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Financial sustainability as a reference for the development of post-primary education in sub-Saharan Africa

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Financial sustainability as a reference for the development of post-primary education in sub-Saharan Africa

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In 2007 the French Development Agency (AFD), in cooperation with the World Bank, launched a study to examine the logistical and financial implications of post-primary education coverage expansion in Sub Saharan Africa. These countries are, and will be even more so in the coming years, facing an increasing pressure to expand to expand the coverage of secondary and higher education because a significant increase in the number of young people who have, or will have, completed primary education (millennium goal).
The objectives of this study, prepared in the context of the ADEA Biennale, is to provide to individual countries and their development partners, some ideas concerning consequences associated with various options for organizing development of post-primary education.

This document is a short version of the 84-page report bearing the same title. While the main document has a pronounced technical dimension including a fairly detailed description of the processes used for analysis and estimation, this version only touches on the analytical aspects constituting the work (inviting the reader to consult the main document) with the aim of facilitating readability and focuses more on the dimension of prospective educational policies.

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I. Study context

All countries in sub-Saharan Africa will progressively be faced with a substantial increase in the number of students completing primary education. Even if initial conditions vary considerably from one country to another, all countries will have to define strategies to address these new challenges. As in any educational policy, the decision-maker will be confronted with the tension between what is desirable and what is possible in a given time frame, taking into account the financial and logistic constraints. For each country, these strategies necessarily concern the sector as a whole since it is not appropriate to target actions at a given level of education and isolate them from actions upstream and downstream, as these are part of the same systemic architecture and mobilize the same overall resources, whether national or external.

II. How to analyze the financial evaluation of possible education and training development strategies at post-primary levels

In order to define global strategies, each country will have to target an education/training structure addressing as far as possible medium-term development needs and also the social demands of the populations (bearing in mind that these two perspectives often diverge). Another aspect is that the strategies envisaged should be financially sustainable in the medium term. In this document, we have focused primarily on the dimension of cost and financial sustainability, which sets a restrictive framework for the development of education/training at post-primary levels. However, as the medium-term sustainability of those programs automatically coming to mind will often be problematic, it will also be useful to have recourse to arguments of economic and social effectiveness and equity in order to guide the inevitable trade-offs.

A financial simulation model has been built in order to assess the financial sustainability of the programs as this is both i) convenient for assessing the logistic (number of students and teachers concerned, needs for building new classrooms) and financial consequences associated with one or another educational strategy, and ii) a necessary wrap-up for checking the overall financial sustainability of the options selected for the sector.

Insofar as many options can potentially be envisaged, and that the idea is not to take the place of the different governments in defining their educational policies, the purpose of such an instrument is mainly heuristic and illustrative to mark out the wide range of possible solutions, identify those that could be of interest and those that are *a priori* less so, in general or in a given context.

The situation of the different countries in the region is relatively diversified in terms of i) structure of the education system, ii) initial coverage at the different levels of education, iii) mobilization of both domestic resources and external aid, iv) organization of educational services and v) expenditure per student in the different types and levels of education. In these circumstances, a single model is not appropriate; it is more relevant to build a simulation instrument based on a common reference framework yet sufficiently flexible as to take into account the specificities of each country; this is the basis on which the model was built and estimated separately for each country.

The overall strategy of the study is to i) analyze the financial consequences connected to a range of reference options, which can be taken into consideration by all countries in the region, and ii) take into account the individual specificities of each country both in terms of the contextual situation and

the initial conditions of organization[1] at post-primary levels. To make these two perspectives hang together, it is of use to consider on the one side the construction of the simulation model and on the other its practical utilization:

. Concerning **the construction of the modeling instrument**, this will be based on a homogeneous structure common to all the countries; however, it will be flexible in its parameters in order to adapt to the characteristics of each system. The most recent year for which data is available (or can be reasonably estimated) has been taken as the model's base year[2]. If it is possibly preferable that this year be the same for each country, this is not the case in reality; as a result, it will be important to target a common horizon for all countries (year 2020), and incorporate the necessary flexibility to adjust to a variable year (between 2000 and 2005) for the baseline data;

. Concerning **the utilization of the model**, common reference options that have an identifiable meaning for each country will be defined first of all; but in addition, the possibility will be left open, for each country, of specific scenarios that could be estimated by national decision makers and/or aid agencies[3] in order to test the consequences of policies that are different from those evaluated in this study.

This method of analysis will be applied to the 33 low-income countries in sub-Saharan Africa, which were selected for the analytical study prior to the definition of the EFA-FTI for primary education[4]. Before looking at the construction of the model and its results, it is important first to examine the extent of the pressure in terms of numbers (of young people, of students) that the education systems in sub-Saharan Africa will be submitted to, and then the educational policy options that could be adopted in order to address the pressure.

III. Very strong pressure on post-primary education in coming years

Table 1 (left side) provides the main indicators of schooling coverage at the different levels of education for a sample of the countries targeted by this study[5]. The situation of the countries overall is to be found in the last line of the table, while some countries have been selected in order to illustrate the extent of the variability in indicators observed from country to country.

* It can be seen first that the primary completion rate is still relatively modest (52% on average for the reference year in each country) and so efforts must clearly be maintained on the road towards universal primary completion[6].

Table 1: Quantitative coverage of education and dynamics in primary school leavers

[1]. Including the structure of the system with regard to the number of years and the organization of the different study cycles.

[2]. Different sources of information were necessary : Country Status Reports, UNESCO Institute for Statistics data, …

[3]. There is indeed no doubt that substantial external financing needs will arise.

[4]. Universal Primary Education by 2015: A Chance for Every Child; B. Bruns, A. Mingat, and R. Rakotomalala; World Bank, 2003.

[5] The different indicators are available for all 33 countries targeted in the complete study.

[6]. It has been demonstrated (A. Mingat : The dynamics of enrolments over the last 15 years and for the 15 years to come in low income sub-Saharan African countries, World Bank 2007) that a genuine change in the rhythm of the evolution of primary completion rate has been observed since 1999 (+1.8 points per annum on average, compared to 0.2 points per annum on average between 1990 and 1999) but that pursuing this rhythm will not enable achievement of the millennium goal by 2015 in general; the average regional primary completion rate is in fact estimated at 72% for 2015.

Level of studies	Primary	General lower secondary		General upper secondary		TVET	Tertiary	Primary education		
Country	% Primary completion	% Transition P-S1	% Access	% Transition S1-S2	% Access	% / Secondary enrolments	Students /100 000 inhab. (000)	Number of students completing the cycle (000)		Ratio
								Initial year (1)	2020 (2)	(2) / (1)
Burkina Faso (2004)	31	58	18	44	4.2	9	201	106.1	513.8	4.8
Cameroon (2003)	60	55	33	65	18.7	23	494	231.3	438.6	1.9
Mali (2004)	42	81	33	40	8.4	10	284	143.8	533.4	3.7
Niger (2002)	22	66	14	40	2.2	3	51	69.0	573.5	8.3
Nigeria (2005)	76	52	40	83	28.3	1	1 188	2 595.4	4 135.0	1.6
Rwanda (2003)	46	35	16	78	10.7	11	252	111.6	295.2	2.6
Tanzania (2002)	60	28	16	30	2.0	< 1	84	555.4	1 096.0	2.0
Zambia (2005)	73	62	45	41	16.0	2	218	227.1	367.2	1.6
Average IDA Africa	**52.2**	**63.1**	**33.1**	**58.2**	**13.7**	**8.8**	**323**	**9 354.9**	**22 234.5**	**3.0*- 2.4****

* Non-weighted average; ** weighted average by the school-age population of the different countries.

* It is then observed that on average around one-third of the age group has access to secondary education, with the primary-secondary transition rate registering at 63%. Only 14% of the age group has access to upper secondary. Students in technical and vocational education and training represent about 9% of secondary enrollments on average and there are 323 students per 100 000 inhabitants on average in tertiary education.

* However all these figures describe an average regional situation, while there is significant variability from one country to another on any one indicator. The countries selected illustrate the extent of this variability. For example, primary completion rate varies from 22 to 80%, while the proportion of the age group accessing secondary education varies from 12 to 58%. Variability is even greater in tertiary education with the number of students per 100 000 inhabitants ranging from under 40 to over 1 100. It would be most unwise therefore to generalize on « education in Africa », and forget to mention the extent of the variability in individual situations from country to country.

* The relatively limited level of primary completion rate (PCR) in the current period, together with demographic pressure, leads to the anticipated number of young people who could complete primary education in 2020 (reference of 95% for PCR in all countries at that time) being significantly higher than that observed in the recent period (right side of table 1); it is thus anticipated that numbers will reach 22.2 million in 2020, compared to 9.3 million in 2003-2005, i.e. an increase by a factor 2.4 over the period.

But there again, the variability in PCR between countries in the current period, coupled with the differences as to the expected intensity of demographic pressure between now and 2020, leads to a very contrasted picture in terms of growth in the numbers of young people who should complete primary education between now and 2020. For the different countries, the average, non-weighted by the population, factor of increase in enrollments at the end of primary education is 3.0 (three times more young people who will complete primary education than today, and potential candidates for access to secondary education at that time), bearing in mind that this factor can be under 2 in some countries (Zambia, Nigeria, Cameroon) and reach almost 5 in Burkina Faso or Burundi, and even be over 8 in Niger. It can easily be felt that the efforts needed to attain universal primary completion differ considerably from one country to another, and also that the intensity of the increasing pressure on lower secondary education between now and 2020 will be much more pronounced in some countries than in others.

We can now assess the impact of primary completion on the increase in lower secondary enrollments, bringing in reference hypotheses on primary-secondary transition. Table 2 below illustrates the type of results obtained.

Table 2: Potential growth of lower secondary enrollments

Country	Initial Year			Year 2020				
				Initial transition rate maintained			100 % Transition	
	Primary-Lower Sec Transition (%)	Lower Secondary access (%)	Lower Secondary enrollments (000)	Access to Lower Sec (%)	Lower Sec enrollments (000)	Ratio of numbers 2020/initial	Lower Sec enrollments (000)	Ratio of numbers 2020/initial
Benin (2004)	73	36	290.7	69	811.7	2.8	1 111.9	3.8
Burundi (2004)	52	17	121.8	50	550.9	4.5	1 055.4	8.7
Republic of the Congo (2005)	79	57	259.0	75	466.6	1.8	589.1	2.3
Gambia (2001)	74	45	38.4	70	95.6	2.5	129.0	3.4
Ghana (2001)	99	65	941.3	94	1703.9	1.8	1 724.6	1.8
Niger (2002)	66	14	147.5	63	1369.6	9.3	2 075.2	14.1
Senegal (2003)	54	27	279.2	51	735.1	2.6	1 361.3	4.9
Tanzania (2002)	28	16	453.5	27	1194.1	2.6	4 264.5	9.4
Average/total IDA Africa	**63.1**	**33.1**	**14 909.0**	**59.9**	**37 227.7**	**3.5* - 2.5****	**62 933.9**	**6.1* - 4.2****

* Non-weighted average; ** average weighted by the school-age population of the different countries.

There are 14.9 million students in lower secondary education in the 33 countries in the base year. Improving primary completion to reach a rate of 95% by 2020, while maintaining primary-secondary transition at the current rate in each country, would bring the number of students in lower secondary education to 37.2 million in 2020, that is a multiplication by a factor 2.5 (weighted average). If the aim were for all students completing primary education in 2020 to carry on into lower secondary (100% transition), enrollments would reach 62.9 million in 2020, a multiplication by an overall factor 4.2 over the period (weighted average).

Not surprisingly, in view of the variability between countries in the growth in the number of young people likely to complete primary education between now and 2020 and in primary-secondary transition rates, the factor of increase in lower secondary enrollments by 2020 varies considerably from one country to another. While the average multiplier coefficient of lower secondary enrollments for the different countries is 3.5 in the hypothesis of maintaining the transition rate, this coefficient varies from less than 1.5 in Lesotho or Zimbabwe, to around 3 in Benin, Ethiopia and Mauritania, to exceed 6 in Mozambique and even 9 in Niger. Taking the hypothesis of a 100% transition rate, figures are much higher (average multiplicative factor of 6.1) with an even greater variability between countries; the figure remains around 2 in Lesotho, Togo and Zimbabwe, is close to 4 in Guinea and Mali, but neighbors on 9 in Burundi, Uganda and Tanzania to exceed 11 in Mozambique and Niger.

In all, it is thus not a euphemism to say i) that the context for the development of lower secondary schooling between now and the year 2020 differs from one country to another, and ii) that, on the basis of student numbers alone, perspectives are clearly very difficult in some countries. In order to summarize this situation, we have looked at the combination of the two objectives, that is to say maintaining the transition rate in 2020 at the value observed in the base year, and bringing it up to 100% in 2020, and we have used conventional benchmarks to identify the degree of logistic difficulty involved in reaching them. Thus, we set out from the idea that a multiplier coefficient of lower secondary enrollments between now and 2020 of i) below 2 or close to this value identifies something quite easy to achieve, ii) between 2 and 3.5 identifies genuine difficulties and iii) over 3.5 undoubtedly identifies a logistic impossibility of reaching the goal. With these conventions, we arrive at the following typology. Table 3 below indicates the different categories of countries obtained.

Table 3: Typology of the different countries according to potential logistic difficulties in achieving the two goals of lower secondary coverage by 2020*

		Logistic aspect of achieving virtually universal lower secondary coverage		
		Fairly easy	Fairly difficult	No doubt impossible
Logistic aspect of achieving the goal of maintaining the current value of primary-secondary transition rate	Fairly easy	Republic of Congo Ghana Lesotho Togo Zimbabwe	Cameroon Côte-d'Ivoire Nigeria Zambia	Malawi
	Fairly difficult		Benin Democratic Rep Congo Eritrea Gambia	Ethiopia Guinea Rwanda Senegal Sierra Leone Tanzania
	No doubt impossible			Burkina Faso Burundi Guinea Bissau Madagascar Mali Mauritania Mozambique Niger Uganda Central African Rep Chad

* Kenya and Sudan are not on this list as, for international comparison, their secondary education has been considered as coming under upper secondary.

While perspectives for achieving the two goals are good for five countries (Republic of the Congo, Ghana, Lesotho, Togo and Zimbabwe) (countries characterized by both high primary completion rates and high primary-secondary transition rates), they are decidedly poor for the group of countries with the lowest primary completion rates in the current period (Burkina Faso, Burundi, Mozambique, Guinea-Bissau, Madagascar, Mali, Mauritania, Mozambique, Niger, Uganda, Central African Republic and Chad). For these countries, the possibility of even maintaining the primary-lower secondary transition rate at its present value is hardly likely (it should be recalled that this rate varies according to the country).

However, this concerns the logistic aspects and is limited to lower secondary education. It is important now to adopt a global perspective for post-primary education as a whole, going beyond student numbers to bring in the financial dimension. Besides, as there is no single way of organizing educational services for the different segments of post-primary education, several options will be considered. In terms of presentation, we shall proceed sequentially examining the options selected in this document[7] in i) the dimension of quantity and of coverage, ii) the definition of services provided, the ways of organizing them and their unit costs, iii) the public-private share of financing within domestic financing, and finally iv) their financial consequences.

IV. Options in terms of quantity/coverage

Aside from the possibility of calibrating the quantitative coverage of the system, beyond primary education, for financial sustainability reasons, two major perspectives are considered, each of which

[7]. There are *a priori* a high number of options ; for practical reasons, a limited number had to be chosen in order to ensure some measure of readability, while covering a good range of possibilities.

can then be more precisely specified; these two perspectives differ in the dimension of student flow in the education system.

IV.1 A perspective of «continuity» in student flow

In this perspective, a situation of «continuity» is anticipated between the different cycles[8], i.e. the number of students in the first year of a given cycle is calculated from the number of students enrolled in the last year of the previous cycle by way of the transition rate. In this perspective, expanding primary coverage towards universal completion leads firstly to substantial expansion of lower secondary education as identified in the previous point, then to a correlative expansion of all segments in the upper part of the system (upper secondary and tertiary education).

IV.2 A perspective of «discontinuity» in student flow

Here, the lower part of the education system (the first 9 to 10 years of study) and the upper part (general and technical upper secondary, tertiary education) are considered differently. While the lower part is intended to move progressively towards universal coverage (there are well-established analytical arguments to justify this[9]), enrollments would be regulated in the upper part. The reasons that make this perspective interesting are two-fold: i) the first is to be found in the structural duality of African economies, with an informal sector concerning almost 90% of the working population, and a limited modern sector (10% of the working population on average) showing little sign of development; indeed the proportion occupied by the modern sector has remained stable between 1990 and 2003; ii) the second reason is that the educational levels in the upper part of the system are primarily directed towards the modern job market of the countries' economies. Empirical observations show that if training at this level is of value in the modern employment sector insofar as the numbers produced are reasonably well in line with the demands of the national economies[10], this is less the case in the informal (agricultural and non-agricultural) sector.

While the first perspective was based on the continuity of student flow, the second perspective is based on a discontinuity in student flow, particularly between lower and upper secondary education. Empirical data on a sample of 23 countries in the region[11] gives an idea of the apparently reasonable number of students that a country "should" have in tertiary education considering its level of (present and future) economic development and the structural characteristics of its economy; this reference number depends of course on a convention as to what seems an acceptable structural unemployment rate for those coming out of tertiary education in the medium term; we can take it as reasonable to avoid a graduate unemployment rate of over 20 or 25%.

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[8]. The said continuity stems both from i) curriculum content in the different cycles of education (organized for continuing studies in the following cycle rather than for entering working life at the end of the cycle) and ii) demands from the families showing their concern for their children to continue their studies as long as possible. However, the aggregation of individual demands does not necessarily lead to a situation that is globally desirable on the economic and social level.

[9]. On the economic side, experience shows that primary and lower secondary education constitute a «good for all» investment for the informal sector. In addition, analysis of the effects of education in social areas (population, health, …) also evaluate that a major share of schooling impacts is obtained with a full course of primary education and that these are consolidated by lower secondary education. Beyond this, additional social impacts are modest. Refer particularly to "Social Impacts of Education in Sub-Saharan African Countries"; A. Mingat and M. Zhao, World Bank, 2006.

[10]. To understand the relevance of flow regulation, one can look at the extent of the drawbacks involved in not applying flow regulation. Indeed, expanding the base of the educational pyramid, especially through to lower secondary education, would lead to a very large number of students being incompatible with the absorption capacities of national economies. This would result in significant intensification of unemployment and downgrading of those trained as already observed in many countries. This is not satisfactory whether from the point of view of the individual of from that of society who, having overinvested in this type of training, can but admit *a posteriori* to inefficient use of public resources.

[11]. Refer particularly to: "Education and Labor Markets: A Match Difficult to Achieve in Sub-Saharan African Countries"; A. Mingat, World Bank, 2007.

This reference to the situation of the labor markets necessarily corresponds to relatively limited figures, in view of the size of the modern job sector. Indeed, the economies of the study's target countries are (and will remain so for the coming 25 years) characterized by a marked discontinuity between the modern sector showing only limited progress over time and the traditional sector that employs (and will continue to employ) the vast majority of the working population. Confronted with the structural discontinuity of the economies, education systems cannot simply follow internal dynamics, but must also incorporate the aggregate demands of society, which are of course external to the systems.

In this context, some form of flow regulation between the lower part and the upper part of the system is inevitable (both with regard to what is desirable for the social and economic development of the different countries and for financial sustainability) and must be tackled positively; experience has shown that an absence of policy (a clear policy discussed with all national stakeholders) in the short term on this critical topic does not lead to suitable situations in the medium term. This suggests a double approach to the way of considering the development of the education systems in the countries concerned:

. In the lower part of the education system, the internal (or bottom-up) approach prevails whereby, starting from the country's population, the aim is for the largest proportion of that population to benefit from a complete course of successful primary schooling; in a comparable manner, starting from the number of young people who complete primary education, the proportion (and this is hoped to be a maximum in view of the logistic and financial constraints) of students who will be able to continue their formal education in general or vocational studies is defined; and the proportion (again hoped to be maximum) who will be able to have access to vocational training or short prevocational courses is defined, in reference to the number of young people not continuing formal education.

. In the upper part of the education system, the external (or top-down) approach prevails and becomes the reference. This approach starts from an empirical estimation of the number of tertiary students that would be compatible with the expected development of the economies of each country from now to 2020, avoiding an overly strict approach (especially as we can only envisage orders of magnitude), that is to say by accepting some level of graduate unemployment (25% could be considered a maximum) that would be politically and economically acceptable.

On this basis, we can estimate the number of students in upper secondary education starting from the idea that this cycle of education is the supplier of young people to be registered in tertiary education in the future. But, once again, the idea is not to have a strict vision, since it is important i) to allow for the possibility of diploma holders from upper secondary education leaving for the labor market or for specific vocational training (school teachers, nurses…), and ii) to authorize universities to profile student admission to the different branches of study. This can for example lead to multiplying by 2.5 the numbers necessary for fuelling tertiary education. After defining in this way the number of students in upper secondary education, these can then be distributed between general and technical/vocational education on the basis of the average observed in somewhat more developed countries.

Once the number of students completing lower secondary education (according to the system's internal logic) have been determined on the one hand and those who would have access to upper secondary (according to the system's external logic) on the other hand, the notion of lower-upper secondary transition rate loses its functional significance; this indicator is no longer used for

strategic management; nevertheless, it is calculated (noted) to have an idea of the intensity of flow regulation applied at this junction in the education system.

IV.3 Possibility of a structural rearrangement of educational cycles

The possibility of a structural rearrangement is looked at here, incorporating a longer cycle of basic education than primary education as presently configured (usually 6 years); universal basic education of say nine years could thus be envisaged. In this context, there would only be a single secondary cycle lasting 3 or 4 years for which access could then be regulated.

Two arguments are in favor of this formula: i) the first is to do with organizational convenience; indeed, these complementary years of study could be incorporated in existing primary schools thus facilitating schooling locally and avoiding the difficulties of organizing secondary schools in rural areas; ii) the second argument is to do with cost; indeed, the average value of unit cost is seen to be around 33% of GDP/capita in lower secondary compared to only 11% in primary education. These additional years of study could no doubt be incorporated in primary education for a unit cost of between 15 and 20% of GDP/capita, especially considering that the three additional classes would require only three fairly multivalent teachers[12]. While there is a strong consensus for using polyvalent teachers for primary education and specialized teachers in upper secondary education, experience suggests that some degree of multivalence is appropriate for teachers in between these two levels. One argument against this formula is to do with its implementation; it is indeed easier to implement educational policy in a stable structure than to change the structure.

V. Unit cost and characteristics of educational services

Generally speaking, it is hoped to be able to offer the best educational context; however, it is well known that good conditions of education are necessarily costly. Existing financial constraints may then lead to only a small number of children being able to benefit from same. Compromises have thus to be sought to provide acceptable conditions of education for as many young people as possible. It is however also appropriate to recall that although the actual quality of educational services delivered, judging from student learning achievements, is partially connected to resources mobilized, it also, and more intensely, depends upon the way in which resources are transformed into results for students. This highlights the importance of factors related to the qualitative operation of the system, the attitudes of the different stakeholders and educational management, and in a way puts the importance of the logistic aspects of the schooling context into perspective. The latter aspects cannot however be ignored, and it is then a matter of determining what the "acceptable conditions" would be for ensuring the development of the system at post-primary levels, bearing in mind that what can seem «acceptable» for one country may not be for another.

V.1 A heterogeneous situation with some unfavorable aspects for the expansion of the system

To start addressing the above question, let us begin with a description of the level of unit costs. Table 4 provides data on the cost per student for the sample of 33 countries and, for reference, the available data for 24 developing countries (often with slightly higher levels of economic development) in Africa and in other regions of the world.

[12]. If we refer to the FTI indicative framework for primary education (salary level of 3.5 times the GDP/capita, class size of 40, and expenditure other than teacher salaries representing 33% of total unit cost), which leads to a unit cost representing 13% of GDP/capita, then taking the following reasonable parameters for the additional years of study i) level of salary representing 4 times the GDP/capita, ii) class size of 35 students, with iii) expenditure other than teacher salary representing 38% of total expenditure, leads to an estimated unit cost of 18.4% of GDP/capita.

This data indicates average values that are detrimental to post-primary development in Africa. Indeed, average expenditure per student in the sample is 11, 33, 60 and 370% of GDP/capita respectively for primary education, lower and upper secondary education and tertiary education (40% of GDP/capita for the two secondary cycles as a whole). Corresponding figures are 15, 27 (lower and upper secondary) and 200 for non-IDA sub-Saharan African countries and 12, 20 and 83 for countries outside sub-Saharan Africa.

Table 4: Unit costs per level of study in the different groups of countries

	Primary	Lower Secondary	Upper Secondary	Lower & Upper Secondary	Tertiary
IDA African countries					
Value (GDP/cap)	**0.11**	**0.33**	**0.60**	**0.40**	**3.7**
Ratio to primary	1.0	3.0	5.4	3.7	34
IDA non-African countries					
Value (GDP/cap)	0.11	-	-	0.12	0.53
Ratio to primary	1.0	-	-	1.1	4.8
Ratio IDA Africa/ IDA outside Africa	1.0	-	-	3.3	7.0
Non-IDA African countries					
Value (GDP/cap)	0.15	-	-	0.27	2.0
Ratio to primary	1.0	-	-	1.8	13.3
Ratio IDA Africa/ non-IDA Africa	0.72	-	-	1.5	1.9
Non-IDA non-African countries(GDP/cap)	0.14	-	-	0.15	0.34

* For **primary** education, unit costs are fairly similar in the different groups of countries considered (11 to 15% of GDP/capita). For secondary and then tertiary education, costs are seen to rise along with the level of education in all countries. However, this is particularly acute in low-income sub-Saharan African countries, with significantly higher levels of expenditure per student than those registered in the other groups of countries.

* In **secondary** education (both cycles as a whole), the average unit cost is estimated at 40% of GDP/capita in IDA sub-Saharan African countries while it is only 27% of GDP/capita in middle-income countries in the region, 12% of GDP/capita on average in other low-income countries, and 15% in middle-income countries. In all, in the group of low-income countries, the unit cost of secondary education is 3.3 times higher in sub-Saharan African countries than in other developing countries throughout the world. Data making it possible to differentiate the unit cost of the two secondary cycles are not generally available[13]; this is only possible for IDA African countries as a result of the high number of education sector studies conducted in the region over recent years. A substantial increase in average expenditure per student is then noted between lower secondary (33% of GDP/capita) and upper secondary (60% of GDP/capita) education.

* Finally, in **tertiary** education, average expenditure per student (3.7 times the GDP/capita) in the sample of 33 countries is substantially higher than that registered in other countries, respectively 2.0 times the GDP/capita in non-IDA countries in the region, and only 0.53 times the GDP/capita in IDA non-African countries, and even 0.34 times the GDP/capita (the level of expenditure observed on average in lower secondary education in IDA African countries) in middle-income countries outside sub-Saharan Africa.

[13]. For countries outside sub-Saharan Africa, most of the available data comes from the UNESCO Institute for Statistics which does not always distinguish the two cycles of secondary education.

The level of unit costs reveals an African specificity: in low-income African countries, educational services at secondary level, and all the more so at tertiary level, appear particularly costly. This contributes to explaining firstly why post-primary coverage is poorly developed there and secondly why scaling up will no doubt be difficult in the future. The following point identifies the school organization modes behind the level of unit costs of schooling. Table 5 provides the main information for low-income sub-Saharan African countries, while table 6 offers broader elements of international comparison.

Data in table 5 shows first of all that generic terms such as «lower secondary education» (but this is true for upper secondary and for tertiary education) can conceal very different characteristics as to educational services provided. For example, in lower secondary education, it is found that average class size can range from under 20 to over 80, while expenditure other than teacher salary (support personnel, running costs) can represent from 15 to 60% of the unit cost of schooling; as for the average teacher salary, this can represent from 2 to over 9 times the GDP/capita.

Table 5: Characteristics and cost of school organization at the different levels of study[14]

Country	Lower secondary						Upper secondary						Tertiary
	Teach Sal (GDP/ cap)	Studt/ Teach (1)	Student/ Class (2)	Ratio (2/1)	% Exp. w/o Teacher	Unit Cost (GDP /cap)	Teach Sal (GDP /cap)	Studt/ Teach (1)	Student/ Class (2)	Ratio (2/1)	% Exp. w/o Teacher	Unit Cost (GDP /cap)	Unit Cost (GDP/cap)
Burkina Faso	9.3	50.0	75.0	1.5	60.4	0.47	13.0	39.0	52.0	1.3	48.0	0.64	2.4
Burundi	9.3	20.5	42.4	2.1	29.1	0.64	11.0	16.4	32.4	2.0	72.0	2.40	8.3
Cameroon	6.5	31.1	40.3	1.3	34.3	0.32	6.8	29.1	36.4	1.3	36.5	0.37	0.8
Ethiopia	8.1	48.3	67.8	1.4	18.6	0.21	11.9	50.3	81.7	1.6	40.5	0.40	11.2
Guinea	2.9	47.6	88.9	1.9	44.0	0.11	2.9	52.3	95.0	1.8	41.0	0.09	1.5
Malawi	7.7	26.3	50.0	1.9	40.0	0.49	7.7	26.3	50.0	1.9	40.0	0.49	14.9
Togo	8.7	54.2	87.9	1.6	13.6	0.19	9.0	33.3	62.4	1.9	15.9	0.32	1.3
Average IDA Africa	**6.0**	**35.5**	**53.5**	**1.6**	**38.0**	**0.33**	**7.4**	**27.1**	**45.7**	**1.8**	**39.9**	**0.60**	**3.7**

In the face of such extensive dispersion, it appears obvious on the one hand that some situations are not suitable references for building the future of post-primary education and, on the other hand, that benchmarks should be proposed in this perspective. In order to make progress, let us examine the experience of developing countries other than those in our sample.

Table 6: Elements of comparison with non-IDA or non-African countries

	GDP/ capita	GER (%)		% Rep.	Students/teacher		Teacher salary (GDP/cap)	Unit cost (GDP/cap)		Tertiary Unit cost	% Private	% TVET
	USD 2003	Sec 1	Sec 2	Sec.	Primary	Sec.	Secondary	Sec.	Tert.	USD	Sec.	Sec.
IDA African countries Overall	**320**	**32.7**	**13.8**	**13.2**	**51.9**	**31.4**	**6.5**	**0.4**	**3.7**	**981**	**19.8**	**7.9**
Non-IDA African countries	3 182	81.6	57.1	8.8	29.3	21	3.8	0.27	2	2 554	21.2	6.9
IDA non-African countries	734	73.5	46.3	4.9	35.3	29.8	2.8	0.12	0.54	292	38.6	4.3
Non-IDA non-African countries	2 477	88	58.5	5.3	22.9	19.1	2.4	0.15	0.34	1 123	22.4	14

In secondary education (the two cycles combined), IDA sub-Saharan African countries do not stand much apart on average from IDA non-African countries as far as the student-teacher ratio is

[14] These indicators are available for all 33 countries in the main study.

concerned (31.4 and 29.8 respectively). Compared to middle-income countries, the number of students per teacher does however come out higher (31.4 compared to 20). On the other hand, the specificity of the countries targeted by this study is clear when looking at teacher salary. Teachers have an average salary of 6.0 times the GDP/capita in lower secondary education, and 7.4 times the GDP/capita in upper secondary, i.e. 6.5 times the GDP/capita for the two cycles as a whole. The corresponding figure is 3.8 in non-IDA countries in the region, but also 2.8 in low-income countries outside the African continent and 2.4 in middle-income countries outside Africa. In all, the average secondary teacher salary in IDA African countries (expressed in units of GDP/capita) is 2.35 times higher than that observed in low-income countries in other parts of the world.

As our central issue is to examine the possibilities of post-primary development in sub-Saharan African countries, there is no doubt that the high level of salary costs will be a great handicap, since it is the numerical value of salaries (and of unit costs) expressed in units of GDP/capita that is important[15]. As a result it will not be possible to escape from the question of teacher salary level in educational policies aimed at extending quantitative coverage of post-primary education in IDA African countries. In a way, the situation is comparable to that observed in primary education in the second half of the 1990's, where the level of teacher salary was indicated as being a major structural obstacle for making progress towards universal coverage. These observations did at the time lead to looking for formulas for recruiting teachers at a lower cost (voluntary, temporary contract, contract and community teachers).

V.2 Definition of references identifying reasonable conditions of education

All the observations made above converge to highlight the extent of the variability between countries in our sample on the different characteristics of the organization of educational services in the two levels of secondary education (tertiary education is no exception although variability has only been estimated on the basis of unit cost). It is clear that the development of educational services at post-primary levels based on current parameters would be easier in some countries than in others; it would be easier for countries with lower unit costs; but it would not necessarily be relevant if this meant accepting a class size of 80 students for example. Two important considerations suggest that individual countries' parameters in the recent period should not be taken as a basis:

i) the first is that there is no reason why these parameters would be optimal for all countries. Some countries may indeed have i) inappropriate characteristics and levels of costs that are too low for projecting services of reasonable quality for the future, or ii) overly high unit costs characterizing inefficiency and not appropriate for the future. Beyond the notion of unit cost, which is an amalgam of the different aspects of school organization modes, it may also be that the level of unit cost is adequate, but that the combination of the factors it incorporates is not well balanced and does not produce good pedagogical results (and is not a good basis for envisaging the future either).
ii) the second consideration is that it is probable that, certainly more so than for primary education, national resources will often not be sufficient to obtain even minimum quantitative and qualitative

[15]. However, if the perspective is of a comparative nature, then it is advisable to contextualize according to the level of development. Indeed it is not relevant to directly compare the value of 6.5 times the GDP/capita in low-income African countries with that of 2.8 for their counterparts outside Africa insofar as i) the average value of GDP/capita was 320 USD in 2003 in the first group and 734 USD in the second and ii) teacher salary (in units of GDP/capita) tends to decrease when considering more advanced countries. Empirical analysis of this tendency in the African context indicates that salaries register on average at 6.9 times the GDP/capita for countries with a GDP/capita of 200 USD, but that they register at 6.6 times the GDP/capita for a GDP/capita of 300 USD, at 5.8 for a GDP/capita of 500 USD and 4.9 for a country where the GDP/capita would be 734 USD (average value of GDP/capita in low-income countries outside Africa). As the value observed is only 2.8 times the GDP/capita, the conclusion can be reached that secondary school teacher salaries, on the basis of international comparisons and controlling GDP/capita, are on average in sub-Saharan Africa, 80 % higher than those in countries with a comparable level of development in other world regions.

goals. Support from external aid will be necessary. Now, this is normally characterized by double ethics: the first one is to provide support to efficient organizations so that the agencies can show their taxpayers that the maximum results have been obtained per dollar/euro mobilized; the second one is to do with the fair handling of the different countries with situations that would be globally inappropriate if aid were to be consequent for inefficient countries and less so for countries having made the effort to produce cost-effective services.

These two reasons suggest following the direction taken in the EFA-FTI, by defining indicative benchmarks for an array of reasonable parameters for the organization of post-primary educational services. It is recalled that the purpose of the EFA-FTI indicative framework is to serve as a reference for countries in defining their educational policy. It is useful i) for targeting the policy discussion on the most crucial structural parameters, and ii) to serve as a reference for a well-balanced and efficient policy. The indicative framework is firstly considered as an aid, not as an element of constraint or conditionality.

For the majority of the 33 countries targeted here, defining the post-primary policy will involve difficult choices and often harrowing trade-offs. That said, the different countries have neither the same constraints nor the same initial conditions. To take this aspect into account, it seems preferable not to attempt to define a single reference because this could be relevant for a country in a median situation but would not be a proper reference for countries far from that. Nevertheless, the considerable variability in national situations today suggests the need for disciplined discussions with a view to defining a development framework for post-primary education for the different countries in the region[16]. In order to reconcile these two aspects, two indicative frameworks have been identified: i) the first can be qualified as «favorable», creating a context conducive to quality and implementation of educational services; ii) the second, more cost-conscious, could serve as a «basic» reference for countries with stronger constraints. It can be noted that this perspective is above all instrumental, and that this «double» indicative framework can be used as a basis for the countries to build the structural outline of their educational policy by «navigating» between the two sets of parameters according to their specific situation.

i) Benchmarks for the two cycles of general secondary education

The set of structural parameters taken into consideration is the following:

. In **the dimension of direct student supervision**, three parameters are taken into account: i) the average number of students per pedagogical division (CS), ii) the number of hours teaching received by the students (StT) (on a weekly basis) and iii) the average number of hours (TeaT) actually worked by the teachers (again on a weekly basis). These three variables are preferred to the student-teacher ratio (STR), which has a more synthetic content but is less linked to the educational policies implemented[17].

Based on data for the 33 countries, the average value of the STR is 35.5 and 27 respectively for the two secondary cycles (aggregate value of 31.4), whilst the corresponding average aggregate value is 29.8 in low-income countries outside Africa and 20 for middle-income countries. In the «favorable» configuration, we have targeted a value of around 24/25 as an average for the two cycles which results in a figure of 25.7 for lower secondary and 21.3 for upper secondary. As we maintain more or less the same average values for student time and teacher time, we arrive at a size of 40 students

[16]. and also because well-identified quantitative elements are necessary for making the calculations in each of the 33 countries.
[17]. STR = CS . TeaT/StT

per pedagogical group in each of the two cycles. This is significantly better than the averages observed in the current period (54 for lower secondary, 46 for upper secondary).

Concerning the more «cost-conscious» configuration, we have opted to play firstly on the two time variables: for that, we have come closer to the choices made by countries like Ghana, a country that has succeeded in reaching one of the highest levels of secondary coverage. The values chosen are 25 hours and 21 hours respectively for students and teachers in lower secondary education, and 27 hours and 18 hours in upper secondary education (these values are not extreme given the variety observed from country to country). In the same way, the «cost-conscious» option targets 50 as an average size for pedagogical groups in lower secondary and 45 in upper secondary. It can be noted that these figures are more favorable than current figures (54 and 46 respectively) and that even if the parameters of the «cost-conscious» configuration are indeed not as good as those of the «favorable» configuration, they are all the same very reasonable and worthy of consideration. We shall see that they enable a very significant reduction in unit cost, and consequently much higher potential coverage for a given budget.

. The second crucial parameter is **the level of teacher salary**. This is a more difficult point, as highlighted earlier: on average, in units of GDP/capita, the level of annual salary registers at 6 in lower secondary and 7.4 in upper secondary education, for a value of 6.5 for secondary education as a whole.
By way of reference, secondary teacher salary is 2.8 times the GDP/capita in low-income countries outside Africa and in middle-income countries; but this international reference, even adjusted, is not relevant for sub-Saharan African countries[18].

A second way of tackling this question consists in using the FTI indicative framework for primary education (3.5 times the GDP/capita) and increasing this reference appropriately to allow for the fact that secondary school teachers have usually studied longer than their counterparts in primary education, 3 years on average for lower secondary, and 5 for upper secondary. By applying a rate of private return to studies of 12% (a very reasonable rate), we arrive at a salary level of 4.9 and 6.2 times the GDP/capita respectively for lower and upper secondary education[19]. Taking this into account, the more «favorable» option slightly raises these figures to reach 5 times the GDP/capita for lower secondary and 6.5 times the GDP/capita for upper secondary, while the «cost-conscious» option is a little stricter and proposes teacher salary levels of 4.6 and 5.6 times the GDP/capita respectively, in lower and upper secondary education.

. The third parameter to be taken into consideration is the volume of **current expenditure other than teacher salary[20]**. We do not really have any reference on this aspect aside from our sample of 33 countries. On average, this expenditure accounts for 38 and 40% of the total operating cost in lower and upper secondary education respectively (with a very high variability between countries).

[18]. Following the analyses conducted earlier in the document, it is highlighted that salaries in our sample countries would be around 80% higher than in countries in other regions with a comparable level of development (and not 134% higher on the basis of raw figures). Were this reference to be applied, then the level of teacher salary in secondary education should register at around 3.6 times the GDP/capita. The latter figure is obviously very low ; only Benin, Congo, and Guinea have a salary level of this order, all the other countries having higher, and often very much higher, levels. It follows that this reference is no doubt too low for the countries in the region overall.

[19]. It can also be observed that, in the current situation, a lower secondary teacher earns 40% more on average than a primary school teacher, while the corresponding figure is 70% for an upper secondary teacher. Applying these coefficients to the EFA-FTI indicative framework value for primary education, we arrive at a teacher salary level of 4.9 and 6 times the GDP/capita respectively for the two secondary cycles. These figures are close to those obtained with the other method.

[20]. This expenditure concerns textbooks, educational materials for students and teachers, water and electricity, upkeep of school buildings and furniture, in-service teacher training, expenditure on administrative and pedagogical support personnel in schools, central and decentralized departments as well as associated operating expenditure.

We have opted for 45% of the total cost in lower secondary and 50% of the total cost in upper secondary in the «favorable» option and for 38 and 42% respectively in the so-called «cost-conscious» option.

. Finally, the last parameter concerns **the frequency of repetition**. This parameter does not have an impact on unit cost but does so however on the budget, since repetition has to be financed. In recent years, the average frequency of repetition was 14% on average in each of the two secondary cycles within the group of 33 countries; it is under 10% in the different comparison groups. A level of 10% has been selected in each of the two cycles and in each of the two reference configurations («favorable» and «cost-conscious» configuration).

Table 7 summarizes the value of the parameters for the two options («favorable» -C1- and «cost-conscious» -C2-) for each of the two secondary cycles and provides the corresponding unit costs of operation. It also gives indications, limited to the level of unit costs, for the different formulas of technical and vocational education as well as for tertiary education and its main branches.

Table 7: Indicative framework for the organization of services at post-primary levels

Parameters	Lower secondary		Upper secondary		Integration *	TVET *	Tertiary			
	C1	C2	C1	C2			TT	Hum.	Scien.	Prof.
Conditions of student supervision										
Number of students / group of students	40	50	40	45						
Number of student hours	28	25	30	27						
Number of actual teacher hours	18	21	16	18						
Student-teacher ratio	25.7	42.0	21.3	30.0						
Teacher salary (GDP/cap)	5.0	4.6	6.5	5.6						
Expenditure other than teacher salary (%)	45	38	50	42						
% of repeaters	10	10	10	10						
Student distribution							100	60	15	25
Unit cost (GDP/cap)	**0.354**	**0.177**	**0.609**	**0.322**	**0.6 / 0.8**	**1.2 / 1.7**	**2.0**	**1.5**	**2.4**	**2.9**

* the two figures reflect activities at lower and upper secondary level

One important piece of information is that while the parameters of the «cost-conscious» option (C2) are not as good as those of the so-called «favorable» option (C1), they do not sacrifice services (in the «cost-conscious» option, unit costs are still much higher than averages observed in each group of comparison countries). It is by systematically making slight adjustments economy-wise to each of the different parameters, but moderately on each one, that we can move from the «favorable» option to the one qualified as «cost-conscious». However, it is indeed striking to observe that unit cost can then vary up to twice as much. This has considerable potential implications on the level of

resources necessary for achieving a given goal in terms of coverage, or on the level of coverage likely to be obtained with a given volume of resources[21].

Activities coming under the title of technical and vocational education are of two very distinct types: i) on the one hand, activities mainly organized in institutions providing training to young people pursuing their education in a technical or vocational, as opposed to a general, course of study, and ii) on the other hand, (pre)vocational training, usually of short duration, aimed at fostering the integration of youth mainly in the informal sector of the economy; these training courses are organized for young people putting an end to their formal studies after primary schooling or lower secondary education. They serve a double purpose, that is to say a) equip young people who are to enter working life with practical skills and contribute to improving labor productivity in the informal sector of national economies, and b) offer a positive alternative to young people who would otherwise be unable to continue their studies due to the constraints existing in the structure of formal education.

* Information available on unit costs mainly concerns the first type of training courses. It is seen that technical and vocational training (aggregating the different formulas on the one hand and industrial and tertiary training on the other) costs almost 3 times more on average than general training at the same level, that is to say around 1.2 times the GDP/capita for training organized at lower secondary level and around 1.7 times the GDP/capita for that organized at upper secondary level. Financial simulations have been based on a cost of formal technical and vocational training that could be around 3 times more than the average references chosen for general education in the two study cycles. We have thus taken a unit cost for technical and vocational training of 0.9 times the GDP/capita for training at lower secondary level and 1.4 times the GDP/capita for training at upper secondary level.

* Empirical information on short training courses targeting labor market integration for young people ending their studies after completing primary or lower secondary education, is very limited insofar as nothing is provided for these young people at the present time in most countries. Figures for the unit cost of these integration-type training courses are estimated at 0.60 times GDP/capita when they follow on from primary education and 0.80 times GDP/capita after lower secondary education.

iii) Concerning tertiary education now, things are *a priori* more difficult, for two complementary reasons:

* The first is that the average value of unit cost in the 33 target countries (3.7 times the GDP/capita) is very much higher than that in low-income countries outside Africa (0.54 times the GDP/capita), which could a priori be used as a comparative reference. But expenditure per student is also seen to be higher in middle-income countries in sub-Saharan Africa (2.0 times the GDP/capita) than in other parts of the world (0.30 times the GDP/capita). This suggests a sort of African «specificity» whereby tertiary education would be more costly in Africa than elsewhere. This should no doubt be considered neither as inevitable nor as desirable; however, ignoring it would probably be unrealistic.

[21]. It is also to be noted that the indicative framework describes average situations (this is what is important financially), but that its implementation can incorporate relevant modulations around the averages in order to take local or regional specificities into account within each country.

* Secondly, the extreme variability in data on unit cost in the group of 33 countries makes it difficult to propose an estimated reference for unit cost of tertiary education. In this respect too, it is fairly probable that the lowest figures correspond to extremely lacking situations in terms of the provision of quality tertiary education and that the highest figures reflect situations of inefficiency that it would probably be appropriate to put right.

These two observations make it difficult to choose a reference value appropriate for all the countries in the sample targeted by this study. What seems to be the most reasonable compromise it to take the average level of expenditure per student observed in middle-income African countries as a reference for 2020, i.e. 2.0 times the GDP/capita, bearing in mind that this value includes the running of the educational structures and social aid to students, particularly generous in some, often French-speaking, countries.

For tertiary education, we wished to incorporate the dimension of study specialties, but without going into great detail, which would obviously be difficult to document. As the distribution of students in the three branches of studies considered (law/humanities, scientific subjects and professional branches) varies little in the different groups of countries used for international comparison, we have taken the respective figures of 60% of enrollments for the humanities and social sciences group, 15% for scientific subjects and 25% for the different professional branches. Regarding their respective unit costs, we have applied the average structure of unit costs observed in the sample of 33 countries in the recent period to the target value of 2 times the GDP/capita previously identified. This arrives at a unit cost of 1.5 times the GDP/capita for the humanities and law group, 2.4 times GDP/capita for scientific subjects and 2.9 times GDP/capita for professional branches.

V. 3 Taking country specificities into account in the indicative references

Having attempted to identify these benchmarks in concrete terms, it is now important to incorporate the experience gained within the FTI framework. In this context, a single indicative framework had been established that was supposed to be applied homogeneously to all countries; that said, this framework was only indicative and, while acting as a useful marker, could be adjusted to allow for possible specificities in the individual countries. Experience has shown that it would be preferable if it could be adapted to some of the country's structural characteristics, particularly with regard to the level of economic development, while maintaining a generic reference common to all countries. It is especially the subject of teacher salary level that had been stated as posing a problem.

In this document, we have thus kept the notion of a single indicative framework, since this is undoubtedly a key reference for an effective and fair approach for external support to the different countries, but we have incorporated important elements to modulate its application depending on the country's level of GDP/capita and on geographic context (distribution of populations between urban and rural areas); in addition, we have also introduced the aspect of stimulating demand:

i) Adjustments to allow for the level of GDP/capita

The need for adapting the inflexibility of the initial FTI indicative framework (and also the indicative frameworks proposed for the two secondary cycles) concerns firstly the level of GDP/capita. Let us look at the drawbacks and proposed remedies in 2 important dimensions:

* the first dimension is that of ***teacher salary***. It has been observed at primary level that a single value of 3.5 times the GDP/capita led to very low salaries in the poorest countries, maybe even under the poverty line when GDP/capita is under 100 US dollars. Empirical observation has shown moreover that while teacher salary expressed in dollars certainly tends to be lower when considering poorer countries, it also tends to be greater when it is expressed in units of GDP/capita. This is the relation that we have used to adjust the value of teacher salary, expressed as a multiple of GDP/capita, in the flexible indicative framework. The basic idea is that the value of 3.5 be used for countries where GDP/capita is equal to or over 300 dollars[22], but that it be increased taking into account the general relation of growth in the level of salaries expressed in units of GDP/capita when considering countries with more modest economic levels. This leads to a level of primary school teacher salary that represents 4.22 times the GDP/capita for a country with a GDP/capita of 100 dollars (year 2000). It is worth 3.94 times the GDP/capita for a GDP/capita of 150, and 3.61 for a GDP/capita of 250 dollars.

* the second concerns the level of ***current expenditure other than teacher salary***. The difficulty arises from the fact that this expenditure covers both purchases in local currency (administrative staff salary, …) and those in foreign currency (textbooks, …). If this expenditure is calculated as a proportion α of total unit cost, then it *de facto* becomes proportional to the level of salary. As the said salary, expressed in dollars is lower the lower the country's GDP/capita, it ensues that, for a given value of α, the amount of these resources, expressed in dollars, will be all the lower when the country has a poor GDP/capita. The procedure followed to avoid this drawback consisted in starting out from a simulation of the standard FTI indicative framework for a country with a GDP/capita of 300 dollars (in 2000) in such a way as to determine the unit amount of this expenditure in dollars for these purchases in all countries where the GDP/capita is under 300 dollars (year 2000).

These procedures for i) adjusting the salary level according to the GDP/capita and ii) defining the share of expenditure other than «in-class» teacher salary in primary education, are also applied using comparable principles for the two cycles of secondary education.

* **The case of tertiary education** is worthy of specific attention. Indeed, this level of education i) must organize training of international quality and ii) has a significant expenditure component expressed in foreign currency that must be similar whatever the country's GDP/capita. In these conditions, it would be detrimental for the unit cost reference to be given only as a proportion of the country's GDP/capita, since that would be a handicap for the poorest countries. The procedure consisted in estimating first of all that around 50% of tertiary costs were derived from a regional reference[23] and that the target value of twice the GDP/capita was suitable for an average African country (from the point of view of its GDP/capita).

Applying this adjustment arrives at an average unit cost for tertiary education representing twice the GDP/capita for countries where the GDP/capita is equal to or over 300 dollars (year 2000), but representing a multiple of GDP/capita that is all the higher the poorer the country. By way of illustration, the average unit cost of tertiary education would then represent 3.0 times the GDP/capita if the country's GDP/capita is only 150 dollars. Having defined the average value of unit cost, the relative values of cost of the different subjects (humanities/law, scientific and professional) are maintained.

[22]. Average value of GDP/capita in the sample of 33 countries, in 2000, to be coherent with the date of introduction of the primary indicative framework. It is of use to specify this in view of the relative fall of the dollar on the international market between 2000 and 2005.

[23]. To arrive at this figure, and on the basis of monographic data, we have estimated that around 70% of current expenditure other than salaries was (should be) made out in foreign currency (library books, computer expenditure, laboratory consumables, …) and that teacher salaries should respect a regional norm.

ii) Giving consideration to the rural dimension in developing the systems

The second area where an adjustment is made to allow for national context is in the distribution of the population between urban and rural areas. This adjustment is only proposed in primary and in lower secondary education[24]. There are three strong observations to motivate such an adjustment: i) the share of urban population (a regional average of 30%) is very variable from one country to another (under 20% in Burundi and Burkina Faso, compared to around 50% in Republic of the Congo and Gambia); ii) schooling coverage is very much lower overall in rural areas than in urban areas; this goes for both primary and lower secondary education. Thus, the regional average for lower secondary education is 66.5% and 22.2% respectively (again with considerable disparities between countries); iii) schooling in rural areas tends to be more costly that in urban areas. In primary education, an analysis conducted in 16 countries in our sample shows that a student enrolled in a 100-student school costs on average 35% more than a student enrolled in a 300-student school. In lower secondary education, the structure of economies of scale is more pronounced, with unit cost in a 120-student school around 70% higher than in a 400-student school. However, on this point again, there are considerable differences between countries, with the ratio between unit cost of a 120-student and a 400-student school varying from 1.15 to 2.40[25] (for a regional average of 1.70).

The first two observations lead to estimating that on average in the region 81% of the primary school age population not actually enrolled live in rural areas; the same analysis for lower secondary education results in an even higher figure of 85%. In the different countries, the rural component of the population currently excluded from schooling at these two levels of study is indeed of variable proportions, but is always in the majority.

In reference to the current period, an increase in unit cost of schooling can therefore be anticipated for the future (between 2005 and 2020) both in primary and in lower secondary education, given that this increase has a structural dimension connected to the distribution of populations between urban and rural areas and to the current levels of schooling coverage in the two areas; but this increase also depends partly on the policies to be adopted in the organization of education during this period. Let us look in turn at the case of primary education and then at that of lower secondary education.

* **In primary schooling**, it is no doubt useful to consider three reasons why i) unit cost is generally higher in rural areas than in urban areas and ii) unit cost will continue to grow along with the approach of universal coverage. The first aspect, connected to the organization of studies for smaller populations at local level (structure of economies of scale), was mentioned above when it was considered that rural unit cost could exceed that observed in towns by around 25%; but in this respect the goal of 40 for the student-teacher ratio is an average to be managed «relevantly and pragmatically», more particularly by authorizing slightly larger classes (within reason) in towns where the local population is high, and slightly smaller ones in rural areas, particularly in sparsely populated areas.

However, experience shows that it is not enough to build a school and assign a teacher for the latter to easily «accept» his/her assignment, and actually be present regularly at his/her job. Many

[24]. For upper secondary education, the idea is that schools will continue to be located mainly in urban areas. This idea does not apply to lower secondary schools, which must remain close to the populations concerned, particularly with a view to a significant increase in schooling coverage.
[25]. Differences are due partly to the number of administrative personnel (whether 1 or 3 in a 120-student lower secondary school), and partly i) to the degree of teacher polyvalence in different subjects and ii) to organization of curriculum content.

countries faced with this difficulty have undertaken actions to motivate teachers working in difficult areas; these actions must target well-identified areas and also be truly motivating to play the role of stabilizing teachers[26]. On the basis of work put in by the countries that have already given thought to this aspect, we have noted that 15% of teachers in rural areas could be concerned and that the associated motivation would correspond to a 20% increase in normal salary.
Complementarily, experience also shows that for a particular fringe of the population (poorest, most traditional, more often girls), actions on supply are insufficient[27]; schooling comes up against insufficient demand from families. In most countries, actions that address family demand are necessary. Here, we have supposed 10% of the rural population to be in these conditions and that the cost of these actions for this particular population could reasonably represent 30% of unit cost.

* In **lower secondary education**, we have taken only economies of scale in school production into account. As mentioned above, there is a significant variety between countries in the capacity for managing the issue of small (rural) schools. This concerns practices for the allocation of administrative and pedagogical support personnel in small schools, and subject content of school curricula together with the degree of teacher polyvalence[28]. The general perspective of this document is indeed to describe the variety existing between the different countries, but also and above all to detect within this variety, the school organization modes that turn out to be the most effective and fair. It is the most effective organization modes in small schools that must be given priority with a view to developing schooling coverage; empirical studies do indeed show that local school supply is the most appropriate for meeting family demands, especially for the most vulnerable segments of society.

Comparative analysis of practice shows that it is possible, through appropriate organization modes, to aim at limiting the «extra cost» of small schools to around 30% compared to urban schools. This figure is taken as a basis to determine the overall extra cost for 2020 connected to the expected proportion of small schools at that time.

VI. Options as to the public-private structure of financing

It remains now to determine how the educational services previously defined are to be financed. We are only to consider domestic financing here. However within this, the distinction must now be made between public financing and private participation. One basic aspect is that a sector-wide vision is essential in order to assess specific policies related to the financing of the different segments of post-primary education:

i) Concerning the definition of public financing firstly, we suggest using the same parameters as the EFA-FTI indicative framework for primary education, that is to say i) fiscal pressure of 14 or 16% according to the level of GDP/capita, ii) a 20, 23 or 26% share of domestic public resources for the education sector, and iii) a 50% share of public expenditure on education for primary (basic 6-year) education. The latter parameter naturally implies that 50% of public resources for the sector would be allocated to segments other than primary education. If we accept the idea that public financing of

[26]. It can be noted that there is always a risk of over-extension of this measure, particularly under pressure from personnel, and that targeting is a prerequesite for the amount of individual motivation to remain convincing.
[27]. Supply is not limited to the existence of a school near the family home with a teacher actually present. It is supposed that more qualitative characteristics have also been taken into consideration (annual and daily school hours, adapted content, …) likely to be acceptable for these traditional families; in some cases, this is still not enough and more direct action is necessary in order to stimulate demand (awareness campaigns, and also school canteens, direct financial transfers, …).
[28]. It is evident that if 3 non-teachers and a minimum of 8 teachers are needed to cover curriculum content in a 150-student lower secondary school, then unit cost will be higher (by about 30%) than if the school has only 2 support staff and 6 (slightly more polyvalent) teachers to cover all the curriculum.

pre-school education could obtain 5% of the overall sector budget (a figure often taken as a reference) then this leaves 45% of the education sector budget for the activities considered here.

ii) Concerning secondly the public/private structure of the financing of educational activities at post-primary levels, the principles can be looked at on the one hand and the practical definitions and implementation modalities on the other.

* **As far as the principles** are concerned, one of the basic ideas is that schooling that is supposed to be universal should be free for those who want this; another of the basic ideas is that education always has an aspect of private and of public good, bearing in mind that the private component increases as we moves up the levels of the system and consider the levels of education that lead out on to the labor market.

* **Practically speaking**, let us recall firstly that the EFA-FTI indicative framework accepts a proportion of 10% for private financing for primary education, since there is always a proportion of the population that wants to, and is in a position to, enroll its children in private structures. For the levels of the system studied here, enrollments in private schools for the recent period[29], and on average for the 33 countries covered by this study, register at around 20% in general lower and upper secondary education, 35% in technical secondary and 18% in tertiary education. However, in this respect, again the situation can differ from one country to another; for example in general lower secondary education, while the average value for the 33 countries is 20%, the figure is around or below 8% in say Eritrea or Zambia, but over 40% in Madagascar and Tanzania.

On the basis of the above principles, and although it is more difficult to propose a common framework for all countries on this aspect, the following reference arrangements could be envisaged for the share of educational activities covered by the private sector:

In general lower secondary education, the current level of private financing is linked to the fact that private education has often developed as a response to failings in supply on the public side[30], given moreover that a noteworthy proportion of enrollments are in urban areas. The private education sector does indeed develop more easily in this geographic context (high demand for schooling and capacity for financing studies), but the progressive scaling-up in coverage will mainly affect the rural world where the public sector will have to play the leading role. In view of that, the share of private financing, for a system where coverage is supposed to become progressively universal, could be modest; we are to adopt the figure of 10%, a value similar to that used by the EFA-FTI indicative framework for primary education, as a desirable reference.

In general upper secondary education, the situation is very different structurally. Indeed, whereas an expansion in coverage towards universal education is anticipated for lower secondary education, regulated and relatively limited student numbers are targeted in upper secondary (aiming at quality rather than quantity). This is therefore the most important crux for structural flow regulation in the system. At this junction, substantial private financing is both more useful and more justified. Public financing must on the other hand remain sizeable to allow for schooling of students from modest social backgrounds who are academically brilliant (argument of effectiveness and of equity). In the

[29]. The proportions of students enrolled in structures financed principally by the users are often underestimated, as although official statistics generally collect information from public schools fairly well, statistic coverage is often poorer for private schools, especially in technical and post-secondary education.
[30]. It can be added that over the last 15 years, public efforts (together with international aid) have focused strongly on primary, and much less so on secondary education.

present situation, around 20% of students are enrolled in private education at this level and a figure of around 40% can no doubt be anticipated for the share of private financing, with a need for thinking on the most appropriate forms of implementation for this overall goal.

Integration-oriented vocational training targets young people who, at the outcome of primary education (so long as lower secondary coverage is not universal) or of lower secondary education, do not pursue their studies in school. This will mainly concern actions conducted by and/or in active collaboration with the professional world. In this context, the government's role will be one of technical support and grant incentives rather than direct provision of services. The function of integration being of crucial importance both for improving labor productivity in the informal sector and for making the necessary regulation of student flow in the formal education system socially acceptable, the government should be present and capable of mobilizing the major part of the resources necessary for effective and efficient implementation.

Technical and vocational education corresponds to training courses that are on a parallel to general education, usually lasting two or three years and organized in schools[31] or centers, even if situations of work-based learning may also be part of the formula. Generally, the private sector plays a noteworthy part here with on average 35% of enrollments in our 33 target countries. It is no doubt important for the private sector to maintain a significant role (possibly increasing to 40%), because it has consistently been shown that private financing (coming from users, firms and professional/employer organizations) can contribute to i) improving the definition of training content, ii) curbing training costs and iii) ensuring better integration of trainees in working life. Discussions must also be conducted on this point in each country, in order to define the most relevant forms of implementation of the envisaged strategy.

Finally, **in tertiary education**, dynamics over the past 10 years have resulted in a very high increase in enrollments (with little regulation) in many countries, and public financing that has not followed the development in enrollments; this has led to significant deterioration in conditions of education. In spite of virtually free education for students in public universities, there has been considerable development of private training structures alongside. It is estimated that these institutions have accounted for at least 18% of students on average over the recent period. In addition, the policy for tertiary education certainly aims at finding some balance in the structure of courses of study, between subjects on the one hand, and between academic and professional branches (to the benefit of the second) on the other hand[32]. Employment difficulties for university leavers are known to be common in many countries. The context is therefore seen to be favorable for pursuing the ongoing dynamics of the private university sector through to 2020, and for some increase in the share of users in the overall financing structure of tertiary education. A figure of 40% for the overall share of private financing seems not only desirable, but also plausible with regard to ongoing dynamics.

VII. Financial consequences associated with the different option combinations: volume of public financing for the sector and estimated financing gaps

VII.1 An aggregate perspective at regional level

Firstly, let us recall the options selected to cover the quantity dimension of the scenarios estimated in the modeling process:

[31]. Even if situations of work-based learning may be part of the formula.
[32]. The effective possibilities of distance education will also probably have to be used.

i) the first option, named Q1, anticipates 95% primary completion in 2020, a rate of transition to lower secondary education of 100%, with 10% of enrollments in technical and vocational education; the overall transition rate between the two secondary cycles is maintained at its initial value, the share of technical and vocational representing 15% of enrollments at this level of studies. This option provides for access to integration-oriented vocational training for 50% of those who end their studies after lower secondary education. Enrollments in tertiary education are calculated from those of upper secondary education according to secondary-tertiary transfer rates observed during the base year.

ii) the second quantity option, named Q2, is comparable to Q1 except that 80% of primary school leavers have access to lower secondary education. Integration-oriented vocational training is introduced for 50% of primary school leavers who put an end to their studies at this point.

iii) the third quantity option, named Q3, introduces the distinction between i) the lower part of the system (primary and lower secondary education) which is intended to move towards universal coverage, and ii) the upper part (general and technical upper secondary and tertiary education) where the number of enrollments and their distribution are determined in reference to the demands of the national labor market. Firstly, the desirable number of students in tertiary education is determined with a view to maintaining the graduate unemployment rate at under 25%; then, on this basis, the number of enrollments is identified for upper secondary by applying a coefficient of 2.5 (to allow for secondary leavers); 25% of upper secondary students are in technical and vocational education. Since we are considering progress towards universal education for the lower part and flow regulation adapted to the (relatively limited) labor market demands in the upper part, transition between the two secondary cycles is the (necessarily difficult) junction where these two principles come face to face; a proportion of lower secondary leavers will therefore put an end to their studies at this point and option Q3 anticipates that 100% of these school leavers would then receive integration-oriented vocational training. The primary-secondary transition rate of 80 % used in option Q2 is maintained.

iv) the fourth quantity option, named Q4, follows on from option Q3. It is however more restrictive on three levels: i) the proportion of primary school leavers who have access to lower secondary education is lowered from 80 to 65%, ii) the proportion of school leavers at the end of lower secondary who could benefit from integration-oriented vocational training is lowered from 100 to 50%, and iii) there are harsher demands as to the number of students in tertiary education in that a graduate unemployment rate of 20% is targeted instead of 25% in option Q3.

v) finally, the fifth option, named Q5, stands out significantly from the others in that it anticipates a structural change in the organization of schooling. Here, the system includes a 9-year basic education cycle followed by a single secondary cycle, the length of which is adapted in order to maintain the total duration of primary education and (generally) of the two secondary cycles in the country. This option anticipates a completion rate of 80% in 2020 after the 9 years of basic education. The parameters for the upper part of the system are the same as those in option Q4.

Table 8 below indicates the main quantitative elements for the year 2020 according to the different options for the development of the education systems in the different countries in our sample between the recent period and the year 2020, which is the target reference of this analysis.

Table 8: Regional recap of the different options and their consequences in 2020[33]

		Students (000 000)						Current Gap primary in 2020 (billion $ 2005)	Current gap post-primary in 2020 (billion $ 2005)			% Public costs on external financing in 2020		
		Prim.	Sec 1	Sec 2	TVET	Integr	Tert.			% Education in public resources			% Education in public resources	
Quantity	Base year	100.4	14.9	7.2	0.3	0.0	3.0		Quality	20%	23%	26%	20%	23%	26%
Continuity (2020)	Q1 Trans. PS1: 100%	161.0	56.6	25.8	9.2	2.7	13.8	5.5	C1	35.0	32.0	29.0	70.1%	65.4%	60.7%
									C2	24.5	24.1	18.4	64.0%	58.3%	52.6%
	Q2 Trans. PS1: 80%		42.8	20.4	9.6	4.1	10.8		C1	27.3	24.3	21.3	65.7%	60.3%	54.9%
									C2	19.1	16.1	13.1	59.6%	53.2%	46.9%
Discontinuity (2020)	Q3 Trans. PS1: 80%		42.8	6.6	8.7	11.1	3.6*		C1	18.8	15.8	12.8	59.3%	52.9%	46.5%
									C2	12.3	9.3	6.3	52.4%	44.9%	**37.4%**
	Q4 Trans. PS1: 65%		32.7	6.0	8.3	7.1	2.8*		C1	12.5	9.6	7.0	52.7%	45.2%	**37.7%**
									C2	7.4	4.6	2.0	45.5%	**36.9%**	**28.3%**
	Q5 9 years Prim.	211.6		6.5	0.8	7.4	2.8*	8.2	C1	5.3	2.3	0.6	47.4%	39.1%	**30.8%**
									C2	4.2	1.3	0.3	45.9%	**37.3%**	**28.8%**

Shaded boxes on the enrollments side correspond to a multiplication in enrollments between the base year and 2020 of over 2.5.
Shaded boxes on the costs on external financing side refer to option combinations that lead to an external financing need of under 38% of current public cost.
* The drop in the number of tertiary students in 2020 compared to the base year is particularly to do with Nigeria and Sudan, two countries with a large population and characterized at the present time by a very high number of students and also a very high level of unemployment..

* Firstly, the table indicates enrollments in the different segments of the education system (regional aggregate). In primary education, there are 100.4 million students during the base year (generally between 2003 and 2005) and 161 million anticipated in options Q1 to Q4 by 2020. In option 5, extending the cycle to 9 years leads to an estimated 211.6 million enrollments in 2020. Estimated enrollments in the other segments of the system vary considerably according to the options taken into consideration, but it is of course option Q1 that registers the highest number of enrollments in all segments of the system insofar as it aims at full transition from primary to lower secondary education and the perspective of continuity in student flow beyond that point. However, what makes the biggest difference to the level of enrollments is the break between options Q1 and Q2 on the one hand, adopting the perspective of continuity in student flow through to tertiary education (with enrollments multiplied by 4 by 2020 in option Q1) and options Q3 and Q4 on the other hand, adopting the option of discontinuity and the upper part of the system driven by the demands of the economy (enrollments in upper secondary education are then much lower than in options Q1 and Q2, but those in integration-oriented training are significantly higher).

The sum total of enrollments in the different segments of post-primary education over the recent period in the 33 countries amounts to 24.4 million students; it is anticipated that numbers could rise to somewhere between 57 and 108 million by 2020. Whatever the options (even targeting the most "restrictive" ones), a very high increase in enrollments is anticipated (a factor between 2.3 and 4.4 according to the options, between Q1 and Q4).

Option Q5 must be considered separately. It simulates **a structural modification in the education systems by introducing a 9-year cycle of basic education** for all countries, followed by a single

[33] In terms of share of private financing, we have opted for the following hypothesis in this section : rate of 10% for primary and lower secondary education, 0% for integration-oriented training, 10 or 40% according to the type of technical and vocational training, 40% for upper secondary and 40% for tertiary education.

secondary cycle; the length of the latter may vary slightly in order to respect the current total number of years for primary and secondary studies in the individual countries. Considering the total number of enrollments in the system, this measure has only minimum impact.

* The table also provides financial estimations of the current financing gap for primary and post-primary education (billion dollars 2005) and the dependence index vis-à-vis external aid, according to three levels of priority granted to education within the countries' public financing (20, 23 and 26%). The current gap is calculated as the value of the cost of the services minus the anticipated private contribution and public resources mobilized for primary and post-primary according to the degree of priority selected for the sector.

In primary education, the financing gap in options Q1 to Q4 (with no change in the structure of the national education systems) for the year 2020 is estimated at 5.5 billion dollars in constant 2005 dollars. For option Q5, which introduces a cycle of 9-year basic education for all countries by 2020, public resources set aside for this cycle of study are indeed greater than in options Q1 to Q4 in order to allow for the extension of the cycle, but the financing gap itself is also more consequent since it reaches 8.2 billion dollars in the year 2020.

For the education system's post-primary segments, the aggregate financing gap for the 33 countries in our sample varies considerably according to the scenarios selected.

* In the **hypothesis that budget priority for the sector would be set at 20%** in each country, financing needs would then be considerable in option Q1 for quantity and level C1 (favorable) for the quality of services. External financing needs for post-primary education alone are indeed estimated at 35.4 billion dollars in 2020, with the foreign aid dependence indicator registering at 70.1%; this total has no chance of being mobilized and external dependence is beyond reason. Option C2 (cost-conscious) for the organization of services in the two general secondary cycles significantly reduces these figures, since external financing needs fall to 24.5 billion dollars in 2020 (dependence indicator of 64%). These figures are indeed lower but are still outside the limits of what is plausible or reasonable.

Transition to the Q2 quantity option (identical to Q1 but with a primary-secondary transition rate of 80%) leads to a reduction in external financing needs for post-primary schooling; they now register at 27.3 billion dollars in 2020 in the « favorable » quality option C1 (foreign aid dependence indicator of 65.7%); corresponding figures are 19.1 billion for the « cost-conscious » quality option C2 (dependence indicator of 59.6%). These figures are significantly lower than those obtained with the scenarios estimated earlier; but the global assessment of these scenarios is not fundamentally different in terms of financial sustainability; we are clearly still too far from an acceptable situation.

Quantity option Q3 marks an important break with previous scenarios. Indeed, it introduces the perspective of discontinuity in schooling flow (a reference of 25% for the anticipated unemployment rate for those trained in tertiary education), while maintaining the value of 80% for the primary-secondary transition. Financing needs fall to 18.8 billion dollars in quality option C1 and to 12.3 billion dollars in 2020 for the thriftier option C2, with the dependence indicator then registering at 52.4%.

Option Q4 is comparable in spirit to option Q3, but it restrains the program's criteria and ambitions: in the first place, enrollments in tertiary education (and so in upper secondary education) are based on a reference anticipating an unemployment rate of 20% rather than 25% for those trained at this level of study; secondly, it anticipates a 65% primary-lower secondary transition rate in 2020. Not

surprisingly, current external financing needs continue to decrease; they are now around 12.5 billion dollars during the year 2020 in option C1 and around 7.5 billion dollars in option C2. The said needs in overall external financing for the sector (including mobilized capital expenditure) lead to a foreign aid dependence indicator of 46%.

Financing needs in option Q5 (introduction of 9-year basic education for all countries) in a perspective of discontinuity in student flow (20% as a reference for the unemployment rate of those trained), are more or less of the same magnitude as in option Q4, but it must be remembered that option Q5 offers 80% completion after 9 years basic education while option Q4 only offers around 60% (the option introducing a cycle of basic education is again found to be a little more favorable than the one maintaining the structure of the study cycles in their present configuration). The dependence indicator is around 48%.

Upon completing these estimations, it is seen that, with a 20% priority for the sector, the volume of domestic public resources for education, as an aggregate value for the 33 countries, would not be compatible with very ambitious goals for post-primary education. That would involve massive external financing; but the estimated figures would seem difficult to mobilize. That said, the cornerstone for progress would consist in having a reference on i) what it would be possible for the countries to mobilize in public resources for the sector; ii) what it would be possible for foreign aid to mobilize, and iii) the level of dependence vis-à-vis external aid that would be acceptable for recipient countries and donor countries alike. This technical study cannot of course make firm proposals in these respects. It is however possible to test some hypotheses in order to make progress.

If we were to concede for the time being that a maximum level of dependence were 33% (external aid financing 33% of total expenditure, or corresponding to 50% of domestic public resources for the sector). On the basis of this criterion, none of the programs envisaged above would be totally sustainable. Two options are then possible: i) the first would be to reduce ambitions, in terms of quantity and/or of quality of services; ii) envisage a higher priority than 20% for the countries' domestic public resources bringing it up to say 23 or 26%. Let us examine the potential impact of this measure.

Bringing the priority for the sector up to 23 or 26% enables a reduction both in the need for external financing and in external dependence. If 33% is targeted for the dependence indicator, we now see that some of the programs envisaged in this document are sustainable; this is not however the case for all of them. Programs Q1 and Q2, whether level C1 or C2 for the quality of services, do not satisfy the reference criterion for financial sustainability. The only programs in line with the criterion are in quantity options Q3 and Q5. Even so, option Q3 is still only more or less sustainable (dependence indicator of 37%) in option C2 and with a budget priority of 26%. The same goes for option Q4 if option C1 were selected for the quality of services. As for quantity option Q4 with the services defined according to the C2 formula for quality and option Q5, they are sustainable with a priority for the sector of 23%.

VII.2 Different situations from country to country and initial conclusions

The analyses just presented concerned the aggregate situation of the 33 countries in our sample. This approach is useful for establishing general directions and overall orders of magnitude; it must be completed in order to incorporate the specific situations of the different countries, which we know to be very different on the issue of interest to us here.

Tables that are comparable to the aggregate one for the 33 countries can be proposed for each individual country. However, this would be too detailed for this synthetic document. That is why we are to introduce this individual perspective without going into detail over each country. In addition, we are to limit the presentation to quantity options Q3 to Q5, insofar as only 5 countries out of the 33, can envisage a level of dependence of under 35% with options Q2 or Q1. These five countries are Republic of the Congo, Gambia, Kenya, Lesotho and Mauritania with the easiest cases being *a priori* Gambia and Lesotho; Congo, Kenya and Mauritania can reach option Q2, but with quality C2 and on condition that they adopt a budget priority of 26% for the sector.

For 14 of the 33 countries in our sample, none of the combinations of the selected quantity-quality-financing options, even the least ambitious in terms of services and the most demanding in terms of mobilization of domestic resources, enables a level of dependence of below the reference of 35%, taken here as a maximum value. These countries are Burkina Faso, Burundi, Democratic Republic of Congo, Eritrea, Ethiopia, Guinea-Bissau, Malawi, Niger, Uganda, Central African Republic, Rwanda, Sierra Leone, Chad and Zambia. This means that new scenarios would be necessary for these countries. As it does not seem desirable *a priori* to go too far below the parameters of option C2 for quality, this will imply either lowering perspectives in schooling coverage on the 2020 horizon (which would mean a more distant horizon for achieving the same results), or reviewing the volume of public resources upward[34] (beyond the 26% priority granted to the sector).

For the other 14 countries, the situation is more or less difficult. The case of Benin, Côte d'Ivoire, Nigeria, Senegal and Zimbabwe seems relatively manageable but on condition that they choose quantity option Q4 and the (cost-conscious) option C2 for quality, given that they could then « make do » with a level of priority of 23%. The case of Cameroon, Ghana and Guinea seems more problematic, and this is all the more true for Madagascar, Mozambique, Togo and Tanzania where quantity option Q4 and C2 for quality are associated with a budget priority of 26%.

Finally, it should be remembered that the different options, particularly those defining the organization of educational services and related unit costs (options C1 and C2), were determined in a reasonable way, but common to all countries. Even if it may be deemed useful to take these options into consideration, they may be difficult to implement for some countries[35].

Revisions and adjustments are therefore probably unavoidable for the majority of countries, and in fact no doubt necessary for all. This is because the choice of structural parameters for coverage, organization of services and their financing, can be more finely calibrated according to the specific characteristics of the different countries and to their social choices. In any case, the modeling structure proposed here must be considered as public good liable to be owned both by each individual country and by the community of development partners in order to simulate new configurations. Definition of any new scenario remains conditioned by the need for medium-term sustainability through the sum of national resources and external aid.

VII. Conclusion:

The estimations made prepare the way for defining the educational policies, a necessary step for the different countries in organizing the development of post-primary levels. Some, inevitably

[34]. If the bar is lowered for the mobilization of domestic public resources and a figure of 23% adopted for the level of priority for the sector, there are then 21 countries, rather than 15, for which no single configuration fits the indeed conventional yet reasonable criterion of 35% for the dependence of the sector on external aid.

[35]. For example, a salary level representing around 5 times the GDP/capita is anticipated in lower secondary education while it represents around 9 times the GDP/capita in Togo and Mozambique at present.

provisional, conclusions of the exercise can however be drawn, taking into account the convention of a level of dependence of 5%, and the specific and limiting dimension of the different options selected. We are to select six important aspects of these multifaceted conclusions:

i) the first conclusion is that options anticipating a significant increase in lower secondary coverage and which adopt a perspective of continuity in student flow, are generally not financially sustainable. Significant formulas for structural student flow regulation at the outcome of lower secondary education (and temporarily at the outcome of primary education) must generally be considered. The options chosen here, in reference to an estimation of the risk of unemployment on the labor market for those trained in tertiary education, seem reasonable. It is to be noted that, while this perspective leads to interesting results in terms of financial sustainability, it is also of interest in itself, since avoiding employment difficulties for a growing number of young people trained in the upper part of the system has obvious advantages.

ii) the second conclusion is that there is no doubt that it will be necessary for the countries to go beyond the reference of 20% for priority to the education sector; a figure of 23% seems a minimum to be considered here.

iii) the third conclusion is that it is no doubt the "cost-conscious" hypothesis in the definition of educational services that should be selected. Once again, options C1 and C2 selected here are of an instrumental and conventional (but reasonable) nature and can be adjusted to adapt to the variety of country situations; that said, option C2 (cost-conscious) for organization, quality and unit cost of services will often probably have to be considered.

iv) the fourth conclusion is that the formula that consists in modifying the structure of the education systems in order to introduce 9-year basic education is somewhat favorable, but that there is no considerable impact on sustainability if the country chooses a C2-type option (cost-conscious) for the organization of educational services at secondary level. It should however be pointed out that structural changes may cause significant disruption and that the issue of international standards for diplomas should also be studied.

v) the fifth conclusion is that while all the countries certainly have some characteristics in common, their situation with regard to the difficulty in setting up an ambitious educational policy for post-primary education is extremely varied; additional work, either using the instrument developed for this study or using sectoral simulation models available in a number of countries, will still be necessary.

iv) finally, the sixth general conclusion is that international aid, whatever the formulas selected by the different countries for post-primary development, will be called upon to significantly contribute to financing these programs in sub-Saharan African countries. It is certainly useful to refer to the level of dependence, but discussion on the financial totals involved in each country will of course be inevitable.