DOCUMENT RESUME

ED 466 655 PS 030 510

AUTHOR Janssens, Wendy; Van Der Gaag, Jacques; Tanaka, Shinichiro
TITLE Arab Republic of Egypt: An Economic Analysis of Early Childhood Education/Development.
INSTITUTION Academy for Educational Development, Washington, DC.
SPONS AGENCY World Bank, Washington, DC.
PUB DATE 2001-07-00
NOTE 55p.; Produced in association with PADECO Co., Ltd. "Deliverable 4(b): Report providing a cost-benefit analysis of ECE/ECD in Egypt, a financial projection of expanding ECE/ECD enrollment, and background information on costs, benefits and financing of different approaches to ECE/ECD."
PUB TYPE Reports - Evaluative (142)
EDRS PRICE EDRS Price MF01/PC03 Plus Postage.
DESCRIPTORS *Access to Education; Comparative Analysis; *Cost Effectiveness; *Early Childhood Education; *Early Intervention; *Educational Finance; Enrollment; Expenditure Per Student; Foreign Countries; *Kindergarten; Public Policy; Young Children
IDENTIFIERS *Egypt

ABSTRACT

Within Egypt's national framework for improving access to and quality of education, the government has announced the intention of enlarging compulsory basic education with 1 or 2 years of preschool. This report to the World Bank examines early childhood development (ECD) in Egypt from an economic and financial perspective. Following an executive summary and introductory remarks, the report is organized in seven chapters. Chapter 1 describes the current state of young children in Egypt and compares human development indicators in Egypt and other Arab and lower-middle income countries. Chapter 2 reviews long-term consequences of early childhood deprivation and summarizes international evidence on ECD benefits. Chapter 3 gives an overview of the current provision of ECD services in Egypt, including kindergarten and nurseries. The remainder of the report focuses on kindergartens because of the lack of data from nursery programs. Chapter 4 provides a cost-benefit analysis of ECD programs in the Egyptian context. Chapter 5 projects the costs of the intended expansion based on population data, current enrollment, and public expenditures. Chapter 6 reviews the current financial provisions for ECD and offers alternatives from international practice for financing a large-scale expansion of ECD services. Chapter 7 asserts that under very conservative impact assumptions, kindergarten expansion is highly desirable from an economic perspective. Benefit-cost ratios average around 2.3, with ratios as high as 5.8 from programs targeted to children most at risk. The report's six appendices include information on enrollment in pre-primary and primary school by age, child mortality rates, the net present value of ECD interventions, estimate of unit costs for kindergarten, projection of expenditures for kindergarten, and kindergarten fees. (Contains 10 tables, 10 figures, 18 notes, and 28 references.) (KB)

The World Bank

Arab Republic of Egypt
An Economic Analysis of
Early Childhood Education / Development

Deliverable 4 (b)

Report providing a cost-benefit analysis of ECE/ECD in Egypt, a financial projection of expanding ECE/ECD enrollment, and background information on costs, benefits and financing of different approaches to ECE/ECD

July 2001

PADECO CO., LTD.

in association with

AED
Academy for Educational Development

World Bank
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List of Abbreviations

CMR:	Child Mortality Rate
COMO:	Central Office for Management and Organization
ECD:	Early Childhood Development
ECE:	Early Childhood Education
GAEB:	General Authority for Educational Buildings
GDP:	Gross Domestic Product
GER:	Gross Enrollment Rate
HDI:	Human Development Index (from Human Development Report of the United Nations Development Program)
IMR:	Infant Mortality Rate
INP:	Institute for National Planning
KG:	Kindergarten
LE:	Egyptian Pound
MOE:	Ministry of Education
MOF:	Ministry of Finance
MOH:	Ministry of Health and Population
MOP:	Ministry of Planning
MOSA:	Ministry of Social Affairs
NCCM:	National Council for Childhood and Motherhood
NER:	Net Enrollment Rate
NGO:	Non-Governmental Organization
NPV:	Net Present Value
PPMU:	Program Planning & Monitoring Unit of the Education Enhancement Program (World Bank/European Union) at MOE
SHIP:	Student Health Insurance Program

Acknowledgements

The preparation of this report benefited from the input of the following people: The staff from the Ministry of Education (MOE) in Cairo, especially Mr. Hamdy El Mihy, Director of the MOE Computer, Information & Statistics Center, Ms. Weded Ibrahim Abdel Al, Undersecretary for Financial Affairs, MOE, and General Mohamed Abdlel Gawad Zamzam, Director of Education and Technology Center. Also, we would like to thank Dr. Mohamed Medhat Abd Al- Aty Hassanein, Minister of Finance, Ms. Laila Mahjoub Al Ghabri, Director of the Department of Childhood and Family from the Ministry of Social Affairs, Ms. Zohra Merabet, Executive Director of North South Consultants Exchange (NSCE) and Mr. Ahmed al Damrawy, Head of the Social Development Unit of NSCE. We appreciated the hospitality of the World Bank resident mission, in particular Mr. Mahmood A. Ayub, country director, Mr. Mahmoud Gamal El Din, Ms. Sahar Nasr, and Ms. Nehal Hassan El Kouesny. Discussions with and input from the mission members under leadership of Ms Mae Chu Chang have been very helpful. Special thanks go to Ms. Khadija Zahzah, and to Ms. Mary Young, knowledge coordinator of the Early Child Development team of the World Bank.

This document was prepared jointly by the following consultants: Wendy JANSSENS (World Bank), Jacques VAN DER GAAG (director of the Amsterdam Institute for International Development) and TANAKA Shinichiro (PADECO).

EXECUTIVE SUMMARY

Despite impressive gains over the past decade in *average* Human Development Indicators, large differences remain in such basic indicators as infant mortality rates or school enrollment among rich and poor governorates, urban and rural areas, and rich and poor households. Young children, who grow up under poor conditions, are at risk from malnutrition and high disease incidence. They are less likely to enroll in school and if they do, they often perform poorly. These children of today's poor families are likely to become the poor parents of tomorrow.

To break this intergenerational transfer of poverty, Early Child Development (ECD) programs have proven to be very effective. This report first sketches the condition of young children in Egypt. Against this background it presents the potential benefits of ECD programs, especially when these programs are targeted to children most at risk. The report then narrows its focus to programs for young children that already exist in Egypt, in particular the Kindergarten (KG) program. This program has grown rapidly in the past few years but still covers only about 10 percent of the eligible population. Moreover, there is evidence that poor children are enrolled less then proportional in the program.

The report underscores the importance of expanding the KG program, by presenting a Cost Benefit analysis of such an expansion, for Egypt as a whole and for selected (poor) governorates. The analysis shows impressive economic returns to such an expansion, even if the impact on school enrollment and performance is assumed to be modest. Benefit-to-cost ratios of 2.3 or higher can be expected.

Given that a large expansion of the KG program is highly desirable, the report estimates the costs of such an expansion. While the resource requirements are large in absolute terms, they remain relatively small as a fraction of, for instance, the overall education budget. The report concludes by discussing alternative funding mechanisms for (the expansion of) ECD programs in Egypt.

INTRODUCTION

Within Egypt's overall national framework for improving access to and quality of the education sector, the Egyptian government has pronounced the intention of enlarging compulsory basic education with one or two years of preschool for the 4 and 5 year olds. This would align the country's education system with practices that are increasingly common all over the world.

The rationale behind this intention is the growing recognition of the importance of the early years for the development of young children. Participation in preschool is shown to have potentially large impact on education outcomes, such as timely enrollment, less repetition and drop-out, more years of schooling and higher school completion. Better educational attainment in turn will increase an individual's productivity and income, and his or her opportunities in life.

The benefits of ECD interventions do not end at educational achievements. Different types of interventions can not only affect cognitive development, but health and nutrition outcomes, and psycho-social development as well. Moreover, benefits typically reach into adult life as findings from the growing body of literature on medical, psychological, educational and economic research show[1].

This report looks at early child development in Egypt from an economic and financial perspective. The first chapter will describe the current state of young children in Egypt and compare latest trends in human development with human development indicators in other Arab and lower-middle income countries. Next, a brief review of the long-term consequences of early childhood development will follow, along with a short summary of international evidence on the benefits of ECD. Chapter 3 gives an overview of the current provision of ECD services in Egypt through an overview of the institutional arrangements for ECD and actual access and use. Although both Kindergartens (KG) and nurseries are ECD programs, the remainder of the report will only focus on Kindergartens because of lack of data from the nursery program.

Based on the international evidence of ECD related benefits, chapter 4 will conduct a cost-benefit analysis of ECD programs in the Egyptian context. The present (economic) value of ECD interventions with various impacts will be calculated for different groups of children and compared to the potential costs of such interventions.

If Egypt expands KG enrollment over the next decade, resources will have to expand accordingly. Chapter 5 projects the costs of the intended expansion based on population data, current enrollment and public expenditures. Finally, chapter 6 reviews the current financial provisions for ECD and offers alternatives from international practice for financing a large-scale expansion ECD services.

[1] See chapter 2 for literature and references.

1

THE STATE OF CHILDREN IN EGYPT

1.1 Progress in Human Development

Egypt has made remarkable progress in all areas of human development over the last decades. Social services and social infrastructure have expanded, and education access has improved. The impact of these improvements is large. As shown in Table 1.1, over the period from 1960 to 1998, Infant Mortality Rates decreased from 108 to 29.2 and Under Five Mortality rates decreased from 204 to 42.1. In 1996, 81.4% of the population had access to safe piped water, compared with 70.0% ten years earlier. Daily calorie supply per capita has gone up with 15% over the last few years. As a result, life expectancy at birth increased from 55 years in 1976 to almost 67 years in 1998 (Institute for National Planning 2000).

Table 1.1: Progress in Human Development indicators in Egypt

	1960	1976	1998
Infant Mortality Rate	108		29
Under 5 Mortality Rate	204		42
Life expectancy at birth		55.0	66.9
Gross enrollment in primary school	61.3%		98.5%
Combined basic and secondary gross enrollment ratio	42.5%		80.7%
Human Development Index	**0.21**		**0.62**

Source: Institute for National Planning (2000)

The Human Development Index (HDI) of Egypt has increased accordingly. In 1960, the HDI was a mere 0.21, rising to 0.35 in 1980, and reaching 0.62 in 1998. This brings Egypt to the medium category of human development, ranking 119th on the index from the 174 countries listed in 1998 (Institute for National Planning 2000). Steady economic growth has fueled the progress. However, not all benefits from economic development have been translated into better life indicators yet. Comparison of Egypt's ranking on the HDI and its ranking based on GDP per capita shows a difference of 7 places. This essentially means that countries with a comparable or lower GDP per capita perform better than Egypt in terms of human development.[2]

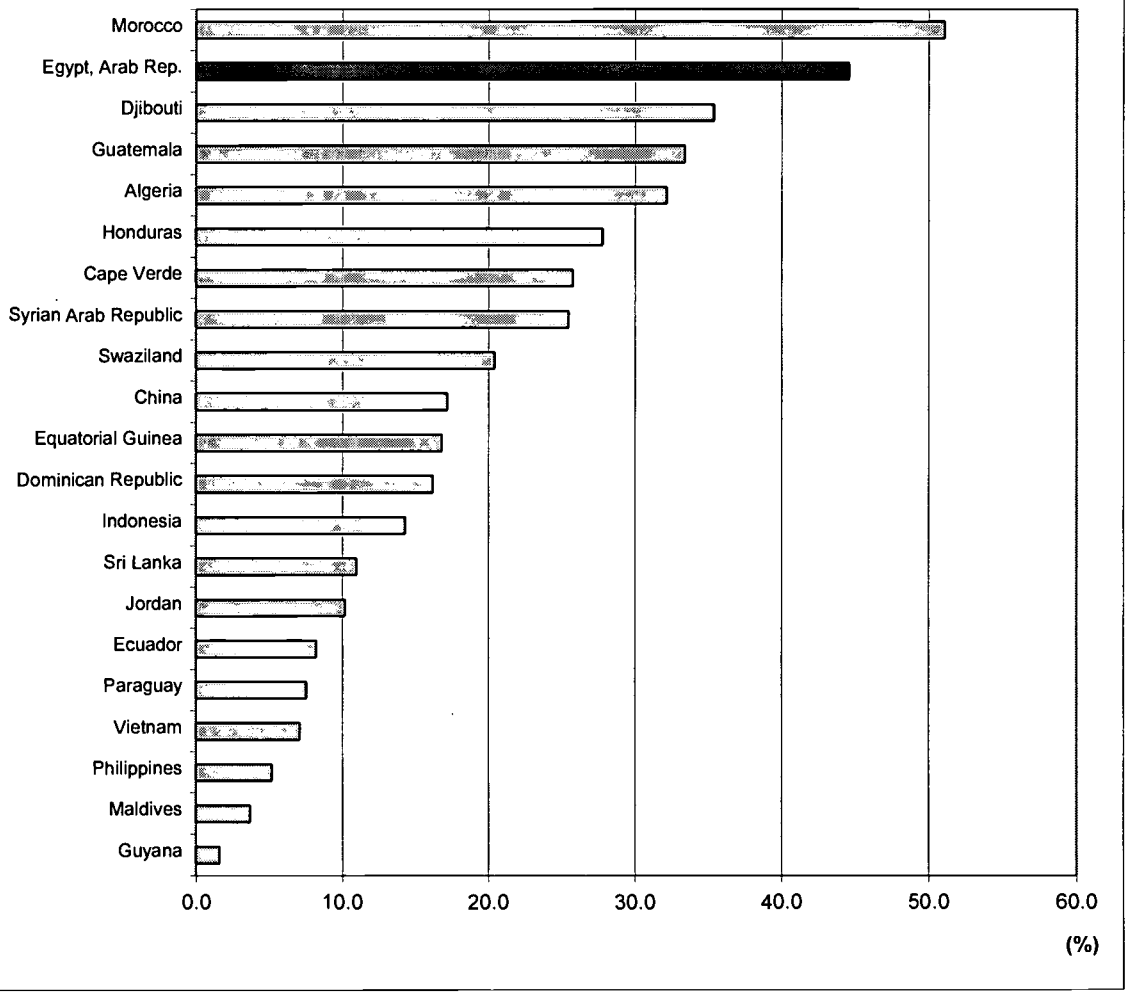
Decomposition of the HDI shows that this gap is mainly due to the low literacy rate. Although the literacy rate has increased from 25.8% in 1960 to 57.7% in 1998, this percentage substantially lags behind the average for lower-middle income countries and even behind countries that are less economically developed than Egypt. Figure 1.1 compares Egypt with other lower-middle income countries. GDP per capita of the countries ranges from US$ 500 to US$ 2000. Egypt –at US$ 1550- ranks in the top

[2] In 1999, the Human Development Index for Egypt reaches 0.635, placing the country at rank number 105 of the 162 countries on the list. This is 8 places lower than its rank based on GDP per capita (UNDP, 2001)

quarter. However, except for Morocco, Egypt shows the worse outcomes in terms of illiteracy of the population over 15 years of age[3].

Equally, despite the progress in gross enrollment ratios for both basic and secondary education, only 52% of the individuals over 15 years of age have completed primary schooling. Access to and enrollment in school –although not universal- are at par with comparable-income countries. What is lacking is actual learning achievement and ability to read and write.

Figure 1.1 Adult illiteracy rates in lower-middle income countries (2000)



Source: Statistical Information Management & Analysis (SIMA) database system of the World Bank.

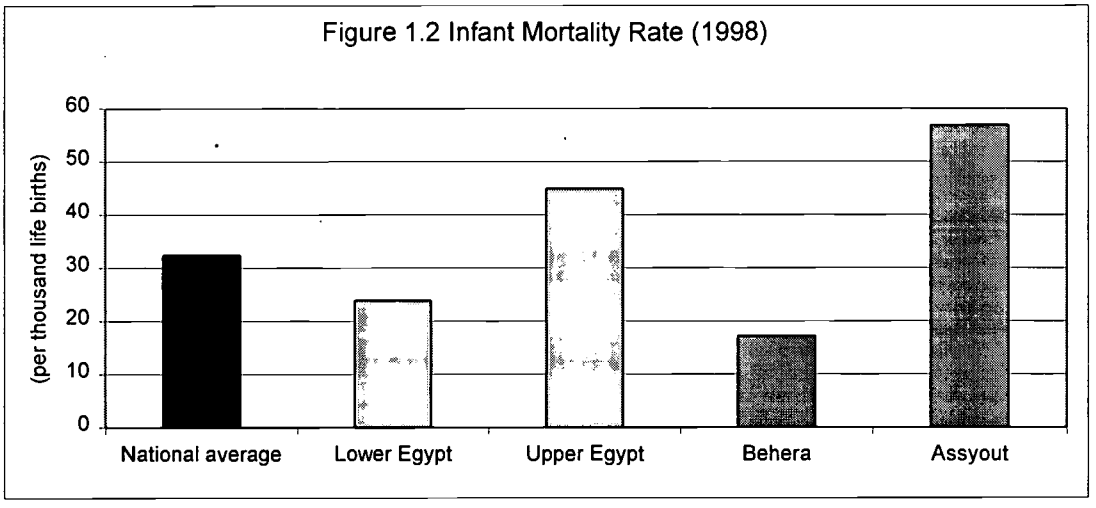
1.2 Differences between groups in society

A large proportion of the Egyptian population has seen their lives improve dramatically. However, some groups of individuals systematically fall short of these improvements. A closer look at the child development and education indicators shows some worrying discrepancies. Children living in rural areas and in several Upper Egypt governorates

[3] Source: Statistical Information Management & Analysis (SIMA) database system of the World Bank.

are especially prone to illness, premature death and low educational attainments. Female individuals and poor families are particularly vulnerable.

National level data hide the regional differences. Figure 1.2 shows that mortality rates differ widely across governorates and Upper and Lower Egypt. Underlying the national Infant Mortality Rate of 32.4 are the average rate of 23.9 in Lower Egypt (even as low as 17.2 in Behera) and the average rate of 44.9 infant deaths per thousand in Upper Egypt (with a high of 56.8 in Assyout). Likewise, the Under Five mortality rate of 42.1 on the national level is as low as 30.7 in Lower Egypt (only 23.6 in Behera) and as high as 58.7 in Upper Egypt (reaching 72.0 in Assyout). In both cases, mortality rates are three times as high in Assyout as in Behera (Institute for National Planning 2000).



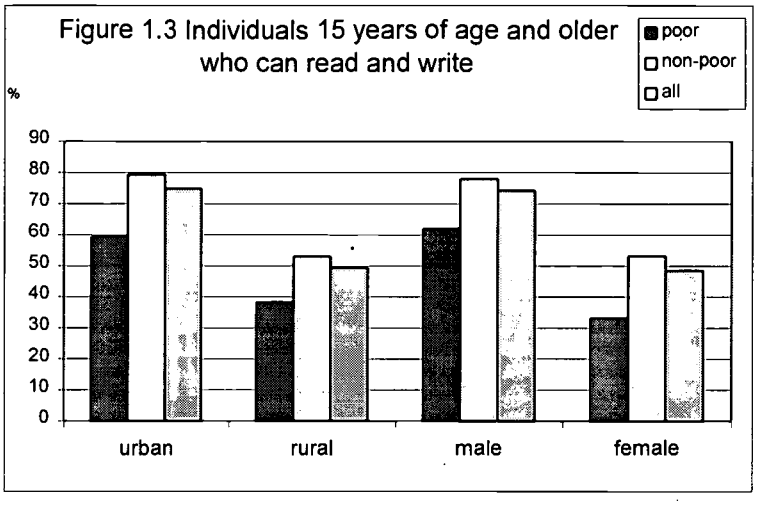
Source: Institute for National Planning (2000)

Systematic underperformance of particular groups does not end at governorate boundaries. In general, urban residents all over the country enjoy better health and nutrition than rural residents. 76.9% of births in urban areas are attended by health personnel, compared to 43.2% in rural areas. 93.1% of urban children are fully immunized compared to 79.5% of rural children. Rural children are more at risk for malnutrition than urban children with 8.9% of children below age 5 living in urban areas underweight compared to 11.9% of rural children.

The education gap is as pronounced as is the gap in health indicators. Overall, poor people, women, and rural residents enjoy significantly less education than their rich, male, or urban counterparts. The non-poor go to school for 7 years an average, while poor individuals enjoy schooling for an average of 4.4 years and the ultra-poor for 3.1 years only. Likewise, 56% of the non-poor has completed their primary school compared to 36% of poor and 24% of ultra-poor people. For each of the income groups, women show considerable lower attainment than men (IFPRI 1998).

Enrollment rates confirm these patterns. Gross enrollment rates in the urban governorates for primary, preparatory and secondary education are 107.6, 100.3 and 54.0 respectively. In comparison, only 83.9% of children in Beni-Suef are enrolled in primary school, preparatory school enrollment is only 70.4 in Fayoum, and gross enrollment for secondary education is as low as 40.1 in Souhag. Again, the percentage of girls and rural children enrolled is less than the governorate averages (INP 2000).

Not surprisingly, these differences in school attainment result in pronounced differences in literacy rates. Figure 1.3 shows that income seems a main determinant of an individual's schooling. Of all non-poor individuals 66% can read and write. In contrast, 47% of poor individuals are literate and only 36% of the ultra-poor. The gap between rural and urban areas is equally large. 72.1% of people living in urban areas can read and write, compared to only 45.9% in rural areas (and 38.3% of the people living in rural areas in Upper Egypt). Women across all regions are less literate then men. Especially in the already low-performing rural areas, female literacy rates are just about half the male literacy rates.



Source: International Food Policy Research Institute (IFPRI), 1998

1.3 Egypt's most vulnerable children

The reach of the differences in human development indicators should not be underestimated. In 1997, 26.5% of the Egyptian population was living in poverty, equivalent to 15.7 million people. Of them, 5.1 million are deemed to live in extreme poverty (IFPRI 1998). The incidence of poverty is worst in rural Upper Egypt, next in rural Lower Egypt and in the urban governorates where inequality is high.

The number of children below the age of 5 years is approximately 8.7 million today. An increasing proportion of the children under 5 will live in the rural areas, in Upper Egypt and in poor families, in other words, in families particularly at risk. This is due to variations in fertility rates. The average woman living in a rural area will give birth to more children than the average urban woman, and women in Upper Egypt are likely to have more children than women in Lower Egypt. An urban governorate resident will only have 2.9 children on average. A woman living in rural Upper Egypt will bear 4.7 children. Similar differences are found when comparing poor and non-poor families. The average non-poor household size is 5.4 compared to 8.0 for the ultra-poor households (IFPRI 1998, INP 2000). This difference in size is almost entirely accounted for by additional children.

Children from poor and rural families are more likely to suffer from malnutrition, illness or to low school performance, which in turn is likely to lead to lower income and human development indicators in later life. If the intergenerational cycle of poverty is to be halted, children particularly at risk deserve special attention and support in their development.

2

LONG TERM CONSEQUENCES OF EARLY CHILDHOOD DEPRIVATION

Children from poor families start their lives with far less bright life chances than their more affluent peers. A child from a poor family is less likely to enjoy good health, sufficient nutrition and to complete his/her schooling. As a consequence, the individual is likely to earn less money as an adult and to raise his or her children in poverty as well.

To halt this continuous cycle, interventions are warranted. The earlier the better. Especially during the early childhood period from 0 to 8 years of age, interventions can have great impact. During the early years, the foundations are laid for healthy physical, cognitive, emotional and social development. Children, who are deprived of appropriate stimulation, care and nutrition during this period, will often develop poorly and not reach their full potential.

2.1 Importance of early years

Strong evidence from neuroscience shows the importance of the first few years for brain development (McCain and Mustard, 1999). By the age of six months, the brain has reached 50 percent of its final weight and it will reach 90 percent by the age of eight. The sensatory and social interactive experiences of the child during this period determine which neurons and pathways are reinforced. At the same time, the neurons and pathways that are not stimulated gradually fade out to be eliminated eventually. The development of the brain is strongly related to the subsequent development of cognitive abilities, learning capacity, personality, and social behavior. Poor stimulation may result in low learning achievement, low intellectual capacity, and behavioral problems. Although not impossible, it is very difficult to alter the outcomes of this critical period in later life.

Equally important for the development of a young child are good nutrition and good health. Malnutrition can slow down brain development, and impair a child's ability to learn, think, socialize and explore its environment. The negative effects of malnutrition are especially hard-felt during the prenatal period and the first two to three years of life, when it can lead to irreversible consequences. Poor nutrition during this period is shown to be related to delays in physical and motor development, harmed intellectual ability, concentration problems and poor social skills (Martorell 1997).

Children that are malnourished during early childhood are more likely to delay enrollment in primary school and are likely to perform less well and to learn less than well-nourished children (Glewwe, Jacoby and King 2000; Glewwe and Jacoby 1993). Malnutrition during later years of childhood, such as the preschool or primary school period, have immediate effects on learning achievement during that period through loss of concentration, apathy and reduced activity (Grantham-McGregor 1995).

Young children are very susceptible to (often preventable) infections and diseases. This vulnerability is even greater when the child is malnourished. Again, research shows the relation between ill health as a child, and physical impairments and health problems later in life (Barker, 1998; Bundy, 1997; Ravelli, 1999). For instance, low birth-weight has been correlated with subsequent increased risk for high blood pressure, chronic pulmonary disease, cardiovascular disease, coronary heart disease, and stroke. Infant malnutrition has been associated with diabetes and reduced stature as an adult. Early infection has been related to the development of chronic bronchitis, acute appendicitis, and asthma in adulthood. In addition, ill health during early childhood can have serious negative impact on cognitive development (Sternberg et al. 1997).

2.2 Benefits of interventions during early childhood

The development of a child into a healthy, productive, and socially adapted adult is dependent on the interrelated effects of good health, good nutrition, cognitive stimulation and social interaction during the early years. Environmental factors such as characteristics of the parents and characteristics of the community are likely to affect this development. In general, especially low family income and low mother's education have a negative impact on the developmental process.

Early Child Development (ECD) programs aim to support healthy child development through a wide array of interventions. Dependent on the identified needs in a particular community, the interventions might range from preschool activities in order to increase school readiness, immunization and feeding programs, or parent training in order to improve appropriate parental care-giving skills.

Evaluation of ECD programs shows their potentially large long-term benefits (see for example Garces, Thomas and Currie 2000; Karoly et al. 1998; Myers 1992; Reynolds et al 2001; Young 1996). Children that participate in quality ECD programs tend to enroll earlier in school, and repeat less grades. Their drop-out rate is lower, they attain higher levels of schooling and their school performance is better. In turn, these children will be more productive as an adult, whether in the labor market or in the home, and enjoy higher income. Productivity is increased even more when the adult enjoys good health. Moreover, quality ECD services increase social competence, verbal ability and emotional development of children. Especially for poor children, participation in ECD programs has a positive impact on adjustment to society.

Not only the children that participate in the ECD program will benefit. Direct benefits follow from the provision of childcare for women who will be able to increasingly participate in the labor market and for older siblings, mostly girls, who can go to school instead of taking care of the younger children. Long-term benefits of ECD for society as a whole stem from a more productive workforce and better-educated population leading to higher economic development, as well as reduced public expenditures on health, social welfare and remedial education.

The synergistic effects of cognitive, physical and socio-emotional development ask for an integrated approach. Either the program itself can address different aspects of child development, or the program can be closely coordinated with other services, such as primary health care for pregnant mothers and infants. A study in Jamaica, for example, shows how either cognitive stimulation or supplementary feeding can increase the

cognitive abilities of a malnourished child. However, the combination of both elements has greatest overall impact (Grantham-McGregor 1991).

The involvement of parents in ECD services is very important. Children are affected by their experiences both in daycare / preschool and in their home environment. The impact of supplementary feeding is higher when parents are aware of the nutritional needs of their child. The impact of exploratory play in Kindergarten will be reinforced by activities such as story-telling at home. The importance of parent involvement is underscored by a recent ECD program in Turkey. Whereas both preschool activities and mother training separately improved overall development of the young participants, the combination of both had the greatest short-term effects. In the longer-term, the children whose mother had participated in the training, performed significantly better in school, had higher self-esteem, were more ambitious, and showed improved social behavior (Kagitçibasi 1996). It is interesting to note that the mothers as well reported higher self-esteem and more equal position compared to their husbands.

Early childhood development is a continuous process that starts in uterus and continues until primary school age. During this period, the child develops at a rapid pace. ECD interventions that are based on an integrated approach will have the greatest impact. Parental involvement in ECD services is of utmost importance in adequately supporting child development, especially for the poorest children. When integrated early child development is supported, the long-term benefits for the individual as well as for society can be very large.

2.3 Targeting ECD interventions

Quality ECD programs can benefit all children but some groups of children will benefit more than others. Especially children from poor families with low-educated parents are at risk for low developmental outcomes. They tend to show higher malnutrition and mortality rates, and lower school performance outcomes. These children are in greatest need of ECD services.

Moreover, studies show how the children most at risk benefit relatively more from the same intervention, as do children from richer or better-educated families. A study of a program in India hardly affected the drop-out rates of the richer children but reduced drop-out rates of the poorest by 46% (Chaturvedi et al. 1987). As such, the cost-effectiveness of ECD programs is increased if they are targeted to the most vulnerable children.

Well-targeted ECD interventions provide a powerful tool to address social inequality and to give the poorest children a better start in life. Providing them with good nutrition and health services, and appropriate early stimulation can be a first step in lifting the most vulnerable children out of poverty.

3

ECE/ECD PROGRAMS IN EGYPT

The previous chapter showed the potentially large positive outcomes of investing in ECD programs, especially for the poorest segments in society. This chapter will look closer at the current provision of ECD programs in Egypt, as well as the children that are actually reached by the services.

3.1 Institutional arrangement of ECD services

Early child development services in Egypt are delivered mainly through three Ministries. The Ministry of Education (MOE) is responsible for early education activities through preschools. The Ministry of Social Affairs (MOSA) takes care of day care centers and nurseries, which might include some early education activities as well. Primary health care activities are provided mainly by the Ministry of Health and Population (MOH). In addition, the National Council for Childhood and Motherhood (NCCM) was established in 1988 as the highest authority for ECD to formulate a comprehensive national strategy.

Early childhood education

The MOE is responsible for preschool education for children aged 4 and 5 years. Preschool education is delivered through public and private Kindergartens (KG). In accordance with a 1992 Presidential decree, all new primary schools should have one KG classroom for every six primary school classrooms. Dependent on the available space, KG classrooms would be added to existing primary schools. Currently, net KG enrollment is around 9.8% and gross enrollment (the total number of children enrolled including the 3, 6 and 7 year olds as compared to the population group of 4 and 5 year olds) reaches 10.9%[4]. MOE aims at an enrollment of 65% towards 2010[5].

The General Department For Family and Childhood of MOSA is in charge of the nursery or daycare program. MOSA used to be responsible for children from 0 to 6 years of age while MOE served primary school children and older. When MOE started the KG program, responsibility for the 4 and 5 year olds was transferred. MOSA officially remained in charge of the 0 to 4 only. However, a relatively large number of nurseries still provide day care to the 4 and 5 year olds, including early education activities, due to inadequate numbers of KGs. MOSA agreed with MOE to temporarily provide services to the 4 to 6 until enough preschools will be established.

Primary health care

Primary health care is predominantly the domain of MOH. Services are delivered through district health offices and primary health care facilities. MOH covers health insurance for all school-aged children through the Student Health Insurance Program (SHIP). With the addition of KG to the official school system, enrolled 4 and 5 year olds are now covered as well. This means that children not enrolled are not insured.

[4] Based on enrollment data from MOE Computer, Statistics and Information Department and population data from General Authority for Educational Buildings.

[5] This target is probably based on gross enrollment rates.

Also, the amount of expenses covered is relatively low. A new policy is being adopted to also expand health coverage to children enrolled in nurseries. This will be a main responsibility of MOSA.

Nutritional activities
Supplementary feeding is not part of the national ECD programs. Some nurseries might offer porridge, or a nutritional biscuit, maybe with a glass of milk. But in general children have to take their own lunch, although some private nurseries serve a full meal.

3.2 Enrollment in ECD programs

A comprehensive review of ECD programs should consider MOE, MOSA *and* MOH services. However, no data are available from MOSA that are specific enough for use in the financial and economic analysis (see Task Deliverable 1b for more details on nurseries). The discussion of health programs falls outside the scope of this report. As such, the rest of the report will focus on the delivery of ECD services through Kindergarten.

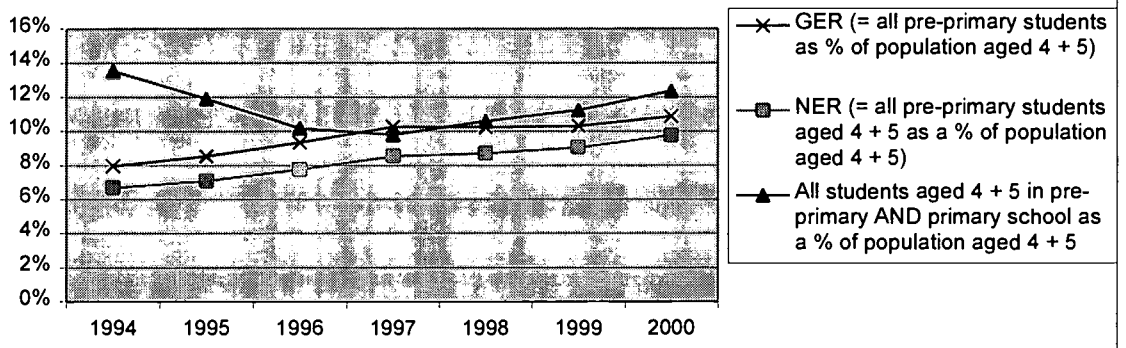
Data sources used
Enrollment ratios vary according to the data source. In general, all institutions use the number of students in KG provided by the MOE Computer, Information and Statistics Department. The difference stems from different population data used. The two main data generating organizations are CAMPUS and GAEB. CAMPUS uses and analyses census data. However, a closer look at their available population database shows mortality rates below 1% for the first few years, which is much lower than the actual 4%. GAEB, the General Authority for Educational Buildings, bases its population data on birth certificates. It uses these data for planning of new school constructions. Again, not all children will be registered at birth. Also, GAEB's population database available to the team covers only children from the age of 4 and onwards. Despite these disadvantages, it is decided to use the GAEB data. These are used throughout the MOE for planning and reporting, as well as by the World Bank and the PPMU in Cairo.

Enrollment ratios
Over the last years, a growing number of children have been enrolled in Kindergarten. In 1993/1994 only 246,100 children received early education services through KG. In 1999/2000 this number has increased with 44% to 345,435. Figure 3.1 charts enrollment ratios between 1994 and 2000. When comparing the number of students with GAEB population data, gross enrollment ratios have increased from 8.0% to 10.9% over the same period.[6] The MOE enrollment ratio does underestimate the total number of children receiving early childhood education services, since a group of children is served through the nurseries.

The net enrollment ratio, that is the number of children aged 4 and 5 that is enrolled in Kindergarten, has increased over the same period with 46% from 6.7 to 9.8. This ratio does not take into account the large number of 5-year-old children (around 5% of the total population aged 5) that is enrolled in the first grade of primary school already. If one looks at all children aged 4 and 5 enrolled in school –whether preschool or primary school--, the enrollment ratio for that age group reaches 12.4% in 1999/00.

[6] According to CAMPAS, GER would be 13.1% in 99/00.

Figure 3.1 Enrollment ratios

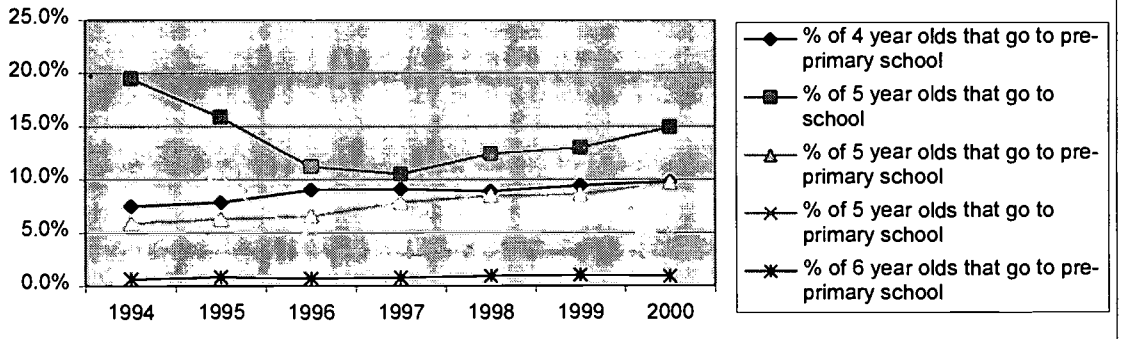


Source: MOE Computer, Information & Statistics Department and GAEB

The increase in enrollment has been accompanied by a rapid increase in KG schools and classrooms. Over the last decade, KG services more than doubled. The number of schools offering KG education increased from 1,196 to 3,705 and the number of classes within these schools increased from 5,673 to 11,427. The largest part of this increase is accounted for by the public Kindergartens that increased eight-fold in number since 1992 (MOE 2000).

Figure 3.2 shows enrollment ratios relating to particular ages. The number of 5 year olds enrolled in *primary* school used to be much higher a little decade ago. With the increase in Kindergarten facilities, this number initially decreased sharply with more than 80% from 13.6% in 1993/94 (211,644 grade 1 students aged 5) to 2.6% in 1996/97 (35,862 grade 1 students aged 5).

Figure 3.2 Enrollment ratios by age



Source: MOE Computer, Information & Statistics Department and GAEB

However, the last years the percentage of preschool children enrolled in primary school has gone up again. This might point to a latent demand for early education services that is not met by actual services provided. Annex 1 provides a detailed overview of the number of students in KG and primary school by age group.

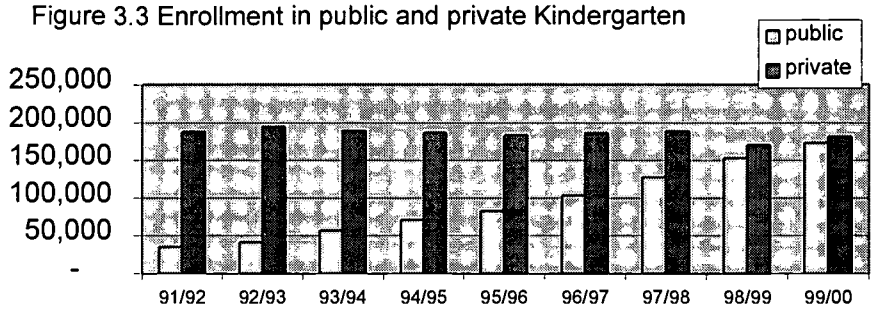
3.3 Public vs. private provision of ECD

There are 2356 public preschools compared with only 1171 private KGs. However, the private schools have twice as much classes per school on average: 4.8 compared to 2.4 in the public schools. This makes the number of private and public classrooms almost equal around 5700 both. Also, private KGs have on average 33.4 children per classroom while public KGs have an average student/classroom ratio of 29.3. As such, there are slightly more children enrolled in private (51.1%) than in public (48.9%) preschools (MOE 2000).

Private KGs play a particular strong role in three governorates: Cairo, Alexandria and Giza. Together, these governorates account for almost half of all preschool enrollments and 70% of all private preschool enrollments. In the rest of the country, the share of public versus private preschool equals on average 70:30.

Over the last decade the *relative* share of public and private KG has changed substantially. Whereas only 15% of KG students were enrolled in public KG in 1991/1992, this share went up to 49% in 1999/2000, as shown in Figure 3.3.

Figure 3.3 Enrollment in public and private Kindergarten

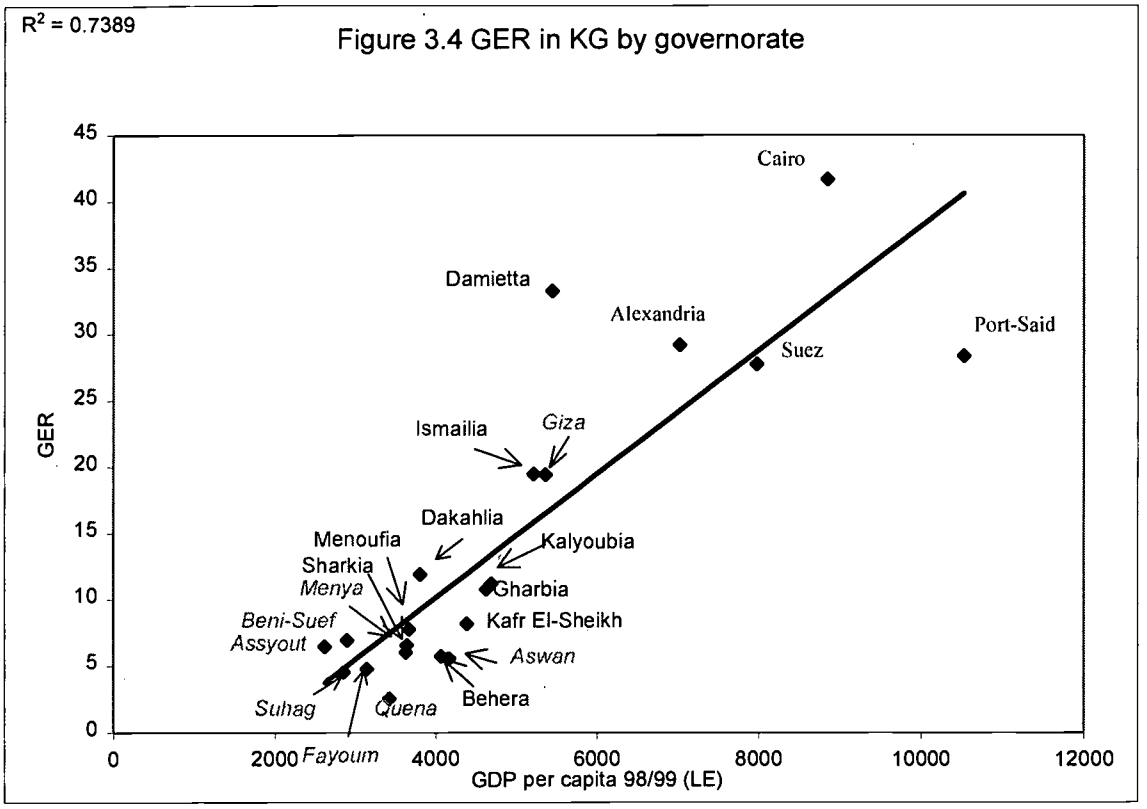


Source: MOE Computer, Information & Statistics Department

3.4 Targeting of services

ECD services are steadily increasing, but not all children profit equally from this growth. Enrollment rates are higher for males than for female children with enrollments of 185,683 and 168,752 respectively (MOE 2000). Larger differences are encountered when comparing regions and governorates.

Figure 3.4 shows that there is a strong correlation between GDP per capita and Gross enrollment in KG: the poorest governorates have the lowest enrollment rates. Moreover, virtually all governorates with lowest GER are located in Upper Egypt. Only Giza stands out. Lowest Ger is found in Quena at the bottom with only 2.6% of preschool children enrolled. Lower Egypt governorates do somewhat better, although the governorates in Lower Egypt with low GDP per capita have low enrollment rates as well. Urban governorates in general score both highest in GDP per capita and in enrollments. Cairo has best performance with a GER of 41.7%.



Source: GER data from MOE; GDP per capita data from INP

It is striking to see that the poorest governorates have such low enrollments since especially the poorest children would benefit enormously from quality preschool. Moreover, the poorest governorates with the lowest KG enrollment show lowest enrollment in the other levels of education (primary, preparatory and secondary) as well. If KG can indeed stimulate children to stay in school longer, special focus on these states is even more warranted.

4

ANALYSIS OF COSTS AND BENEFITS OF EGYPTIAN ECE/ECD

4.1 Introduction to the cost-benefit analysis of ECD

Over the last decade, Egypt has been expanding its ECD services by almost 50%. Still, only one tenth of all preschool-aged children are enrolled in Kindergarten. The poorest children have not benefited much from the growth in KG classes. This chapter underscores the large benefits to be gained from an increase in coverage, based on a cost-benefit analysis. The analysis facilitates an economic judgment of the returns of ECD programs. It compares the costs of the program with its future benefits discounted to the present-day value. The resulting benefit-to-cost ratio enables the comparison of early childhood intervention programs with other investments, making a case for investing in ECD and allocating financial resources to young children.

The main difficulty in performing a cost-benefit analysis of ECD is not the identification of benefits but their expression in monetary terms. The economic analysis of investments in education is usually based on increased productivity in the labor market (and increased income) as an adult. Improvements in health or life expectancy can be translated into disability-adjusted life years, which in turn could be valued as increase in productive years. Other methods look at the value of avoided treatment costs due to less morbidity, for example. Likewise, it is possible to express a reduction in delinquency in monetary terms, through the estimation of a reduction in public spending on the judicial system. These methods give some indication of monetary value, but they will not capture all benefits simply because not all benefits can be expressed in those terms (for instance, a healthy life is worth invaluably more than just its returns through increased labor productivity).

This report will make an initial estimation of the benefit-to-cost ratio for ECD. The analysis will only look at benefits for the *individual* in terms of the individual's increased productivity. The benefits for society as a whole (improved economic growth, reduced fertility or delinquency etc.) are not taken into account. Moreover, the report will focus on the economic returns of improved *schooling*. It will not consider impact on other areas of a person's life. As such, the analysis greatly underestimates the benefits of ECD. Real benefit-to-cost ratios will be higher than the calculations made in this chapter.

Since no studies are available that explicitly measure the impact of preschool in the Egyptian context, the cost-benefit analysis cannot estimate the cost-benefit ratio of a real existing program. Studies underway will become available during the summer of 2001. For the moment, the cost-benefit analysis will have to be based on international evidence of the impact of ECD. The report will estimate the Net Present Value of the assumed impact of ECD interventions, given the Egyptian schooling system, costs of schooling and wage structure. The discounted benefits will give the maximum amount that a real program could cost and still break even, assuming that the program leads to the expected outcomes.

4.2 Preparing the base-line data: the Egyptian education system

Basic education in Egypt used to consist of five years of primary education and three years of preparatory education. Since 1999 basic education has been expanded to nine years by adding a sixth year to primary school. The analysis will use the 8-year system, as that is the years of schooling on which all enrollment and repetition data have been based so far. The secondary level consists of three years, either through general secondary education, which gives subsequent access to university for the best 30% of the students, or through vocational education (industrial, commercial, agricultural). Tertiary level consists of four years of university education or two to five years of non-university higher education. For practical purposes, the analysis will use the university data for tertiary level. The indicators used to measure school performance are net enrollment rates, repetition rates and drop-out rates. The national averages for these indicators are given in the table below.

Table 4.1 National school performance indicators

School level	Years	Net Enrollment Rate	Drop-out rate	Repetition rate
Primary	5	90.9	1.5	5.5
Preparatory	3	68.9	2.4	8.7
Secondary	3	47.1	*2.5*	2.7
Higher	4	20.9	2.5	*2.5*

Source:
*- Institute for National Planning (2000) for primary to secondary level****
- Ministry of Higher Education (MOHE) for university level (repetition for university not available: held equal to secondary repetition)
**** Data on NER, drop-out rates and repetition rates by governorate are only available from INP, not from MOE*

Timelier, more and better schooling increases the individuals future productivity in the labor market, and the associated higher income. In particular, returns to education are estimated to be more than 5% for every additional year of primary education, 11% for preparatory school years, 4.5% for each year of secondary education and a high of 14.3% for university education.[7]

In the present, more schooling leads to more costs. The direct costs of one year of additional schooling should be taken into account (both public spending and household expenditure), but also the opportunity costs of going to school. Every additional year of schooling delays entrance in the labor market and means one year of lost earnings. In the cost-benefit analysis, we will include these lost earnings as additional costs of education. Table 4.2 summarises the costs of education for each school level.

[7] These estimates are derived from *NAME* (2000) and are based on 1988 labor surveys. These are the latest complete estimates for the wage equation (including also wage information and the return to experience) available. Assuming that the wages have gone up over the years, but the returns to different levels of education stayed more or less the same, we will use the results of this research report.

Table 4.2 Public and private costs of education

School level	Public cost per student per year (in LE 2000)	Private cost per student per year (in LE 2000)	Total cost per student per year (in LE 2000)
Primary	596	168	764
Preparatory	661	302	963
Secondary	1,272	788	2060
Higher	3,112	885	3997

Source:
- *Public costs: Based on the average costs per student over the years 1995/96 – 1999/00 as calculated by the MOE Budgeting Department*
- *Private costs: INP (2000) – Egypt Human Development Report 1998/99*
- *LE 2000 prices calculated based on deflator World Bank*

4.3 Estimating the benefits of ECD

Direct benefits

The direct benefits of ECD programs, i.e. benefits that are enjoyed at the time of the intervention, usually consist of benefits in terms of supplementary feeding, primary health care services, and the baby-sitting function. These benefits will not be incorporated in the analysis. In Egypt, direct benefits of supplementary feeding (in terms of the market value of the food) are virtually absent since Kindergartens usually do not provide nutritional services. The direct benefits of primary health care are received through the health insurance provided to the students. However, we do not have information on either use or costs of the health services. Finally, another direct benefit is the delivery of childcare to families. This will enable both older sisters who use to take care of their siblings to go to school, and mothers to go to work outside the home. The economic value resides in increased schooling for older siblings and increased income from female labor force participation (minus reduced productivity in the household). Estimating this value is an elaborate exercise however, and falls outside the scope of this report.

Impact of ECD on school performance

The most common reason for investing in preschool is to increase the readiness of the child to enter primary school. Especially in Egypt, parents are generally convinced that children should start learning to read and write at the preschool age. ECD programs affect future primary school outcomes. Achievements and performance are likely to improve. Enrollment (both entry in school and duration of enrollment) tends to increase as well when children are better equipped to enter primary school.

For instance, the Integrated Child Development Project in Bolivia (Proyecto Integral de Desarrollo Infantil or PIDI) provides non-formal, home-based day care and nutrition and education services to young children (6 months to 6 years) in poor, predominantly urban areas. The program has improved cognitive test score outcomes for the older age group by roughly 5% and even higher for children that participated more than a year in the program. Also, virtually all children participating in the program subsequently entered primary school (enrollment of 95-100%), compared to a mere 20% for non-participating children (Behrmann, Cheng & Todd, 2000; Van der Gaag & Tan 1998).

Interventions usually have a particularly strong impact on poor and disadvantaged children. Participation as a young child in the Integrated Child Development Scheme of India's Haryana project for example, did not have a significant effect on later primary school dropout rates for children from the higher caste. However, participating children from lower castes showed a subsequent reduction in primary school dropout with 46 % (Chaturvedi et al, 1987).

The recent evaluation of the Chicago preschool program in the USA supports these findings. Preschool participation was significantly associated with higher rates of school completion (49.7% vs. 38.5% in the control group), lower school dropout (46.7% vs. 55.0%), less grade retention (21.9% vs. 32.3%) and less need for special education (13.5% vs. 20.7%) in primary and secondary education (Reynolds et al. 2001).

Health and nutrition

The impact of improved health and nutrition in this context is two-fold. First, primary health care services can reduce child mortality. Every child that survives can contribute to the economy of her country by growing up into a healthy adult. Second, reduced morbidity and malnutrition in early childhood leads to earlier entry in school (less delay in enrollment), less absenteeism and better performance in school because of greater learning productivity per year of schooling. Research on child nutrition in the Philippines shows how a one standard deviation increase in height, increases school attendance with on average 1.1 academic years and even 2.1 academic years if only the most malnourished children are considered (Glewwe, Jacoby & King, 2000). The result of improved health and nutrition can be either higher enrollment ratios, or less drop-out and repetition rates. A final impact of childhood health is its impact on adult health. Improved adult health in turn leads to greater productivity. In principle, the economic effects of this increase in productivity can also be incorporated in the analysis, though the report will not do so.

Social development

A comprehensive study in Turkey evaluates the on the impact of different types of day care combined with mother training on later school performance. Especially the training of the mother had a significant long-term effect on school attainment and enrollment. Seven years after the ECD program, 86% of the children whose mother had received training were still in school, compared to only 67% of the children whose mother had not participated in the training. Also, children that had participated in the educational day care (preschool) program, as opposed to the custodial day care, showed less repetition and higher test scores in primary school. One of the factors cited to explain these outcomes is the higher self-esteem of the mother-trained adolescents, and higher expectations that both the child and its parents have regarding the child's academic performances.

International evidence makes it clear that benefits are greatest for the most deprived. The benefits for children from the poorest families with the least educated parents can be extremely high. In contrast, children from middle-income or richer families usually enjoy a home environment that is relatively conducive to healthy child development. This is not to say that ECD programs or enrollment in KG will not support all children in the development of their cognitive abilities, whether rich or poor. However, it does mean that the impact will be more impressive for the poorest.

4.4 Costs of ECD programs

The costs, to which the benefits will be compared, are the costs of current public preschool provision through Kindergarten. The average cost per student of one year of Kindergarten over the last six years was LE 385 in public funding. This includes both recurrent and investment costs. The private costs of sending a child to preschool should be considered as well. For Kindergarten, these are the fees paid by parents. Fees differ between KGs from the official fee set by MOE (LE 19.20) up to several hundreds or even thousand LE for the most expensive private Kindergartens. The official fee will be used in the analysis.

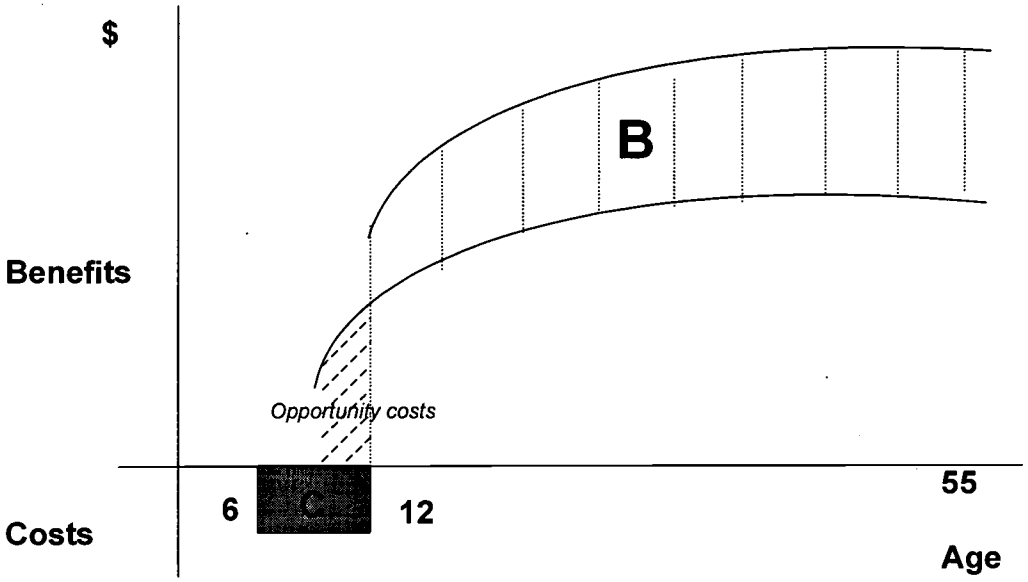
4.5 Results of the cost-benefit analysis

The cost-benefit analysis is performed with "The ECD calculator", as developed in Van der Gaag & Tan (1998). Based on the country characteristics of the education system and the labor market, the Net Present Value of an intervention is calculated. Impact of interventions is measured through improvements in enrollment and reductions in repetition. Because data on drop-out rates are either not available or not reliable[8], the analysis will not consider impact on drop-outs. Reduction in child mortality is omitted from the analysis as well, because it has only a very limited impact on NPV.

In summary, the analysis will measure the benefits derived from ECD programs in terms of increased lifetime productivity. These benefits are related to the costs of schooling and the opportunity costs of delayed entrance in the labor market. See figure 4.1 for a graphic representation of the age-earnings profile with and without schooling. The total cost of schooling is the sum of the education costs C plus the opportunity costs. The area B represents the extra benefits derived from six years of schooling in terms of increased productivity.

[8] It seems that only children that are deceased are counted as drop-outs. All the other drop-outs are considered repeaters, who are automatically promoted to the next grade after two years, repeat again, etc.

Figure 4.1 Age-Earnings Profile with and without Schooling



The discounted value of the impact of ECD

As was discussed in the first chapter, differences in human development indicators between governorates are large. The variations in net enrollment rates and repetition rates confirm this finding. The analysis will focus on the governorates that perform below the national average at the basic education level, that is primary and preparatory school: Dakahlia, Kafr El-Sheikh and Behera in Lower Egypt; Beni-Suef, Fayoum, Menia, Assyout, Souhag and Quena in Upper Egypt; and Matrouh from the frontier governorates. These are the governorates that on *average* would benefit most from investments in early childhood education (although in other governorates there are rural, poor or other children potentially at disadvantage as well). It should be remembered that within the governorates the impact will be larger for some groups than for others.

Simulations were run for three different scenario's based on different impacts of interventions. In the first scenario, the NPV of a mere one percentage point increase in primary and preparatory net enrollment ratios will be calculated[9]. This impact is then enlarged with one percentage point reduction in repetition rates. The second scenario estimates the NPV of a slightly higher two percentage points increase in primary and preparatory net enrollment ratios, and then combines this hypothetical impact with a two percentage point reduction in repetition rates. Finally, the third scenario is the most optimistic. Instead of assuming a very modest impact on enrollments, it will measure the economic benefits of an increase in primary and preparatory net enrollment ratios, and reduction in repetition that will reduce the gap to the national average by half. Table 4.3 summarizes the three scenarios.

[9] We first calculate the Net Present Value of the future benefits, i.e. increased future productivity minus the public, household and opportunity costs for education at the basic and higher levels. Costs of the ECD program are not yet incorporated.

Table 4.3 Three hypothetical scenario's of the impact of ECD programs

	Scenario I	Scenario II	Scenario III
Primary enrollment	+ 1 % point	+ 2 % point	Gap to national average reduced by half
Preparatory enrollment	+ 1 % point	+ 2 % point	
Primary and preparatory repetition	- 1 % point	- 2 % point	

The first scenario returns a NPV of the benefits of on average LE 471 (US$ 144) per child if only the enrollment rates in basic education increase with one percentage point. If repetition rates would decrease with one percentage point as well, the NPV of the benefits rises to LE 481 (US$ 147) per child. For instance, according to this scenario the primary and preparatory enrollment in Beni-Suef are assumed to increase from 83.2% to 84.2% and from 51.1% to 52.1% respectively. Repetition rates go down from 6.2% to 5.2% in primary and from 11.1% to 10.1% in preparatory school. This leads to a discounted benefit after deduction of the costs for education (public, household, and opportunity costs) of LE 483 per child (US$ 126) for Beni-Suef.[10] Essentially, these results mean that an ECD program producing a one percentage point change in enrollment and repetition for a cohort of 1000 children, can cost almost half a million Egyptian pounds and still break-even.

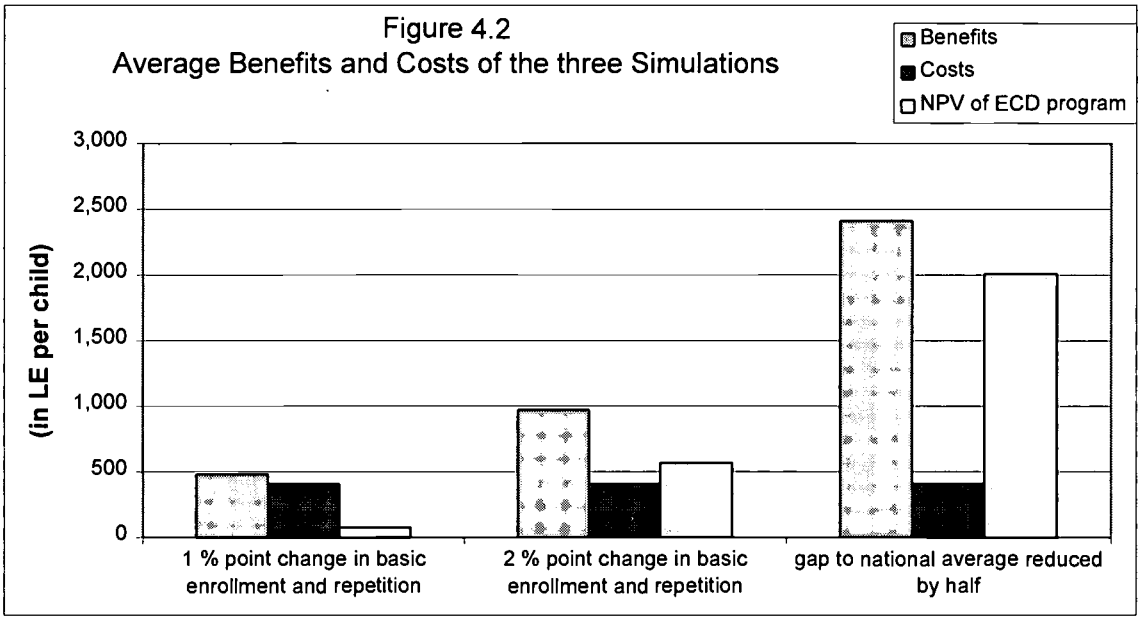
If an intervention could increase net enrollment rates in basic education with two percentage points, that would boost the *additional* returns to education to almost one million L.E. on average for a 1000 children cohort. To be precise, a program with a two percentage point impact on basic enrollment would increase returns to education with an average of LE 950 per child (US$ 291) , or between LE 886 in Menya and as much as LE 1,119 in Matrouh. Again, a decrease in repetition rates adds to the returns. The NPV increases to LE 972 per child (US$296). It is obvious, however, that increasing enrollment has greater impact on returns than decreasing repetition rates.

Finally, imagine an intervention or program that would reduce the gap between a governorate's basic enrollment and repetition rates and the national average by half. The benefits of such an intervention are very large. For every 1000 children, the program could cost on average LE 2.7 million and still break even. In Souhag, for example, this scenario implies that the net enrollment rate in primary education increases from 72.1% to 81.5%, which is still almost 10% below the national average. Note that *any* intervention with such an impact in Souhag would have a present value of almost 4 million per thousand children. Given the fact that a year of Kindergarten costs approximately LE 400,000 per thousand children, LE 3.6 million would be left over for other programs (such as girls programs or rural development programs) if the interventions combined would manage to raise enrollment to just above 80%.

[10] For a complete overview of the NPVs for all governorates, see Annex 3.

Figure 4.2 summarizes the average benefits of the three scenarios for the governorates that were analyzed. The NPV of the benefits are compared to the costs of one year of Kindergarten to give the NPV of the ECD program (assuming that KG can achieve this impact). A one percentage point increase in basic enrollment and repetition can return about LE 75,000 for every 1000 children enrolled **net of costs of KG**. The NPV is even larger if a year of KG could indeed increase enrollment with two percentage points. In that case, the economic benefits derived from better education of 1000 children returns more than half a million LE after deduction of the costs of Kindergarten. If Kindergarten could reduce the gap with the national average for a particular cohort of 1000 children, the benefits net of costs would amount to more than LE 2 million.

Figure 4.2
Average Benefits and Costs of the three Simulations



Benefit-cost ratios

The above analysis is useful in determining whether to undertake a project or not: if the NPV of benefits minus the program costs is negative, than undertaking the program is not economically sound (although not all benefits are incorporated in the analysis!!). However, programs also have to compete with other investments for financial resources. The benefit-cost ratio provides a tool for this comparison by converting the benefits and costs of different types of projects into the same indicator. The table below shows the benefit-to-cost ratio for the various scenarios.

Table 4.4 Benefit-cost ratio of three scenario's

Governorate	Scenario I: 1 percentage point increase in prim+prep enrollment	Scenario I: & 1 percentage point reduction in prim+prep repetition	Scenario II: 2 percentage point increase in prim+prep enrollment	Scenario II: & 2 percentage point reduction in prim+prep repetition	Scenario III: Gap to national average reduced by half
Dakahlia	1.14	**1.17**	2.30	**2.36**	**0.14**
Kafr El-Sheikh	1.10	**1.13**	2.23	**2.29**	**1.55**
Behera	1.25	**1.28**	2.52	**2.58**	**3.10**
Beni-Suef	1.14	**1.16**	2.30	**2.35**	**9.25**
Fayoum	1.10	**1.13**	2.22	**2.28**	**6.66**
Menya	1.05	**1.08**	2.13	**2.18**	**7.47**
Assyout	1.06	**1.08**	2.13	**2.18**	**8.39**
Souhag	1.06	**1.09**	2.15	**2.19**	**9.49**
Quena	1.08	**1.10**	2.17	**2.23**	**3.47**
Matrouh	1.33	**1.36**	2.69	**2.74**	**8.53**
Average Benefit-cost ratio	**1.13**	**1.16**	**2.29**	**2.34**	**5.81**
Average for Egypt	**1.20**	**1.23**	**2.43**	**2.49**	

If the impact of Kindergarten were only a one-percentage point increase in enrollment in basic education, the benefit-cost ratio would lie between 1.05 and 1.33 with a benefit-cost ratio of 1.20 for the country as a whole[11]. If on top of the increased enrollment ratio repetition would decrease with one percentage point, the average benefit-cost ratio rises to 1.16 and ranges between 1.08 and 1.37 for the individual governorates (1.23 for Egypt).

The picture changes dramatically if one year of KG could increase net enrollment in basic education with two percentage points. This is still a very small increase, considering the enrollment rates around 75% in several governorates compared to the national average of 90.9%. The increase in enrollment could be caused either through timelier, swiftlier or longer enrollment. In that case, the benefit-to-cost ratio jumps up to a high of 2.29 on average. This number is far above the average benefit-to-cost ratio for traditional projects, but comes close to the ratios calculated for ECD programs in other countries[12]. An additional reduction in repetition increases this ratio even more to 2.34 on average for the governorates considered.

[11] The benefit-cost ratio of a one or two percentage point increase in performance for Egypt as a whole is higher than for the average low-performing governorate because the average school performance in the country as a whole is better (in terms of repetition etc.) which makes average benefits of the education system higher and average costs lower. However, the *impact* of KG will be greater for low-performing governorates, shifting their benefit-cost ratio towards scenario three. A similar impact for well-performing governorates is less likely.

[12] Such as the benefit-to-cost ratios of 2.38 – 3.18 for ECD in Bolivia (Van der Gaag & Tan, 1998); 3.00 for Philippines early childhood program (Glewwe et al. 2000); 7.16 for Perry Preschool Program in the USA (Schweinhart et al. 1993).

If KG could reduce the gap with the national average by half, the benefit-to-cost ratios shoot up to an average of 5.81. The ratio for the governorate of Dakahlia is very low because its school performance indicators are already very close to the national average. Omitting Dakahlia from the calculations leads to an average benefit-to-cost ratio of 6.43. For individual governorates, the ratio lies between 1.55 and 9.49.

4.6 Concluding remarks

If one year of Kindergarten could increase net enrollment in basic education with only 2 percentage points, this would return benefits to the amount of at least LE 950,000 per 1000 children (that is US$ 300,000 for every 1000 children). This represents a benefit-to-cost ratio for KG of 2.29. Although this ratio might seem extremely high compared to the traditional investment projects, it is very much in line with outcomes of cost-benefit analyses of ECD investments in other countries.

The question, of course, is whether the Kindergarten program in Egypt can indeed increase enrollment with 1 or 2 percentage points. No Egyptian impact studies are available yet, but the answer is very likely to be affirmative, considering the international experience with preschools. Programs all over the world have been able to increase subsequent enrollment of disadvantaged children in primary education with 10%, 20% or even more. For children who lack appropriate cognitive stimulation and learning experience in their home environment because of poverty, low-educated parents or otherwise, preschool has been shown to produce a large impact in both school enrollment and school performance.

Moreover, it should be remembered that the analysis above only looked at the benefits of KG through *increased schooling* and only took into account the benefits for the *individual*. Thus, the real benefits are seriously underestimated as the analysis does not include effects on health and socio-emotional development for example, nor does it look at the positive outcomes for society as a whole.

To reap the highest economic benefits from investing in ECD, it would be wise to start with targeting the children that are likely to be most affected by it. At the same time, this would be the best investment in terms of poverty reduction and equity among different groups in society.

The specific method of early childhood education can make a large difference in outcomes. Obviously, the better the quality of an ECD program, the larger the benefits. Quality is context-specific however, and resides in a large number of factors such as the adopted approach (formal vs. non-formal; home-based vs. center-based), curriculum, student/teacher ratios, involvement of parents in the program, use of materials and toys, etc. Although the cost-benefit analysis shows the profitability of investing in ECD compared to investments in other sectors, it does not compare ECD programs with each other. In order to make a sound judgment regarding the exact program to invest in, cost-effectiveness studies of a variety of programs in alternative settings should be conducted. The results presented here can be considered as overall averages of programs that closely resemble the current KG system.

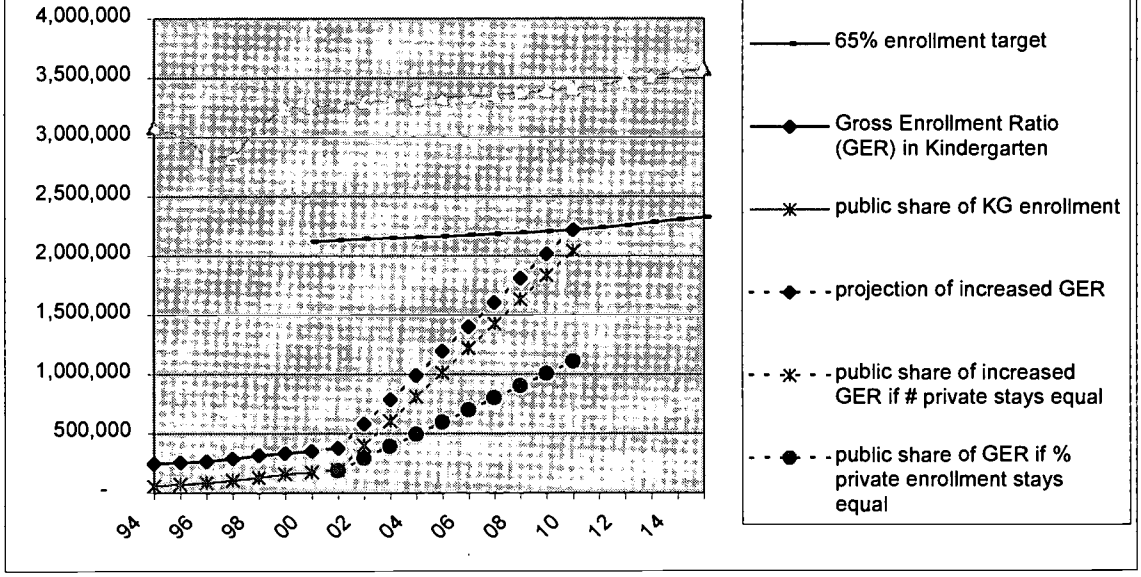
5

EXPANSION OF THE ECE/ECD SYSTEM IN EGYPT

5.1 Projection of Kindergarten enrollment

Children, who would benefit most from Kindergarten, have least access at the moment. In light of the previous chapters, it is very well justified to invest in ECD programs, in particular programs targeting children most at risk, and to expand coverage. The MOE aims to reach an enrollment rate in Kindergarten of 65% by the year 2010.[13] Figure 5.1 shows a projection of the population aged 4 and 5 for the coming years. In 2010 almost 3.5 million children will be in the relevant age group. Egypt needs a substantial boost in its KG growth rate if it ever wants to serve 65% of the 4 and 5 year olds. In the target year this equals a number of more than 2.2 million; 1.9 million more than the current enrollment of 354,435 (with a net enrollment of only 318,000 children).

Figure 5.1 Projection of Kindergarten population (children aged 4 and 5 years)



Source: Current and projected population data are based on the data of GAEB. Current private and public enrollment in KG is based on numbers received from MOE Computer, Information & Statistics Department.

Achievement of the target will require a major effort for expansion over the next decade.

Each year, another 200,000 *additional* children will have to enroll. Almost 70,000 KG classrooms would need to be built on a yearly basis. Two scenarios are presented: the first one assumes that private provision of KG will not increase substantially just as it

[13] It is not clear whether the target aim is based on gross or net enrollment. Ideally this should be a net enrollment, that is, 65% of all 4 and 5 year olds are appropriately enrolled in Kindergarten. However, MOE usually uses gross enrollment rates for reporting purposes (that is, ALL children enrolled in KG regardless of their age). The report will use GER in this chapter as well.

has not done over the last years. When keeping private services at the current level of 181,158 children enrolled, public schools will have to serve the bulk of the young children: 1.74 million towards the year 2010.

If instead the private sector will grow on equal footing with public KG provision, expansion is shared. Currently, the government provides services to approximately half of the children enrolled. If the private sector continues to provide 50% of ECD services in the coming years, this would require an increase of 950,000 KG places each, or almost 32,000 new public KG classrooms and 32,000 new private classrooms.

5.2 Cost projection based on the 2010 enrollment target

The total unit cost of KG over the years has been on average LE 383 per student in year 2000 prices. The breakdown of unit costs leads to LE 335 recurrent costs per student per year and LE 7250 investment costs per new classroom. See Annex 4 for detailed information and calculations.

Based on the enrollment projections and the unit cost estimates, the financial consequences of the proposed expansion of Kindergarten services are estimated. Two scenarios are considered. First, private provision remains the same and the public sector accounts for the total expansion. Second, the share of private and public provision remains the same at about 50% each, and both sectors support the expansion to an equal extent. Annex 5 provides a detailed overview of the projected expenditures per year.

Since expansion requires enough facilities, investment is necessary before enrollment can increase substantially. The new investments in construction in the first year will not be available until year 2. Enrollment during the first year can thus only increase according to construction investments budgeted in the year previous to expansion. If the new classrooms become available in the second year, enrollment can increase accordingly (assuming of course that there are no demand constraints). At the end of the ten-year projection period, enrollment will be at 65%.

Public costs of the expansion are obviously highest in the first scenario. Every year, approximately LE 50 million is needed for investment in additional construction and equipment. By the end of the period, investment costs will total LE 446 million (= US$ 116 million)[14]. Salaries for teachers and other recurrent expenditures will rise steeply as the number of students increases. LE 49 million would be spent in the first year on chapter 1 and 2. In the final year, this number would have risen to a yearly LE 500 million. Although this might seem a very large amount, the average spending per student on teacher salaries for basic and secondary education is twice as high. After including the additional costs for supplementary activities, the total recurrent costs per year equal LE 684 million (=US$ 177 million).

Scenario two assumes that the private provision of KG will not remain at the current level of services, but will increase as much as public provision. In that case, yearly investment costs for the government are slightly less than LE 25 million in order to establish enough classrooms for public expansion. This leads to a total budget for investment of LE 223 million for the total ten-year period (=US$ 58 million). Recurrent chapter 1 and 2 costs will reach LE 272 million per year by 2010. Total recurrent costs,

[14] Using an exchange rate of 1:3.85; IMF June 2001.

which is including the additional expenditures of MOE, lifts the yearly expenditures to LE 372 million per year (US$ 97 million).

5.3 Other costs to be financed

Note that the cost projection only takes into account salaries and wages of teachers, other recurrent expenses such as educational materials and facilities, and new investments in classrooms. Several items important for a large-scale expansion of KG over a longer period are not included.

First of all, the previous analysis leaves the supply of teachers out of consideration. However, this might be a major bottleneck in expanding ECD. Currently, 14,883 teachers serve KG students in 11,379 Kindergarten classes. Of them, almost 8,000 work in public KG and almost 7,000 in private KG. The average class-size in private KG is slightly larger with 32 students per class compared to 30 students per public classroom.

Nowadays, most public Kindergartens require new KG teacher applicants to be qualified that are to have at least a bachelor degree with specialization in education and childhood. Some part-time teachers might be hired with a non-ECD diploma. In private Kindergartens, specialization requirements are less strict. This has resulted in a sharp increase in qualified teachers in public KG over the last decade from 39.9% in 91/92 to 92.3% in 99/00. The share of specialized teachers in private KGs has increased as well, but remains far below the public level. In 91/92 3.5% of private teachers were ECD-specialized and in 99/00 21.1% were qualified. In general, there is an oversupply of ECD teachers in urban areas, and an undersupply in rural areas. This is mostly handled through overtime and by putting in other subject or primary school teachers.

To increase KG enrollment up to 65%, 61,500 additional teachers must be recruited over the next decade, or about 6,850 extra teachers per year (apart from the natural demand for teacher replacement due to retirement or job changes). However, the two universities that are specialized in ECD training (Cairo and Alexandria) deliver only 600 new teachers per year each. A few other training centers provide for a small number of additional teachers. This amounts to about 1,300 new teachers per year, far short from the requirements for expansion. If the current higher education system is not able to fulfill demands, additional and/or temporary training might be needed to educate enough professional teachers. Related to the increase in teachers, is the need for in-services teacher training that will increase as the total number of teachers increases.

Another cost related to a large-scale expansion of Kindergarten, is the need for development of a comprehensive curriculum for KG. Also, the current cost projection of investments only takes into consideration investments in *new* classrooms (based on the unit costs of LE 7,250). It omits the needs for rehabilitation of existing classrooms, and investments in replacement of equipment.[15]

Moreover, increasing enrollment is not only a matter of increasing supply. There should also be a demand for the services. Especially if direct and opportunity costs are perceived as high compared to the benefits, parents might not be inclined to enroll their child. Keeping fees low for lower-income groups will reduce costs for the household.

[15] Chapter 2 Other recurrent costs from the budget does not cover rehabilitation of buildings or replacement of equipment. This could be considered an investment and thus belongs to chapter 3.

Similarly, good quality of the delivered service can increase the benefits. Increasing parental recognition of the developmental needs of their child and of the benefits of early childhood education in KG might need public awareness campaigns.

It is highly recommended to initially target the expansion to the groups that would benefit most, and gradually enlarge the scope in order to encompass the entire age group by the end of the expansion period.

6

FINANCING THE EXPANSION OF ECD

Commitment to the expansion of Kindergarten requires considerable additional resources. This chapter will shortly describe the current process and sources of financing KG. Next, alternative options based on international practice will be reviewed. Note that formal ECD services such as official KG are generally more costly than non-formal programs. Formal programs require larger budgets, although the private costs for parents and communities (in terms of time "volunteered" for the program) might be high in non-formal programs as well.

6.1 Public budget for Kindergarten

The budget for Kindergartens is drawn along the same lines as the budget of all other education levels. The Ministry of Finance (MOF) is responsible for the yearly allocation of the total government budget to all ministries (central and governorate level) and agencies.

The Central Office for Management and Organization (COMO), a semi-ministry that falls directly under the Minister of Administrative Development, further allocates wages and other chapter 1 expenditures (that is, civil servant salaries) for the entire country. Wages for KG teachers are paid directly to the Governorates. MOE is kept out of this process except for setting the level of allowances, incentives, pensions and insurance. These are set yearly for each type of education civil servant and apply nationally. They are 'used' by MOE to install certain incentives or rewards for certain functions.

The Ministry of Finance keeps control over the chapter 2 education budget for Other Recurrent Expenditures. Chapter 2 resources for KG are allocated mainly on the basis of last year's budget and on the basis of number of students, number of schools and/or number of teachers in each Governorate. MOE has not direct influence on this chapter of the budget, except for its own central expenditures.

All chapter 3 Investment expenditures of the Egyptian government are channeled through the Ministry of Planning (MOP). For the Education Sector, it is the General Authority for Education Buildings – a sub-agency of the MOE-, that determines the further allocation of the investment funds to the Governorates. Based on their calculations of population, number of students and number of buildings, a construction plan for the next year is set up and carried out.

Although MOE is closely involved in the budget process, it is clear that the central Ministry has relatively little influence on spending for education. Chapter 1 accounts for 61% on average of the entire education budget. This chapter is allocated directly via the COMO. MOE can only determine the structure of the allowances and incentives. MOF allocates and pays chapter 2 Other Recurrent Expenditures to both governorates and the central Ministry, on average 17% of education budget. GAEB plans and decides on investments in new classrooms and schools, accounting for 27% of the budget.

6.2 KG funding as compared to other education levels

It is useful to compare the KG budget to the budget of other education levels, especially with primary school. The table below shows how the number of KG students over the last six years has increased from just above 1% of the number of primary students, to 2.83%. The number of KG classrooms has even increased to above 4% of primary classrooms, because KGs in general have a lower student-classroom ratio. The budget allocated to KGs has not kept up with this trend however.

Table 6.1 Comparison of Kindergarten budget with primary education level budget

Year	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00
Number of Pupil	1.05%	1.20%	1.83%	1.86%	2.66%	2.83%
Number of Classroom	1.35%	1.64%	2.39%	2.51%	3.55%	4.16%
Chapter 1 (wages and salary)	0.87%	0.97%	1.32%	1.34%	1.32%	1.32%
Chapter 2 (other recurrent cost)	0.15%	0.29%	0.45%	0.60%	0.63%	0.63%
Chapter 1&2 Total recurrent	0.75%	0.87%	1.21%	1.26%	1.23%	1.23%

Source: Based on MOE Budgeting Department data

Kindergarten wages were only 0.87% of wages for the primary level in 1993/94 (compared to 1.35% share of classrooms), and only 1.32% in 1999/2000 (compared to 4.16% of classrooms). This could be due to either lower wages (because of less senior staff), allowances and benefits at the KG level, or less staff per classroom (teachers and non-teachers) in KG. Other recurrent costs show an even wider discrepancy. Although KG had 2.83% of the number of students in primary, it receives a budget for chapter 2 that is only 0.63% of primary budget, or only 22% percent of the budget per student that primary education receives. Again, this might be due to less expensive requirements for educational materials and facilities in KG compared to primary school education. Nevertheless, the gap is very large.

Comparison of chapter 3 by education level is not really relevant. Investments in classrooms should depend on enrollments (or more specifically, on the number of children not yet enrolled), and the state of buildings. As argued earlier, investments in KG can be very beneficial especially for children most at risk, and enhance and support investments in primary school. For that matter, instead of comparing KG investment with primary school investment, investments in KG should compared between regions, governorates, urban and rural areas, and poor versus rich areas. Unfortunately there is no geographical information available on investments in KG. Investments in education buildings by governorate (chapter 3) are available for the whole education system (that is, all levels). These investment spending bare no relation with enrollments in the various governorates, neither primary, nor preparatory or secondary enrollments.

Any expansion of KG enrollment, and subsequent increase in KG budget should either come from reallocation within the total MOE budget, or from a higher budget allocated to MOE by MOF. Reallocation within the budget will not solve the enormous difference between current resources and projected expenditures though. Moreover, ECD is *complementary* to the other levels of education and not a substitute. Higher efficiency

at all levels could increase resources available for KG to some extent, but larger enrollment in KG will ultimately result in higher demand for all levels of education.

6.3 Other current sources of financing

User fees

Fees for Kindergartens are supposed to be symbolic because the country has a free public education system. However, this is only true for the Public Arabic (pre-) primary schools. The Public Language schools (English, French, German) and the Private Arabic and Language schools can set their fees as they like. This would explain the enormous gap between the very low "symbolic" fees as prescribed by the MOE, and the much higher average fees charged by the preschools. The prescribed fee for *public* preschools is LE 19.30. The average actual fee for schools in poor districts is under LE 100, the normal average fee is LE 200-300 and expensive private schools ask for much above that. MOE seems to exercise little control on the actual amount of fees charged.

The official fees set by MOE consist of a part based on law and a so-called 'optional' part. The fees levied based on law go directly to MOE. The optional part is distributed over several institutions. A predetermined part of the optional fees goes to the central government, another percentage goes to governorates and districts and the rest stays in the school. For instance, fees for sports go in part to the Ministry of Sports that will organize national activities such as competition, in part to governorates and districts, and schools can use the remainder to organize sport classes and events (see Annex 6 for an overview of fee destination). Fees that are collected to the central level are not necessarily allocated to KG events but might be used for activities at all basic and secondary education levels.

Private sources

Private funding of KG in Egypt is very large. About half of children enrolled, go to private schools. Private KGs might be financed by local, national, or international NGOs on a non-profit basis. Other private KGs are for-profit centers. They charge high user fees (up to several thousand LE per year) and serve the higher income groups. As such the for-profit KGs are actually financed by the family.

Ministry of Social Affairs

A part of the nurseries also provide early childhood education comparable to KG classes. These nurseries often receive grants from the Ministry of Social Affairs to partly cover set-up and yearly operational costs. NGO funds and fees cover the remainder.

6.4 Alternative options for the financing of ECD programs

Government

All over the world, governments pay substantial parts of the ECD programs. Resources are often channeled through the regular budget, such as is the case in Egypt. Ministries involved vary however, ranging from the Ministry of Education, Health, or Social Welfare, to Women Development, Rural Development, or Finance. Very often, rooms exist for improvement of coordination and cooperation between the ministries involved in order to better target services, to improve efficiency and enhance comprehensiveness and quality of the programs.

Kindergarten in Egypt is under the jurisdiction of and is (partly) financed by the Ministry of Education. A number of children aged 4 and 5 currently receive early childhood education through nurseries which are under the jurisdiction of and partly financed by MOSA. The Ministry of Health finances health insurance and primary health care services for young children. Coordination between the three ministries seems rather limited.

Some governments channel ECD funds not through the regular budget, but through earmarked taxes, such as a percentage on pay-roll taxes, income taxes, profit taxes, import/export taxes or gambling taxes. In the case of financing based on a percentage of the pay roll, ECD is usually perceived as the provision of day care services to support working parents within a wider social package benefiting employees (including for example provisions for social welfare, medical insurance, pensions). As such, earmarked taxes can be justified. Moreover, the stronger the link between origin and use of the resources, the more secure resources will be available for ECD, instead of being used for other programs. On the other hand, a special designated fund for ECD might be an obstacle for receiving additional resources if needed. Also, unforeseen circumstances (such as a sudden decline in export) can drastically diminish funds for the program. In Egypt however, Kindergarten is not so much a day care service as it is an early education program to prepare young children for primary school. Moreover, many children potentially benefiting from ECD have parents working in the informal sector. Often, earmarked pay roll taxes are only used for day care centers for working mothers.

Contributions from the family

There are very few ECD programs that do not charge at least a small amount of user fee. In a number of countries – especially when ECD programs are non-formal--, these fees are generally used to pay for the honorarium of the ECD teachers. In Egypt, KG teachers are civil servants and paid by the government. Fees could be used for other categories of expenses. Currently, the fees charged for KG, especially the fees allocated to MOE, are not earmarked for subsequent KG activities but can be used for activities at all levels of the education system. Under such a system, fees are not so much of an instrument to cover costs of ECD, as they are an income-generating source for the central ministry in general.

A serious disadvantage is attached to user fees. The families that would benefit most, are most likely not able to pay fees. Although the official KG fee for public KG is set at LE 19.30, the average KG seems to charge much more. Moreover, current access is limited and most public (affordable) KG places might be already occupied. Only children from relatively wealthy families will be able to pay for private KG. It is essential that sufficient affordable ECD services are offered in poorer or rural areas to ensure equal access for all. Some countries solve this problem by levying progressive fees, with low-income families paying a very low amount. Other programs charge fees that decrease when additional children from the same family enroll. It is also possible to subsidize KG fees for poorest families, to pay a certain allowance per child or to subsidize fees for working mothers.

Parents could also contribute to the costs of ECD programs through in-kind contributions. This could come in the form of labor (during the construction of the ECD center), voluntary work with the children, fabrication of toys, cleaning of the building etc. These options are often used, but mostly in the context of less formal ECD

programs. Still, program costs should also take into account the opportunity costs for parents. When these are too high, parental willingness to contribute can rapidly decline.

Non-Governmental Organizations

NGOs such as charitable, religious, community or other non-profit organizations can and often do play an important role in providing ECD services. Their contribution might consist of the actual delivery of services, of training, of financial contributions or of contributions in-kind. The latter can be the donation of land for construction, the donation or availability of a building for the ECD services, materials, facilities or voluntary work, among others.

In the Egyptian context, NGOs are a major player in the field of ECD. Apart from the large number of private KGs that are run by NGOs, the majority of nurseries is managed by NGOs as well. These organizations are either based on the local level, national level or international level (international donors will be discussed in a later paragraph).

The government can support and stimulate NGO involvement in the provision of ECD through several instruments. It can grant subsidies to NGOs for the delivery of services. Essentially, this is the way in which MOSA supports nurseries. Subsidizing NGOs would be particularly beneficial if targeted at NGOs serving the poorest, rural, remote or other disadvantaged areas and children at risk. Subsidies can come in the form of matching funds for the organization (to cover part of either set-up costs, recurrent costs or both), or a certain amount of resources per child enrolled.

Support can consist of the provision of training facilities for ECD teachers, both pre- and in-service. Especially in ensuring quality of services delivered through NGOs, training could be indispensable. Public Kindergartens usually have relatively high requirements for qualification. This is not the case for private KGs.
Finally, favorable credit-schemes for NGOs to establish KGs can stimulate private provision against lower costs than the grants just described (see later paragraph).

For-profit private sector

The for-profit private sector receives its resources from the beneficiaries through user fees. As such, in general they target the richer segments in society. Egypt is no exception. Stimulating for-profit private provision can be warranted when coverage is still very low. Private KGs aim at the higher-income families, making room for less wealthy children in the KGs with lower fees. Encouragement of private sector involvement in provision of ECD can have the form of tax reduction, tax exemption, or improved access to credit to stimulate start-up of small businesses for example.

Employers

Employers are not involved in the provision of Kindergarten services. In the field of nurseries however, involvement of employers could be larger than it currently is. The legislation requiring all companies with more than 100 female employees to provide day care services is hardly enforced. Mauritius shows a nice example of a tri-partite system in which government, employers and parents all contribute to a common ECD fund. This fund in turn hires NGOs to provide ECD services to the children of the employees.

International donors

International donors, such as bi- and multilateral organizations or international NGOs, provide a substantial amount of the funds for (expansion of) ECD in a lot of countries. Generally, these funds are used mainly for the initial investment costs or to set up a larger infrastructure (both hardware and software) for ECD. This can mean not only the construction and equipment of ECD classrooms, but also the establishment or strengthening of the administrative structure, pilot projects to test different ECD models or approaches, research studies regarding the actual impact of ECD, the development of an appropriate curriculum, or training of the ECD workers. Over the years of such a project, international donors usually expect their share in financing of the recurrent/operational costs to decline.

Other alternatives

Over the last years, some innovative alternatives to stimulate ECD provision have developed. Although they are generally aimed at supporting non-formal ECD services, they provide interesting illustration of alternatives. The mechanism of micro-enterprises is one of these innovations. In several countries pilot projects are underway. Micro-finance could mean the provision of loans to women who want to start-up a (home based) day care center, or to small-scale organization that want to establish a private KG. Another way of funding ECD programs is to finance (separate) income-generating projects attached to the preschool (such as a garden or the production of handicraft). The mothers of the students can work for the project while their child is enrolled, and part of the profits will be used for operation of the ECD center. Or, women could receive loans from micro-credit organizations to earn or improve their income. Part of the income can be used for ECD fees. The latter example is piloted in Vietnam, where daycare centers were established in conjunction with a rotating and credit association for the women.

Another relatively new financing mechanism is the use of capital funds or endowments. Initial endowment can be created through contributions of donors, government and community. The flows of funds from the endowment can then partly finance the provision of ECD services in the particular community or districts. This might also be used in combination with the earmarked taxes for example. If the government sets up a separate trust fund for ECD, other donors might be more inclined to contribute resources. The tri-partite fund in Mauritania is an example. Other examples can be found in the Philippines, Thailand, Kenya, Tanzania, Uganda, and Mexico. It seems that the most important in this case is a strong management and monitoring & evaluation system for the fund.

For more information, and/or project descriptions, see for instance Evans, Myers and Illfeld, 2000 (also available on internet: www.ecdgroup.com > ECCD info > Programming Guide); Waiser 1998; Barnett 1997; Wilson 1995.

7

CONCLUSION

In this report we made the case for the expansion of ECD programs, in particular of KGs, in Egypt, based on the current situation of the country's young children, existing ECD programs and a Benefit-Cost analysis. The latter shows that, under very conservative impact assumptions, expansion of KGs is highly desirable from an economic point of view. Benefit-cost ratios average around 2.30, with ratios as high as 5.80 from programs that are properly targeted to children most at risk. The desired expansion of the program to reach a coverage of 65% by the year 2010 will require considerable extra resources, up to LE 684 million annually once this target enrollment rate has been reached. Given the very favorable outcome of the Benefit-cost analysis, the use of these resources for KG expansion seems highly justified, especially as seen in the context of a more comprehensive national Human Development policy. Chapter 6 discusses a number of alternative financing mechanisms. The chapter underscores the need to subsidize, or provide free of charge, ECD services that are targeted at those who will benefit most: the children the poor.

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Annex 1. *Enrollment in pre-primary and primary school by age*

Total 93-94

Age	Pre-Primary	Primary					population	% enrolled in	total % enrolled
		Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	by age	KG by age	by age
3	28,262								
4	114,551						1,530,201	7.49%	7.49%
5	91,507	211,644					1,554,855	5.89%	19.50%
6	11,402	1,192,928	186,548				1,713,982	0.67%	81.15%
7	378	80,625	1,127,473	170,084			1,692,682	0.02%	81.44%
8		4,216	156,787	985,628	201,369		1,688,350		79.84%
total	**246,100**				**Gross enrollment in KG:**		7.98%	(= all KG students / population aged 4 + 5)	

Total 94-95

Age	Pre-Primary	Primary					population	% enrolled in	total % enrolled
		Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	by age	KG by age	by age
3	29,861								
4	117,829						1,492,614	7.89%	7.89%
5	96,376	145,541					1,526,064	6.32%	15.85%
6	13,245	1,226,592	203,610				1,551,618	0.85%	93.03%
7	504	79,883	1,190,407	178,500			1,710,546	0.03%	84.73%
8		5,443	167,661	1,062,880	166,210		1,689,424		83.00%
total	**257,815**				**Gross enrollment in KG:**		8.54%	(= all KG students / population aged 4 + 5)	

Total 95-96

Age	Pre-Primary	Primary					population	% enrolled in	total % enrolled
		Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	by age	KG by age	by age
3	33,424								
4	123,582						1,364,105	9.06%	9.06%
5	98,043	69,074					1,488,836	6.59%	11.22%
6	10,821	1,263,706	164,258				1,523,018	0.71%	94.47%
7	632	83,410	1,190,863	218,353			1,548,725	0.04%	96.42%
8		5,487	162,793	1,104,474	209,101		1,707,424		86.79%
total	**266,502**								

Gross enrollment in KG: 9.34% (= all KG students / population aged 4 + 5)

Total 96-97

Age	Pre-Primary	Primary					population	% enrolled in	total % enrolled
		Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	by age	KG by age	by age

3	36,492							
4	133,613					1,466,650	9.11%	9.11%
5	107,637	35,862				1,362,641	7.90%	10.53%
6	11,818	1,261,995	151,162			1,479,808	0.80%	96.29%
7	571	51,011	1,163,840	159,764		1,516,066	0.04%	90.71%
8	6	5,822	167,735	1,127,038	217,326	1,538,749		98.65%
total	**290,137**							

Gross enrollment in KG: 10.25% (= all KG students / population aged 4 + 5)

Total 97-98

Age	Pre-Primary	Primary					1998 pop	% enrolled in KG by age	total % enrolled by age
		Grade 1	Grade 2	Grade 3	Grade 4	Grade 5			
3	33,453								
4	144,985						1,624,498	8.92%	8.92%
5	124,471	57,836					1,465,076	8.50%	12.44%
6	12,919	1,183,078	109,801				1,360,447	0.95%	95.98%
7	401	95,411	1,146,949	148,534			1,477,487	0.03%	94.17%
8		14,056	156,992	1,109,621	170,166		1,513,734		95.84%
total	**316,229**								

Gross enrollment in KG: 10.24% (= all KG students / population aged 4 + 5)

Total 98-99 ***

Age	Pre-Primary	Primary					1999 pop	% enrolled in KG by age	total % enrolled by age
		Grade 1	Grade 2	Grade 3	Grade 4	Grade 5			
3	25,573								
4	154,000						1,624,676	9.48%	9.48%
5	139,999	71,365					1,622,755	8.63%	13.03%
6	15,381	1,157,112	78,448				1,462,886	1.05%	85.51%
7	379	81,833	1,152,637	115,979			1,358,423	0.03%	99.44%
8		10,924	154,784	1,084,403	160,633		1,475,347		95.62%
total	**335,332**								

Gross enrollment in KG: 10.33% (= all KG students / population aged 4 + 5)

Total 99-00

Age	Pre-Primary		Primary				2000 pop	% enrolled in KG by age	total % enrolled by age
	KG 1	KG 2	Grade 1	Grade 2	Grade 3	Grade 4			
3	19,933	1,056							
4	133,579	27,027					1,635,861	9.82%	9.82%
5	28,020	129,606	84,748				1,622,932	9.71%	14.93%
6	216	14,637	1,176,792	86,546	12		1,620,502	0.92%	78.88%
7		361	80,655	1,131,647	92,649		1,460,910	0.02%	89.35%
8			10,376	139,693	1,089,303	145,829	1,356,601		102.11%
total	**181,748**	**172,687**							
	total pre-primary:	**354,435**							

Gross enrollment in KG: 10.88% (= all KG students / population aged 4 + 5)

***

Pre-primary data for 98/99 are own estimation. Not available are *female* enrollments *by age* for *pre-primary*. Estimation is based on male enrollments by age in pre-primary, total female enrollment in pre-primary, and share of female enrollment by age in 97/98.

Annex 2.

Child Mortality Rate, Net Enrollment Rate and Repetition Rate by governorate, 1999

Governorate	CMR	primary		preparatory		secondary	
		NER	repetition	NER	repetition	NER	repetition
Cairo	31.2	99.3	4.2	79.4	6.3	54.3	4.3
Alexandria	30.0	104.7	8.4	83.8	14.3	49.6	3.8
Port-Said	26.7	111.0	5.7	91.4	3.6	71.1	3.5
Suez	34.3	103.2	7.0	84.5	11.4	73.4	2.4
Urban Governorates	**31.2**		**5.8**		**9.0**		**4.1**
Damietta	27.4	95.6	8.3	84.6	11.7	57.6	2.8
Dakahlia	32.5	89.5	6.1	73.5	8.2	53.0	3.5
Sharkia	36.6	93.5	4.3	71.3	6.1	51.5	2.2
Kalyoubia	30.3	103.8	8.3	78.1	14.9	47.5	2.7
Kafr El-Sheikh	29.0	88.1	4.6	66.2	8.6	50.2	3.5
Gharbia	28.8	91.2	6.6	74.8	8.3	54.3	2.6
Menoufia	32.3	92.9	7.9	76.4	10.2	51.6	2.4
Behera	23.6	92.3	8.3	62.9	16.2	43.1	4.1
Ismailia	34.9	101.2	8.1	78.2	9.8	58.1	3.0
Lower Egypt	**30.7**		**6.7**		**10.4**		**3.0**
Giza	41.8	101.4	5.2	73.9	9.4	46.1	4.1
Beni-Suef	67.8	83.2	6.2	51.1	11.0	33.4	3.4
Fayoum	46.7	86.0	3.8	55.8	5.4	41.9	2.9
Menya	66.5	78.2	4.8	55.3	11.1	38.0	2.4
Assyout	72.0	76.5	7.5	53.9	13.8	35.5	2.7
Souhag	56.5	72.1	5.0	53.3	18.2	32.8	2.6
Quena	61.2	83.2	2.5	63.0	8.1	45.0	4.5
Aswan	65.8	99.2	2.7	79.7	7.5	50.4	4.1
Upper Egypt	**58.7**		**4.9**		**10.8**		**3.4**
Red Sea	29.7	138.4	7.7	99.0	10.0	71.8	1.6
New Valley	35.0	104.9	3.6	91.7	5.6	62.4	2.3
Matrouh	41.6	86.4	7.0	53.6	15.1	27.6	5.1
North Sinai	50.0	92.9	5.7	63.7	6.5	48.6	5.6
South Sinai	42.6	129.0	5.3	70.6	14.1	40.3	6.5
Frontier Governorates	**41.3**		**6.0**		**9.4**		**3.9**
National	**42.1**	**90.9**	**5.9**	**68.9**	**10.2**	**47.1**	**3.3**

Source:

- *CMR and repetition rates: Human Development Report Egypt, 1998/1999*
- *Net Enrollment Rates: General Authority for Educational Buildings, 1999*

Annex 3.

Net Present Value of ECD interventions: Benefits of increased productivity per child

(in LE 2000)	Scenario I		Scenario II		Scenario III	
Governorate	1 % point increase in prim+prep enrollment	& 1% point reduction in prim+prep repetition	1 % point increase in prim+prep enrollment	& 1% point reduction in prim+prep repetition	Gap to national average reduced by half	Reduction of CMR to national average
Dakahlia	474	487	957	983	59	
Kafr El-Sheikh	459	471	928	952	646	
Behera	519	531	1,047	1,072	1,287	
Beni-Suef	474	483	956	976	3,847	230
Fayoum	458	469	925	947	2,770	29
Menya	439	448	886	906	3,104	220
Assyout	439	448	887	906	3,488	238
Souhag	442	451	894	912	3,945	118
Quena	447	458	903	925	1,444	138
Matrouh	555	565	1,119	1,141	3,547	
Average NPV	**471**	**481**	**950**	**972**	**2,414**	**162**

(in US$)	Scenario I		Scenario II		Scenario III	
Governorate	1 % point increase in prim+prep enrollment	& 1% point reduction in prim+prep repetition	1 % point increase in prim+prep enrollment	& 1% point reduction in prim+prep repetition	Gap to national average reduced by half	Reduction of CMR to national average
Dakahlia	123	127	249	255	15	
Kafr El-Sheikh	119	122	241	247	168	
Behera	135	138	272	279	334	
Beni-Suef	123	126	248	254	999	60
Fayoum	119	122	240	246	720	8
Menya	114	116	230	235	806	57
Assyout	114	116	230	235	906	62
Souhag	115	117	232	237	1,025	31
Quena	116	119	235	240	375	36
Matrouh	144	147	291	296	921	0
Average NPV	**144**	**147**	**291**	**296**	**921**	**42**

Annex 4.
Estimation of Unit Costs for Kindergarten

In order to project the public expenditures needed to enable KG expansion, this paragraph will estimate the unit costs for recurrent and investment expenditures of KG.

Public budgets are composed of four chapters. Chapter 1 consists of salaries, allowances and other benefits and incentives for civil servants. Chapter 2 allocates the other recurrent expenditures such as educational materials and facilities (electricity, telephone, etc.). Investments in buildings as well as equipment (initial and renewal) are funded through chapter 3. Finally, chapter 4 contains capital expenses such as debt payments. The Ministry of Education provides an overview of all expenditures per year by education level and chapter. The table below is a summary of the actual expenditures for KG over the years 1994/1995 until 1998/1999 and the budget for 1999/2000. The budgets for all years are recalculated to real 2000 prices.[16]

Table A.1 Unit cost per Kindergarten student (in LE, 2000 prices)

Year	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00
Number of Pupil[17]	71,227	83,192	128,885	127,534	182,322	189,718
Chapter 1 (wages and salary)	16,143,602	20,517,793	31,208,042	34,934,853	36,967,409	38,259,000
Chapter 2 (other recurrent cost)	513,460	1,046,451	1,612,770	1,692,677	2,553,728	2,677,000
Total Chapter 1 and 2	**16,657,062**	**21,564,244**	**32,820,812**	**36,627,530**	**39,521,136**	**40,936,000**
Chapter 3 (investment cost)	23,351,444	1,196,960	557,624	1,203,587	72,520	85,000
Total Chapter 1, 2 and 3	**40,008,506**	**22,761,204**	**33,378,436**	**37,831,117**	**39,593,656**	**41,021,000**
Unit Cost per student	**562**	**274**	**259**	**297**	**217**	**216**
Additional cost per student	**52**	**59**	**69**	**70**	**145**	**148**
Total unit cost per student	**614**	**333**	**328**	**367**	**362**	**364**

Source: MOE Budgeting Department

Based on the total recurrent and investment expenditures for Kindergarten, MOE calculates a unit cost per student. To this unit cost, MOE adds an additional cost per student. The additional cost stems from supplementary activities and central agencies that provide general services for all levels of education. MOE allocates these costs equally to all pre-university students regardless of their level of education. The sum provides the total overall unit cost per student for Kindergarten.

According to the calculations of MOE, the average total unit costs per KG student over the last 6 years was LE 385. In general, unit cost lies between 325 and 375

[16] Adjustment to year 2000 prices based on the World Bank deflator for Egypt. The average deflator for 1995 and 1996 is calculated and used to convert the 1995/96 prices, etc.

[17] Note that the number of pupils and classrooms in MOE budget calculations do not coincide with the number as registered and used by both GAEB and MOE Computer, Statistics and Information Department. Differences for students are not that large.

approximately. The very high unit costs in 1994/95 are remarkable. These are entirely due to high chapter 3 investments (over 23 million) compared to the much lower investments in the following years. These high investments do not coincide with concurrent large increase in classrooms in the same year, as can be seen in the table below. Perhaps the investments have been spread out over the subsequent years.

Table A.2 Increase in number of public classrooms

	94/95	95/96	96/97	97/98	98/99
Number of public classrooms at start of year	2,060	2,544	3,176	3,908	4,925
Construction of new classrooms during year	484	632	732	1,017	881

Source: MOE Computer, Information & Statistics Department

To get a clearer view of the cost structure, costs per students are calculated by chapter of the budget. Recurrent costs are composed of wages and allowances for teachers (chapter 1), other recurrent expenditures (chapter 2) and additional costs (see table 5.1). The average recurrent unit cost per student over the last 6 years is LE 335 in 2000 prices.

To estimate the unit investment costs per classroom, comparison of yearly investment costs with yearly increase in new classrooms does not provide an adequate basis since there seems to be little direct relation between both. Taking the total investment expenditures of the last six years and dividing them by the total increase in classrooms, might give a better estimate. The unit investment costs per additional classroom including equipment can be estimated at LE 6297.

Table A.3 Recurrent and Investment Costs for Kindergarten

Recurrent unit cost per student	94/95	95/96	96/97	97/98	98/99	99/00	Average
Chapter 1	227	247	242	274	202	203	
Chapter 2	7	13	13	13	14	14	
Additional costs	52	59	69	70	148	145	
Total recurrent costs	**286**	**319**	**324**	**358**	**364**	**362**	335
Investment cost per new classroom							6297

This unit investment costs corresponds to the unit costs per new classroom based on a real construction plan of GAEB to build 160 new KG classrooms. The total budget for this project amounts to 1.16 million, of which 0.9 million is allocated to construction (LE 5625 per classroom), and 0.1 million to equipment and facilities (LE 625 per classroom). Total investment costs for construction, equipment and facilities are LE

Table A.4 Construction plan 2000-2001 of GAEB for 160 new KG classrooms

		Per classroom
construction	0.9 million	5,625
equipment and facilities	0.1 million	625
administrative and other costs	0.16 million	1,000
total	**1.16 million**	
Unit costs per new classroom:		7,250

Source: MOE – GAEB

6250.[18] The remainder of the construction budget is spent on administrative and other costs (LE 1000 per classroom or 14% of total costs). Maybe these are not incorporated in the table 5.2 costs but rather allocated to GAEB in general. Based on the construction plan, overall total unit cost for a new classroom is LE 7250.

[18] The construction and equipment cost of LE 6,250 roughly coincides with the investment costs of LE 6,297 as calculated by MOE Budgeting department. Perhaps GAEB receives a separate budget for administrative costs which are not allocated to specific education levels such as KG.

Annex 5.

Projection of expenditures for KG

BASED ON 6% INCREASE IN ENROLLMENT FOR 00/01 (=AVERAGE INCREASE OVER LAST YEARS) AND LINEAR INCREASE UP TO 65% ENROLLMENT FROM 01/02 TO 09/10.

(in LE million, 2000)

of private KG enrollment stays equal

	Unit costs	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10		
Number of Pupil		195,564	400,576	605,587	810,599	1,015,610	1,220,622	1,425,633	1,630,645	1,835,656	2,040,668		
Number of Classroom		6,549	13,383	20,216	27,050	33,884	40,717	47,551	54,385	61,219	68,052		
Chapter1	232	45.43	93.05	140.67	188.30	235.92	283.54	331.17	378.79	426.41	474.04		
Chapter2	12	2.40	4.92	7.44	9.96	12.47	14.99	17.51	20.03	22.54	25.06		
Chapter 1 & 2 total		**47.83**	**97.97**	**148.11**	**198.25**	**248.39**	**298.54**	**348.68**	**398.82**	**448.96**	**499.10**		
Additional costs	91	17.74	36.33	54.92	73.52	92.11	110.70	129.30	147.89	166.49	185.08		US$:
Total recurrent costs		**65.57**	**134.30**	**203.04**	**271.77**	**340.51**	**409.24**	**477.97**	**546.71**	**615.44**	**684.18**	**684.2**	**177.7**
Chapter 3	7,250	49.54	49.54	49.54	49.54	49.54	49.54	49.54	49.54	49.54		**445.9**	**115.8**
Total costs		**115.11**	**183.85**	**252.58**	**321.32**	**390.05**	**458.78**	**527.52**	**596.25**	**664.99**	**684.18**	**4,194.6**	**1,089.5**
	US$	29.90	47.75	65.61	83.46	101.31	119.16	137.02	154.87	172.72	177.71		

% of private enrollment stays equal

	Unit costs	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10		
Number of Pupil		188,361	290,867	393,373	495,878	598,384	700,890	803,396	905,901	1,008,407	1,110,913		
Number of Classroom		6,309	9,726	13,143	16,559	19,976	23,393	26,810	30,227	33,644	37,061		
Chapter 1	232	43.76	67.57	91.38	115.19	139.00	162.81	186.62	210.44	234.25	258.06		
Chapter 2	12	2.31	3.57	4.83	6.09	7.35	8.61	9.87	11.13	12.38	13.64		
Chapter 1 & 2 total		**46.07**	**71.14**	**96.21**	**121.28**	**146.35**	**171.42**	**196.49**	**221.56**	**246.63**	**271.70**		
Additional costs	91	17.08	26.38	35.68	44.97	54.27	63.57	72.86	82.16	91.46	100.75		US$:
Total recurrent costs		**63.15**	**97.52**	**131.89**	**166.25**	**200.62**	**234.99**	**269.36**	**303.72**	**338.09**	**372.46**	**372.5**	**96.7**
Chapter 3	7,250	24.77	24.77	24.77	24.77	24.77	24.77	24.77	24.77	24.77	-	**222.9**	**57.9**
Total costs		**87.92**	**122.29**	**156.66**	**191.03**	**225.39**	**259.76**	**294.13**	**328.50**	**362.86**	**372.46**	**2,401.0**	
	US$	22.84	31.76	40.69	49.62	58.54	67.47	76.40	85.32	94.25	96.74		

Annex 6.
Kindergarten Fees

	Amount (LE per child)	*Allocation of fees*	school	district	governorate	ministry
Category I: Annual Educational Fees						
parent association	1.50	parent association	85%	10%	3%	2%
maintenance and labs	0.30	maintenance and labs	-	-	-	100%
social activities	0.50	social activities	70%	15%	10%	5%
scouts and sports	1.00	scouts and sports	70%	15%	10%	5%
art	1.00	art	70%	15%	10%	5%
cultural	2.00	cultural	-	-	-	100%
school libraries	2.00	school libraries	35%	15%	10%	40%
technology	1.00	technology	-	-	-	100%
building maintenance	4.40	building maintenance	30%	-	-	70%
orphanage care	1.00	orphanage care	-	80%	15%	5%
special education	0.50	special education	-	-	-	100%
total	**15.20**					
Category II: Annual Obligatory Parental Fees						
care for children and youth	0.10	care for children and youth	-	-	-	100%
health insurance	4.00	health insurance	-	-	-	100%
total	**4.10**					
Category III: Optional Fees						
Insurance against accident	0.50	Insurance against accident	-	-	-	100%
total	**0.50**					
total fees	**19.80**					

Source: MOE Budgeting Department

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