2	1.2

Note: \* Public domestic revenue (excl. grants) as % of GDP in 2001 is very high compared to other years. Thus, the target indicator of 30 percent is set.

Target indicator of 1.2 is used because we assume 20 percent of classes would consist of double shifts in the next 15 years.