

POLICY NOTE 7

Capital investment in the education sector

Egypt Public Expenditure Review
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About this Policy Note

This Note is part of a program of work carried out under the Egypt Public Expenditure Review (PER), launched in October 2004. It is one of three notes so far on the education sector but, given the subject, may have implications for other sectors as well. This analysis was requested by the Minister of Finance of Egypt as part of the PER. While some of the material is more technical and the level of detail greater than most of the other notes in the PER series, we do address structural issues related to the overall manner in which schools are financed and built in Egypt and how that relates fundamentally to issues of effective public expenditure. The technical analysis is designed to help respond to the government of Egypt's decisionmaking needs in the short run, while the structural analysis is designed to help guide more fundamental reforms in the medium and longer terms.

This note was written by Hernando Garzón, consultant, and Alec Ian Gershberg, consultant, under the general direction of the PER team leader, Richard Allen, Social and Economic Development Department of the Middle East and North Africa Region (MNSD). The field work was mainly done on a mission to Egypt, January 10–20, 2005, and supplemented with field work in Egypt, July 1–August 10, 2005. We greatly appreciate the quantitative and qualitative support and input of Dr. Mohammed Ragheb, national consultant. We thank Bilal Erdogan, MNSD, for able research and analytic assistance, and Don Winkler and Jeffrey Hammer for helpful comments as peer reviewers.

For a list of other policy notes in this series, see [http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/MENAEXT/EGYPTEXTN/0,,contentMDK: 20601542~pagePK:141137~piPK:141127~theSitePK:256307,00.html](http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/MENAEXT/EGYPTEXTN/0,,contentMDK:20601542~pagePK:141137~piPK:141127~theSitePK:256307,00.html).

Contents

Acronyms and abbreviations	iii
1 Introduction	1
2 Is there an infrastructure gap?	2
Infrastructure needs	2
How needs compare with current yearly supply	3
3 How well does Egypt invest in educational infrastructure?	6
4 Institutional challenges and issues	8
Main institutional challenges	8
5 Efficiency of investment decision-making: The budget cycle	10
Expenditure efficiency	11
Supply efficiency	12
Demand efficiency	13
Maintenance efficiency	13
6 Main policy options	16
Policy options to close the infrastructure gap	16
Policy options to improve planning and budgeting	17
Policy options to enhance supply efficiency	18
Policy options to enhance demand efficiency	18
Policy options to close the maintenance gap	18
Policy options for decentralization	18
Annex 1 Policy matrix	20
Annex 2 ACS target scenarios	22
Notes	23
Bibliography	26

Figures

1	Real capital investment trend	4
2	International comparisons of public expenditure on education	4
3	School unit costs across alternatives	12
4	Gap in school maintenance expenditure	15

Tables

1	Estimates of the infrastructure gap under current government assumptions	3
2	Distribution of schools by ACS	6

Boxes

1	GAEB goals and targets	3
2	The role of donor investment	5
3	The budget cycle: Capital expenditures—Specific steps and timing	11
4	Inadequate resources for school maintenance	14

Acronyms and abbreviations

ACS	average class size
CARE	Cooperative for Assistance and Relief Everywhere
CAPMA	Central Agency for Public Modification
CDC	Cairo Demographic Center
GAEB	General Authority for Educational Buildings
GDP	gross domestic product
LE	Egyptian pound
LMIC	low- and middle-income countries
MoE	Ministry of Education
MoF	Ministry of Finance
MoP	Ministry of Planning
NIB	National Investment Bank
OECD	Organisation for Economic Co-operation and Development
PER	Public Expenditure Review
UNDP	United Nations Development Programme
USAID	United States Agency for International Development

1

Introduction

As part of public expenditure policy, particularly in the education sector, the government of Egypt wants to identify specific potential for savings in sectoral spending by enhancing expenditure efficiency. The government is especially interested in determining whether there is a significant gap between needed and current educational infrastructure, as well as in assessing expenditure efficiency in infrastructure. The government is focused on identifying opportunities to improve investments in schools for primary, preparatory, and preuniversity education.

There are serious concerns within the Ministry of Planning (MoP) and the Ministry of Finance (MoF) that the schools built by the General Authority for Educational Buildings (GAEB), the agency¹ in charge of contracting for construction, are too expensive and not efficiently located or matched to local needs. It is not clear how many more schools are needed or whether there is a gap in infrastructure. Hence, there is uncertainty about how much of the budget should be allocated every year for school construction.

There are claims within the government that many new schools are located where no efficient use can be made of them, while many areas urgently need schools. Therefore, in recent years budgetary authorities have been somewhat reluctant to allocate additional financial resources for new schools. Furthermore, some donors have reallocated part of their resources from school construction to school maintenance, arguing that schools are not properly maintained. Several governors, meanwhile, claim that many of these problems could be resolved if governors were given authority over school construction and contracting, as well as a greater role in school maintenance.² For all these reasons, the government is interested in exploring decentralization opportunities that may include reassignments in the decision-making process for sectoral expenditures.

While focusing on the education sector, this Policy Note raises issues concerning the budgeting process and the system of allocating budgetary resources for capital investment and maintenance expenditures. These issues are directly relevant to improving efficiency in delivering such other key public services as health care, water, and transportation (also being reviewed in the PER).

This review has four objectives. First, it assesses the adequacy of sectoral capital investments to determine whether there is a gap in education infrastructure. Second, it evaluates how well investments are distributed across the population areas they intend to serve. Third, it examines sectoral institutional arrangements regarding the efficiency and effectiveness of the procedures for determining both the level of capital investment and the level of maintenance of the infrastructure. Fourth, it evaluates the cost efficiency of investments and explores opportunities for decentralizing the provision and maintenance of educational infrastructure. The emphasis is on estimating the need for new schools as well as determining the use made of existing schools and the resources needed for an adequate level of maintenance. Based on the findings, this review suggests specific policy options for improving efficiency in each area (annex 1).

2

Is there an infrastructure gap?

Infrastructure needs

The current population of school-age children is approximately 11.5 million, and the gross enrollment rate is about 97 percent. These students are taught in about 25,000 school buildings of 11–12 classrooms each, which totals about 277,000 classrooms nationwide. The average class size (ACS) is 40 pupils.³ But this figure requires extensive discussion. There is wide variation across jurisdictions, and class sizes can range from as few as 10 students in the most remote desert areas to more than 70 in large urban areas. Thus, the underlying conditions that school construction must address involve access, to some extent, and quality, to a greater degree.⁴

Prominent analysts, both in the government and independent from it, have made popular calls for more capital investment in education. For instance, the influential United Nations Development Programme's (UNDP) Human Development Report for Egypt (2004), a joint effort of UNDP and the MoP, argues:

One of the biggest obstacles facing the education system is [the] budgetary constraint. Increases in budget allocations to education do not meet demand. For example, with regard to school buildings and infrastructure, it is estimated that there are 3,730 primary and 1,729 preparatory schools that will be needed by 2007 (El Baradei 2000; MoE 2001). Currently, class density can reach 70 pupils per class in certain areas (UNESCO 2003).

Combining the UNDP estimates for primary and preparatory schools suggests that about 5,459 additional schools may be needed by 2007. Building about 1,820 new schools a year over the next three years would close this gap in 2007. These estimates are compared below with calculations that take into account other policy criteria. Neither the UNDP's argument regarding the GAEB's budgetary limitations

nor calls from the GAEB and the MoE for increased school construction budgets address significant inefficiencies in the GAEB's capital expenditures. These inefficiencies are caused by a fairly high unit cost per classroom, the elimination of which could produce fiscal savings. Nonetheless, some practical estimates⁵ of the need for additional schools must be considered. These figures are thus important as a point of reference.

Compared with UNDP data, GAEB figures indicate a much greater need for new investment in school buildings. According to the GAEB, approximately 7,669 schools have a class size between 41 and 70 students, 3,844 schools operate more than one shift, and 700,000 children lack access to schools.⁶ The question for the GAEB is how many schools are needed not only to bring class sizes to adequate levels, but also to be able to operate in one shift and to offer access to all children (box 1). These are stated policy goals of the GAEB and the MoE and do not necessarily reflect our judgment about the right policies. In fact, significant analysis should be done to determine whether the costs of eliminating all double shifts outweigh the benefits of having additional resources to spend elsewhere.⁷ This analysis should also consider additional

The GAEB's policy goals and construction targets argue for four assumptions:

1. No classes larger than 40 students.
2. No double or triple shifts.
3. No real changes in the ways schools are planned, designed, located, and built.
4. No reallocation of resources or teachers between jurisdictions.

Each goal should be judged through detailed cost-benefit analysis, taking into account the complex issues of educational production, the equity of educational opportunity, and the likely effect on educational outcomes for a wide range of students in a wide range of schools.

Clearly such analysis lies outside the scope of this study. This large and crucial research agenda requires significant commitment by both the government and the donor community. The World Bank's education sector strategy paper will address the need to define such an agenda and perform a small part of it.

policy innovations designed to minimize the time that capital invested in schools is unused—innovations such as year-round schooling and alternative uses for school buildings.

Acknowledging the debate in the international education literature about the optimum ACS, we first consider four basic scenarios to reduce ACS (table 1 and annex 2).

The first scenario estimates school needs using an ACS of 40, the national average. The second and third scenarios simulate an ACS of 35 and 30, which may be considered as the middle of the road, while the fourth scenario examines the more ambitious target of an ACS of 25. These initial analyses make four assumptions (see box 1) and do not account for any changes in current construction methods or inefficiencies in school construction. For instance, we do not yet consider strategies for selectively reducing class size other than simply building more schools, largely as they are currently built. But this is an important benchmark to establish.

But, in terms of policy implications and based on empirical findings, ACS targets for primary and preparatory schools should not be the same for all grades. The specialized literature argues that the greatest learning benefits may be achieved during the first years of schooling (first and second grades). So, this important policy question merits more in-depth analysis—particularly of ACS by grade level—to identify

specific infrastructure needs (beyond the scope of this Note).⁸

How needs compare with current yearly supply

During the past 15 years (1990–2005) nominal capital expenditures in education have grown, though they have experienced significant ups and downs, particularly recently.

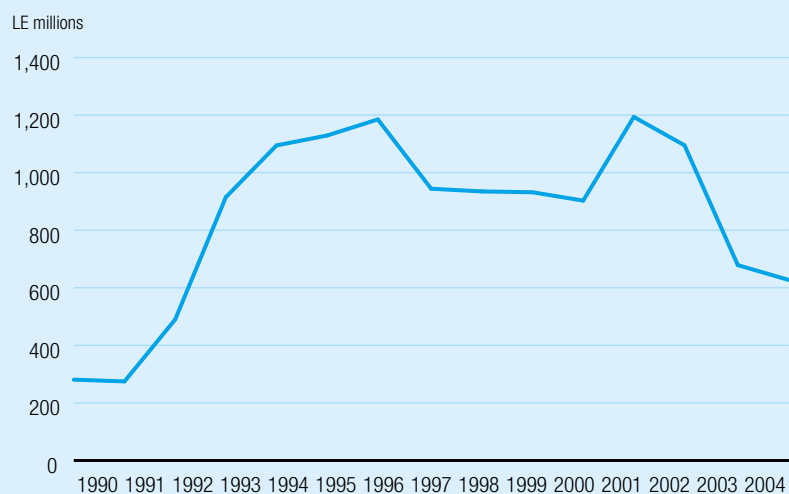
Current investment levels show a dropping trend in growth (figure 1). But Egypt's overall education spending is still high when compared internationally (figure 2). The substantial drop⁹ is due partly to a four-year period (1999–2002) of relatively high levels of investments in educational infrastructure (LE 2,712 million at its highest, in 2001) and partly to the stabilizing school-age population. But real capital expenditures in educational infrastructure over the period have grown at a significant 5.9 percent

Table 1 Estimates of the infrastructure gap under current government assumptions

ACS: Different scenarios	Number of schools needed				Total
	To lower ACS	To eliminate two shifts	To lower ACS in two-shift schools	To reach 100% enrollment	
40	1,917	1,922	0	1,458	5,298
35	2,554	1,922	481	1,667	6,623
30	3,328	1,922	961	1,944	8,156
25	4,080	1,922	1,442	2,333	9,777

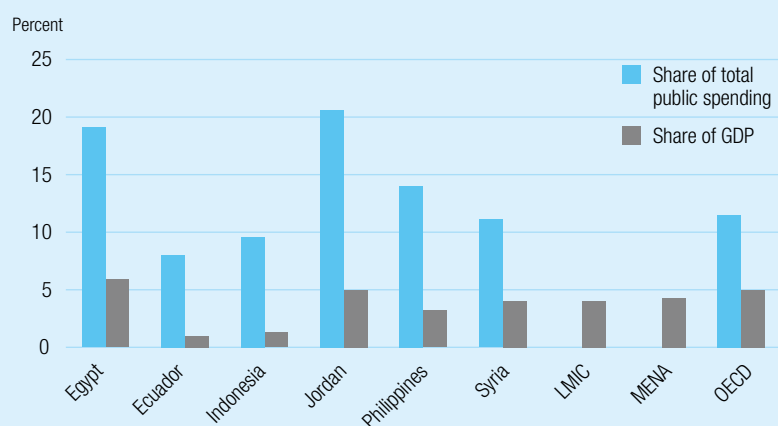
Source: GAEB data and author's estimates.

Figure 1 Real capital investment trend



Source: GAEB data and authors' calculation.

Figure 2 International comparison of public expenditure on education



Note: LMIC = low- and middle-income countries. MENA = Middle East and North Africa. OECD = Organisation for Economic Co-operation and Development.

Source: World Bank, EdStats.

per year. And public investment in educational infrastructure, while dropping as a proportion of gross domestic product (GDP) and overall educational expenditure, still ranks Egypt at the very high end of educational capital investment among countries in its region, other low- and middle-income countries (LMIC), and even countries in the Organisation for Economic Co-operation and Development (OECD).

In terms of public policy, considering the trend in investment and the goals of equity and efficiency, these results suggest the importance of reexamining the priorities in the allocation of resources within the sector. The questions are whether the real growth rate is adequate for current sectoral needs, what the expected effect of new investments would be, and how efficient this investment is compared with opportunities to address other crucial educational needs.

The efforts of the government, together with the support of foreign donor investment to meet the demand, are expected to have some budgetary effect on the new schools' operating costs (box 2). Also, because capital and operating expenditures are managed by two institutions, significant allocations are out of balance in current and capital expenditures. So it may be prudent to consider the effect on the sector as a whole of capital expenditure planning. Hence, the next section briefly attempts to examine the expected effect of new investments on sectoral operating cost.

Egypt's education sector enjoys financial and technical support, mainly for school construction, in the form of loans (up to US\$50 million) from multilateral organizations and grants (as large as US\$35 million) from donors. Generally, both loans and grants are targeted to specific governorates. Foreign resources for school construction should be coordinated so their allocation is consistent with the highest sectoral priorities: meeting the demand to ensure 100 percent primary enrollment, reducing high class densities, eliminating two-shift schools, reducing construction unit costs, and facilitating the dissemination of examples of good models and best practices.

Donors: Summary of operations

Donor	Contributions	Number of schools
World Bank	US\$100+ million	881
German government and KfW	DM 131 million Euro 15.5 million	530
Arab Fund for Economic and Social Development	Dinar 45 million	455
Saudi Fund for Development	Saudi riyal 100 million	178
Kuwait Fund for Arab Economic Development	Kuwaiti dinar 10 million	130
European Community	US\$36.5 million	111
China grant	Yuan 120 million	110 sites for a Remote Education System Network
African Fund for Development	US\$35.4 million	109
USAID/CARE/EHAF	US\$19 million	70
Islamic Bank for Development	US\$37 million	51
Japanese government	US\$20 million	30
Egyptian-Italian Debt Swap for Development	LE 69.4 million	23

Source: Author's calculation based on MoE information.

3

How well does Egypt invest in educational infrastructure?

Despite the relatively high level of spending in education, the system could improve both its efficiency (for example, ACS) and its effectiveness in reaching and graduating all of the population it is supposed to serve. However, before specific recommendations can be offered on how to improve the quality of the physical conditions of the learning environment (and consequently graduation rates), the use of and access to existing schools, and the criteria for choosing their location, need to be examined in more detail.

This section addresses how well distributed educational investments are in terms of matching actual demand. As an indicator of the adequacy of this distribution and how much use is made of capital investments, this review uses ACS per school. Data on ACS are actually available for the aggregate of all schools by governorate and consolidated for the country. The results show a rather broad variance in class size. Most schools (72 percent) have an ACS of 40–50 students. Eighteen percent have an ACS of 10–30 students, while 9 percent have an ACS of 60–70 (table 2). Though in relative terms these results might resemble a normal distribution, in absolute terms they deserve closer examination, given their social implications.

The findings suggest several conclusions. First, the ACS for many schools is fairly high.

Significant portions of the existing educational infrastructure seem overburdened, with a likely detrimental effect on student learning. This situation is likely most acute in the poorest urban areas. In absolute numbers, these results suggest that the number of schools in the country with overcrowded classrooms may be as high as 13,000. Based on GAEB information, the number is at least 7,669. Second, a gap seems to exist in educational infrastructure, particularly in those areas where the current infrastructure is overburdened and in the 2,898 areas where infrastructure simply does not exist.¹⁰ The ACS results could also suggest a shortage of teachers. However, the student-teacher ratio is about 22 for primary schools and about 20 for preparatory schools. These figures indicate no shortage of teachers but rather shortages of classrooms and schools, and poor distribution of teaching

Table 2 Distribution of schools by ACS

ACS	10	20	30	40	50	60	70	80	90	100	Total
Number of schools	281	707	2,227	6,596	6,527	1,390	230	80	28	6	18,072
Percent	2	4	12	36	36	8	1	0	0	0	100
	10–30		40–50			60–100					
Percent	18		72			9				100	

Source: MoE/GAEB.

resources across schools.¹¹ Furthermore, adding the medium (72 percent) and high (9 percent) ACS results given above shows that at least half the educational infrastructure is overcrowded. Consequently, the ACS indicator seems to suggest some need for more primary and preparatory schools—but only if they are effectively planned, constructed, located, and staffed.

When analyzed across governorates, the ACS results show significant variation. In the rare governorate, such as Matroh, more than one-third of the schools enjoy an ACS of about 20 students, in contrast to such governorates as

Medina and Fayoum, where 55 percent and 61 percent of the schools, respectively, have an ACS of 50 students. Given this situation and given at least short-term civil service constraints, there is also a need for more schools in some areas because a significant number are overburdened, which likely compromises the quality of the learning environment.

Careful analysis of new school construction and location, school and classroom unit costs, and school rehabilitation and maintenance is critical. Examination of these aspects is taken up in the following sections.

4

Institutional challenges and issues

It is important to assess the institutional arrangements for key sectoral aspects—such as decisionmaking on budgeting for new schools, forecasting and investment planning, construction and contracting, and school rehabilitation and maintenance—to determine their economic implications for the current assignment of expenditure responsibilities.

Main institutional challenges

Most responsibilities regarding forecasting and planning, school construction and contracting, and school rehabilitation, as well as most maintenance, fall under the same institution (the GAEB). Almost all phases of the project cycle are the exclusive responsibility of the GAEB as well. Investment decisionmaking happens in six phases:

1. *Identification:* The GAEB identifies needs through its own information system and its regional offices in each governorate. Sub-national administrative units participate in making investment decisions—except for land donations for school sites—in only limited ways. Neither needs identification nor project preparation benefit from formal participation by the community (the beneficiaries)—or their representatives, the districts (idarah), or the governorates.
2. *Investment planning:* To determine capital investment needs, the GAEB forecasts the growth of the school-age population for all localities. Then, using its own forecast, it plans investment in school construction for the nation's Five-Year Plan, as well as the specific amounts for each year.¹² Based on this plan, and subject to approval by the MoP of its yearly budgetary requests, the GAEB also tenders contracts for school construction to private firms.¹³
3. *Construction:* Contractors operate on the basis of disbursements made to them by the National Investment Bank (NIB), which manages the capital funds and disbursements subject to invoices for school construction progress and completion. Once schools are built, the GAEB is responsible for contracting for and approving all school equipment and furniture. The new buildings remain the responsibility of the GAEB until the end of the fiscal year in which they were built. In the following fiscal year they are handed over to the MoE for operation and maintenance.
4. *Supervision and evaluation:* The GAEB supervises construction, and the NIB is in charge of disbursing funds on the basis of implementation progress. Responsibility for evaluating school projects, however, has not been assigned to any institution.
5. *School location:* In principle, the GAEB database identifies places where schools are needed; however, the GAEB is not responsible for ensuring the availability of sites for new schools. That responsibility lies with the governorate, which generally contributes land for the new schools.
6. *School maintenance:* Several institutions have responsibility for school maintenance, including the MoP/NIB, the MoE, the GAEB, the governorates, and the schools themselves. This responsibility has been

divided into three types of maintenance. The MoP primarily allocates resources for capital investments and is also in charge (through the GAEB) of school operations, repairs, and maintenance during the fiscal year in which school construction is completed. Responsibility for operation and maintenance is then handed over to the MoE for five years. At that time periodic and emergency maintenance become the responsibility of the GAEB, while the schools carry out basic or daily maintenance using their own resources (with or without financial help from the governorates).

Until recently, 50 percent of school fees (collected directly by the schools) had to be transferred to the GAEB, 30 percent stayed in the schools to finance simple daily maintenance, and 20 percent was sent to the governorate. More recently, the MoE has allowed most of the funds from fees to stay at the school, a policy that should affect basic maintenance but that will also strain already insufficient funds for maintenance in poor jurisdictions. There is no established procedure or mechanism in the budgeting process for estimating the resources needed to adequately maintain new schools, through either the MoP or the MoE.¹⁴

5

Efficiency of investment decision-making: The budget cycle

The expenditure side of the national budget is divided into three broad accounts—salaries (chapter 1), maintenance (chapter 2), and capital expenditures (chapter 3).¹⁵ Each chapter consolidates the expenditures of the line ministries, the service agencies, and the 26 governorates (or “local governments”).¹⁶ Recurrent expenditures (chapters 1 and 2) are managed directly by the MoF, while capital investment (chapter 3) is administered by the MoP in close coordination with the MoF (box 3).

Each line ministry, service agency, and local government¹⁷ makes annual requests to the MoF and the MoP for recurrent and capital expenditures.¹⁸ The GAEB operates independently of MoE headquarters and relatively independently of the governorates (see Policy Note 6 on budget construction and reconciliation). Requests for recurrent and capital expenditures generally are made based on historical figures as well as national plans (which may or may not reflect reality). Explanations and justifications of budgetary requests and final agreements on amounts take place between the spending institutions and the MoF (for recurrent expenditures) and the MoP (for capital expenditures). The GAEB’s investments are supply driven: “The demands of the governorates or the MoE headquarters [or the households (beneficiaries)] do not figure prominently in the GAEB decision methodology” (World Bank 2005a, p. 21).

Furthermore, the GAEB’s decisionmaking process does not include economic analysis (cost-benefit analysis) of its projects. Hence, projects can be approved in the annual investment plan without being well scrutinized for their social effects. Proposed school buildings with low economic rates of return may indicate a need for either smaller investments or better

locations; those with fairly high economic rates of return may indicate a need for larger investments in the proposed locations. Significant improvements in resource allocation could be achieved by introducing cost-benefit analysis into the GAEB’s investment decisionmaking. This analysis should be overseen or performed by an independent organization, for obvious reasons.

For purposes of budget management, the NIB classifies capital budgetary funds according to their source, as government funds, donor funding, or self-funding (fees and other small revenues). The NIB disburses funds to the GAEB on a quarterly basis. The first installment is paid in advance, and the rest are paid according to construction progress. However, auditing of the invoices is fairly weak, and our interviews revealed that the NIB has found irregularities between the description of the job performed and the actual job done. Apparently, senior NIB officials believe significant savings could be achieved through closer physical inspection (auditing) of works in progress and their corresponding invoices.

There seems to be a lack of transparency in the GAEB’s investment planning and its corresponding capital budgetary requests.¹⁹ The GAEB’s investment proposals are generally

1. In December the MoP circulates Forms and Guidelines for submitting public investment proposals for the new budget.
2. In January the GAEB prepares a proposal with lump-sum figures, specifying the total number of classrooms and total capital budget required. In principle, the yearly requirement must be consistent with the investment targets established in the Five-Year Plan. The plan under implementation goes from FY 02 to FY 07.
3. In February the MoP discusses the proposal with GAEB officials and comes up with the so-called Planning Proposal, which generally uses smaller figures suggested by the GAEB. The reductions are mostly based on proposed total cost and its equivalent in terms of number of classrooms. However, needs and changes in cost due to inflation are taken into account.
4. In March the Minister of Finance determines the final ceiling for capital expenditure at the country level and for each sector (ministry). The MoP follows the total investment ceilings established by the MoF for the MoE/GAEB.
5. In April the MoE and GAEB, in coordination with the MoP's Education Department, adjust the Planning Proposal according to the available ceiling, giving priority to replacements and improved school access.
6. In May the Minister of Planning communicates the Proposal to the Minister of Education. The GAEB may still ask for a moderate increase in the proposed budget.
7. The Cabinet (government) submits the total proposed budget to the Shura Council (budget commission) for feedback and approval.
8. Subsequently, the Cabinet submits the total proposed budget to the People's Council (parliament) for approval. Ceilings on capital expenditures may still be increased marginally, based on the declared portion of the budget that is reserved for occasions when there might be a need to accommodate legislators' requests.
9. In June, upon the approval of the People's Council, a presidential decree is issued accrediting the budget for the new fiscal year.
10. Budget execution starts in July, which is the beginning of the fiscal year.

produced with broad amounts, lacking detail and specific objectives regarding school type and location.

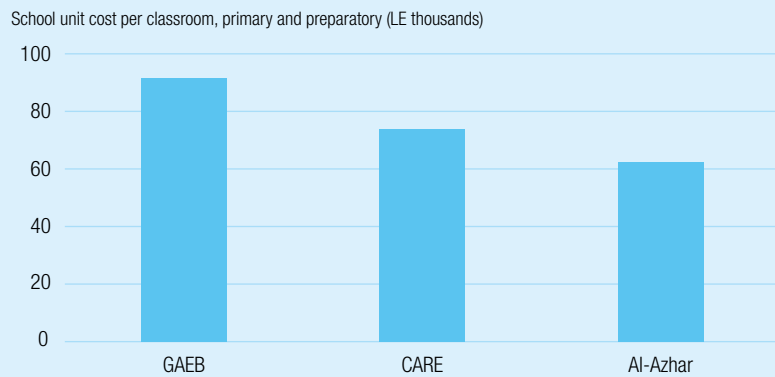
The MoP would benefit from a specific, detailed breakdown of yearly investments for assessing the GAEB's budgetary request. Specific targets are needed to support the GAEB's investment plans. Consequently, it would be useful for the MoP if some broader description and categorization were made of the proposed allocations—in terms of replacement, rehabilitation, improved access, decreased class density, shift elimination, and the new requirement that grade six be mandatory (which of course affects the adequacy of school infrastructure), among other issues. Also, when the budget proposal specifies no actual number of buildings, only the equivalent in terms of numbers of classrooms, it is practically impossible to compute the real unit cost of the infrastructure that would be built—and therefore impossible to measure the GAEB's capital expenditure efficiency, let alone any relation it may have to the on-the-ground reality of schools. Clearly, standard practice is needed to connect actual line-item expenditures to physical outputs and to apply specific, quantifiable, performance indicators for each agency output, such as the unit cost of real classrooms and the cost per unit of ACS.

Expenditure efficiency

GAEB-built schools cost more than comparable alternatives. The schools that some donors finance can cost as much as 30 percent less than the schools contracted out by the GAEB. Based on the yearly number of schools built by the GAEB and its actual investment (provided by the MoF), the GAEB's average cost for a 12-classroom school is about LE 1.1 million (in 2004 prices)—equivalent to a unit cost of LE 91,600 per classroom. This is higher than the Cooperative for Assistance and Relief Everywhere's (CARE) average cost per classroom (LE 73,800).²⁰ The GAEB's most recent request to build new schools used a cost of LE 105,000 per classroom. Comparing these figures with the information obtained from the Al Azhar school system shows that the average cost per classroom of a 32-classroom primary/preparatory school is about LE 62,500 (in 2004 prices), while the average cost per classroom of a 38-classroom secondary school is LE 79,000 (figure 3).

These results indicate that the GAEB's classrooms cost as much as 46.5 percent more for primary and preparatory schools and 15.9 percent more for secondary schools.

Figure 3 School unit costs across alternatives



Source: Author's calculation.

Al Azhar and CARE classrooms are comparable alternatives—in other words, they can provide the same social benefits. It is worth noting that high-density areas and difficult-to-reach populations could benefit from mobile classrooms, which do not seem to be an option considered by anyone. Even the OECD countries use them—that is, they are interim measures to help alleviate short-term overcrowding while medium-term demand is determined, so that capital investment does not reflect short-term needs. The policy implication of this finding is the need to bring the GAEB's unit cost down to more competitive levels. In absolute terms, this means that if more efficient use were made of the current investment budget, no fewer than 14 classrooms could be built for the same cost as 10 classrooms now. It may also be necessary to reexamine the earthquake codes that govern construction.

Supply efficiency

The following are the main institutional issues compromising supply efficiency.

- *Forecasting and contracting:* When the same agency that is in charge of school construction and contracting is also in charge of population forecasting to determine the need for new schools, a conflict of interest may emerge. In principle, the larger the estimate of population growth, the greater would be the role of the agency in its contracting responsibilities. In fact, some concerns have already emerged regarding the likelihood of this outcome. Some MoP officials are

concerned about the GAEB's population growth estimates, which are larger than those of the National Bureau of Statistics (Cairo Demographic Center) and thus may overestimate the need for new schools.²¹ Specific policy options can address this issue, in the short as well as the medium terms. They include separating the population forecasting function (needed for investment planning) from the construction and contracting responsibilities, assigning or devolving the population forecasting function to the Cairo Demographic Center, and devolving the function of estimating needs for investment planning purposes to the sectoral ministry.

- *Planning and contracting:* When the agency in charge of contracting school construction is also in charge of planning the yearly investments needed, again, a conflict of interest may arise. The larger the yearly investment plans, the greater the agency's institutional role and its contracting activity. In fact, the MoP and the GAEB have different views on the number of schools needed and their appropriate location. Moreover, the process for making decisions about schools needed may be characterized primarily as a top-down system (that is, supply driven). To resolve this issue the government should examine several institutionally significant medium-term policy options. The most important include separating the investment planning function from the construction and contracting function and assigning the planning function to the sectoral ministry (or, perhaps better in the long term, decentralizing it to the governorates).
- *Setting specifications and contracting:* When only one institution or supplier has the authority (in other words, is a monopoly) to select and approve school models²² and construction specifications and select construction materials, and that same institution is in charge of contracting the projects, there is the likelihood of overspecification and hence of greater unit cost. Given a fixed capital budgetary constraint and a higher unit cost per classroom, a smaller number of

schools or classrooms can be supplied. The larger the projects, the greater the institution's power. In fact, several donors, private sector schools, the Al Azhar school system, and local financial institutions argue that the unit cost of the schools built by the GAEB is substantially higher (by about 30 percent) than the unit cost of comparable schools built by other agencies. It is remarkable how often apparently unrelated sources cited the 30 percent figure. Policy options the government should contemplate to resolve these inefficiencies in resource allocation include separating the function of setting specifications and standards from the function of contracting, revising, and adjusting the specifications and standards, introducing some form of competition in unit cost through other school providers, and decentralizing or devolving the school capital budget to the governorates, allowing them to do the contracting.

- *Optimal location and site-related constraints:* The location and construction of new schools is subject to land availability and donation. These circumstances to a large extent defeat the objective of the current optimization model for school location except where land donations happen to occur in sites identified by the model as optimal. In practice land donations seem more likely to occur in the periphery of urban areas, while the demand for additional schools and classrooms comes from areas with greater population density. Policy options that the government should examine to resolve these supply-side inefficiencies due to constraints on site selection include involving the community of prospective beneficiaries in site selection; rehabilitating and expanding existing infrastructure, including the use of mobile classrooms; providing some form of transportation for students to schools located out of walking distance; sharing the GAEB's digital maps with governorates, Al Azhar, donors, and all development agencies; and including all schools in the school mapping system regardless of who built them and irrespective of their type (religious, one-room,

community school, and so on). These policies would enhance supply efficiency.

- *Investment decisions and accountability:* Without formal cost-benefit evaluation and hence accountability, the probability of allocating resources to projects that may not yield expected benefits is greater. As already discussed, there are cases (such as Southern Sini) that illustrate this risk in some school projects. In fact, 2 percent of schools nationwide (281 schools) have an ACS of 10 students.²³ The implicit policy option that the government should consider is to set up an evaluation system and establish some form of institutional accountability for school projects with low social rates of return—whether they are carried out by a central government agency or in a decentralized manner.

Demand efficiency

Decisionmaking without beneficiaries: When beneficiaries (or the local administrative unit or governorate) do not formally participate in the identification of their needs—at least with opinions if not with decisionmaking power—the likelihood of supplying educational infrastructure that does not match or satisfy actual need is greater. In fact, several schools have been built in places where little use is being made of them. For instance, in the governorate of Southern Sini more than half the schools (54 percent) have an ACS of only 10 students. To resolve these inefficiencies in resource allocation the government should examine several policy options. In the short term, it should consider formalizing the participation of beneficiaries in the identification of needs and project design. It should also consider establishing a procedure (a clearance mechanism) by which some assurance is received from representatives of the intended beneficiaries (or the local administrative unit) that the proposed school size and its specific location meet community needs and preferences, before contracting out construction.

Maintenance efficiency

The following are the key institutional problems compromising maintenance efficiency.

When the responsibility for school maintenance falls on more than one institution (partly or for a specific period), no one institution is accountable for effective maintenance.

In other words, when the expenditure function is shared, there is the incentive to try to shift at least part of the financial burden to other institutions simply by doing less maintenance. The interinstitutional arrangements for maintenance have thus been fairly ineffective (box 4).

Because the GAEB may step in, there is an inherent disincentive for the MoE, schools, and governorates to provide adequate maintenance. However, the main role of the GAEB is school construction, not school maintenance. The MoF's annual budgetary allocation for maintenance is insufficient, remaining constant in real terms for the past several years. Because budgeting for maintenance is inherently much less effective than budgeting for capital expenditures,²⁴ these interinstitutional arrangements provide additional disincentives. It does not

appear desirable to send resources (voluntary school fees for services) collected at the school level to upper levels of government only to send them back to provide maintenance. The MoE and the MoF recently decreed that such funds should stay at the school level, but they need to address disparities in socioeconomic levels. To maintain accountability and address equity concerns, the government should consider a needs-based match for local contributions.

*The resources budgeted for maintenance are inadequate—about one-third of what is needed (figure 4).*²⁵ The interinstitutional division of maintenance responsibility is not only ineffective but seems to discourage maintenance. A key institutional challenge is to design a better assignment of responsibilities. The analysis suggests three policy options:

- First, *simplifying interinstitutional arrangements* could eliminate inherent disincentives and devolve the main responsibility and financial resources to the schools and

Box 4

Inadequate resources for school maintenance

Current operations and budgeting

Simple maintenance is the responsibility of the schools and, in principle, financed through small school fees. Preventive maintenance is taken care of by selecting high-quality and relatively more costly construction materials. Annual maintenance refers to needs such as school painting, and emergency maintenance covers breakages and the like. The GAEB provides periodic and emergency maintenance through specialized private providers. The funds are disbursed through the NIB, which manages them according to specific budgetary appropriations across governorates. The funds are disbursed against actual maintenance expenditures. The Al Azhar school system uses a similar approach. Specific ceilings are established and disbursements are made against actual invoices, which are in principle subject to verification by the contracting entity. Allocations are based on historical trends. However, some adjustments are generally made for inflation through discussions between MoE branch officers at the governorate level and MoF headquarters officials in Cairo.

The maintenance gap and fiscal implications

Based on GAEB calculations, adequate maintenance funds for FY 05 would be about LE 240 million. Actual resources available are LE 84 million, leaving the GAEB with about one-third (35 percent) of the amount needed. Budgetary resources for maintenance have been dropping in absolute and real terms for several years.

Adequate levels of maintenance are highly desirable not only to ensure the realization of expected benefits, but also because rehabilitation generally costs more than maintenance. Consideration should also be given to a system of matching grants to mobilize local resources and ease the fiscal burden. In the short term this policy option could gain the financial support of donors.

Donors' role

The lack of adequate resources for maintenance is not a new problem. It was one reason USAID stopped its school construction program in 1992—the schools being built were not being properly maintained. Since then, USAID decided to donate LE 60 million a year (to the GAEB's budget) for school maintenance. Even though donations from the international community yield tangible benefits they do not seem to be the right long-term approach; maintenance is a recurrent expenditure that needs a permanent and stable financial source.

Transfer formula

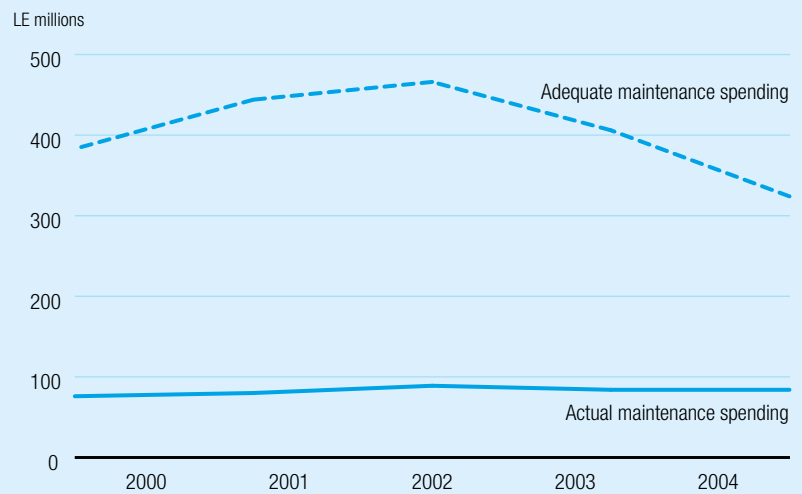
Optimal matching proportions should be determined based on empirical analysis. Consideration should be given to a ratio of 3 to 1. Reimbursements should be based on verifiable invoices. The matching arrangement should encourage viable financial efforts from both sides.

perhaps the governorates. An institutional arrangement at the local level may correct the inherent bias at the national level since the political economy at the local level seems more favorable.

- Second, *letting schools keep their fees* would be a much greater incentive to collect them—and pay them. Also, since the ability to pay school fees is not equally distributed across all schools, it would not be equitable, or efficient, to rely only on such fees. Some financing from the central government would still be needed in most locations, but it should not discourage local revenue mobilization efforts—to the contrary, it should reward them. The allocation of national resources should also be rewarded (in a decentralized environment) to correct the current bias. A mechanism that rewards both local and central efforts could easily be devised.²⁶
- Third, *adopting a decentralized system of matching grants for school maintenance* could address the apparent bias against budgeting for it. Such a mechanism could encourage both local and national revenue mobilization efforts. For instance, a system could appropriate a basic amount per school (for daily and annual maintenance) and in doing so automatically reward local efforts with the use of central government financial resources.

The main reason to suggest the matching grants approach is that the current approach—recognizing that maintenance is cost-efficient and therefore adequate budgeting would save fiscal resources in the long term—has not been sufficient. Some leveraging of budgetary appropriations at the central and local levels may be needed. Finally, governorates should be allowed to enter into cross-sectoral maintenance agreements—for hospitals, schools, and other government buildings—to reap economies of scale. In the longer term, government employees could be encouraged to take jobs with private sector maintenance firms.

Figure 4 Gap in school maintenance expenditure



Source: GAEF data and author's calculations.

The assignment of institutional responsibilities in the decisionmaking process for new schools suffers from inherent inefficiencies in school design and operation that compromise the system's efficiency on both the demand and the supply sides. The following findings should be highlighted:

- The decisionmaking system for capital investments does not require consultation with users or beneficiaries.
- Educational infrastructure is provided under a monopoly, with one central government institution responsible for the whole country.
- Schools provided by this institution cost more than comparable schools built by donors, the private sector, and Al Azhar.
- Budgetary constraints mean that higher unit prices reduce the quantity of new schools that can be built.
- Regardless of where new schools are needed, their location depends on land availability and donations, which do not always coincide.
- Evaluation of school buildings is not required, so the accountability of the system is fairly weak.

6

Main policy options

There is still a significant gap in infrastructure. About 550,000 to 750,000 children do not have access to schools. This equates to a need for at least 5,000 new schools (or no fewer than 60,000 classrooms). In addition, most schools are overcrowded; no less than half operate with an ACS greater than 41 students. OECD countries and others, with smaller investment in the education sector (as a share of their GDPs), have an ACS of 20–25 pupils.

There is, however, operational capacity for building up to 1,500 schools per year, as was done between 2002 and 2004. That said, there are serious concerns regarding the cost efficiency of past investments, partly reflected in limited sectoral budgetary appropriations. In the most recent years the budget for school investment has been reduced in nominal and real terms, apparently as a response to such concerns. Consequently, it was important in this review to examine in more detail the claim that GAEB schools are expensive relative to other schools. Comparing the unit cost (LE 91,600) for a classroom built by the GAEB with the average cost (LE 73,800) for a similar classroom built by a donor, shows that GAEB classrooms are more costly by 46.5 percent. In other words, for every 10 primary/preparatory classrooms built by the nation's central authority a more efficient investment system could build no fewer than 14 classrooms.

Similarly, the GAEB, a highly centralized agency with fairly high operating costs, has had practically no competition. GAEB schools are highly regulated in their foundations, designs, numbers of classrooms, models, construction materials, and other detailed and rigorous construction specifications. This type of “market” structure usually leads to higher unit prices and lower quantities than a more competitive

structure. GAEB officials are adroit in addressing such criticism in engineering terms but far less so in addressing the societal trade-offs.

The situation is further complicated by the relative scarcity of suitable land for the pre-defined school models. But there is little exploration of how alternative school design could fit more effectively within land constraints—especially in large urban areas. Furthermore, financial resources for school maintenance are inadequate and do not reflect long-term costs and benefits. There appears to be a bias in favor of construction and against maintenance.

Policy options to close the infrastructure gap

The following policy options should be examined as the most important recommendations to improve the efficiency of sectoral investment. First, and most important, reassessing priorities in the allocation of resources within the sector seems critical for overcoming the investment gap on preuniversity educational infrastructure. Under current conditions, assuming all single-shift schools and no other innovations to better use school buildings, at least 1,000 additional schools a year (or 12,000 additional classrooms) is the most modest scenario for new investments

for the next five-year period. This means that, under the no savings (current prices) scenario, an average yearly investment of about LE 1.1 million needs to be maintained in real terms. However, under a more efficient costing of schools (that is, capitalizing on potential saving), the yearly investment needed could be one-third less—LE 800,000. Furthermore, an increase in the number of schools (classrooms) does not necessarily mean that more teachers and staff need to be hired, at least in the short term. The student-teacher ratio is about 20:1 and there are almost as many school administrative staff members as teachers. So closing the gap in infrastructure would be an opportunity to increase the productivity of teachers and administrative staff. Although this issue is largely beyond the scope of this Policy Note, it is clear that the rigidities in the system need to be addressed outside the GAEB. These changes are part of the policy dialogue, however, and the capital investment needs to be considered in that discussion.

Policy options to improve planning and budgeting

The policy implication of the findings for potential improvements in the capital budget procedures is primarily a need to include in the MoP's budgetary forms a request for the specific physical quantities that the proposed investments would buy.²⁷ This would enable not only transparency, but also accountability and with it the possibility of assessing capital expenditure efficiency (cost efficiency), and developing quantitative indicators of the GAEB's investment performance. Other donors (such as KfW) appear well positioned to put the meat on the bone here and should be encouraged to do so. It would be beneficial to have a school construction conference that brought together engineers and planners from the GAEB, Al Azhar, CARE, and others to share construction models.

In addition, interaction with the GAEB in the preparation of this review suggests that its information system for historical data,

particularly yearly capital budget execution and their links to physical and financial targets, does not operate on a timely basis. In fact, the GAEB's yearly reports show a weak link between capital expenditures and physical performance, as well as a need for higher quality information and for a better reporting system for financial issues and timeliness.

Furthermore, the concepts of unit cost and cost efficiency are not reflected in the GAEB's reports and do not seem to be a major institutional concern. Rather, the focus is on construction, with high and rigid specifications.²⁸ The implications of the current unit cost of infrastructure and its associated opportunity cost in terms of forgone social infrastructure (social welfare) do not seem to be a major institutional concern either. In fairness, this is not really the job of the GAEB but of the MoE, MoP, and MoF together. Because the GAEB is the only authority handling school construction it has no inherent incentive to be price competitive. The consequent policy implication is a need to create some form of competition in the supply of school buildings. Perhaps, as suggested above, market competition could come at least partly from fiscal decentralization of this function to selected governorates that could contract with either the GAEB or the private sector.

Finally, the accuracy (quality) of the GAEB's information, including actual budgetary executions, figures on population growth, and specific demand estimates, seems to be a concern for other institutions, such as the MoE and the MoP. The policy implications of these findings: the needs to require greater transparency in GAEB operations, use only one official source for demographic data, consider redefining the responsibility for sectoral investment planning, and consider separating school construction contracting from sectoral investment planning. These policy options could eliminate potential conflict of interest in the GAEB's operations as well as uncertainty about the quality of both demographic figures and actual investment needs.

Policy options to enhance supply efficiency

Other policy options to increase expenditure efficiency may be attained through institutional rearrangements. They could include the following:

- Separating the student population forecasting function from the construction and contracting function.
- Assigning or devolving the population forecasting function to the Cairo Demographic Center or some other organization.
- Devolving the function of estimating needs to the sectoral ministry's branch office at the governorate level and encouraging further decentralization to localities.
- Separating the investment planning function from the construction and contracting function.
- Assigning the planning function to the sectoral ministry (that is, transferring the GAEB's information planning data to the MoE's regional office at the governorate).
- Separating the function of setting minimum specifications and standards from the function of contracting.
- Revising and adjusting the minimum specifications on construction standards.
- Making school projects subject to cost-benefit analysis before submitting them for approval.
- Allowing for competition in unit costs through other school building providers.
- Auditing school construction costs—significant savings could be achieved through closer physical inspection of buildings and invoices by an independent agency.
- Decentralizing or devolving the school capital budget to the governorates and allowing them to do the contracting of school construction (which should include the option to contract with the GAEB).

Policy options to enhance demand efficiency

The following policy options may resolve other inefficiencies in resource allocation: formalizing the participation of beneficiaries in

the identification of needs and project design, expanding and rehabilitating the infrastructure, ensuring some form of transportation to schools not located in walking distance, involving the community of beneficiaries in site selection, requiring clearance from representatives of direct beneficiaries or the local administrative unit before contracting out new constructions, setting up an evaluation system for school projects, and establishing some form of accountability of the decisionmaking authorities for projects with low social rates of return.

Policy options to close the maintenance gap

In the long run, adequate maintenance of schools is more cost-efficient than rehabilitation. However, the current interinstitutional arrangements create an inherent disincentive for maintenance. Thus, devolving the responsibility and the resources to the school level seems more effective than the current distribution of expenditure responsibilities. A decentralized system of matching grants for school maintenance would encourage local and national revenue mobilization efforts for this purpose. Specifically, the following should be considered: appropriating a basic technically defined amount per school for daily and annual maintenance, and allocating additional resources from the central government as a reward for local revenue mobilization efforts. For instance, a matching grant of LE 3 (central) could be considered for each LE 1 (local). The ratio should be determined through an empirical study of the optimal matching proportions based on technical criteria, using a poverty map to vary the matching rate inversely with ability to pay.

Policy options for decentralization

Devolution of power should improve education service delivery through a more efficient demand and supply system, and it should strengthen accountability. Governorates are probably the best place to begin, given the gradualist approach prevalent in Egypt. Formalizing daily school maintenance, including the

use and allocation of local school fees, should strengthen accountability in budget management and school maintenance. Similarly, delegating responsibility for periodic and emergency maintenance to the local administrative units (that is, governorates) should strengthen accountability. Decentralizing the management of GAEB information systems would strengthen the planning of public investments and decisionmaking. Making GAEB information available at the governorate level would make it possible to rationalize and coordinate school construction by donors and Al Azhar.

In the short term the government should consider formalizing the participation of local government units and direct beneficiaries in the identification of needs, investment planning, project design, implementation, supervision, project evaluation, and school maintenance. Involving stakeholders at all levels, including school heads and the community of beneficiaries, in site selection should enhance project performance. In the medium term, devolving responsibility for making decisions on school construction to governorates, providing them with the capital budget, and allowing them to decide on allocations and contracting would also enhance accountability. Performance on selected pilot cases should be monitored and results assessed based on explicit, agreed-on, quantifiable indicators.²⁹

Some policy options included here have already been considered from the perspective of how to improve supply and demand efficiency. Because such measures also apply to decentralization efforts, they have been highlighted here as well. Consistent with efficiency enhancement efforts, the following decentralization policy options should be considered.

In the short term:

- Formalizing the participation of local government units and direct beneficiaries in the identification of needs, investment planning, project design, implementation, supervision, project evaluation, and school maintenance.

- Involving governorates, districts, *markaz*, towns, and villages, including school heads and the community of beneficiaries, in site selection—as a responsibility of the governorate.
- Requiring clearance from representatives of direct beneficiaries or administrative units to ensure community participation and to enhance project performance before contracting out school construction.
- Decentralizing the management or availability of GAEB information systems to support the planning of public investments and decisionmaking.
- Formalizing daily school maintenance (and accountability) including the use and allocation of fees currently collected at the school level.
- Devolving responsibility, jointly with strengthening accountability, in the management of budgetary resources for school maintenance (periodic/annual and emergency maintenance) to the local administrative units (governorates).
- Examining old legislation on decentralization (Local Administration Law 43/1979 and its amendments).

In the medium term:

- Devolving responsibility (accountability) in making decisions about school construction to the governorates, providing them with the capital budget, and allowing them to decide on allocations and contracting.
- Decentralizing GAEB operations and redefining its regional offices' role to support the governorate.
- Giving governorates authority to reallocate funds from school construction to expansion, rehabilitation projects, school equipment, and maintenance.
- Adopting gradual asymmetric decentralization based on local (governorate) readiness to take over additional responsibilities, subject to assessing the performance of selected pilot cases based on explicit, agreed-on, quantifiable indicators.

Policy matrix

Functions	Issues	Policy options	Institutions involved
Investment planning and budgeting	The agency in charge of school construction and contracting (GAEB) also plans, proposes, and decides the type and quantity of schools needed. This creates a conflict of interest—the larger the investment amount, the greater the contracting function).	<p>Separate the investment planning function from the construction/contracting function.</p> <p>Assign the planning responsibility to the sectoral ministry. Specifically, transfer the GAEB's planning capacity to the MoE.</p> <p>Include cost-benefit analysis in the evaluation of school projects.</p>	MoP MoE GAEB
Population forecasting	The agency in charge of school construction and contracting also forecasts population growth to determine needs and decides on the type and quantity of schools required. This creates a conflict of interest—the greater the estimated needs, the larger the contracting function.	<p>Separate the population forecasting function from the construction/contracting function.</p> <p>Assign/devolve the population forecasting responsibility to the National Bureau of Statistics (Cairo Demographic Center) or the sectoral ministry.</p>	MoF MoE GAEB CAPMA CDC
Balance between investments and maintenance	There is a large imbalance and a bias toward investment and against maintenance. For example, the FY 05 budgetary appropriation of LE 128 million is about 50 percent of what would be adequate.	<p>Establish a minimum percentage of capital investment for maintenance.</p> <p>Reduce the GAEB's capital investment budget and increase the maintenance budget.</p> <p>Decentralize the maintenance budget at the school level, in the form of a matching grant.</p> <p>Match may come from governorates (a fund for maintenance), the community of direct beneficiaries, and private sector.</p> <p>Consider the option of endowments for maintenance.</p>	MoP MoF MoE Government School
Classroom unit cost and school design	The GAEB's school designs are expensive. School foundations and specifications are oversized. Unit cost is higher by about 46 percent compared with alternative designs. Decision-making on school designs is a top-down (supply-driven) process.	<p>Review cost structure and designs to establish new parameters to measure and monitor cost efficiency in school construction.</p> <p>Reconsider the need to oversize foundations for all schools.</p> <p>Review construction code and consider corresponding adjustments.</p> <p>Consider mobile classrooms for difficult-to-reach populations.</p> <p>Introduce competition in unit cost through decentralization.</p>	MoF MoP MoE GAEB Donors
Public buildings construction code	Since the 1992 earthquake new schools must be earthquake-proof. The GAEB tests all school building construction materials on an ongoing basis. These changes apparently are due to a requirement in the construction code.	<p>Consider reviewing construction code specifications and testing of construction materials.</p> <p>Quantify the cost and effect of continuous testing on both unit cost and GAEB overhead.</p>	MoF MoP MoE GAEB Donors

Functions	Issues	Policy options	Institutions involved
School furniture and equipment	Current furniture types and designs are more costly than suitable alternatives. Computers are underused and other school equipment is insufficient.	Adopt less costly furniture designs. Change policy on computer maintenance and provide new financing sources to the schools.	MoF MoP MoE GAEB Donors
School site selection and community participation	Sites for schools are not always available and alternative locations may require transporting students.	Systematically include community participation in school site selection. Consider transportation alternatives for students, other than walking. Consider mobile classrooms for high-density areas that are difficult to serve.	MoE GAEB Government <i>Idarah</i> Community school
Land acquisition and community participation	Options for school location are considered after school investments have been decided—to a large extent in a top-down manner.	Make planning of investments conditional on the availability of school sites. Conduct site planning before school investments are approved. Require community participation in site decision-making—in a bottom-up planning process. Review current land use planning (urban zoning regulations) for the need to ensure land availability for institutional use, such as urban space for schools.	GAEB Government <i>Idarah</i> Community
School maintenance	Inadequate interinstitutional arrangement and inadequate budgetary appropriation for maintenance needs.	Redesignate maintenance responsibility and financial sources. Decentralize maintenance. Create matching grants for maintenance.	MoF MoE Government <i>Idarah</i> Schools
Intensity of use of schools	Operating two shifts reduces pressure on construction but compromises teaching time and most likely the quality of education.	Eliminate second shifts. Two shifts should be used only as a short-term solution while new classrooms or schools are built. Consider mobile classrooms.	MoE Schools Community
Community participation	Participation of communities in investment decision-making is very limited, weakening the local sense of ownership and compromising adequate involvement in school location and maintenance.	Systematically involve the community in all phases of the project cycle, including school location and site identification, school design, and maintenance.	MoE GAEB Government <i>Idarah</i> Community school
Information systems for investment decision-making	GAEB management information systems are not sufficiently transparent for making decisions on needs and unit costs.	Initiate sharing of databases across sectoral institutions. Disseminate current information to all stakeholders.	GAEB MoP MoE
Decentralization	School construction and maintenance are among the most pressing functions at the local level, and both could substantially benefit from decentralization.	Decentralize construction at the governorate level and maintenance at the school level.	MoF MoE Government <i>Idarah</i> Schools

ACS target scenarios

First scenario (Target ACS: 40)

This scenario estimates how many new schools would be needed to bring all schools in line with the national average. This scenario seems particularly important considering that some empirical studies have argued that an ACS of more than 41 pupils may contribute to a decline in student achievement.

The estimates indicate that about 5,298 new schools would be needed to meet the target of an average of 40 pupils per classroom. This total includes 1,917 new educational buildings. It is worth noting also that the school needs under this scenario are fairly close to the estimate of 5,459 schools that the UNDP reports as the infrastructure gap as of 2007.

This scenario is the least demanding one in terms of budgetary resources; as such, it gives greater flexibility to the government to aim for some additional objectives. After reaching a target ACS of 40, perhaps the next priority should be lowering the ACS further, especially in the first and second grades. Empirical studies show that the greatest benefits of smaller class sizes occur primarily in the early years of schooling—that is, in the first and second grades.

Second scenario (Target ACS: 35)

Under this scenario about 25 percent more schools would be needed—a total of 6,623, rather than 5,298. This is 33 percent more schools (2,554) to meet the target ACS of 35, 50 percent more (1,922) to make all two-shift

schools one-shift, about 12.5 percent more (481) to reduce the ACS of more than 41 in two-shift schools; and about 14 percent more (1,667) to reach universal enrollment applying a target ACS of 35 (see table 1).

Third scenario (Target ACS: 30)

Under this more ambitious scenario about 8,156 new schools would be needed (3,328 to reduce class size, 1,922 to eliminate double shifts, 961 to reduce ACS in the two-shift schools, and 1,944 to meet the 100 percent enrollment target).³⁰ The total number of schools needed is about 50 percent more than under the first scenario (target ACS of 40). It would take about eight years (rather than five) at the current pace in yearly investments to close the infrastructure gap.

Fourth scenario (Target ACS: 25)

A class size in primary and preparatory schools of 20 to 30 students is generally considered adequate. For instance, in OECD countries the ACS is between 20 and 25 students. For an LMIC, which Egypt is, an ACS target of 25 may be considered fairly ambitious. This scenario was developed primarily as a point of reference, to put policy options in perspective. The simulations for an ACS of 25 indicate that at least 9,777 new schools would be needed (see table 1), about twice as many schools as under the first scenario. It could take twice as many years to implement.

Notes

1. An agency that operates under the MoE but is largely independent of it.

2. These claims have not only been reported in national and local media but were also confirmed to the mission in interviews with the governor of Fayoum in January 2005 and with the governors of Alexandria and Qena in August 2005.

3. Calculated as the number of pupils divided by the number of classrooms— $11,127,735/277,401 = 40.1$.

4. Issues of access are largely twofold: First, there are students not in school—although building schools is not likely to be the only requirement for reaching 100 percent enrollment, since the out-of-school population is likely to be significantly more disadvantaged in many ways than the in-school population. Second, issues of quality largely relate to the effect of class size on schooling outcomes and educational production and the match of school buildings (in design and location) to the educational and pedagogical goals of the MoE and others invested in educating students (students, teachers and school staff, parents, industry, taxpayers). This work thus relates closely to the themes of the Education Sector Strategy Paper under way in the Social and Human Development Group of the Middle East and North Africa Region—equality of quality and efficiency of expenditure.

5. More elaborate estimates include mathematical models for each area in the country, taking into account the school-age population, growth rate, repetition and graduation rates, dropout rate, class size limit, and the existence of other schools in the same area (including one-classroom schools) provided by other suppliers—such as Al Azhar and donor schools.

6. The breakdown is as follows: 3,844 school buildings operate more than one shift; 743 schools have an ACS of more than 70 students, 801 schools have an ACS of 61–70, 1,977 have an ACS of 51–60,

and 4,148 schools have an ACS of 41–50 students. Apparently, some schools that operate more than one shift are similar to those with high densities. This analysis assumes that the ACS for these schools is the same as the national average.

7. Triple shifts are a different story. We support the goal of eliminating all triple-shift schools.

8. This type of analysis requires data on ACS not only by school but also for each grade level. Information on ACS by grade level nationwide was not available during the preparation of this report.

9. Though recurrent expenditures are not within the scope of this review, it is worth noting that while capital expenditures by the GAEB have been dropping during the past three years (2002–04), operational expenditures by this agency have been growing in absolute and real terms in a fairly steep pattern (from LE 47.7 million to LE 87.8 million). Because the opposite trend should be expected, the overhead of this agency merits examination in a separate review of expenditure efficiency regarding operational costs.

10. The GAEB reports that 2,206 areas are deprived of elementary education (schools) and 692 areas are deprived of preparatory education.

11. Despite the overstaffing of teachers and administrators, significant legal and regulatory factors in the civil service system constrain the availability of teachers and administrators to cover certain areas. In a best case scenario of perfect geographical mobility of the staff, the shortage of classrooms would be the constraint. These issues merit further examination, but they lie beyond the scope of this Note; we address them in both previous and future PER work.

12. The yearly investment plans also cover the addition of classrooms needed for eliminating shifts and decreasing density, replacing old buildings, introducing grade six, and procuring school furniture and equipment.

13. Contractors have to use the school designs and models developed by the GAEB and must also follow its construction specifications. The specifications follow the Construction Code for Public Buildings. The GAEB also chairs the commission in charge of defining the Code.

14. Detailed cost estimates based on actual needs carried out by KfW's technical and financial assistance to the GAEB (through Dorsch Consult) concluded that regular (basic/daily) maintenance is equivalent to about 0.52 percent of school construction costs, while annual (periodic) maintenance is equivalent to 0.64 percent.

15. There are now officially seven budget chapters, but we use the old definitions of the four budget chapters because this is how budgeting was done during our fieldwork, and this is largely how government officials still think about it.

16. Sources of financing of districts, towns, and villages need to be examined to determine potential revenues for decentralization. This is being done under a separate Policy Note on fiscal decentralization.

17. Here we refer primarily to the governorate level, the equivalent of regional or state government. Egypt also has lower levels of local government such as districts (*idarahs*). Generally, when we refer to "local government" we mean all subnational governments together.

18. Figure 5 includes the budget decision-making process for one line ministry (the MoE) and one service agency (the GAEB), to illustrate the separation between recurrent and capital budgets, both at the central level and within each entity. This figure also illustrates the vertical relation of line ministers and service agencies with the MoF and the MoP. Note the weakness, or absence, of horizontal relations to coordinate capital and recurrent expenditures both within each entity and at the central and subnational levels. In this respect, it is worth highlighting the rather isolated role of governors, and that of the beneficiaries.

19. The GAEB usually makes yearly global requests, which are not adequately broken down by number, type, and size of schools, or their expected physical sites. The request is generally limited to a global magnitude, with an equivalent in terms of number of classrooms. The MoP has challenged the unit costs per classroom used by the GAEB,

claiming that they significantly exceed the historical average unit costs derived from experience. The MoP has also advised that they no longer accept at face value the GAEB forecasts of the requirements for new classroom construction. Significantly more direct involvement in sectoral investment planning by the MoP, MoE, and governorates, as well as the beneficiaries (the communities) seems highly desirable to make the planning process more transparent.

20. This figure comes from the average cost of a 12-classroom school built by CARE (LE 885.6 million).

21. In this respect it is worth noting that according to the GAEB the population of children deprived of education is at least 750,000. However, the total school-age population is about 11.5 million, and the total number of students enrolled is approximately 11 million. This suggests that the total number of children deprived of education—because of the infrastructure gap—may be only 500,000.

22. The GAEB has about 80 school models and designs from which a specific model is selected and contracted out for construction.

23. In these cases the government may want to consider moving away from the standard 12-classroom school model, perhaps offering a size more suitable to the demand in the specific location. For instance, a school half the standard size (a 6-classroom school) or even smaller should be viable. Also, the use of mobile classrooms could add more flexibility (and more efficiency gains) to the current approach in school provision. Furthermore, with the technical and financial assistance of the Chinese government, Egypt has already developed some experience with the Remote Education System Network for teacher training; the same technology could be applied to help educate pupils in remote areas.

24. Given budgetary constraints, recurrent expenditures for maintenance have to compete with recurrent expenditure for salaries and operational expenses. Therefore their magnitude tends to be shaped more by the residual in the budget for recurrent expenditures than by actual needs.

25. It may be worth comparing the GAEB's maintenance estimates with the results from applying the specific technical percentages for daily and annual maintenance. In round numbers, 25,000

schools at today's prices (LE 1 million each) would be worth LE 25,000 million which, multiplied by 0.005, would require LE 125 million for daily maintenance. Now, computing annual maintenance (25,000 million \times 0.006 = 150 million) and adding these two amounts, the total would be LE 275 million—fairly close to the GAEB's estimate of LE 240 million.

26. In the design of a matching grant mechanism, a Poverty Index by school—or at least by jurisdiction—should be considered as an indicator of household capacity to contribute to school fees. Ongoing PER work will help develop appropriate poverty maps and indexes.

27. The current budgetary forms are fairly generic and standard across ministries and agencies, leaving little room for specifics.

28. This is not unique to the GAEB but endemic in the decades-old budgeting system, which cannot provide expenditure per pupil or school in an analytically meaningful form.

29. Without relevant baseline indicators it is practically impossible to assess governorates' performance; hence, it would be very difficult to objectively determine whether decentralization improves performance. Explicit agreed-on indicators would strengthen governors' accountability. They are even more important when governors are appointed, rather than elected.

30. This argument is based on the official data available from the GAEB. There are no independent figures from the MoE, the governorates, or other sources (such as the National Bureau of Statistics) to cross-check the accuracy of that data.

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