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**Facing the Challenge of  
Defining Early Childhood  
Development Models that can  
be Scaled Up**

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**Early childhood care and education in Sub-Saharan Africa : What would it take to meet the millennium development goals?**

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**Working Document  
DRAFT**

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## Introduction

The importance of the interaction between the status of health, education and well-being of children and poverty reduction is gaining recognition by policy makers dealing with international development. Five of the eight Millennium Development Goals (MDG) relate to health, nutrition and education of young children. These include, halving the percentage of children who suffer hunger, reducing by two thirds the rate at which children under the age of five are dying, cutting by three quarters the ratio of maternal deaths to live births, providing the opportunity to all children to complete primary education, and eliminating gender disparities in schooling opportunities. In addition, the first of the six goals set at the Dakar Forum on Education For All in April 2000 proposes to “*Expand and improve comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children*”.

African governments are also placing an emphasis on improving the status of health and education of children, and in many countries, the Poverty Reduction Strategy Papers (PRSP) goals and targets are aligned with the MDGs. Poor children are likely to grow up to become poor adults and give birth to children who are poor, perpetuating the poverty cycle. In contrast, children are more likely to go to school and perform well if their parents have been educated. Healthy newborns are more likely to be born from mothers who were healthy and well nourished as children and adolescents. The economic, private and social returns on investments in nutrition, health and education early in life, have been demonstrated by Van Der Gaag and Tan (1998); Meyers (1998); and Schweinhart, Barnes and Weikart, (1993). There is not much room for doubt that meeting basic health, nutrition and education needs of young children, is a key element in breaking the poverty cycle.

### **How well prepared are African countries to meet the child-related MDGs or the EFA first goal?**

The summary table below shows how far behind Sub Saharan Africa is in relationship to other regions, and to the global average, specially on indicators regarding the situation of young children. For example, the prevalence of malnutrition of under 5 year olds is twice that found in East Asia, and almost 4 times of that in Latin America and the Caribbean (LAC). The net primary enrollment is almost half of that in East Asia and LAC; the under 5 mortality rate is almost twice the global average, and four times higher than in LAC and more than 3 times higher than in East Asia. A very similar pattern is found regarding the infant mortality rate, while the rate of immunizations for under 12 month olds is almost double in LAC, and 20 percentage points lower if compared with the global average.

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	<b>Africa, 1990</b>	<b>Africa, 2000</b>	<b>All developing countries, 2000</b>	<b>LAC, 2000</b>	<b>East Asia, 2000</b>
<b>MDG 1</b>					
Population below \$ 1 a day (%)	47.1	48.1		12.1	14.7
Prevalence of child malnutrition (% of children under 5)		26.5		7.6	12.2
<b>MDG 2</b>					
Primary Completion Rate	49	54	77	85	84
Percentage of cohort reaching grade 5 (%)		67.2		85.4	95.4
Youth literacy rate (% ages 15-24)	67.7	78	85.6	93.9	97.3
<b>MDG 3</b>					
Ratio of girls to boys in primary and secondary education (%)	78.6	79.9	86.5	98.7	89.2
Ratio of young literate females to males (% ages 15-24)	79.8	88.7	91.8	100.8	97.9
Share of women employed in the nonagricultural sector (%)				41.2	
<b>MDG 4</b>					
Under 5 mortality rate (per 1,000)	158.5	161.2	77.8	36.7	45.3
Infant mortality rate (per 1,000 live births)	102.5	91.2	53.8	29	36
Immunization, measles (% of children under 12 months)	64.2	52.9	72.6	93	85

In the Region, the overall enrollment rate for pre-school is 16 %; - 10 % for IDA countries, and in most cases paid by parents contributions. It is important to analyze how the Early Childhood development goals be positioned where universal completion of six years of primary education (a Dakar objective as well as an MDG for the year 2015) remains the priority while appearing in itself an objective not easy to reach ? In addition, in Africa, the health situation has not been improving at the same pace as in other continents. The rate of improvement of infant mortality has been much lower than in South Asia, the only region with comparably poor health indicators. Even when country income and health expenditures are accounted, international comparisons systematically underscore the relative lower level of performance of Sub-Saharan African countries as compared to other low-income countries. Africa scores lower in terms of access to professional services, health staff per capita, and levels of use of low cost technology. In many ways, the situation has even deteriorated with immunization levels being lower in year 2000 than in 1990.

It is acknowledged that Early Childhood activities are not confined to pre-schooling. It concerns the total well-being and development of the child: emotionally, physically and intellectually, from birth to six years of age, a crucial period in a child's life. For those knowledgeable on the benefits of Early Childhood Care and Development (ECCD), the objectives of supporting early interventions have been mainly two: to prepare children for entry into primary school or to unburden families from their child care duties during the work day hours. However, the scope of ECCD goes beyond these two main objectives and concerns every child's right to survival, protection, care and optimal development from conception onwards. Taking this into account, successful ECCD interventions provide an integration of health-nutrition, social and cognitive development, with a clear distinction between programs for the 0-3 and 4-6 year olds. At the earlier stages, the limited range of

child behavior is more easily supported in home settings, and the main inputs from intervention include parental education, and health and nutrition interventions. From ages 3-6, children are more physically mobile, ready to form relationships with non-family adults and have sufficient language and cognitive development to engage in active interactions outside the home. This favors the center-based or community-based programs.

The objective of this paper is not to advocate that ECCD is an important objective to pursue; this is supposed to be already known, and there are many publications available on this matter. (See Young, 2000) It is neither to discuss the type of programs or content of the activities that are undertaken under the generic name of ECCD activities. For a review of the literature available on the subject, and in particular in developing countries see *Early Childhood Counts* edited by Evans, Myers and Ilfeld, 2000; *ECD: Laying the Foundation of Learning 1999* (UNESCO publication), the *Reflection Series* published by The Bernard van Leer Foundation (1992 -2000), or the *Coordinators Notebook* published quarterly by the Consultative Group on ECCD). The main focus of the paper is more on the logistical and financial aspect of ECCD. It is an attempt to provide answers to questions such as : what are the main structural decisions that could be made to implement the MDG and Dakar goals and what would it entail in terms of (human and financial) resources ? How could pursuing this objective be financed ?

The paper is organized in four sections : in section 1, we provide an analysis of the current state of the coverage of preschool in the Sub-Saharan Africa, while putting the case of the region in perspective with the other regions of the world on the one hand and analyzing the case of individual African countries on the other. We also analyze the time dimension of the evolution both by analyzing the progress made during the last decade and by projecting the current trend until the year 2015. Section 2 discusses the choices and tradeoffs that need to be made to design a strategy toward reaching the MDG and ECCD goals set in the Education For All Dakar Forum; in particular, are discussed the respective merits and costs of community based activities and those associated to more formal structures. This section takes into account the work developed by Agnes Soucat and others on: Marginal Budgeting for bottlenecks and the new costing and resource allocation practice to buy health results, specifically the community and family-based key packages of health services for priority interventions such as immunization, prevention of malaria, and vitamin A supplementation. Section 3 proposes the results of country specific simulations that help to get a sense of what it would entail financially for the different countries of the region to move toward the goals in 2015; and how it can be financed. It also takes into account the work developed by Agnes Soucat and others on the marginal budgeting and costing based on calculations of the costing of overcoming the bottlenecks identified as key to improve the performance of health indicators. Finally, section 4 tries to draw the lessons of the exercise.

#### 1. The current state of preschool in Sub-Saharan Africa (and in the world)

Table 1, below, presents aggregate figures by world region for the Gross Enrollment Ratio in pre-schooling, both for 1990 and 1999, as well as the Primary Completion Rate and the Proportion of children under 5 that are underweight.

Table 1 : Some Basic Statistics : Preschool, Primary Education and Proportion of Children Underweight by World Region (circa 1998/99 and 1999, Country weighted averages)

Regions	GER in Preschool Education (%)				Primary Education			% children < 5 underweight 1995-2000
	Girls 1999	Boys 1999	Together		Completion Rate (%)	Survival to Grade 5 (%)	Repetition Rate (%)	
			1999	1990				
<b>Sub-Saharan Africa</b>	16.6	16.0	16.3	11.1	54.0	67.2	17.8	26.5
. IDA Countries	9.8	10.0	9.9	8.5	45.6	66.0	19.3	28.6
. Non-IDA Countries	51.6	54.7	53.2	20.3	90.6	73.3	11.9	17.9
<b>Non Sub-Saharan Africa Dev. countries</b>								
Middle-East and Northern Africa	27.4	30.2	28.8	21.3	77.2	92.3	7.2	16.1
Eastern Europe and Central Asia	58.8	60.2	59.5	61.4	93.4	98.0	1.4	6.1
South and East Asia & Pacific	36.5	36.5	36.5	25.7	85.8	78.8	7.9	30.3
Latin America and the Caribbean	62.4	61.0	62.8	46.3	86.0	85.4	7.6	8.9
. IDA Countries	22.6	22.8	22.7	26.0	76.4	70.2	8.0	29.5
. Non-IDA Countries	52.7	53.4	53.0	42.2	88.0	89.3	5.6	12.3
<b>OECD Countries</b>	78.7	78.7	78.7	71.8	(100)	(100)	1.3	-

When analyzing first the coverage of preschool as measured by the Gross Enrollment Ratio (table 1), it appears clearly that, in 1999 and on average, countries in Sub-Saharan Africa, with a figure estimated at 16 percent, are lagging behind countries in other parts of the world. Average GER of Countries in the Middle East (29 percent) is more than 10 percentage points higher, that of Asia (36 percent) being more than twice that observed in the Africa region, while coverage in Eastern Europe or Latin America about four times as high as it is in Sub-Saharan Africa.

It is however to be stressed that, on average and as expected, coverage of preschool tends to be larger in countries with both a higher level of economic development and a larger coverage of schooling (at the primary level in particular). This assertion holds within the Africa region as the average GER for preschool is estimated to stand at only 10 percent in IDA countries (average per Capita GDP of US\$355 and Primary Completion Rate of 45,6 percent), while the corresponding figure is 45 percent in the few non-IDA countries of the region (average per capita GDP of US\$2,880 and Primary Completion Rate of 90.6 percent).

This overall relationship between coverage of preschool and that of primary education and level of economic development is yet relatively loose when considering countries within a limited ran-

Table 2 : Gross Enrollment Ratio in Standard Preschool, Proportion of Children Under 5 that are

underweight, under five and infant mortality in Sub-Saharan African Countries  
(circa 1999)

Countries * IDA ** Non IDA	Per Capita GDP 1999 (1995 US\$)	GER in Standard Preschool (%)			% Children <5 Underweight	Under five mortality rate	Infant mortality rate
		Girls	Boys	Total			

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Angola *	523			2	42	295	172
Benin *	402	7.1	6.7	6.9	29	156	99
Botswana **	3,909				17	59	46
Burkina Faso *	253	1.6	1.7	1.6	36	199	106
Burundi *	143	0.9	0.8	0.9	37	176	106
Cameroon *	662	9.6	10.8	10.2	22	154	95
Cape Verde **	1,466				14	73	54
Central African Republic *	335			1	27	172	113
Chad *	222			1	39	198	118
Comoros *	452	1.6	1.8	1.7	26	86	64
Congo Democratic *	113			2	17	207	128
Congo Republic **	802	2.2	3.2	2.7	26	108	81
Côte-d'Ivoire *	777	2.8	2.7	2.7	24	171	102
Equatorial Guinea **	1,405	29.3	30.7	30.0		160	105
Eritrea *	173	5.7	5.3	5.5		105	66
Étiopía *	113	1.8	1.7	1.7	47	176	118
Gabon **	4,406					143	85
Gambia *	362	29.8	26.8	28.3	26	75	61
Ghana *	408	57.3	56.9	57.1	25	101	63
Guinea *	605			2		181	115
Guinea Bissau *	199	3.8	4.0	3.9	23	200	128
Kenya *	337	37.1	39.7	38.4	22	118	76
Lesotho *	538	20.3	23.3	21.8	16	134	93
Liberia *					25	235	157
Madagascar *	242	3.3	3.4	3.4	40	156	95
Malawi *	169			2	30	211	132
Mali *	291	1.9	2.9	2.4	40	235	143
Mauritania *	487			1	23	183	120
Mauritius **	4,043	95.2	97.0	96.1	16	23	19
Mozambique *	192			2	26	203	127
Namibia **	2,370	60.2	69.3	64.7	26	70	56
Níger *	209	0.9	1.0	0.9	47	275	162
Nigeria *	250			2	36	187	112
Rwanda *	234			2	27	180	110
Sao tome & Principe *	338				16	76	59
Senegal *	592	2.9	3.0	3.0	22	118	68
Sierra Leone *	146	3.9	4.2	4.0	29	316	182
Somalia *					26	211	125
South Africa **	3,954	21.8	21.8	21.8	9	69	54
Sudan *	300	23.0	21.5	22.2	34	109	67
Swaziland **	1,488				10	90	62
Tanzania *	186			2	27	141	90
Togo *	339	2.2	2.3	2.2	25	143	80
Uganda *	345	2.9	2.9	2.9	26	131	83
Zambia *	388	2.1	2.5	2.3	24	202	112
Zimbabwe *	665				15		
<b>Country-weighted Average *</b>	<b>343</b>	<b>10.1</b>	<b>10.0</b>	<b>9.9</b>	<b>28.6</b>	<b>173</b>	<b>107</b>

ge of per capita GDP, such as the IDA countries. Within this group, there is both virtually no such relationship and wide variations across countries in terms of their coverage of preschool, as data presented in table 2 show. For example, the two neighboring countries, Gambia and Senegal, have very different figures for the coverage of preschool with a figure of 28 percent in the former country and only 3 percent in the latter. Similarly, Sudan has a preschool GER of 22 percent while the corresponding figure in its neighbor Ethiopia is only 1.7 percent. The comparison between Kenya with a GER of 38 percent in preschool while the figure in Uganda is 2.9 percent completes the demonstration : Beyond contexts that clearly make the

expansion of preschool more likely, there is quite an amount of political will in making decisions about the coverage of pre-school in a given country.

This being said, among the different regions of the world, the continent as a whole is quite far away from achieving the Dakar goal, even though it needs probably to be more operationally defined (we will come to that point in the next section). Focusing on the poorest Sub-Saharan countries (those that are eligible to IDA credits, that is have a per capita GDP below 775 US\$), the average GER at the preschool level is estimated to be only 10.3 percent in 1999. The mileage is quite long to get to any high figure (100 percent !) in 2015. Analyzing the trend over the last decade provides a bleak picture of what the coverage of preschool would be in 2015, if the current trend observed between 1990 and 1999 was to hold until 2015. Table 3 below provides the relevant information for the Africa region, as well as for the other regions of the world.

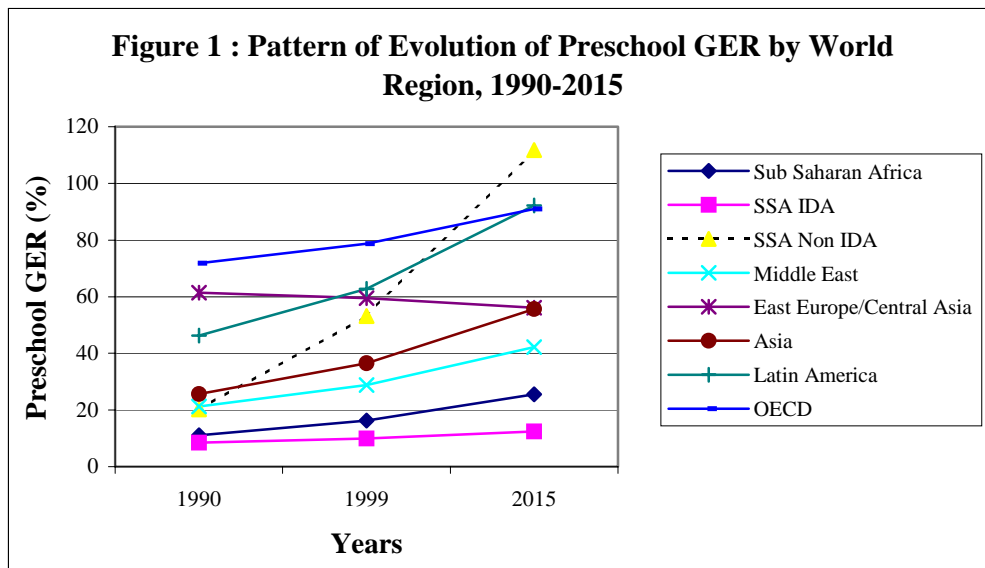
Table 3 : The Observed Pattern of Evolution in Pre-school GER by Region of the World (1990-1999) and Projection of the Trend till 2015

	GER at the Pre-School level (%)			
	1990	1999	Gains 90-99	Projected 2015
<b>Sub Saharan Africa</b>	11.1	16.3	+ 5.2	25.5
IDA Countries	8.5	9.9	+ 1.4	12.4
Non-IDA Countries	20.3	53.2	+ 32.9	111.7
<b>Non Sub-Saharan Africa Developing Countries</b>				
Middle East and North Africa	21.3	28.8	+ 7.5	42.1
Eastern Europe and Central Asia	61.4	59.5	- 1.9	(56.1)
South and South East Asia & Pacific	25.7	36.5	+ 10.8	55.7
Latin America and the Caribbean	46.3	62.8	+16.5	92.1
IDA Countries	26.0	22.7	- 3.3	(16.8)
Non-Ida Countries	42.2	53.0	+ 10.8	72.2
<b>OECD Countries</b>	71.8	78.7	+ 7.1	91.0

Based on average figures at the regional level, all regions with the exception of Eastern Europe and Central Asia, have made progress on the coverage of pre-school during the 1990s'. However the intensity, or the pace of the progress, has been quite different across the different regions : quite large gains have been obtained in African non-IDA countries with overall average gains of around 3 percentage points per year, and in Latin American countries with an average gain of around 2 percentage points per year. By contrast, for IDA African countries, the gain has been very limited as they amount to only 1.4 percentage point but for the whole decade. However, even though this performance is obviously modest, it is not as bleak as that of IDA countries, elsewhere than Africa, as the coverage has declined over the last decade.

At the trend rate of progress registered over the 1990s', where would the different regions stand on coverage of pre-school in the year 2015 ? The data are provided in table 3 above, while Figure 1, thereafter, illustrates the pattern.





According to the projections, the Pre-school GER would be above 90 percent in 2015 in both Latin America and OECD countries; this would be quite a good achievement, but it is of interest to note that the average figure for OECD countries (most countries with per capita GDP over US\$ 20 000) would still not be 100 percent; countries such as Finland or Canada have projected figures around 70 percent, while the figure for US, around 60 percent in 1999, showed no gain between 1990 and 1999. When it comes to other regions of the world, the prospects are less encouraging. In the Middle East and North Africa region, the projected average Gross Enrollment Ratio at the preschool level would be 42 percent in 2015 and 56 percent in the South and East Asia region. A similar figure is expected on the basis of the current trend for the countries of Eastern Europe and Central Asia; but one has to be careful about the validity of the projection given its mechanistic nature, as this is the outcome of a negative trend during the last decade (due to circumstances that may not last).

Low income (IDA) African countries are characterized by far by the bleakest prospects. The projected figure for the pre-school GER in 2015 is only 12.4 percent. At the current trend, it would be necessary to wait until the year 2200 for the GER figure to reach 50 percent; or it would be necessary to increase the pace observed during the last decade by a factor of 12.4 to allow the GER to reach 50 percent in 2015; needless to say that an objective of 100 percent in 2015 would be even more ambitious. These back of the envelope calculations are not meant to bring discouragement; they are meant to alert policy makers (in the countries as well as in the bilateral and multilateral agencies) that the challenge is immense and that strong commitment and consequent actions are with no doubt necessary for this objective of the Dakar goal to materialize in the region.

If now we go beyond regional averages and focus on individual countries, we find quite wide differences across countries in general, to a lesser extent across countries of the Africa Region. Since the specific target for coverage of preschool has not been made totally explicit in the Dakar statement (*“Expand and improve comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children”*), and not to

preclude a specific figure for the target, we simulate different levels of coverage in 2015, namely preschool GER of 25, 40, 70 and 90 percent. Table 4 provides the distribution of the 133 developing countries for which the data have been made available according to their likelihood of reaching different levels of coverage in 2015 based on where they stand on this count in 1999 and how they have progressed during the last decade.

We distinguish four cases : i) the case of the countries that have already reached the targeted figure in 1999; ii) the case of the countries that have not reached the target in 1999, but that would reach it in 2015 provided that they keep the trend of progress registered on average between 1990 and 1999; iii) the case of the countries that have not reached the target in 1999, that registered a positive trend during the 1990s' but will fall short of reaching the target if the observed trend was maintained as is between 1999 and 2015; and iv) the case of countries that have not reach the target in 1999 and are characterized by a negative trend over the last decade.

Table 4 : The prospects for Achieving Some Target Levels of Coverage of Preschool in 2015 in 133 Developing Countries on Current Trends

	Target Preschool GER in 2015			
	25 %	40 %	70 %	90 %
Countries that have already reached the target in 1999	65	48	25	10
Countries that are likely to reach it in 2015 on current trend	5	12	13	16
Countries with a positive trend but that will not reach the target in 2015	43	51	66	75
Countries with a negative trend that will not reach the target in 2015	20	22	29	32
Total number of developing countries	133	133	133	133

Obviously the more ambitious is the target for the year 2015, the lesser are the countries that are likely to make it on current trends. Out of the 133 developing countries, more than half ( $[(65+5)/133]$ ) have (or will have in 2015) a coverage larger than 25 percent. However if the target is 40 percent for the coverage of preschool in 2015, the proportion declines to 38 percent and drops further to 28 percent with a target of 70 percent, to stand at only 20 percent if 90 percent of GER was targeted at the preschool level. One can instead examine the number of countries that are unlikely to make it on current trends. Even with a modest target of 25 percent for the GER of preschool in 2015, 63 countries would be short of achieving the goal on current trends; this number would increase respectively to 73, 95 and 107 if more ambitious targets of 40, 70 or 90 percent were envisaged. These figures suggest clearly that for most countries, and to some extent irrespective of the degree of ambition of the goal for 2015, quite strong actions are to be taken between now and 2015 to prevent the scenarios described above from happening.

The prospects are not great for the developing countries of the world in general; they are even much bleaker for the countries in Sub-Saharan Africa as data in table 5, below, show.

Table 5 : The prospects for Achieving Some Target Levels of Coverage of Preschool in 2015 in 44 Sub-Saharan African Countries on Current Trends

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	Target Preschool GER in 2015					
	25 %		40 %		70 %	
	IDA	Non-IDA	IDA	Non-IDA	IDA	Non-IDA
Countries that have already reached the target in 1999	3	3	1	2	0	1
Countries that are likely to reach it in 2015 on current trend	1	1	1	1	1	1
Countries with a positive trend but that will not reach the target in 2015	21	1	23	2	24	3
Countries with a negative trend that will not reach the target in 2015	11	3	11	3	11	3
<b>Total Number of Sub-Saharan African Countries</b>	<b>36</b>	<b>8</b>	<b>36</b>	<b>8</b>	<b>36</b>	<b>8</b>

Whatever the target, at least 33 out of the 36 low-income Sub-Sahara African Countries are unlikely to meet the goal in 2015, if the trends observed during the 1990s' were maintained. The results obtained so far on the likely attainment of the goal (whatever its definition) was based on the assumption that the current trends would be maintained; what they tell us is basically that the current trends do not constitute a reasonable basis to project the future since the results of the projections generate results that are too far away from what is felt to be acceptable. The purpose of this exercise is however to keep focus on what realistically could be attained, given the constraints. To move away from current trends but considering an objective that may be within reach, one may suggest, based on international experience, that gains in the order of magnitude of two percentage points per year constitutes already a fairly high ambition. To make this objective a reality would nevertheless imply that adequate decisions be taken and implemented, and that funding be secured. Under these circumstances, the prospects would obviously be better as table 6 shows.

Table 6 : The prospects for achieving the 2015 preschool targets with a 2 percentage point

increase per year in GER between 2000 and 2015

	Preschool GER in 2015 (%)			
	25	40	70	90
<b>Developing Countries</b>	109	109	109	109
Achieve the goal	109	84	51	35
Do not Achieve the goal	0	25	58	74
<b>African Countries</b>	27	27	27	27
Achieve the goal	27	10	4	2
Do not Achieve the goal	0	17	23	25

With this pace of increase ( +2 percentage points per year on preschool GER during the period spanning from 2000 to 2015), the 25 percent target is mechanically met by all countries, both in the Africa region and in the World; however, the 70 percent target would not be met by a majority of developing countries in the world, and the vast majority (about 85 percent) of Sub-Sahara African countries would fall short of achieving that objective. For these countries, a three percentage point gain in preschool GER would be necessary to reach even the figure of 40 percent in 2015, given their very low initial level; but a three percent increase a year sustained for more than 10 years is not easy to achieve.

## 2. Elements Toward the Design of a Strategy for ECCD in the Africa Region

In this section we analyze two important issues : i) the first concerns the factual documentation that support the extension of ECCD and preschool activities in the African context; ii) the second concerns a discussion of the respective merits of using formal or non-formal (community-based) structures to implement the types of activity under consideration. We analyze these two aspects in turn.

### **2.1 The arguments to support the extension of ECCD activities in the African context**

The arguments to support ECCD may carry both quantitative and qualitative dimensions. They may also be of a factual or a rhetoric nature. Besides, they may be based on an international comparative perspective (macro dimension), trying to draw the lessons from the variety existing in the experience of different countries, or drawn from studies comparing within a national context the costs and benefits associated to attending these types of activities. Finally, even though the point made that children may enjoy participating these activities, it is generally more compelling to base the assessment on outcomes; for example, to what extent do children that attended ECCD programs show better health indicators; or to what extent do children who went to preschool, other things equal, perform better in primary education (less likely to repeat or dropout, get better level of learning) than those who did not ? Then what is the balance between the cost incurred and the impact on outcomes and to what extent is preschool a cost-effective strategy given the alternatives to improve educational outcomes in primary education ?

In this section, we examine in turn the results of the analysis of the literature and of studies on ECCD conducted in a number of countries, then the results obtained in a comparative analysis on preschool specifically conducted in the context of this study.

#### ***2.1.1 Elements of a review of the literature***

Education for All is not a new goal, in 1990 it was stated in Jomtien. The Framework for Action adopted at the Jomtien Conference stated: “The pre-conditions for educational quality, equity and efficiency are set in the early childhood years, making attention to early childhood care and development essential to the achievement of basic educational goals”.

The endorsement given to ECD at Jomtien, spurred new and old interest among many governments. A proliferation of government programs some supported by multilateral, bilaterals, NGOs and philanthropic institutions was seen in Latin America, some countries in East Asia, MENA and to a much lesser extent in Africa. Different modalities have been tested and replicated in many countries, and as seen in the previous section, many of them have become national policies with wide coverage.

It is well known that there is no single effective model for ECD programs that can meet the needs of different environments and cultures. But there is also enough evidence from around the world, of what are the types of programs that are effective, and more so, what are the key

characteristics that make them successful. Among the different modalities there are roughly two distinguished types of programs: those that target the 0-3 age group, and those that are aimed at the 4-6 year olds. Programs for younger children are more focused on parental education and health and nutrition and psycho-social development. This type of programs are rarely center based. The main audience are the parents, and in most cases the key people in this type of intervention are community leaders trained on health and nutrition and if available psychosocial development. In most cases this type of program is operated under the supervision of Ministry of Health or the like. On the other hand, the more center-based approach found often to meet the needs of the 4-6 age group is linked to the Ministry of Education, and the caregivers/ teachers are trained and supported by this Ministry. However it is also found, and has proven to be the most effective approach, to have the two programs combined. Often parents of the 4-6 age group have toddlers or infants at home, and parental education and outreach programs conducted out of the center based can be more focused and make monitoring easier.

The past decade has provided important lessons for developing countries, and it is time for the Africa Region to take some of these lessons into account. In 1992, and later ratified in 1995, Myers reviewed longitudinal studies from Colombia, Guatemala, Mexico, Turkey, India, Morocco, Argentina, Bolivia, Chile, Brazil and Peru. All the programs reviewed had at least a one-year preschool program, some also had a nutritional component and some included home visits. Ten of the 14 studies showed less repetition among primary school children as compared to those that did not have access to ECD programs. One of the 4 cases in which there was no difference found was in a system that followed automatic promotion system.

From the extensive body of knowledge built on what work and what doesn't on ECCD, built over the years by research institutions conducting research or international organizations supporting programs and evaluating them in developed and developing countries such as High Scope Educational Research Foundation, The Consultative Group on ECCD, the Bernard van Leer Foundation, UNICEF, UNESCO and many other institutions conducting evaluation of programs at national level, there are key lessons that emerge repeatedly. These lessons are found across regions, and from studies in countries in Asia, Latin America and the Caribbean, MENA and Africa. They apply for both age groups 0-3 and 4-6, and can be summarized as follows:

The most effective programs are those which integrate health, education, nutrition, social and economic development.

The most effective programs are those that empower parents, either by involving them in ongoing relationships as full partners with teachers/caregivers in supporting their children's development; or by making them responsible for the management of the programs.

The most effective programs are those that blend traditional child-rearing practices and build from cultural beliefs and practices, and integrate them with modern "western" approaches.

The programs that most significantly increased educational performance measured by higher completion rates and reduced need for special education are those that empowered children and teachers. Children are empowered by enabling them to initiate and carry out their own learning and exploration of their surroundings. Teachers are empowered by providing them

with systematic in-service training, supportive and continuous supervision, and observational tools to monitor children's development.

The most effective teachers/care giver programs are those that have flexible in-service modalities; with emphasis on practice and good theoretical and learning material support to enable teachers to carry out child-centered pedagogical activities.

The most successful programs are those that build partnerships for the delivery of services. This means not only an integration of health, nutrition and education, but greater collaboration between governmental ministries, bilateral and multilateral agencies and local and international NGOs.

Children from lower socio-economic backgrounds and disadvantaged communities are the ones who benefit more from ECD interventions.

Illustrative examples of all the above can be found in Africa. Collectively, there is enough knowledge and experience in the region to provide quality programs. More so, as early as 1992 at a Conference in Lesotho, **negative aspects of the existing programs were identified as**

Over emphasis on center-based

Too much concentration on a cognitive approach- "grade zero" of primary education

Limited coverage

Lack of integration with the community

Neglect of the 0-3 year olds who do not attend centers

The following section provides illustrations of programs in African countries, featuring some or in several cases, more than one of the key aspects that can make an ECD intervention successful.

#### ***a) Integrated health, nutrition early education and mothers' empowerment***

**\* Mali : Mobilization of women to create innovative early education structures "Clos d'enfants" (Early Childhood Development, Laying the Foundations of Learning; UNESCO, 2000)**

This program started as a pilot phase based on a partnership between the Malian Ministry of Education, UNESCO, UNICEF, and the "Fédération Internationale des Centres d'Entraînement aux Methods d'éducation Active (FICEMA), an NGO aimed at fostering development of young children in Francophone Africa. This program is now being brought to a national scale under the WB Education For All Project in Mali.

The Clos d'enfants is based on traditional practices and employs the minimum equipment to care effectively for good health and education of children aged 3-6. They are aimed at children from rural communities, and designed as an integral part of the activities of the women's association. The latter is the organization responsible for the administration of the Clos. In small groups of 12-15, children are being cared by "educators-mothers". The educators-mothers, in teams of 3 provide every day of the week daily meals to the 15 children, and conduct structured play activities such as story-telling, dance, and cognitive skill building activities. Emphasis is also made on hygiene and promotion of basic health

practices. The main inputs in this program are the training of the educators-mothers, meals for the children and basic learning materials.

*b) Blend of traditional cultural believes and practices with modern western approaches*

**\* Nigeria: Child care in markets (Source: Cohen Ruth et al. ; Building on People's Strengths: Early Childhood in Africa, Bernard van Leer Foundation, 1994)**

Markets are places where many African women go to sell their produce. In urban areas they tend to operate every day, and in rural areas every few days. Women selling their produce often bring their small children with them. In Lagos Island for example, fisherwomen of Ilubinn who weave fishing nets and smoke fish, carry their babies as they go to the streets and markets of Lagos. In Ibadan's sabon-gari market, women selling vegetables bring their children of different ages. Such women are beginning to establish child care facilities for their children on market days. These tend to be on a voluntary basis, with women taking turns to look after the children. UNICEF, NGOS, and church groups are taking this opportunity to improve the conditions of this day-care centers by providing meals for the children, improved sanitary and hygienic conditions, providing immunization for children on market days, and support to the mothers on how to conduct constructive play activities with the children.

*c) Flexible in-service training modalities*

**\* Zimbabwe: In-service on site training (Source: Cohen Ruth et al. ; Building on People's Strengths: Early Childhood in Africa, Bernard van Leer Foundation, 1994)**

The Kushanda early childhood project in northeast Zimbabwe began in 1984 as part of a local development plan. It included an agricultural production cooperative and expansion of employment opportunities. By the end of 1992, 138 pre-schools had been established, and the program is currently run by a federation of parents' associations. Due to distances, the program adopted from the beginning an intensive on-site training on ECD, for women who had already been trained as farm health workers. To ensure the practical aspect of the training program, the training of mothers/pre-school teachers, was only possible where ECD centers existed. It was originally intended to have a follow-up training and support two day visit per term to each center. However, as the centers increased in number so quickly, it was not possible to give this kind of support. Instead, cluster workshops bringing 4-6 trained teachers together at one of the centers for a period of three days takes place 3 times a year. These workshops not only provide a concentrated refresher course, but also allow the teachers to discuss their progress, problems and support and learn from each other. As an indicator of success of this program, demand for this training from teachers not associated with the Kushanda projects is high

*d) Partnership for the delivery of services*

**\* Kenya: Community-based grants program, (Source: Supervision mission report, World Bank, 2003)**

Kenya has one of the most developed ECD provision of services in Africa. It has been a government policy to provide ECD services since independence in 1963. From the start, pre-schools were planned and set up by local communities. In 1970, a National Centre for Early Childhood Education (NACECE) was established to provide training of teachers/care-givers and upgrade the quality of the pre-schools. Today, 38 % of Kenyan children aged 4-6 have access to pre-school services, funded from parents contributions. NACECE provides a good quality training program (2 year in-service), for which teachers receive accreditation. This high quality training system unfortunately has a 40 % attrition rate, mainly from the difficulty of parents to raise the fees in order to increase the teachers salaries. In addition to the 2 year training program, NACECE offers a 5 week course, and a wide range of materials to support the teachers in their daily activities, and support is provided by the NACECE district level offices, available in all Kenyan districts. With the aim to support the most needy children in low socio-economic communities, the Kenyan government is providing grants to communities that are willing to expand the ECD services to children whose parents can not afford to pay for fees. Grants are given to and administered by ECD committees, which have proven to be very effective in the provision and management of services. Children are provided with daily meals, pre-school activities, deworming, and growth monitoring. In some cases grants are given to women associations to start up income generating activities, these associations run the ECD centers. Community based grants program are also operating successfully in other African countries. Examples are found in Guinea, Mali, Tanzania and Mozambique.

*e) Sound planning must address the needs of the most vulnerable*

**\* Affordable early childhood development provision for preschool children in South Africa (Source: Eric Atmore, Co-operative Research Programme: Affordable Social Provision; Human Research Council, 1996)**

Up to 1993, the enrollment on ECD in South Africa was 11%. With the aim to increase access, specially for children from disadvantaged populations, the following framework for investment on ECD has been adopted:

Funding for ECD services involves a partnership between the national, provincial and local governments; the private sector, organized labor, community organizations, parents and donor agencies

A wide range of programs and services are eligible for state financial support, based on needs of the target populations

Funding allocations are based on present and projected needs, and as a priority addressed the needs of children and families not presently reached

Employers have direct responsibility to contribute to meet the needs of their employees young children's development

Parents contribute according to their means

State subsidies must be sufficient to ensure good quality service

*f) The most disadvantaged population are the ones that benefit more*



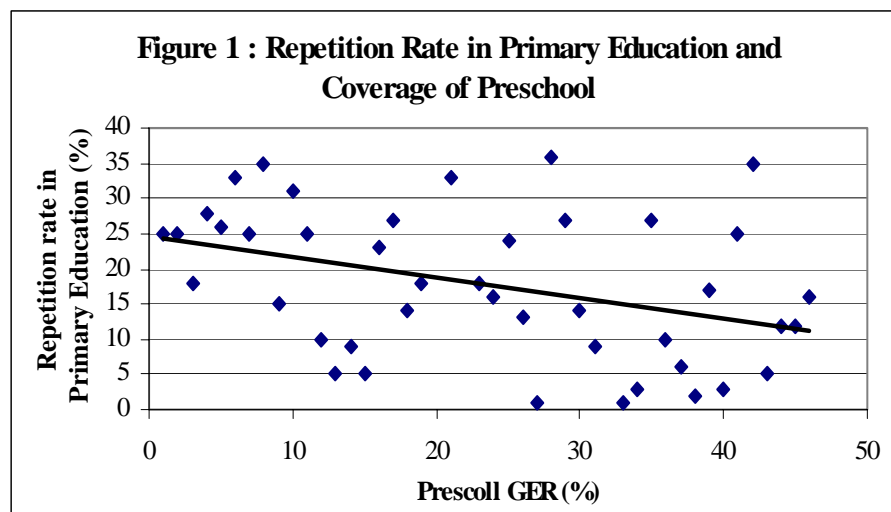
## Who benefits from ECD

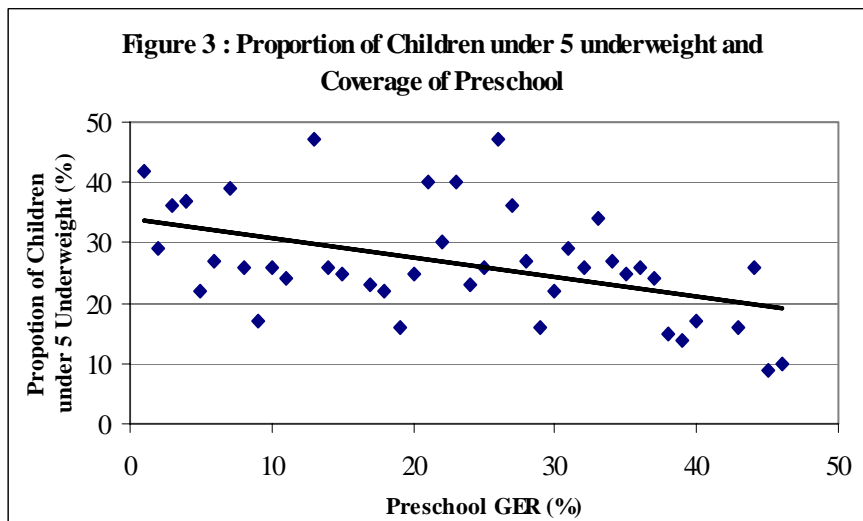
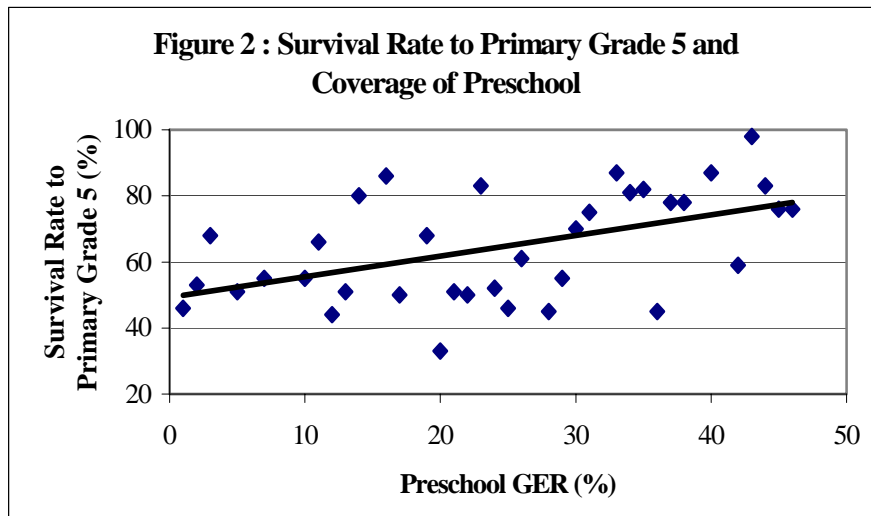
A series of studies by Short and Biersteker (1984) on South African children who had attended the Early Learning Centre (ELC) program showed that children from lower socio-economic backgrounds who participated in the ELC program obtained mean scores equal to their middle-class peers attending a traditional pre-school program, and greater than the children who did not attend any program. Similar findings were observed by Jaramillo and Tiejn, (2001), in a study in Guinea and Cape Verde, where children from disadvantaged communities benefited more from preschool attendance compensating for the lack of support from the family environment that children from higher income families get. It also showed that lack of preschool can widen the gap between rich and poor children, as those who are likely to afford for the private provision of pre-school are those better prepared for it. Thus, failure to provide support to children from poorer households, situates them at a major disadvantage for success in school, compared to children from higher income levels.

### 2.1.2 Identifying the impact of preschool from a comparative analysis

As we have observed in section 1, there is a wide variance across developing countries in both coverage of preschool as well as on performance indicators in primary schooling or in the proportion of children under 5 that are underweight. We try here to assess the extent to which we can associate better performance in primary education to better levels of development of preschool at the country level.

To this end, we can first adopt a bivariate and graphic perspective by just plotting the GER at the preschool level against repetition and survival rates in primary education using country level data. Figure 1 relates preschool GER to the repetition rate in primary education; figure 2 relates preschool GER to the survival rate to Grade 5 among students entering primary Grade 1. Figure 3 relates the preschool GER with the proportion of children under 5 that are underweight.





The three Figures present interesting and expected associations between the coverage of preschool in a country on the one hand and each of the three aspects of possible outcome explored here, on the other. In all cases, there is obviously quite a substantial variance on both sides of the overall relationship, but there is also quite a clear pattern of association between the variables on both axis :

- i) as far as grade repetition in primary education is concerned, the frequency of repetition tends clearly to decline as the proportion of the children that had preschool increases; the magnitude is not anecdotal as the estimated figure for a preschool GER of zero percent would be around 25 percent to decline and stand around 12 percent in countries where the coverage of preschool 45 percent;
- ii) a similar pattern is observed for the impact of preschool on completion of Grade 5 among students entering Grade 1; the trend is however positive, the completion rate of

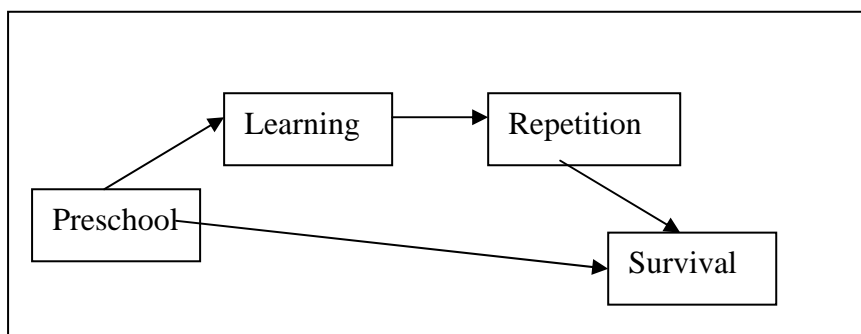
students during the course of primary education (at least up to Grade 5) being better when a larger proportion of the age group had access to preschool. Here again, the magnitude of the impact is quite noticeable, from a completion rate of about 50 percent in the absence of preschool to a figure of around 80 percent when half of the age group has benefited of some kind of preschool;

iii) finally, the proportion of children under 5 that are underweight tends to decline as the coverage of preschooling in a country increases. Here again, in spite of the overall variance, the bivariate impact is relatively substantial with a figure of 33 percent of children underweight in countries where there is no preschool to less than 20 percent when half of the school age population benefits from preschooling.

One has however to be very careful in drawing conclusions too rapidly from these graphs. This is particularly so as some other factors, such as the level of economic development of the country, may influence both of the two variables taken into consideration in each of the three figures above, creating spurious correlation leading to erroneous conclusions. It is therefore preferable to move to econometric analysis and control for the influence of other factors such as the per capita GDP, to assess the impact of preschool upon the identified outcomes.

This has been done for the three relationships on two samples of countries: i) all countries of the world for which the relevant data are available (40 countries); and ii) all Sub-Sahara African countries (24 countries). The results are very clear and are very similar for the two sets of countries : Concerning the impact of preschool upon both the repetition rate and the survival rate in primary education, controlling for per capita GDP makes virtually no difference as the pcGDP variable is statistically not significant. The  $R^2$ 's are around 30 percent and the preschool variable is significant at the 5 or (more often) 1 percent confidence level. However, when it comes to analyzing the proportion of children under 5 that are underweight, the impact of per capita GDP is very significant, leaving the preschool variable without any statistically significant impact. Which means that there is no direct relationship between preschool and underweight, which is not surprising, as it is not common to provide feeding programs in preschools. On the other hand, these results provide support to the point that there exists indeed some structural relationship between preschool and primary education. This was probably expected; it is not trivial to show factual results to support the anticipation.

However, it may not be adequate to suppose the existence of flat or direct relationships between the coverage of preschool on the one hand, the frequency of repetition or the survival in primary education on the other. It may be preferable to think that the reality would be better described by using a structure such as the following :



In this framework, Preschool is supposed to have a (positive) impact on Learning in the course of primary education; then Learning has a (negative) impact on Repetition; finally lower levels of repetition imply better Survival in primary education, as repetition is often seen by parents as a signal that the child is not fit for the school and that he/she should better stay at home to contribute to the household economy. However, beyond this line of impact of preschool upon survival (through student learning and repetition), there is also a possibility of a direct impact of preschool upon survival associated to the fact that children (and their parents) have developed more positive attitude for schooling and have developed a stronger demand.

The data mobilized in the context of this study concern only Preschool, Repetition and Survival; we do not avail enough comparative data on student learning. We are therefore led to focus on a reduced form of the framework presented above, with a “short circuit” between Preschool and Repetition. The framework has been tested on the sample of the 24 Sub-Saharan African countries for which the relevant data are available in our data set (the results for the 40 IDA countries of the world are very similar). The results of the estimates are the following [\*\* means significant at the 5 % level; \*\*\*, at 1 %]; they are summarized in Figure 4, below.

**\* Impact of Preschool upon Repetition**

$$\text{Repetition} = 20.56 - 0.123 \times \text{Preschool GER} + 0.37 \ln(\text{pcGDP}) - 7.45 \times \text{Anglophone} \quad [R^2=0.509]$$

(\*\*) (\*\*\*)

**\* Impact of Repetition upon Survival**

$$\text{Survival} = 82.87 - 0.875 \times \text{Repetition} \quad [R^2 = 0.280]$$

(\*\*\*)

**\* Impact of Preschool upon Survival**

Total Effect :

$$\text{Survival} = 65.35 + 0.317 \times \text{Preschool} \quad [R^2 = 0.268]$$

(\*\*\*)

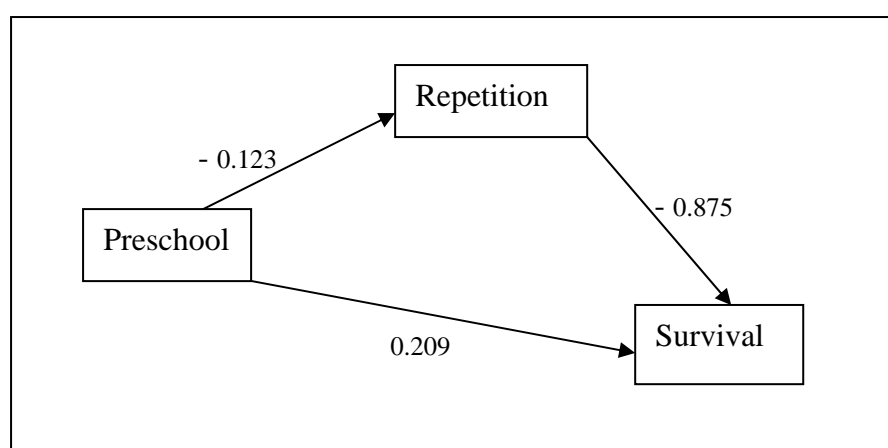
Direct net effect :

$$\begin{aligned} \text{Survival} &= 65.35 + [0.317 - (0.123 \times 0.875)] \times \text{Preschool} \\ &= 65.35 - 0.209 \times \text{Preschool} \end{aligned}$$

The estimates show that i) preschool has a negative effect on repetition (a larger coverage of preschool implies lower levels of repetition, with one additional percentage point in Preschool GER implying on average a reduction of 0.12 percentage point in the repetition rate in primary education). This estimate also shows that, for a given level of preschool GER, Anglophone countries are characterized by a frequency of repetition which is significantly lower (by 7.5 percentage points) than that of their Francophone counterparts; ii) repetition has a negative impact upon survival with an elasticity of - 0.875, implying that a reduction of one percentage point in the repetition rate in primary commands on average in African countries an increase of 0.875 percentage point; concerning finally the impact of preschool upon survival in primary education, the total effect is quite substantial, an increase of one percentage point in the preschool GER implying on average an increase in the survival rate to Grade 5 of primary school of 0.317 percentage point. This effect results from two sources : a)

an indirect effect through the combined impact of preschool upon repetition and of repetition upon survival; and b) a direct effect (that may represent the impact of preschool on the demand for schooling), which impact is estimated here at 0.209, implying that an increase of 1 percentage point in preschool GER commands an increase of 0.209 percentage point in the survival rate to Grade 5 of primary education.

Figure 4 : Direct and Indirect Effect of Preschool upon Repetition and Survival in Primary Education (24 Sub-Saharan African Countries)



In order to make these results available in a more concrete manner, they are presented under the form of numerical simulations. Table 7 provides the results obtained.

Table 7 : Simulation of the Survival Rate to Grade Five and Repetition Rate According to Coverage of Preschool in 24 Sub-Saharan African Countries

Preschool GER (%)	0	10	20	30	40	50	60
<b>Repetition Rate (%)</b>							
All African countries	20.4	19.2	17.9	16.7	15.5	14.2	13.0
Francophone Countries	22.7	21.5	20.3	19.0	17.8	16.6	15.3
Anglophone Countries	15.3	14.0	12.8	11.6	10.4	9.1	7.9
<b>Survival Rate to Grade 5 (%)</b>							
Total effect	65.3	68.5	71.6	74.8	78.0	81.2	84.3
Indirect effect	65.3	67.4	69.5	71.6	73.7	75.8	77.8
Direct effect	65.3	66.4	67.5	68.5	69.6	70.7	71.8

From the data in Table 7, it appears clearly that preschool has quite a positive impact on the performance of student flow in primary schooling. From an initial context of very low coverage of preschool (most African countries are in such circumstances in 2000) to circumstances in which the GER of preschool could reach say 40 percent in 2015 (a goal that seems “reachable” based on the discussion in the previous section), the anticipated benefits are quite substantial : Repetition rates could go down from 20 to 15 percent while the proportion of primary Grade 1 students that reach Grade 5 would increase from 65 percent in 2000 to 78 percent in 2015. This would mean that i) it would create a context in which the objective of universal completion of six years of primary education has better chances to be met, and ii) it would help improve the efficiency of resource use in the primary cycle of studies.

So as to get a sense of what these figures imply in terms of potential efficiency gains in primary education as a consequence of preschool investments, it is straightforward to simulate the pattern of student flow in primary education of an hypothetical country that has currently no coverage of preschool (survival rate to Grade 5 of 65.3 percent and repetition rate of 20.4 percent) and that of the same country with a coverage of preschool set at 40 percent (survival rate to Grade 5 of 78.0 percent and repetition rate of 15.5 percent). For each of the two student flow patterns, we can calculate an input-output ratio, defined as the ratio of the effective number of pupil-years to produce one graduate given the existing pattern of repetition and dropout and the optimal number of pupil-years in the absence of repetition and dropouts to produce the same graduate. In an ideal case (no repetition nor dropout), the input-output ratio is equal to 1; its value is all the more larger than that reference that dropout and repetition rates are high.

The results obtained show that the numerical value of the coefficient of student flow efficiency in primary education is 1.67 in the case with no coverage of preschool, while it is 1.37 with a preschool GER of 40 percent. This means that in the first case the country needs to spend 67 percent more resources than ideally necessary, while this figure is only 37 percent in the second case. The savings associated to the 40 percent coverage of preschool can therefore be estimated to amount to 17.5 percent  $[(1.67-1.37)/1.67]$  of spending on primary education. This represents quite a substantial amount of resources saved. But it should be stressed that these savings are in a sense “real” or virtuous since they are obtained in a context where the quality of primary education is not compromised (as it would be the case with an increase in class-size or a cut in the availability of pedagogical materials) but strengthen.

### ***2.1.3 The conditions for additional resources allocated to preschool be justified***

The results obtained in the previous section suggests that preschool has positive impacts. However, it is not enough that a positive impact of preschool be identified to justify that such activity be undertaken. In a world of scarcity of resources, the cost dimension needs be taken into consideration. Three complementary aspects of cost may play a role in this respect : the first is merely linked to financial sustainability; the second is related to cost-efficiency and the relation between spending and expected benefits; the third is that under the common label

of preschool, activities that are indeed very different in both content, mode of implementation and finally cost may exist. Each of the above have obvious consequences in terms of the discussion of both financial sustainability and cost-benefit analysis.

i) the first aspect has to do with **financial sustainability** and the competition among alternative claims within government budget. For example, within the education budget, the indicative framework of the Fast-Track initiative suggests that 50 % of recurrent spending on education be allocated to the primary cycle (for a six year cycle). If we accept this benchmark, this implies that an other 50 % of the budget is available for all other levels (preschool, lower and upper secondary general and technical education as well as for higher education). If there are good reasons to give more resources to preschool, similar good reasons do exist to provide additional resources to these other segments of the system. One could suggest that external funding could be used for preschool to complement domestic public allocations; but the same argument holds for other sector needs: external financing is also scarce and primary education comes now also into the competition since the donor community has given some kind of priority to the goal of universal achievement of primary education and since this is likely to absorb a significant proportion of their financing.

ii) the second aspect concerns whether the use of additional resources for preschool would be the first aspect has to do with **financial sustainability** and the competition among alternative claims within government budget. For example, within the education budget, the indicative framework of the Fast-Track initiative suggests that 50 % of recurrent spending on education be allocated to the primary cycle (for a six year cycle). If we accept this benchmark, this implies that an other 50 % of the budget is available for all other levels (preschool, lower and upper secondary general and technical education as well as for higher education). Below we present some evidence on the first of these two points.

To assess the extent to which the benefits of preschool are higher than its costs would obviously require an estimation of both the costs and the benefits; this suggests that careful studies be undertaken first to get the relevant data and second to conduct the analysis. This is beyond the scope of this paper. However, it is possible to slightly move into that direction. On the cost side, it may be said that preschool type activities can be organized in a formal setting or in a non-formal one (community-based activities). The costs may be very different. We do not have readily available a complete set of data; we rely on a limited set of data (table 8), with the idea that they provide nevertheless some useful orders of magnitude.

Table 8 : Selected data on the cost of public preschool in four countries

Country/ Region	Per capita GDP (000 Fcfa)	Unit cost					Pupil-Teacher Ratio			Ratio a) / b)
		In Fcfa unit		In per capita GDP unit		Preschool / Primary a)	Preschool	Primary	Preschool / Primary b)	
		Preschool	Primary	Preschool	Primary					
Benin, 1998	227	33,200	27,600	0.146	0.121	1.20	28	53	1.89	0.635
Cameroon, 1998	363	50,000	26,000	0.138	0.072	1.92	23	56	2.43	0.790
Côte-d'Ivoire, 2000	464	107,300	49,055	0.217	0.106	2.05	23	43	1.87	1.098
Niger, 1998	105	63,779	36,972	0.608	0.352	1.73	20	39	1.95	0.885
<b>Average 4 countries</b>	-	-	-	<b>0.236</b>	<b>0.139</b>	<b>1.70</b>	<b>23.5</b>	<b>47.8</b>	<b>2.03</b>	<b>0.838</b>

Sub-Saharan Africa	-	-	-	0.170	0.129	1.37	27.2	44.6	1.64	0.838
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From actual data on unit cost in both public preschool and primary education in four countries (Benin, Cameroon, Côte-d'Ivoire and Niger), we get the sense that formal preschool can be relatively costly. There is indeed some variation within this group of countries, but in all of them preschool is more costly than primary education on a per pupil basis; on average, unit cost in preschool (0.236 times the per capita GDP) in that small sample of countries exceeds that of primary education (0.39 times the per capita GDP) by 70 percent. We are however a bit reluctant to use these figures as estimates for the Africa region as we know that these countries are unlikely to be representative of the region as a whole.

From other sources (Bruns, Mingat and Rakotomala, 2003) we know that the unit cost of primary education in low income Sub-Saharan countries represent on average around 12.9 percent of the per capita GDP of the countries, while it is estimated at 13.9 in our sample of four countries. We also have at our disposal data on the pupil teacher ratio in both primary education and preschool in our sample and for the region as a whole. PTR is respectively 23.5 and 47.8 in preschool and primary education in our sample, while the corresponding figures for the region are 27.2 and 44.6. These data suggest that, if our sample indeed deviates from the average figures for the region, the overall pattern looks relatively much the same. In our sample of four countries the ratio of unit costs in preschool and primary education (1.70) is lower than that of pupil teacher ratio (2.05). This implies that teaching staff are on average paid less in preschool than they are in primary education (and/or that non salary inputs are less abundant in preschool than at the primary level). If it is mostly the salary argument that holds, data imply that, on average, teacher salary in preschool would represent about 81 percent that in primary education; this figure appears reasonable.

To estimate the ratio of unit cost in preschool and in primary education for the region as a whole, we use this latter figure (0.81) and recalibrate the ratio found in our sample of four countries according to the ratio of the PTR in preschool and primary education in the sample and in the region. This leads to a ratio of 1.37 between unit cost in preschool and primary schooling, which in turn implies that the average unit cost in preschool could represent about 0.17 unit of per capita GDP. It is likely that, like within the sample, there exists a substantial variety from one country to another, depending both on the level of remuneration of personnel and the way the services are organized (for example, pupil teacher ratio varies between 15 and 47).

On the benefits side of preschool, we may distinguish between those that arise during preschool itself and those that arise after the children have left preschool in their subsequent life. On the first count, one can cite that women whose children get to preschool may be freed for productive activity, or that girls whose younger siblings have access to preschool may themselves more easily get enrolled in primary education. On the second count, as a follow up of what we analyze in the previous section, one can cite that children who have benefited from preschool are better prepared for primary schooling; the consequence is that they are less likely to repeat grades and dropout out before completing this cycle of study. Regarding



the benefits associated with the reduction of opportunity cost of women and girls' time that could be associated to preschool, Lokshin and al. (2000) showed that, in Kenya, ECD programs targeting poor households, boost the enrollment in primary school of older girls, and increased the number of mothers who work, thus augmenting the level of income of the family.

Concerning the impact of preschool on improvement of the pattern of student flow in primary education, we do have a few elements for the analysis. From the estimates presented in table 7, we have the sense that a 50 percent coverage in preschool (which represents about a cost of two years of study for half of the relevant school age population, that is the equivalent of 1 year of studies at the preschool level) could imply a gain of 6.2 percentage points in the repetition rate (from 20.4 to 14.2 percent) in primary education and of 15.9 percentage points in the retention rate (from 65.3 to 81.2 percent). These improvements in student flow can be consolidated in a gain of 20 % in the efficiency of resource use in primary education (the ratio of the number of student-years effectively used to the number of student-years required to produce the same number of outputs without neither repetition or dropout). Twenty percent of a six year cycle amount to a gain of an equivalent of 1.2 years. Given that the unit cost of preschool is estimated on average to amount to 1.37 times that of primary education, we can conclude that the cost of preschool could be offset for up to 87 percent by the expected benefits incurred in the course of primary education.

\* If we want **to be positive**, we can conclude that most of the public spending in preschool could be recouped through efficiency gains in primary education; other benefits (in particular in the course of preschool) need not be very important to allow for spending in preschool to get to an acceptable balance between the costs and the benefits.

\* If we want **to be less positive**, we can stress that the costs of preschool are in fact hardly recouped and that in a context of stringent public finance constraints, the priority may not be to allocate substantial additional resources to expand coverage of preschool.

If we want **to be pragmatic and concrete**, we may want to stress that the calculations made above are based both on average figures and on a mode of delivery of preschool services that may not be the most efficient. One needs to underscore that there exist wide possibilities to implement preschool activities, both in terms of content, modes of delivery and intensity of inputs per child. It is therefore not totally convincing to base the assessment on a mix of cases some of them being efficient while some others are not. If we could identify the most efficient ways of implementing preschool, they would likely either be less costly and/or generate larger benefits. The results above suggests that the search for efficiency in preschool is not an option and should without doubt be analyzed carefully since the justification for investment in preschool probably rest on the capacity of government to implement preschool activities that are more efficient than average. We come to this point in the section 2.2.

## **2.2 Implementing a strategy for the development of ECCD : the respective merits of formal structures and of community-based arrangements**

From the elements gathered in section 2.1 above, it appears that there are arguments that could support the development of ECCD activities in African countries, provided that preschool is organized in an efficient manner. As stressed above, there remains alternative ways by which ECCD activities can be implemented. The range of options is in fact relatively wide along various dimensions, content, institutional setting and financing, unit cost and input mix. We have for example an idea that formal preschool can be organized in different ways, implying quite different levels of unit cost, when we know that within the Africa region, pupil-teacher ratio does vary between 15 and 47 (other things being equal, the cost per pupil is more than three times higher in the first than in the second case). Within the sample of the four countries analyzed in table 8, the unit cost (expressed as a proportion of per capita GDP) is four times larger in Niger (0.61) than in Benin or Cameroon (0.14). These variations occur within the formal system of preschool. Obviously, the magnitude of variability is much larger if we consider preschool activities organized in a formal and a community-based setting. The cost per pupil in community-based activities is likely to be lower than that observed in a formal setting, but what makes a real difference is that preschool in community-based programs are currently only partially subsidized by the government with the consequence that the level of public spending per pupil is generally much smaller than in formal public preschool. In The African context, we have data on community based programs in Cape Verde, Guinea, Guinea Bissau and Senegal. Table 9 provides some basic information.

Table 9: Per child public spending in formal and community-based preschool programs  
in four countries (per capita GDP units)

Countries	Formal Preschool * a)	Community-Based Preschool b)	Ratio a) / b)
Cape Verde	0.066	0.037	1.78
Guinea	0.073	0.037	1.97
Guinea Bissau	0.117	0.035	3.34
Senegal	0.306	0.057	5.37
Average	0.141	0.042	3.39

\*Authors estimates based on pupil teacher ratio and teacher salary all 4 countries with the exception of Cape Verde

Source :

Even though these cost estimates can be taken only for reasonable orders of magnitude, the data presented in the table clearly show that community-based programs are largely less costly in terms of public resources than formal public preschool programs (here between 1.8 and 5.4 times less costly) with an average figure of 4.2 percent. This figure is also in line with the 5 percent of per capita GDP reported for community-based preschool programs in India (...). The data also suggest that, if there exists a wide variety in per pupil public spending in the formal system of preschool (as already noted above in the Benin, Cameroon, Côte-d'Ivoire and Niger sample), this seems to be much less the case for community-based programs : all 4 of them are concentrated between 3.5 and 5.7 percent of the per capita GDP of the country. This is obviously good news for the potential public finance sustainability of preschool investments in the context of the stringent constraints that country face for achieving the various Dakar goals for EFA.

However, it is not enough that community-based programs be cheap to justify that they should be expanded. The benefit side needs also to be considered. The data on the benefits of community-based preschool programs are even scarcer, in particular if we focus on the impact of these programs on the frequency of repetition and dropout in the course of primary education. The single factual documentation that we know is the study by Jaramillo and Tietjen (2001) on Cape Verde and Guinea. In that study, the outcome is measured in terms of cognitive (language, basic concepts and readiness for reading) and physical development at the outset of preschool programs both formal and community based. The results show that, in spite of the relatively substantial difference in per pupil public spending, there is little difference on average in the sphere of outcomes, the community-based programs tending even to outperform formal preschool programs. There is however a substance variance across schools within both formal and community-based schools suggesting that monitoring the programs upon the results they effectively achieve is not an option and should probably be a necessary ingredient of their design.

**2.3 Improving health and nutrition indicators. This section is based on the recent work done by Soucat, Van Lerberghe, Diop, Nguyen and Knippenberg (2003). The authors have conducted an analysis on how to improve outcome on health programs and have identified what they call the bottlenecks for health service delivery and the new performance frontier.**

*The authors argue that while a basic package of health services can make the difference in health outcomes, it is implementation bottlenecks rather than the package that need to be costed. According to their findings, a new approach to budgeting for the new fiscal space will need to focus on strategies to overcome the bottlenecks to coverage with packages of known and predictable impact. Of key relevance for the work on ECCD are the family and community based service delivery packages.*

The notion of packages of effective health care has been highlighted since the early work in Nigeria (Gwatkin et al.) and Zaire (Van Lerberghe et Pangu al, 1988, Porignon et al 1998) and advocated for by the World Bank (World Bank, 1993) for almost ten years. Interventions such as immunization, malaria prevention, skilled assistance at delivery, basic surgical care or vitamin A supplementation as well as many others have been found to be able to significantly dent into child and maternal mortality. *Key packages of health services can make a difference.* One of the areas of noticeable gains is the potential of some key health services to impact on health. Ministries of health as well as the donor community are usually well aware of the potential of these interventions. The health care delivery packages considered strategic for reaching the millennium goals are nothing fundamentally new. They have evolved out of 15 years of experience with Minimum Package of Activities in countries such as Mali or Guinea. However, there have been technical additions and changes of accent – and one should expect this to continue to evolve with the development of technologies. The end result is quite a bit more sophisticated than it was a couple of years ago.

The authors have grouped them in three packages – basically on operational grounds: the bottlenecks and constraints to service delivery are likely to be different for each package, and so are the strategies for lifting these constraints. These three packages are: self-care in households and communities; Professional care provided in health centers, clinics and hospitals; and professional care provided through outreach.

*Bottlenecks not packages need to be costed.* Quite a number of countries, such as Guinea, Mali or Tanzania have defined ‘minimum’ or ‘essential’ packages of care they want to provide to their populations. Some attempts have sometimes been made to cost them and to align funding for them as in Zambia or Burkina Faso. Nevertheless, this approach has often failed to take into account the policy and operational constraints to its implementation. The coverage of the basic package, especially among the poor, is often well below what had been hoped for. A likely explanation is that in the real world, a basic package is not delivered as a set of separate diseases-specific activities the way it is often costed. Instead, it is a part of a system in which service delivery modes determine the inputs and operational strategies more than diseases affect cost. To improve the coverage of the basic package, a country needs to address a number of system-wide bottlenecks, particularly in terms of human resources, physical accessibility, supplies and logistics as well as technical and organizational capacity. As a consequence, budgets are not - and should not - be organized by diseases. Practically, although the nature of the services still matters, it is a set of system-wide bottlenecks in service delivery rather than the basic package that needs to be identified and costed.

Building on the experience of countries who have made significant progress in terms of delivering health interventions, three packages of interventions are proposed: a household-community package, a health facility package and an outreach package. Each of these packages includes interventions that contribute to improving maternal and child health as well as controlling communicable diseases at each stage of the process of production of health services. Of particular relevance for the delivery of ECD services, is the *Self-care in households and communities package*, which refers to what households can do to improve their own health and nutrition. This includes: use of soap; child care and development; clean delivery; exclusive breastfeeding and proper feeding practices; home care for common illness including diarrhea and ARI; safe sexual behavior; use of bednets. For each of these activities, it is known that their presence or absence makes a significant difference for outcomes such as under-fives mortality or nutritional development of children. Table 10 below has an example of Priority interventions and the proposed packages in Mali.

<b>Table 10 : Examples of Priority Interventions for Preventive women's health, well child and curative care Intervention Packages –Mali MTEF 2002</b>			
	<i>Preventive women's health care</i>	<i>Well Child Care</i>	<i>Curative Care</i>
<b>Community &amp; Family</b>	Birth Spacing/Condom use	Children sleeping under ITN's	Malaria case management

<b>Based Care</b>	ITN for pregnant women Use of iodized salt	Breast/Complementary. Feeding Hygiene promotion	Diarrhea management/ORT ARI case management
<b>Facility Based Care</b>	Modern Contraception  Antenatal Care (TT/IPT/Iron/PMCT)  Institutional Professional delivery	Immunization  Vitamin A supplement  Deworming	IMCI (Malaria/ARI/Diarrhea/ NN sepsis)  DOTS/STD/Malaria management
<b>Professional Outreach &amp; Referral</b>	Modern contraception Antenatal Care (TT/IPT/Iron/PMCT) Community/home based professional delivery	Immunization Vitamin A supplement  Deworming	Emergency Obstetric Care DOTS for tuberculosis

## 2.4 Policy implications

The policy implications of these findings are two-fold and relatively straightforward :

i) since community-based preschool programs and community and family based care for health service delivery are clearly less costly in terms of public finance than formal traditional approaches, while producing results that appear to be at least equivalent or even reach better outcomes like in the case of household and community based interventions for modifying health indicators, there is a clear message that in times of stringent constraints on public resources, community-based integrated health, nutrition and early education programs are to be preferred;

ii) the second implication is that if community-based programs are characterized by unit cost say around 5 percent of per capita GDP, while generating potentially similar levels of outcomes for children, these programs not only may be better than formal or traditional programs, they are also justified in terms of the allocation of resources as the cost-benefit ratio of community-based preschool activities, instead of being 0.88 (1.2/1.37) in the case of formal preschool, stands at 3.1 (1.2\*12.9/5). Even though this figure is to be taken only for its order of magnitude, it is such that it provides a reasonable level of confidence that extending preschool activities in a well designed community-based mode is probably to be considered as a serious option. Soucat et al. argue that 15 years of experience with Minimum Package of Activities in countries such as Mali or Guinea, it has been demonstrated that actions taken at the household level, such as exclusive breastfeeding and proper feeding practices; home care for common illness including diarrhea and ARI; safe sexual behavior, use of bednets have a significant impact on outcomes such as under-five mortality or nutritional development of children.

Obviously more work should be undertaken in an implementation perspective to identify the concrete design of the community based ECCD programs : What is the practical description of the activities to be implemented ? How can they be best organized ? how is the system to be precisely structured and what would be justified in terms of staffing and support to help the system deliver the expected outcomes ? How is the training of personnel, in particular of community leaders organized ? How are the resources (consumables, financial resources,

training, support) to be made available at the local level, in particular in remote areas ? Which monitoring and incentive mechanisms are to be implemented as part of the system to maximize effective outcomes ? Will need be addressed when designing the implementation of these programs, and important cultural and specific country contexts need to be accounted for.

### 3. Costing Alternative Ways of Interpreting and Implementing the MDG and Dakar Goals related to ECCD

A first step needed to assess how reachable are the goals is to conduct sound planning. The financial simulation model presented below is intended to help countries design their strategy for ECCD by bringing its financial implications into the policy discussion. Most low income countries are likely to face hard choices, given the budgetary constraints they face and the claims on public resources made by many competing activities. This tool is intended to help in the decision making process, since it is likely that the availability of financial resources will play a major role in shaping the definition of National Strategies for ECCD.

The proposed Marginal Budgeting for Bottleneck (MBB) approach developed by Soucat et al, is organized in three main modules: bottleneck identification, costing & budgeting, and estimation of expected impact :

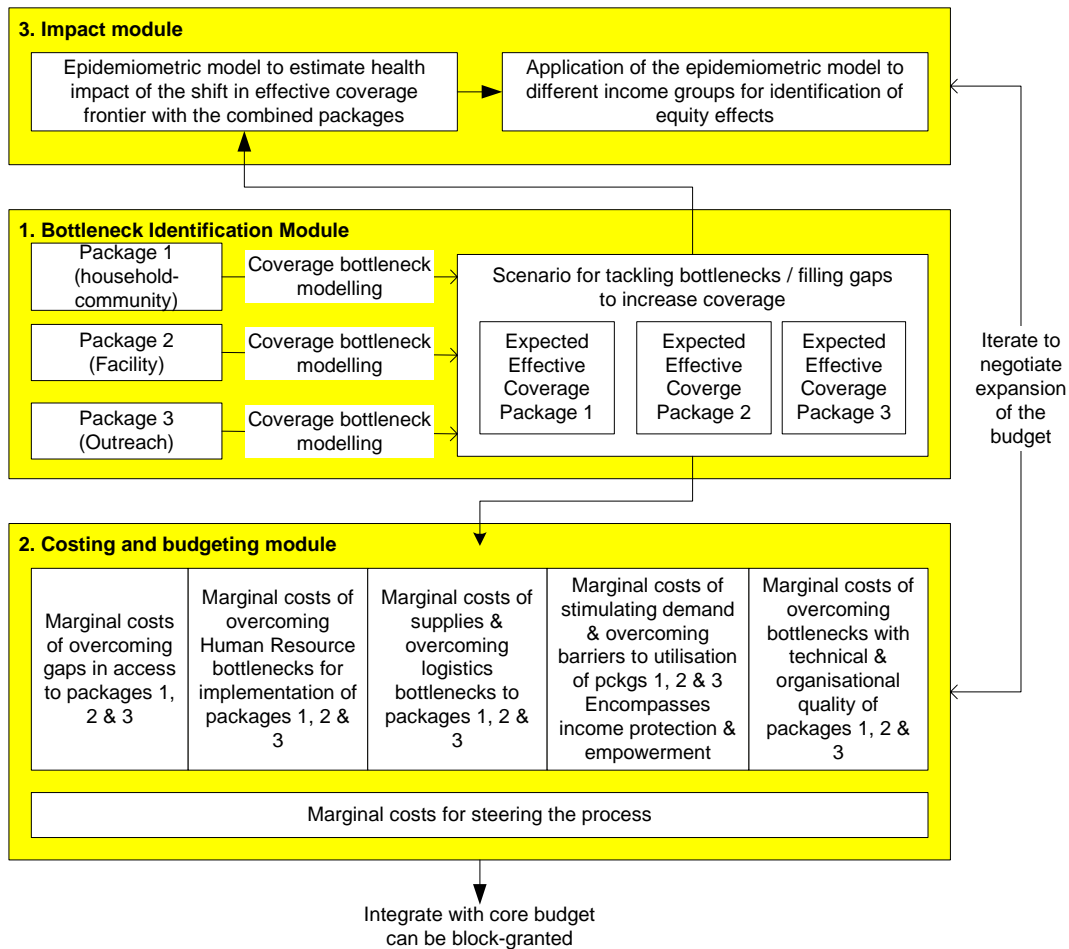
The bottleneck identification module, using country specific data, defines three main packages of health interventions in function of service delivery. On the basis of present levels of coverage of such packages, it analyzes bottlenecks in implementation and sets new performance frontiers;

The costing & budgeting module is structured to take into account the strategic changes in the health care delivery policies, addressing both supply and demand constraints. These target the budgetary expansion to overcoming the bottlenecks that constrain effective coverage with the three main packages;

An ‘expected impact module’ relying on the results of epidemiological modules gives the policy makers a view of the consequences of their choices, as a basis for the policy debate.

The overview of the three modules is displayed in the Figure below. The approach can be used for two rather different but somewhat related purposes. First it can be used as a basis for a country to develop its expenditures program and its MTEF, taking into account country specific policies and including strategic directions outlined by the PRSP. The approach has been used this way in Mauritania, Mali and Cameroon. But it can also be used also as a simulation tool to assess how much health services can contribute to reaching the MDGs, what are the operational constraints and what would be the cost of lifting those. Such an exercise can be conducted as a way to examine the potential cost and impact of various scenarios aiming at using marginal funding to lift constraints to implementation in SSA.

Such a simulation exercise would differ from previously conducted costing exercises, such as the ones conducted for the World Development Report 1993 (World Bank 1993) or for the Commission on Macro-Economics and Health (2001) in many ways. It is country specific and be based on country specific identification of constraints to implementation. Packages of care are defined in function of operational strategies to deliver services and not on diseases only. It focuses on lifting constraints rather than on costing standard approaches. Marginal cost rather than unit cost is used.



### An integrated costing model, for Health, Nutrition and Early Education

Building on the Package 1 (household and community-based) MBB, and the EFA costing exercise, this ECCD simulation model was designed. In the design of this financial simulation model, three steps have been considered : i) The first one describes the general policies for ECCD: targeted coverage of the main two age-groups (0-3, and 4-6); modalities of delivery of the services; role given to the community for the delivery of services; and percentage of public financial resources to be allocated. ii) The second describes the way in which the contemplated activities are to be implemented with their cost implication per beneficiary; and iii) the third one estimates the budgetary implications of the policy options described above, putting them in perspective with the public resources likely to be made available to deliver them.

Before analyzing these three steps in detail, it may be useful to underline that the model is to be used for countries that anticipate progress in coverage from where they currently stand and where they expect to be in 2015.

## 1. The general policies for ECCD

Successful ECD interventions provide an integration of health-nutrition, social and cognitive development, with a clear distinction between programs for the 0-3 and 4-6 year olds. At the earlier stages, the limited range of child behavior is more easily supported in home settings, and the main inputs from intervention include parental education, and health and nutrition interventions. From ages 3-6, children are more physically mobile, ready to form relationships with non-family adults and have sufficient language and cognitive development to engage in active interactions out side the home. This favors the center-based or community-based programs.

There are three main aspects to consider in defining the general policy, they are: a) the amount of public resources that could be mobilized to provide the services; b) the coverage desired for the 0-3 age group; and c) the coverage for the 4-6 age population. Each of these elements of the policy have important implications and are described below.

### a. Allocation of Public Resources

The first element in defining the policy concerns the amount of **public resources** that could possibly be mobilized by the country for ECCD activities. In most African countries these resources are currently relatively limited, representing generally less than 2 percent (and even less than 1 percent) of the public resources mobilized for the education sector. Although ECCD implies education, health, nutrition and social protection; the reference is taken here with the education sector, as the share of expenditures to cover these services is higher than for health.

One element that can facilitate the definition of a policy consists in calculating what could be, by the year 2015, the budgetary envelope to support these activities. Given the integrated approach of ECCD activities, the budget can be attached to both health and education with the assumption that the budgets of these two sectors could contribute to the financing of these activities.

From an education point of view, the indicative framework of the Fast-Track initiative suggests that the first six years of basic education (primary schooling) should be allocated 50 percent of the domestic public resources mobilized for the sector (representing themselves 20 percent of total public revenues). This leaves 50 percent for all other education related activities (preschool, lower and upper secondary schooling, vocational education and training, higher education and non formal education). This implies that the competition for budgetary resources is likely to be very high, given the legitimate claims of these different segments of the sector. It is clear that a balance view is needed given the systemic nature of educational activities. For example, it is obvious that the improvement of the proportion of the population achieving a complete cycle of primary schooling will



generate a pressure on secondary education and that it will be necessary to provide some response to it. On the other hand, it has been shown that having gone through ECCD and preschool activities at a young age, provides a favorable basis for investments in primary education.

For a review of the literature on the costs and benefits of investments on ECCD, see Haveman and Wolfe 1995; Myers, 1995 and 2000a; Eming Young 1996; Van Der Gaag and Tan 1998, Evans et al 2000.

Even though the benefits of ECCD have been demonstrated to surpass their costs- Van Der Gaag and Tan calculated that in Bolivia, the cost-benefit ratio of the PIDI program was between 2.38 and 3.06; Evans reported that in Brazil the cost of producing a first grade graduate was less for PROAPE children, and the savings exceeded the per-child cost of the program; and Meyers (1998) found that in Nepal the Shishu Kaksha Centers program generated \$ 4 million in cost savings to the government, due to reduced primary school repetition- we do not have any justified yardstick to suggest that ECCD activities should receive a given amount of public resources as a general policy. In addition, the circumstances of the education sector are quite different from one country to another, therefore the decisions will have to be made on a country by country basis. This being said, it appears that in most African countries, ECCD activities are not likely to be able to claim more than 5 to 7 percent of the education budget. This does not mean that countries can make different choices and express a stronger, or weaker, priority for these activities.

Table A below provides an image of the Excel file in the model; the cell for the public resources devoted to ECCD activities is given in a yellow cell denoting that the numerical value of the proportion is a matter of choice and can be changed.

Considering the expenditure framework for health, we know that on average, public spending for health is about half of public spending for education but that private spending is larger in health than in education. Public spending in education in low income African countries is on average between 3 and 4 percent of GDP. If ECCD is to get between 5 and 7 percent of that envelope, it implies that public spending for ECCD would amount to something between 0.15 and 0.25 percent of a country's GDP. If public spending for health amounts to 1.5 to 2.0 percent of GDP, a similar proportion devoted to ECCD would suggest a figure around 0.3 percent of GDP. This is at best a first idea of an order of magnitude. In any event, individual countries will have to make a choice on the amount of resources that they intend to allocate to ECCD coming from the health sector budget. In the proposed model, this choice is expressed as the proportion of GDP that could progressively be allocated to ECCD activities out of the national health budget by 2015. In Table A, the target figure (percentage of GDP from health budget for ECCD) is to be provided in the yellow cell.

b. Coverage for the 0-3 age population

The second element in the definition of the policy concerns the **coverage envisaged for the [0-3] age group**. For this age group the activities consist mainly of assisting the families to enrich the environment of the children and to provide parental

education related to health, nutrition and psychosocial development, as well as provision of services such as de-worming, supplemental nutrition, vaccination, growth monitoring, and prevention of childhood common diseases. The unit costs proposed in this section are consistent with those proposed in the Household and Community Package proposed in the MBB for health results. The policies are expressed along two complementary lines : i) which proportion (from zero to hundred percent) of the [0-3] age group in the country is progressively and until 2015 going to benefit from ECCD activities?

And, if coverage is only partial, what targeting (regions, population groups) are to be prioritized? This targeting, albeit important, does not concern however the costing side of the policy. ii) which proportion of the activities offered are to be delivered as fully financed (by the State) and how much is expected to come from community-financed activities, with only partial support from the State? The content and cost elements of these services are to be described in section 2.

### c. Coverage for the 4-5 age population

The third element concerns the **coverage envisaged for the [4-5] age group**. The policies are expressed in a similar way as for the [0-3] age group, with the additional qualification that a “choice” has to be made on the role and scope of the publicly and privately financed sector as providers of formal preschool services.

Table A : The general policy box

Elements of Policy	Target 2015
Public Recurrent Resources for ECCD as % Public Spending on Education	6
Public Recurrent Resources for ECCD From Health as % of GDP	0.1
[0-3] % Coverage	20
[0-3] % Coverage in the Partly Subsidized System	75
{0-3} % Coverage in the Fully Subsidized System	25
[4-5] % Coverage	30
[4-5] % Enrollments in the Community-Based System	70
[4-5] % Enrollments in the Formal Preschool System	30
[4-5] % Enrollments in the Formal Preschool System in Privately financed Schools	35
[4-5] % Enrollments in the Formal Preschool System in Publicly financed Schools	65

### 2. The policies concerning the ECCD services offered and their unit cost

After having described the objectives in terms of coverage and defined the overall strategy concerning the types of services offered (fully and partly financed services or formal or

community-based services), it is now useful to describe with more detail how the intended services will be delivered and what are to be the corresponding unit costs. Table B provides the unit cost estimates for the [0-3] age-group both for the partly and the fully subsidized system.

The partly and fully subsidized systems are alike in that the activities considered consist at large in assisting the families to enrich the environment of the children and to provide parental education related to health and nutrition and psychosocial development, as well as provision of services such as de-worming, supplemental nutrition, vaccination, growth monitoring, and prevention of childhood common diseases.

This assistance is itself provided by an individual, usually a community leader, specifically trained for this purpose and located in the near by area, in order to remain in contact on a regular basis with the families. The two systems differ only in that the remuneration of the community leader in charge of providing the assistance to the families is fully or partly borne by the State. The possibility in the partly subsidized system is that the community leader be totally financed by the community. In both options, partly or fully subsidized, the unit costs include training (every year) of the community leader, as well as advise and support by a qualified advisor/supervisor from the district/regional level on a continuum basis during the year. Similarly, unit costs include administrative costs of supervisors at the central level.

To estimate the unit cost, we start (table B) at the community level, by identifying the number of children that a community leader is supposed, on average, to be in charge of. This estimate is also consistent with the estimates developed by Soucat et al. (2003) This is a matter of choice (the cell in yellow manifests that a decision is to be made); in the example above, the community leader is in charge on average of 80 [0-3] children<sup>1</sup>. This assumption comes from the idea that one community leader can serve up to 20 families on a regular basis. Once this is determined, the next decision is the remuneration of the community leader. In the fully subsidized option, the remuneration of the community leader is taken by the State and the level of yearly salary chosen is expressed in per capita GDP units. In the partly subsidized system, the yellow cell represents the amount of the subsidy (also expressed in per capita GDP terms) provided by the State to help the community recruit and maintain an individual with adequate characteristics to carry the job (the figure is 0 if no subsidy is provided to help the community finance the community leader).

At the community level, two items are then considered, the first is the yearly cost of training and the amount of consumables. Consumables in this case include drugs, nutritional supplements, training materials, etc. The cost of training is expressed in per capita GDP units and concerns the cost per community leader. The cost of consumables is expressed in dollar terms since most of the goods concerned are bought on the international market and corresponds to the amount per child and for a one year period.

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<sup>1</sup> This figure will help determine the number of community leaders to be used given the number of [0-3] children in the country, the proportion of that population to be covered (table A) and the choice made between partly and fully subsidized services.

The advisor/supervisor level follows a relatively similar pattern with i) the number of community leaders per advisor, ii) its level of remuneration (paid by the State), iii) the amount of consumables to allow him/her to effectively assist the community leaders he/she is supposed to advise on a regular basis and iv) a provision for his/her training every year. Finally, the recurrent unit cost depends also on the overheads incurred to run the program, i.e., the cost of administrators and supervisors (depending on how many they are and how much they are paid) and the amount of the goods and services they need to mobilize to perform their task.

On the basis of the elements above, the recurrent unit cost for both systems is calculated as a mix of a per capita GDP term and of a dollar term. To complete the costing, a cell is provided to indicate the amount of the cost of construction of a community center. This assumption is made on the basis that besides home visits, the community leader needs to organize parental education sessions, conduct vaccination campaigns, distribute drugs and nutritional supplements, on a regular basis. The construction of such a center can be fully or partially subsidized by the community. These are expressed in dollar terms and will help calculate the capital requirements for the [0-3] age group. In the example on Table B, the unit cost of building a classroom was used. Finally, in order to provide an example of what would be the unit cost in a given country, the dollar amounts are provided for two different scenarios, for a country of a GDP of US\$ 150, and one of a GDP of US \$600.

Table B : The unit cost policy box for the [0-3] age group

<b>* Fully subsidized</b>				<b>Cost Elements in US\$ according to pcGDP in US\$</b>	
<b>Elements of recurrent costs</b>				150	600
Community level					
	1 community leader per	80	Children		
	Remuneration of community leader	2.5	Community	375	1,500
	Training of community leader	0.35	PCGDP	53	210
	Consumables	6	US\$ per child		
Advisor level					
	1 advisor for	40	Community leader		
	Remuneration	3.5	PCGDP	525	2,100
	Consumables	2	PCGDP	300	1,200
	Training of advisors	0.3	PCGDP	45	180
General services					
	Administrators (basic)	5	Administrators		
	1 Supervisor per	20	Advisors		
	Remuneration (Admin/Supervisor)	5	PCGDP	750	3,000
	Consumables	300	PCGDP	45,000	180,000
<b>Per child recurrent spending</b>		<b>0.0531</b>	PCGDP	<b>12.1</b>	<b>30.3</b>
		<b>6</b>	US\$	<b>19.7</b>	<b>78.8</b>
			Primary EFA unit cost		
<b>Capital costs</b>					
	Construction of community center	8000	US\$		
<b>* Partly subsidized</b>					
<b>Elements of recurrent costs</b>					
Community level					
	1 community leader per	80	Children		

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	Public subsidy per community leader	0.5	PCGDP	75	300
	Top up per community leader		Community		
	Training of community leader	0.35	PCGDP	53	210
	Consumables	6	US\$		
Advisor level					
	1 advisor for	40	Community leader		
	Remuneration	3.5	PCGDP	525	2,100
	Consumables	2	PCGDP	300	1,200
	Training of advisors	0.3	PCGDP	45	180
General services					
	Administrators (basic)	5	Administrators		
	1 Supervisor per	20	Advisors		
	Remuneration (Admin/Supervisor)	5	PCGDP	750	3,000
	Consumables	300	PCGDP	45,000	180,000
<b>Per child recurrent spending</b>		<b>0.0218</b>	PCGDP	<b>9.3</b>	<b>19.1</b>
		<b>6</b>	US\$		
			Primary EFA unit cost	19.7	78.8

**Capital costs**

	Construction of community center	2000	US\$
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Table C is similar to table B, but for the [4-5] age group. For this age group, children are more physically mobile, ready to form relationships with non-family adults and have sufficient language and cognitive development to engage in active interactions outside the home. This favors the center-based or community-based programs, where children are gathered for 5 -6 hours a day. This type of setting can be formal and look like existing pre-schools; but it can also be organized in a more informal way, with the activities being implemented by the community, albeit with adequate support (financial and technical) from the state.

Table C : The unit cost policy box for the [4-5] age group

**\* Fully subsidized (formal)**

**Elements of recurrent cost**

	1 teacher for	30	Children
	Remuneration of teacher	2.5	PCGDP
	Materials and support	40	% of Salary bill
<b>Recurrent spending per child enrolled</b>		<b>0.163</b>	<b>PCGDP</b>
			Primary EFA unit cost

<b>Cost Elements in US\$ according to pc GDP in US\$</b>	
375	1,500
210	840
<b>18</b>	<b>70</b>
19.7	78.8

**Capital costs**

	Classroom construction	8000	US\$
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**\* Partly subsidized (Community-based)**

**Elements of recurrent cost**

Community level			
	1 community teacher per	25	Children
	Public subsidy per community teacher	0.5	PCGDP
	Top up per community teacher		Community
	Training of 1 community teacher	0.5	PCGDP
	Consumables	0.6	PCGDP

75	300
75	300
90	360

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	Pedagogical kit	0.1	PCGDP	15	60
Advisor level					
	1 advisor for	40	Community teacher		
	Remuneration	3.5	PCGDP	525	2,100
	Consumables	2	PCGDP	300	1,200
	Training of advisors	0.3	PCGDP	45	180
General services					
	Administrators (basic)	5	Administrators		
	1 Supervisor per	20	Advisor		
	Remuneration (Admin/supervisor)	5	PCGDP	750	3,000
	Consumables	300	PCGDP	45,000	180,000
<b>Recurrent spending per child enrolled</b>		<b>0.077</b>	<b>PCGDP</b>	<b>12</b>	<b>46</b>
			Primary EFA unit cost	19.7	78.8

**Capital costs**

	Classroom construction	2000	US\$
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The unit costs presented in Table C, follow those used for teacher salaries and costs of teacher training and provision of teaching and learning materials estimated for the EFA costing.

Regarding the fully subsidized preschool system, the first parameter is the average pupil-teacher ratio; it is set to 30:1 in the example, but the numerical value of that parameter is obviously an important matter of choice (the cell is in yellow). The second parameter to be set is the amount of teacher remuneration (expressed in per capita GDP unit). The third parameter is the amount of the resources that need to be mobilized to cover all costs other than teacher remuneration (consumables, training and supervision of the teachers); these “other costs” are expressed as a proportion of the teacher salary cost (the numerical value in the example is set to 40 percent). From this element, the value of the unit cost, expressed again in per capita GDP unit) is calculated (0.163 per capita GDP unit in the hypothetical example). The cost of construction of a classroom is also used (8,000 US\$ in the example) so as to enable the estimation of the capital cost requirement.

Concerning the partly subsidized (community-based) system, the structure of the unit cost estimate is very similar to that described above for the [0-3] age group. The unit costs used in the example for training of the community teacher, consumables and teaching and learning materials, are equivalents to what was calculated for the fully subsidized option.

### 3. The costing model

The data both from table A (share of public resources for education devoted to ECCD activities, targeted coverage for the two age groups and the strategy intended to implement the policy) on the one hand, and from tables B and C (recurrent public unit costs and public cost for construction of either the community center or the pre-school classroom) are the crucial ingredients to help estimate the financial aspects of the policy at the country level. The costing model is presented in table D below.

The top part of the model helps determine **the amount of public resources that could be allocated to ECCD activities**. Two sources for the funds are to be allocated are considered: those which are likely to come from education and those which are to be allocated from the health budget. i) For education, the model follows the same structure as that used for the

EFA (Fast-Track) costing exercise. It starts with the projection of the country's GDP and population (calculates the evolution of the per capita GDP over the period) and calculates the amount of public revenues on the basis of a projection of the fiscal pressure (the 2015 target depends on the level of per capita GDP of the country<sup>2</sup>). Then the public resources for education are projected as a proportion of public domestic revenues that evolve progressively from what it is in 2000 to a target value of 20 percent in 2015. Finally, the amount of public resources that are dedicated to ECCD from the education budget is derived by projecting the proportion of the public resources for the sector as a whole from what is observed in the base year (2000) to the target value identified in table A above (the policy box), i.e. 6 percent in the hypothetical example. ii) For the resources coming from the health budget, the target value is expressed as the proportion of GDP in 2015; this proportion is progressively to increase from its initial value to the targeted one in 2015 (0.1 percent in the hypothetical example). The amount of resources derives directly from this figure (and from GDP) to determine the evolution of the public resources for ECCD coming from health. The last line of the bloc consolidate the public resources for ECCD from both health and education budgets.

The second bloc in the modeling aims at estimating **the recurrent cost of ECCD activities** in the country given the objectives stated in the policy box (coverage and type of service delivery) as well as in the unit cost box. The process of estimation starts with the projection of the population in the 2 age-groups; the data used are from the United Nations-World Bank data base. From this population basis, based on the objectives stated for coverage in 2015 in the two age-groups on the one hand and in the fully and partly subsidized systems on the other, the projections [2000-2015] of the number of children in the two-age groups and in the two types of system can be made. Concerning the formal preschool system [4-5 age-group], a further distinction need be made to describe the respective role of the privately and publicly financed sector in delivering the services. The modeling has been made taking into account four steps: 1) Defining a coverage target for 2015, in terms of percentage of children to be enrolled in the private programs; 2) identify the progression between the existing coverage in 2000 and that estimated in 2015; 3) subtracting the number of children estimated to be enrolled in the private programs for that same period, and 4) calculate the progression of children enrolled in the public system by estimating the difference between the total enrolled in the public system and those in the private programs. Then, the model takes into account the recurrent unit costs from the data in table B and C so as to reckon the amount of recurrent spending in the two age-groups and separately for the partly and fully subsidized systems. The last line of the bloc provides the evolution of total recurrent spending for ECCD in the country between 2000 and 2015, based on the policy elements described in tables A, B and C.

The next bloc focuses on capital spending; only the capital cost at the local level is considered here. It starts with the identification of the number of "groups", that is the ratio between the number of children covered in the two age-groups and the two systems and the

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<sup>2</sup>. The figures used in the EFA costing exercise are 14 percent for countries which per capita GDP is below 300 US\$, 16 percent if per capita GDP is between 300 and 600 US\$ and 18 percent if per capita GDP is comprised between 600 and 885 US\$ (the ceiling for a country to be considered eligible to IDA credits).

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number per children per community leader or teacher. This ratio provides the evolution of the number of community leader offices and of classrooms needed. From this information, the estimate of the capital cost is simply the product of the public unit cost or subsidy of either a community center or a classroom (given in tables B and C) and of the incremental number of such centers and classrooms to be build during year (y) to accommodate the incremental number of groups between year (y) and (y+1). Since the unit costs of construction in tables B and C are expressed in US\$ terms, the total capital costs requirements are also expressed in that unit.

**Table D : The Costing Model**

Year of Projection	2015	2000	2003	2006	2009	2012	2015
<b>Public Resources</b>							
GDP (million LCU)	5.0%	20343400	23550028	27262102	31559290	36533824	42292468
Population (million)	2.5%	14.592	15.7	16.9	18.2	19.6	21.1
Per Capita GDP (LCU)		1394147	1498667	1611021	1731800	1861632	2001199
Domestic Revenue as % of GDP	16.0	10.6	11.7	12.8	13.9	14.9	16.0
Domestic Revenue (Million LCU)		2164800	2758422	3485398	4373018	5453863	6766795
Public Recurrent Resources for Education as % Domestic Revenue	20.0	18.8	19.0	19.3	19.5	19.8	20.0
Public Recurrent Resources for Education (million LCU)		406500	524712	671519	853223	1077440	1353359
Public Recurrent Resources for ECCD as % Public Spending on Education	6.0	2.4	3.1	3.8	4.5	5.3	6.0
Public Resources from education for ECCD (million LCU)		9553	16161	25585	38736	56781	81202
Public Resources from Health for ECCD as % of GDP	0.10	0.0	0.02	0.04	0.06	0.08	0.10
Public Resources from Health for ECCD (million LCU)		0.00	4710	10905	18936	29227	42292
<b>Total Public resources for ECCD (million LCU)</b>		9553	20871	36490	57672	86008	123494
<b>Recurrent Spending for ECCD</b>							
[0-3] Population (thousands)		2193	2270	2354	2450	2521	2579
[4-5] Population (thousands)	1.8%	996	1051	1104	1150	1193	1235
[0-3] % Coverage	20.0	0.0	4.0	8.0	12.0	16.0	20.0
[0-3] % Coverage in the partly subsidized System	75.0	75.0	75.0	75.0	75.0	75.0	75.0
[0-3] Coverage in the partly subsidized System (thousands)		0	68	141	221	303	387
[0-3] Coverage in the fully subsidized System (thousands)		0	23	47	74	101	129
[4-5] % Coverage	30.0	5.7	10.6	15.4	20.3	25.1	30.0
[4-5] Total Enrollment (thousands)		57.0	111.2	170.4	233.3	300.0	370.5
[4-5] Enrollments in the Formal Preschool System (thousands)	30.0%	57.0	67.8	78.7	89.5	100.3	111.2
[4-5] Enrollments in the Private Formal Preschool System (thousands)	35.0%	26.0	28.6	31.2	33.7	36.3	38.9
[4-5] Enrollments in the Public Formal Preschool System (thousands)		31.0	39.2	47.5	55.7	64.0	72.2
[4-5] Enrollments in the Community-based System (thousands)	70.0%	0.0	43.3	91.7	143.8	199.7	259.4
[0-3] : Unit Subsidy for partly subsidized Community Centers (pcGDP units)	0.051	0.040	0.049	0.047	0.045	0.044	0.042
[0-3] Unit cost for fully subsidized Community Centers (pcGDP units)	0.082	0.060	0.080	0.078	0.076	0.075	0.073
[4-5] Unit Subsidy for Community Centers (pcGDP units)	0.077	0.060	0.063	0.067	0.070	0.074	0.077
[4-5] Unit cost for Public Formal Pre-Schools (pcGDP units)	0.163	0.220	0.209	0.197	0.186	0.175	0.163
<b>Recurrent Public Spending for [0-3] Children (million LCU)</b>							
[0-3] Community Centers (million LCU)		0	4982	10680	17254	24529	32545
[0-3] Formal centers (million LCU)		0	2724	5930	9729	14043	18912
<b>Recurrent Public Spending for [4-5] Children (million LCU)</b>							
[4-5] Formal Preschool System (million LCU)		9508	16397	24990	35489	48255	63735
[4-5] Community-Based-System (million LCU)		0	4123	9889	17531	27445	40120
<b>Total Recurrent Public Spending for ECCD (million LCU)</b>		9508	24103	41600	62472	86827	115192
<b>Capital Spending for ECCD</b>							
[0-3]Partly subsidized system : Number of groups		0	851	1766	2756	3782	4836
[0-3] Fully subsidized system : Number of groups		0	284	589	919	1261	1612
[4-5] Public Formal Preschool System : Number of groups		1033	1308	1583	1858	2133	2408
[4-5] Community-Based System : Number of groups		0	1734	3669	5753	7986	10374
<b>Capital Public Spending for [0-3] Children (million US\$)</b>							
Capital Spending on [0-3] Community centers (million US\$)		0.6	0.6	0.6	0.7	0.7	
Capital Spending on [0-3] Formal centers (million US\$)		0.7	0.8	0.9	0.9	0.9	
<b>Capital Public Spending for [4-5] Children (million US\$)</b>							
Capital Spending on [4-5] Community centers (million US\$)		1.1	1.3	1.3	1.5	1.6	
Capital Public Spending on [4-5] Formal Public Schools (million US\$)		0.7	0.7	0.7	0.7	0.7	



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<b>Total Capital Public Spending for ECCD (million US\$)</b>		<b>3.1</b>	<b>3.4</b>	<b>3.6</b>	<b>3.8</b>	<b>3.9</b>	<b>0.0</b>
<b>Recurrent financing Gap (million LCU)</b>		-44.7	3232.1	5109.9	4800.0	818.9	-8302.3
Exchange Rate (LCU per US\$)	6745						
<b>Recurrent financing Gap (million US\$ of the year 2000)</b>		<b>0.0</b>	<b>0.5</b>	<b>0.8</b>	<b>0.7</b>	<b>0.1</b>	<b>-1.2</b>
<b>Total financing gap (million US\$ of the year 2000)</b>		<b>3.1</b>	<b>3.9</b>	<b>4.3</b>	<b>4.5</b>	<b>4.0</b>	<b>-1.2</b>
% of recurrent spending domestically financed		100.5%	86.6%	87.7%	92.3%	99.1%	107.2%
% of total spending domestically financed		31.2%	44.5%	55.5%	65.3%	76.0%	107.2%

Finally, the last bloc provides estimates of the financing gaps. Since it is anticipated that public domestic resources are first to be used to cover recurrent expenditure, the recurrent financing gap for each year between 2001 and 2015 is calculated as the difference between the recurrent spending to achieve the stated objectives and the amount of domestic public resources that could be allocated to ECCD activities. This recurrent financing gap is expressed in local currency unit and turned into US dollars by using the exchange rate prevailing in 2000. The total financing gap is calculated as the sum of the recurrent financing gap and of the total capital spending. The bloc ends with an estimate of the proportion of both recurrent and total spending that is covered by domestic budgetary resources.

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