EDUCATION SECTOR ANALYSIS METHODOLOGICAL GUIDELINES

VOLUME 1

United Nations Educational, Scientific and Cultural Organization
International Institute for Educational Planning
Pôle de Dakar
THE WORLD BANK
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GLOBAL PARTNERSHIP for EDUCATION
quality education for all children

CHAPTER 3

COST AND FINANCING

› Chapter Objective:
To offer approaches to the analysis of: (i) the structure of education financing (including by the government, donors and households), its distribution (by item, education level and type of school) and evolution over time, and (ii) the breakdown of spending, through recurrent unit costs, household contributions, and capital costs.

1. EVOLUTION OF EDUCATION EXPENDITURE AND ITS COMPOSITION

ISSUE

Does the country prioritise the education budget? How have priorities between different expenditure items and education levels evolved over recent years? Does the distribution of spending across sub-sectors reflect the education system's development priorities? What is the level of education funding from development partners and how dependent is the sector on international aid?

OBJECTIVES

- For the last 10 years, detail the amount and breakdown of education spending, differentiating between recurrent and capital (development) expenditure;
- For recent years, detail the distribution of spending by item and level;
- For the most recent year, consolidate personnel data from different sources, break down recurrent expenditure into salary and non-salary expenditure, by level, location and cost-center (central services, decentralised services, schools, and so on); and
- Review the evolution of education financing through international aid;

METHODS

- Consolidate overall public education and training expenditure;
- Select the most recent year for which expenditure data is available by level;
- Compare the different numbers and lists of personnel from various departments, distinguish between the sector personnel, personnel used by the system but on other ministries' payrolls, and personnel on the education payroll but practicing elsewhere, and then estimate salary expenditure by personnel type; and
- Compile a list of activities financed by partners through projects and budget support (education sector or global), at least for the chosen reference year.

SOURCES

- Detailed executed/actual budget data supplied by the budget division of the finance ministry, and/or the education ministries' financial affairs departments;
- School survey data, personnel data from the education ministries' human resource departments and payroll data from the finance ministry and the civil service commission;
- Consolidated school grants expense reports; and
- International aid data collected from development partners or the OECD/DAC.

2. ESTIMATION OF UNIT COSTS AND ANALYSIS OF THEIR COMPOSITION

ISSUE

What is the level of spending per student? What is the trade-off, intentional or not, between the number of pupils enrolled and the spending on each? What are the most expensive items of this spending? What scope exists to change unit costs?

OBJECTIVES

- Calculate public recurrent unit costs for each cycle;
- Evaluate the respective importance of the different factors of unit costs through a comparative approach; and
- Analyse disparities in teaching salaries by status and how attractive teaching salaries are compared to other civil servants' and private sector pay.

METHODS

- Use a macro approach that consists of dividing the amount of public recurrent expenditure for each cycle by the number of pupils enrolled in public or private subsidised schools; and
- Use a micro approach to detail the different factors of unit costs.

SOURCES

- As above; and
- For salaries: employment surveys, household surveys (where questionnaires detail individual income) and data on teacher attrition and loss.

3. ESTIMATION OF HOUSEHOLD CONTRIBUTIONS

ISSUE

What is the level of household contributions to education? What is the public-private cost-sharing for each cycle? Do private schooling costs penalise the enrolment of the poorest pupils, especially in basic education?

OBJECTIVES

- Estimate the level of household education spending and the share of household contributions to total education spending, by level;
- Study the variations in household spending by type of school, location, and parents' socioeconomic characteristics; and
- Analyse the sustainability of household education spending, in particular for the poorest.

METHODS

- Calculate average annual household spending by type of school, gender, area of residence and family income; and
- Compare, for each education level, the costs borne by households and those borne by public financing.

SOURCES

- Estimations based on household survey data (living standards surveys, household budget and consumer surveys and so on).

4. COMPARISON OF THE COST OF DIFFERENT TYPES OF SCHOOL CONSTRUCTION AND OTHER EQUIPMENT

ISSUE

How does the unit cost of the construction of an equipped classroom vary according to the building approach used? What are the unit costs of other types of construction and necessary key equipment (laboratories and so on)? Are these costs sustainable for the system's development? What is the importance of capital expenditure in comparison with recurrent expenditure?

OBJECTIVES

- Compare the cost of providing an equipped classroom according to the various building options available nationwide (those used by the state, by communities, by development partners and by NGOs);

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- Estimate the unit costs of other types of buildings and key equipment; and
- Compare annualised infrastructure costs with recurrent unit costs.

METHODS

- Review the types of construction, buildings, procurement methods and execution methods used by the state and its partners as exhaustively as possible, and compare their costs and comparative advantages;
- Calculate annualised infrastructure costs on the basis of their life-span, and compare with annual recurrent expenses, per classroom or per student; and
- Compare annualised costs with those of a comparable country.

SOURCES

- Construction departments of the education ministries and the ministry responsible for infrastructure and public works; and
- Data supplied by development partners who finance capital costs.

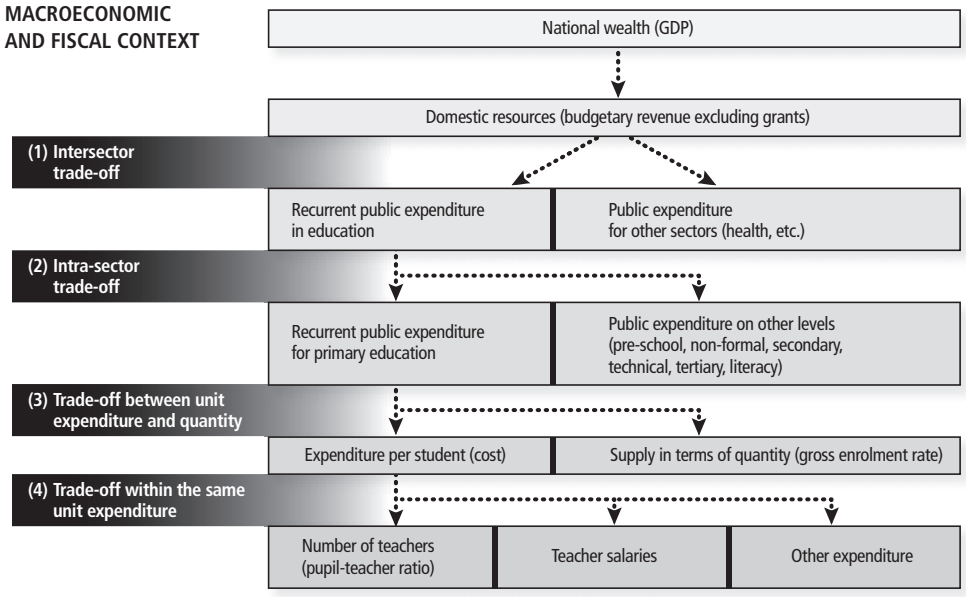
Introduction

This chapter explains how to survey and analyse all information pertaining to the resources mobilised for the education sector. Although the analysis focuses first and foremost on public financing, over which the state has most control, all funding sources are examined (public resources, international aid, private spending). The chapter also deals with the use that is made of these resources, and especially measures the cost per student (unit costs).

The chapter is divided into four sections: (i) The first analyses the evolution of the volume of public and external resources mobilised by the sector, from an aggregate perspective. It analyses the evolution of public education expenditure by education level and according to its different components (salaries, goods and services, scholarships and other welfare, operating costs). It then analyses, for the most recent year for which data are available, the detail of these expenditures by level and component; (ii) The second part deals with the estimation of education unit costs for each level, and evaluates the respective importance of the three main factors of unit costs (average teacher salary, the percentage of recurrent expenses other than teaching salaries and the pupil to teacher ratio), from national and comparative international perspectives. It also analyses disparities in teacher salary levels according to their status (civil servants, contract teachers, and community teachers, for instance); (iii) The third section examines the contribution of households to each cycle and their potential impact on enrolment; and (iv) Finally, the fourth section analyses the costs related to school construction and equipment.

Figure 3.1 summarises and illustrates the different financial trade-offs, voluntary or not, that are made in education expenditure. The first level (macroeconomic and fiscal context) has been dealt with in Chapter 1. The distribution of spending within and across sub-sectors is analysed in the first section of this chapter, and the last two levels are examined in section 2.

FIGURE 3.1 - Summary of the Different Levels of Financial Trade-offs



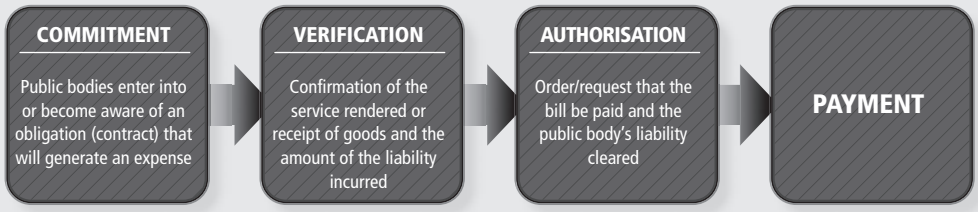
SECTION 1 PUBLIC EDUCATION EXPENDITURE

1.1 GOVERNMENT SPENDING

Public education expenditure can come from different sources. In some countries, various ministries are in charge of education services, by level (one is in charge of basic education for instance, another of secondary and a third of higher education) or by type (general education, higher education and TVET for instance). Some education or training programmes can be organised or financed by ministries responsible for specific areas (the ministries of health, agriculture, justice, or employment for instance). Furthermore, in decentralised contexts, some local institutions can be in charge of multisectoral budgets, of which a share may be allocated to the education sector. The aim of this section is thus to consolidate all public expenditure for education and training activities, independently of individual national arrangements, aiming to be exhaustive and to avoid duplication of accounts.

Also, despite the availability of official documents (finance laws, budgets), it is important in such an analysis to determine as precisely as possible what has effectively been spent. Finance laws or budgets indicate spending intent, and not effective spending. This may be lower due to governments' spending capacities or due to issues related to the collection of funds (taxes, duties and so on).[18] Effective spending can also be intentionally reduced with respect to the initial budget, when this is greater than expected, in which case a budget revision is generally voted. The analysis will therefore clearly distinguish between the voted budget and the executed budget, which accounts for what has effectively been spent and incorporates potential further expenditure associated with budget revisions. On the other hand, there is great tension in this exercise between the search for precision and the will to use the most recent data, as executed budget data is often only available for relatively old

FIGURE 3.2 - The Stages of Public Expenditure



periods (two or even three years back). To use committed expenditure data is a good compromise in such cases.

This analysis will examine, in addition to the level of education expenditure, some key indicators that reflect the importance of this expenditure in the national context. It will focus on two indicators in particular:[19]

- *Public recurrent education expenditure as a share of public recurrent expenditure, excluding debt service.* This indicator reflects the priority that is effectively given to education by governments within the expenditure over which it has control (for this reason debt service is excluded, being "compulsory"). This is often considered an indicator of effort towards the education sector; Box 3.1 presents the elements to keep in mind while calculating it.

- *Public recurrent education expenditure as a share of GDP.* This indicator places education expenditure in the context of national wealth. It is the share of national wealth spent by governments on education. This indicator can also be presented as education expenditure per capita as a share of GDP per capita, placing education expenditure in relation to the size of population and average income.

• Key Definitions

Recurrent Education Expenditure as a Share of Public Recurrent Expenditure Excluding Debt Service is the relation of all recurrent education expenditure financed with national resources to total recurrent public expenditure excluding the service of debt:

$$\frac{\textit{Recurrent Public Education Expenditure}}{\textit{Recurrent Public Expenditure, Excluding Debt Service}}$$

Recurrent Education Expenditure as a Share of GDP is the ratio of total recurrent education expenditure to gross domestic product:

$$\frac{\textit{Recurrent Public Education Expenditure}}{\textit{Gross Domestic Product}}$$

Recurrent education expenditure may also be examined as a percentage of governments' domestic resources for instance, or total national education expenditure as a share of GDP.

All of these indicators have the advantage of being comparable in both temporal and international perspectives. Their evolution over recent years may therefore be examined, before comparing them to those of other countries in the region, or sharing similar development levels.

BOX 3.1
THE FINANCIAL EFFORT FOR EDUCATION

The financial effort made by countries for the funding of their education is often used by development partners to determine their own level of financial commitment. This financial effort is generally measured by the share of the education budget in the total national budget. It is thus important to properly define both numerator and denominator, in order not to distort this representation of the national effort.

- The budgets considered in the calculation are recurrent budgets. Investment budgets are often more volatile, which would create artificially great variations in the indicator value. They are also more often financed from development partners' programs, which don't represent the national effort.

- External funding should be excluded from both numerator and denominator, because they do not result from national decisions and effort. In practice, the denominator is thus the expenditures made from domestic resources, and does not includes external resources (grants and loans); all education projects and sector budget support financed by development partners will also be excluded from the numerator, the only exception is general budget support, for which it is difficult to dissociate the funds from domestic resources at the sector level. One may thus keep general budget support both in the recurrent education expenditures and in the domestic resources.

- As mentioned above, debt service is excluded from the domestic resources. Servicing public debt is mandatory for indebted developing countries, and the amount of resources that the state has decision power over is what is left when this service is paid.

The indicator is thus calculated as follows:

$$\textit{National Financial Effort for Education} = \frac{\textit{Recurrent Education Expenditures financed from domestic resources}}{\textit{Total Recurrent Expenditure financed from domestic resources, excluding debt service}}$$

Example 3.1 below, drawn from The Gambia CSR, 2011, presents the volume of education expenditure, both recurrent and capital, in a summary table, as well as recurrent education expenditure as a share of total recurrent expenditure, of national income and of GDP (See Section 1.4 for an analysis of international aid).[20] This example also presents the country's situation in the context of ECOWAS and the continent.

EXAMPLE 3.1

(Breakdown of Public Education Expenditure by Type and Source): Public Education Expenditure, The Gambia, 2001-09

Source: Adapted from The Gambia CSR, 2011.

The government assumes the majority of recurrent education expenditure, and donor contributions are devoted largely to development (capital) expenditure. For analytical purposes, spending on government scholarships to support girls' schooling in upper basic and senior secondary schools, generally included in development expenditure, has been considered within recurrent expenditure.

TABLE 3.1 - Breakdown of Education Financing, by Type and Source, The Gambia, 2001-09

	2001	2007	2008	2009
Level of Education Funding (Millions of Dalasis)				
Recurrent (Government spending)	142.5	341.2	426.8	479.7
Development (Capital)	84.2	249.8	416.9	416.3
Government Financing	5.7	14.7	29.9	69.3
Donor Financing	78.4	235.1	387.1	347.0
Total National Education Expenditure	148.2	355.9	456.7	549.0
Total	226.7	591.0	843.7	896.6
Recurrent Education Expenditure (Percent)				
As a Share of Total Government Recurrent Expenditure*	16.7	19.2	17.2	17.8
As a Share of Domestic Revenue (Excluding Grants)	14.4	9.8	12.2	12.0
As a Share of GDP	0.9	1.6	1.9	1.8
Donor Financing as a Share of the Total Education Budget	34.6	39.8	45.9	38.7
Total Government Expenditure as a Share of GDP	0.9	1.7	2.0	2.1

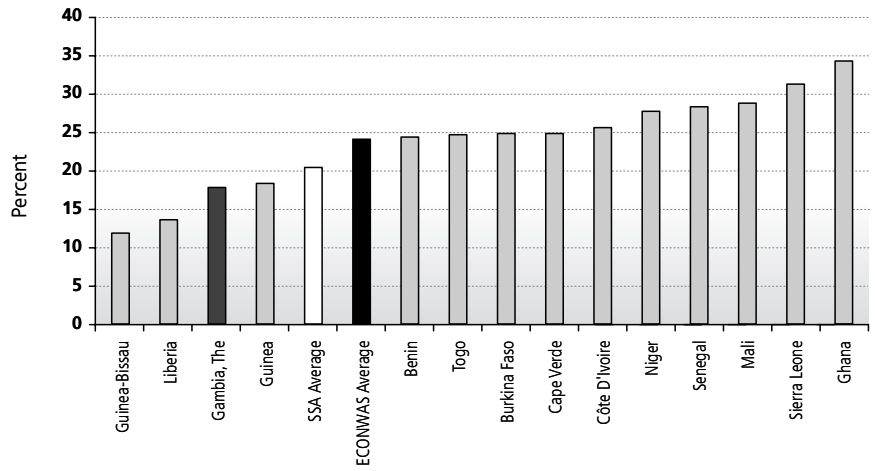
Note: * Government recurrent expenditure excludes the service of debt.

Findings

Total national education expenditure increased from 0.9 percent of GDP in 2001 to 2.1 percent of GDP in 2009. Recurrent education expenditure represents an average of 18 percent of recurrent government expenditure, excluding debt service. Most of public education expenditure has been devoted to recurrent costs, with negligible amounts being spent on investment. However, government capital spending has risen from 4 percent [=5.7/(5.7+142.5)] of total public expenditure in 2001 to 13 percent [=69.3/(69.3+479.7)] in 2009.

Figure 3.3 shows that in spending 17.8 of total recurrent expenditure excluding debt service on education in 2009, The Gambia ranks well below its neighbours in the ECOWAS sub-region; this percentage is only higher than those of post-conflict Guinea-Bissau and Liberia (See Figure 3.3), and is below the FTI benchmark of 20 percent. With a sub-regional average of 24 percent, there is scope for The Gambia to increase the priority given to education in public spending.

FIGURE 3.3 - Education Share of Public Recurrent Expenditure, The Gambia and ECOWAS Countries, 2009 or MRY



1.2 EVOLUTION OF PUBLIC EXPENDITURE BY TYPE OF SPENDING

The objective of this section is to analyse the distribution of education expenditure by type of spending. According to the structure of the budget, some budget lines may have to be consolidated or separated. National budgets are generally composed of two types of expenditure: recurrent and capital (also known as development or investment). Within recurrent expenditure, the budget lines devoted to personnel, goods and services must be isolated from the budget lines devoted to subsidies and transfers. Scholarships and other welfare spending are generally included in the budget line for transfers. Some personnel expenditure (contract or community teachers paid by the government) may also be included within the budget line for transfers; it is important that they too be isolated.

To summarise, the accounting logic that prevails in budget elaboration often leads the spending items that the analyst seeks to identify to be combined with others. Only a very mindful read of the budget enables these distinctions to be made. As a first step of analysis, attempts should be made to categorize spending items as follows:

- *Wages and Salaries:* All spending on the salaries, bonuses and expenses of education civil servants, both teaching and non-teaching (administrative, maintenance, security personnel and so on) as well as payments by the government (possibly at the decentralised level) to to civil servants, contract/volunteer/ community teachers and other non-teaching

education personnel. The allowances and social benefits received by such staff are also included in this category, such as retirement funds, health insurance and so on;
- *Goods and Services:* All spending on goods, excluding capital spending, as well as service contracts, subcontracting or consultancy expenses (distribution of pedagogical materials, external audits and so on);
- *Subsidies and Transfers:* All fund transfers and subsidies to independent education agencies and institutions (training institutes, universities and so on) as well as school grants;
- *Scholarships and Other Welfare:* All school feeding, university restaurant and boarding expenses, as well as the amounts allocated to student scholarships both at home and abroad.

The categories obtained will thus often differ from those presented in the budget. It will be necessary to ensure that they are clearly defined (and calculated in the same way for each year covered by the analysis), and that the total effectively coincides with the total education expenditure identified in Section 1.1. Annex 3.3 provides the concrete methodology for the consolidation of financial data.

Example 3.2 below, drawn from the Benin CSR, 2009, illustrates how these spending categories and their evolution can be analysed. It offers a presentation of the amounts spent per category, each of which is then analysed in terms of their share of total expenditure. It is apparent that the authors were unfortunately not able to isolate the remuneration of local contract teachers, paid by parent-teacher associations. This remuneration is therefore included in the transfer category, which limits the analysis somewhat. On the other hand, this problem having been identified, the figures and their evolution can be analysed in this perspective.

EXAMPLE 3.2

(Breakdown of Public Education Expenditure by Nature): Public Education Expenditure, Benin, 1992-2006

Source: Translated and Adapted from the Benin CSR, 2009.

TABLE 3.2 - Structure of Public Education Expenditure, by Nature, Benin, 1992-2006

Share of Total (%)	1992	2000	2003	2004	2005	2006
Recurrent Expenditure	*96.9*	*85.0*	*81.3*	*84.4*	*90.1*	*90.5*
Personnel	78.3	51.5	45.1	48.8	52.9	54.2
Goods and Services	8.1	14.1	13.7	11.6	9.7	9.7
Transfers	10.5	17.7	19.1	21.2	24.8	25.1
Equipment	0.0	1.7	3.4	2.7	2.7	1.5
Capital Expenditure	*3.1*	*15.0*	*18.7*	*15.6*	*9.9*	*9.5*
National	1.2	5.6	13.1	7.4	5.4	3.7
International	1.9	9.4	5.6	8.3	4.5	5.8
Total	100	100	100	100	100	100

Note: * Not including the (minimal) expenditure of the literacy subsector.

Findings

Table 3.2 illustrates the extreme predominance of recurrent expenditure in total expenditure, as is the case in most education systems, with a share between 80 and 97 percent for the 1992 to 2006 period. The share of recurrent expenditure dropped in the 1990s before increasing from 2001 onwards. This increase is generally at the expense of capital expenditure, whose share of total expenditure dropped considerably, from 15.0 percent in 2000 to 9.5 percent in 2006.

The data also reveals that the share of personnel spending has not significantly increased since 2000, having reached 54.2 percent in 2006 from a level of 51.5 percent in 2000, despite the important evolution noted in enrolment (mentioned in Chapter 2 of the CSR). This finding does not reflect the reality however, given that the salaries of local contract teaching staff for preschool, primary, general secondary and technical and vocational secondary, recruited in part to respond to the expansion of the system, are paid on public resources transferred to parent-teacher associations (PTAs). In the past they had taken the initiative to recruit this type of teacher on their own resources. These resources, made available to PTAs and included in the transfer category, are the source of strong growth in the share of transfers since 2000, and the real cause of the structural change of the budget.

Finally, although the reduction of the share of spending devoted to socio-administrative equipment is less significant (1.5 percent in 2006 against 1.7 percent in 2000), the reduction of the share of spending devoted to goods and services (used in part for the purchase of pedagogical material) is notable, given that it was below 10 percent in 2005, against 14 percent in 2000.

In terms of capital spending, the share of investment spending supported by external funds (i.e. international) has evolved erratically: from 9.4 percent in 2000, it first dropped to 5.6 percent in 2003 before rising to 8.3 percent in 2004 and dropping anew to 5.8 percent in 2006. The evolution of the share of capital spending supported by national funds has not been quite as irregular. An increase from 5.6 percent in 2000 to 13.1 percent in 2003 was nevertheless followed by a drop, to reach 3.7 percent in 2006.

1.3 THE DISTRIBUTION OF SPENDING ACROSS SUB-SECTORS

Executed or committed budgets should be used here to distribute spending among the different education cycles according to their purpose (for instance, transfer spending to give primary community teachers a bonus should be accounted for as primary spending). In practice, this allocation is not always easy: for instance, budgets often consolidate primary and secondary administrative spending (or general secondary and technical training spending). Some spending items also cover different education levels by their very nature, such as the operational expenses of the planning or human resource departments of the education ministry, that provide services to all cycles covered by the ministry. Estimations are then carried out to distribute these common expenses among levels.[21] A breakdown

formula must thus be determined. Usually, the distribution is carried out according to the pro rata of the payroll of active teachers or that of all school personnel, or in their absence, according to the pro rata of spending specifically pertaining to each level. This method is described in Annex 3.3.

The structure of the distribution of spending among different education levels provides an idea of the priority that governments give to each and enables the identification of potential desirable adjustments in the priorities, in particular as compared to the policy priorities intended.

In this analysis of the national situation, and of the distribution of expenditures across the locally defined cycles, it can also be helpful to compare the distribution of expenditure by level for the country of analysis with that of countries with similar contexts. However, as the length of the cycles is different in some countries, two approaches can be used to avoid comparative bias. The first compares the country of interest with others sharing the same education system structure (most francophone countries have a 6-4-3 structure for instance: six years of primary, four years of lower secondary and three years of upper secondary). The second is to erase the difference that may exist among countries in the duration of their education cycles by artificially harmonizing those durations through preliminary adjustments (See Annex 3.1).

Example 3.3, drawn from the Mali CSR, 2010, presents the distribution of public education expenditure by level and its evolution over recent years, before placing it in a regional context, in comparison with countries whose education system structures are similar.

1.4 DETAILED ANALYSIS OF PUBLIC RECURRENT EXPENDITURE FOR THE MOST RECENT YEAR

The aim of this section is to carry out a more detailed analysis of the data used in the previous section, for the most recent year for which data is available. This analysis will aim to provide additional information on the functional distribution of expenditure, distinguishing between different spending items (teaching and support personnel, pedagogical and service spending, scholarships and other welfare) for each level as well as between the various cost-centers responsible for their execution (schools, central and decentralised services, subsidised private schools and so on). This involves a fairly detailed analysis, whose coherence must be carefully checked. Experience shows that it is helpful to begin with a clear description of the distribution of the actively employed personnel, to then reconstitute the distribution between personnel expenditure and other non-salary spending, and that a preliminary cleaning and consolidation of the personnel data is often necessary.

EXAMPLE 3.3

(Distribution of Public Education Expenditure in Regional Context): Public Education Expenditure by Level, Mali, 2008

Source: Adapted from the Mali CSR, 2010 and the Mali CSR, 2007

Findings

The distribution of public education resources across sub-sectors has significantly evolved over the last 14 years, although somewhat erratically. The share of recurrent expenditure allocated to primary education grew from 27.4 percent in 1995 to 35.0 percent in 2004 and 36.5 percent in 2008. This however remains significantly below the 50 percent observed in many other countries (which is also the Global Partnership for Education benchmark). Other data (not shown in the table) shows that the share of expenditure devoted to lower secondary in 2008 (16.7 percent) is below that observed in 2004 (17.8 percent). On the other hand, the share allocated to upper secondary education has decreased from 16.4 percent in 2004 to 12.9 percent in 2008, and that of technical and vocational education has remained grossly stable, at 9.3 percent in 2004 and 9.9 percent in 2008. The reduction in the share allocated to upper secondary between 2004 and 2008, although benefitting primary education, has equally benefitted higher education, whose share grew from 16.3 percent in 2004 to 17.6 percent in 2008.

TABLE 3.3 - International Comparison of the Structure of Recurrent Education Expenditure, by Level (Francophone Countries of Sub-Saharan Africa)

Country	Year	Primary	General and Technical Secondary	Higher	Other (Pre-primary, Literacy, etc.)
Mali	(1995)	27.4	45.6	23.1	3.9
Mali	(2004)	35.0	43.5	16.3	5.2
Mali	**(2008)**	**36.5**	**39.5**	**17.6**	**6.5**
Benin	(2006)	53.6	23.5	19.7	3.2
Burkina Faso	(2006)	56.4	17.2	22.2	4.2
Burundi	(2004)	47.0	29.9	20.0	3.1
Congo	(2005)	25.8	39.0	29.8	5.4
Côte d'Ivoire	(2007)	42.7	34.6	20.9	1.8
Guinea	(2005)	37.5	30.8	26.4	5.3
Guinea Bissau	(2006)	56.7	26.9	11.1	5.3
Niger	(2008)	57.3	26.3	13.1	3.3
CAR	(2005)	49.0	25.0	21.0	5.0
Senegal	(2004)	43.9	27.7	27.8	0.6
Togo	(2007)	38.8	39.7	20.3	1.2
Average of 11 Countries		**46.2**	**29.1**	**21.1**	**3.5**

1.4.1 CONSOLIDATION OF THE PERSONNEL DATA

The analysis should begin with an inventory of the personnel. This is justified on the one hand by the importance of salary spending (usually at least two-thirds of the education budget) and on the other by the need to clean up and consolidate the data. Indeed, some staff may be paid on the education budget despite not performing any education system

duties (staff that perform other roles or are transferred to other ministries, and ghost teachers/staff), or conversely, some staff may work in education while being paid on other ministries' budgets (sports trainers that are paid by the ministry of youth and sports, art teachers that are paid by the ministry of culture and so on). The analysis will be focused on those personnel paid by the state (or, if relevant, by decentralised public institutions). However, by the same logic, if some personnel paid by the state are posted in public or community school, they should be included in this analysis.

This process is carried out by comparing various data sources, including: (i) school statistics (school staff censuses); (ii) data from the human resource department of the education ministries (databases covering all personnel employed in the sector; in some countries, this may be limited to staff working in central and decentralised services); and (iii) finance ministry payroll data, or in some countries, that of the ministry of civil service.

The reconciliation of figures from different sources often represents an arduous but necessary task, as it is an indispensable basis for further analysis as well as for the estimation and definition of parameters of the financial simulation model for the sector's planning process. Once the personnel inventory is complete, it is important to reconcile the numbers with the related financial amounts. This must be carried out based on information on the distribution of personnel by qualification type and salary on the one hand, and information on average salary levels for each category on the other. It eventually enables the consolidation of the entire payroll for the sector. Annex 3.3 details the important steps for the consolidation of these data and the reconstitution of the payroll.

When the gaps between different data sources are significant, it is sometimes helpful to present the data obtained from each source, and the corrections and adjustments done.

1.4.2 DESCRIPTION OF EDUCATION PERSONNEL AND RELATED SALARY EXPENDITURE, BY LEVEL AND ROLE

Once the personnel data are consolidated, these personnel numbers and associated budgets can be presented. To that end, staff must be classified according to their job and not their status. It is common that teaching staff carry out administrative duties, in which case they should be treated as non-teaching staff for the purpose of the analysis. Personnel must therefore be broken down into those effectively responsible for teaching activities on one hand (in-class teachers also called "chalk in hand" teachers), and those who carry out administrative or support duties on the other. Distinction should be made by type of institution (schools, central or decentralised administrative services) and level.

Example 3.4 below, drawn from the Congo CSR, 2010, illustrates the kind of table that can be produced once the personnel numbers from various sources have been consolidated. This example also shows the relative importance of the respective payroll burdens, and presents the share of non-teaching staff in a regional perspective.

EXAMPLE 3.4

(Analysis of Personnel Expenditure): Public Education Personnel Expenditure, Congo, 2009

Source: Adapted and Translated from Congo CSR, 2010.

Table 3.4 presents the data for active staff working for the three education ministries. It incorporates the cost of personnel paid for on transfer budget lines such as volunteers or the personnel of the Marien Ngouabi University. The distinction between "chalk in hand" teachers and non-teaching staff is obtained by crossing function and posting information.

TABLE 3.4 - Education Sector Personnel and Related Salary Expenditure (Payroll in Millions of CFAF), Congo, 2009

	"Chalk in hand" Teachers	Non-Teaching Staff		Total	Payroll (in Millions of CFAF)			
		Schools	Services		Teachers	Other (Schools)	Other (Services)	Total
Preschool	243	298	435	976	254	348	588	1,191
Primary	*4,030*	*1,417*	*3,229*	*8,676*	*4,682*	*1,871*	*4,260*	*10,813*
Civil Servants and Contracted	3,211	1,374	3,193	7,778	4,199	1,845	4,237	10,281
Volunteers	819	43	36	898	484	25	23	532
Lower Secondary	*1,732*	*1,183*	*1,293*	*4,208*	*2,595*	*1,755*	*1,868*	*6,218*
Civil Servants and Contracted	1,463	1,158	1,268	3,889	2,357	1,733	1,845	5,935
Volunteers	269	25	25	319	238	22	23	283
Upper Secondary	*1,364*	*837*	*872*	*3,073*	*2,373*	*1,334*	*1,227*	*4,935*
Civil Servants and Contracted	1,164	821	864	2,849	2,161	1,317	1,219	4,697
Volunteers	200	16	8	224	213	17	8	238
Technical Education	*1,546*	*791*	*568*	*2,904*	*1,840*	*835*	*1,219*	*3,894*
Civil Servants and Contracted	879	791	568	2,237	1,425	835	1,219	3,479
Volunteers	667			667	415			415
Vocational Training Institutes	*174*	*147*	*82*	*404*	*252*	*135*	*177*	*564*
Civil Servants and Contracted	139	147	82	369	231	135	177	542
Volunteers	35			35	22	0		22
Teacher Training Colleges	100	47	52	199	156	88	111	355
Higher Education	600	536	105	1,241	6,358	3,359	187	9,904
TOTAL	**9,789**	**5,256**	**6,636**	**21,681**	**18,511**	**9,725**	**9,638**	**37,873**

Findings

Of the 15,045 staff working in Congolese government schools, 34.9 percent [5,256 / (9,789 + 5,256)] are employed in non-teaching posts. The share of non-teaching staff in the entire education system is significant (54.8 percent); 5,256 members of staff work in schools and 6,636 in support services. These figures vary from one education level to another. The share of non-teaching staff in schools is greatest for the preschool level (55 percent). It remains high for primary (26 percent), and especially for secondary (40.6 percent for lower secondary and 38.0 percent for upper secondary). When considering all the education system's personnel, the share of non-teaching staff reaches 53.5 percent at the primary level, 58.8 percent in lower secondary, and 55.6 percent in upper secondary. It is greatest at the preschool level, at 75 percent.

1.4.3 NON-SALARY EXPENDITURE AND THE CONSOLIDATION OF SPENDING BY LEVEL

Non-salary expenditure is examined in this section, and will be broken down as far as is practical to do so. Spending items such as pedagogical materials, textbooks, operational costs, scholarships and other welfare and so on should be differentiated. These items should then be consolidated with the salary expenditure reviewed in the previous subsection, to ensure that the total effectively amounts to the total recurrent education budget.

This consolidation will then be distributed among education levels, assigning the appropriate share of non-targeted administrative expenses to each. Coefficients will be used for this breakdown when spending cannot be assigned to a single level, usually the same as those used for the salaries related to services provided to multiple levels (See Annex 3.3). The structure of recurrent expenditure by education level will then be established, as per Example 3.5 below, distinguishing between its different components (teaching staff, non-teaching school staff, operational costs, administrative costs and scholarships and other welfare).

EXAMPLE 3.5 (Analysis of Non-Salary Expenditure): Public Expenditure by Function and Level, Benin, 2006

Source: Adapted and Translated from the Benin CSR, 2009.

TABLE 3.5 - Distribution of Public Recurrent Education Expenditure, by Function, Benin, 2006

	Percent	Literacy	Pre-school	Pri-mary	Teacher Training	General Secondary		TVET		Higher	All
						Lower	Upper	Level 1	Level 2		
MAIN	Government Teachers	—	61.7	52.9	46.4	27.9	41.0	14.6	19.4	19.3	**40.7**
MAIN	Community/temporary Teachers	—	3.9	5.6	—	25.5	18.3	3.2	3.1	—	**7.5**
MAIN	University Research	—	—	—	—	—	—	—	—	2.6	**0.5**
MAIN	Subtotal	**0.0**	**65.6**	**58.5**	**46.4**	**53.4**	**59.3**	**17.8**	**22.5**	**21.9**	**48.7**
AUX.	School Management	—	—	—	0.0	17.4	9.5	6.7	3.6	3.3	**3.6**
AUX.	School Operational Costs	2.9	7.4	9.6	26.0	4.3	4.3	6.6	3.4	10.9	**8.8**
AUX.	Subtotal	**2.9**	**7.4**	**9.6**	**26.0**	**21.7**	**13.9**	**13.4**	**7.0**	**14.2**	**12.4**
GENERAL	Sector Administration (Central/Decentralised Service Personnel)	62.0	14.6	16.5	14.8	13.8	15.4	31.4	31.4	8.3	**15.3**
GENERAL	Central/Decentralised Services' Operational Costs *	35.1	12.4	15.4	12.9	11.0	11.3	31.1	32.8	10.4	**13.3**
GENERAL	National Scholarships, School Grants and University Works	—	—	—	—	—	—	5.2	4.9	38.5	**7.8**
GENERAL	Scholarships abroad and Contributions to International Schools	—	—	—	—	—	—	—	—	6.7	**1.3**
GENERAL	Subtotal	**97.1**	**27.0**	**31.9**	**27.6**	**24.9**	**26.8**	**68.8**	**70.5**	**63.9**	**38.9**
	TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: * Includes 7.9 percent for deconcentrated services, or 1.1 percent of recurrent education expenditure.

Three categories of spending are considered here: Main, Auxiliary and General. Main spending includes teaching staff expenditure, university research subsidies, and subsidies for the payment of temporary and local contract teachers. Auxiliary spending includes administrative staff expenditure, services, and pedagogical materials spending at the school level. In addition to this expenditure carried out directly by schools, the education sector incurs General expenses, which relate to the management and administration of the sector, both at the central level (ministries) and at the regional administration level. Student grants constitute a further item of General expenditure. Table 3.5 describes the functional distribution of these expenditure items according to this classification.

Findings

For the education system overall, close to half recurrent expenditure is devoted to its Main function (49 percent), 12 percent is devoted to Auxiliary spending and 39 percent to General expenses. The share devoted to the Main function is less today than it was at the end of the 1990s: for the primary cycle it has dropped from 73 percent (data not shown in the table) to 59 percent of recurrent expenditure; for general secondary from 86 percent (data not shown in the table) to 56 percent, and for higher education from 29 percent (data not shown in the table) to 22 percent. This relative drop has been more significant for the primary and secondary cycles.

This could be explained by the financial constraints that obliged the state to rely on teacher categories that are paid less than permanent government teachers (contract teachers) or those partially paid by the government (temporary and local contract teachers), to ensure that education is effective. The share devoted to inputs other than teacher salaries has thus increased, which suggests an evolution towards an improvement of the material conditions of study offered to students, as well as of the system's management. However, it is possible that the resources allocated to Main expenditure items are still low, given the supervision offered to students and/or the remuneration offered to teachers in light of the heterogeneity of their status.

Generally speaking, the average share of recurrent expenditure devoted to inputs other than teacher salaries is 52 percent [=100-(40.7+7.5)], although this varies from one level to another, from 34 percent [=100-(61.7+3.9)] for preschool to over 70 percent for TVET and higher education. It is difficult to make a normative judgment of these scales; international comparative data may help to appreciate the allocation. They show that the share of expenditure devoted to inputs other than teacher salaries is comparatively higher in Benin for the primary level, lower secondary and TVET. For primary in particular, the Fast Track Initiative benchmark of 33 percent is significantly surpassed (42 percent [=100-(52.9+5.6)]).

Expenditure other than teacher salaries is in fact mainly composed of General expenditures (over 75 percent, based on calculation using data of the table). General administration and operational expenditures (of central and decentralised services) each account for approximately 15 percent of recurrent education expenditure, although the share devoted to the operational costs of decentralised services is weak, despite such spending being helpful for inspections and the decentralised management of the system. The share of expenditure devoted to the operational costs of central services therefore appears to be considerably higher than that devoted to the operation of schools (13 percent on average for central services, against 9 percent for schools, or a ratio of 1.4 to 1). This situation is more apparent for TVET (recurrent and operational expenditure of central services are 7 times higher than those of schools) and the literacy subsector (12 times higher).

1.5 EXTERNAL FUNDING

The contribution of development partners to education is limited to the financing of investment expenditure in many countries, even if it is also used to fund recurrent expenditure in some cases.[22] Previously, data on international aid was widely dispersed, when this was provided through numerous projects. The evolution of aid disbursement arrangements, and the development of sector program support in particular (budget support that is more or less ear-marked for certain ministries or spending items), has increasingly led to amounts allocated appearing in beneficiary ministries' budgets. This facilitates their identification, but it is not systematic that national budgets provide full traceability of all activities financed by international aid. In this situation, a quick census of development partners enables the collection of information on the activities financed by level, the amounts committed and those effectively disbursed.

Furthermore, when a country receives global budget support, external resources are fungible with national resources and it becomes impossible to precisely determine the share of this funding that is allocated to the education sector. In this case, a commonly used proxy is that the same share of external support is devoted to education as that of the national resources. The figures offered in subsection 1.1 of this chapter would then be used. For instance, if 20 percent of the budget is allocated to education, it is estimated as a proxy that 20 percent of external budget support is also allocated to the sector.

Firstly the analysis will present the total amount of external funding received by the country for its education sector, and its importance in relation to national funding. Secondly, it will be worthwhile comparing the average value of the aid for education received by the country over recent years as a share of GDP with that received by other countries in the region, or those with similar levels of economic and education sector development, to estimate the degree of dependency of the sector on external funding and its degree of sustainability.

1.5.1 A NATIONAL PERSPECTIVE

At the national level, the analysis may focus on the total volume of aid, the diversity of donors and the type of expenditure and activities supported by development partners, as per Example 3.6 below, drawn from the Malawi CSR, 2010. It may also comment on the quality of data, their source, coherence and the reliability of the collection approach. To assist this collection process, a questionnaire model to be shared with development partners is offered in Annex 3.2.

EXAMPLE **3.6** **(Analysis of External Aid - National): Donor Financing for the Education Sector, Malawi, 2005/06-2007/08**

Source: Adapted from the Malawi CSR, 2010.

In order to get information on donor activities in the education sector, the analysis used data from a survey conducted by DFID.

TABLE 3.6 - Donor Financing and Extra-Budgetary Grants to Education

Millions de MK	Objective of Assistance	Committed 05/06	Disbursed 05/06	Committed 06/07	Disbursed 06/07	Committed 07/08
General	General	3,973	1,650	2,619	2,224	2,113
	TA and Other	396	243	387	270	460
Primary	Construction	608	599	916	739	1,618
	Curriculum and books	1,343	931	2,346	1,557	1,346
	PRESET	1,092	409	616	510	792
	School Feeding	1,335	1,261	1,428	1,406	1,685
Secondary	PRESET	40	40	33	30	290
Higher	Universities	30	30,45	—	—	—
TOTAL		**8,818**	**5,163**	**8,346**	**6,737**	**8,303**

Findings

Donor contributions play a critical role in the development budget of the government. Based on calculations using data from the table, on average, their contribution amounts to 86 percent of the total development budget. Over 60 percent of donor support to education goes towards construction in primary education. In both 2005/06 and 2006/07 about 63 percent was committed to the construction of primary schools (66 percent in 2007/08). The commitment towards secondary education is very low, even if it has increased from 1 percent of total donor financing in 2005/06 to 3 percent in 2007/08. This increase is due to the current African Development Bank project, which has focused on improvements in secondary education. Universities have received very little official development assistance in the recent past (1 percent in 2005/06 and none in 2006/07 and 2007/08).

1.5.2 AN INTERNATIONAL PERSPECTIVE

For the international comparison, OECD/DAC data should be used. The comparison may focus on the level of external funding for the education sector, either as a percentage of public education expenditure, or as a share of GDP. Example 3.7, drawn from the Mauritania CSR, 2010, presents an international comparison of external education funding.

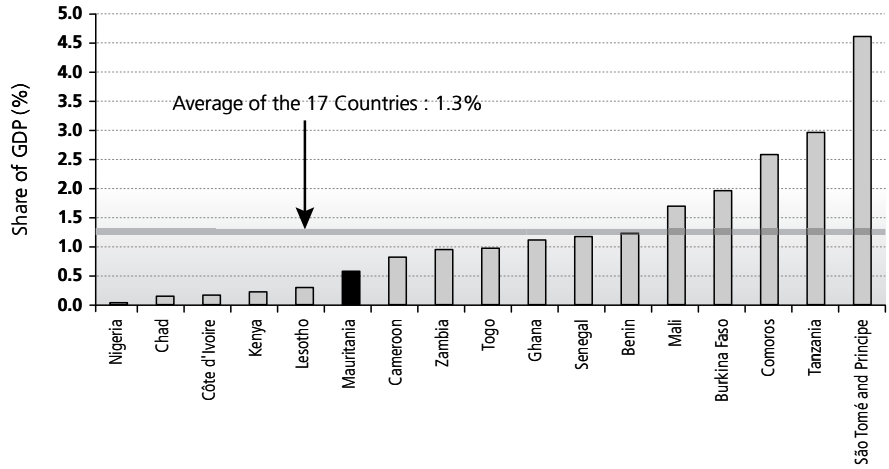
EXAMPLE 3.7

(Analysis of External Aid - International): International Comparison of External Funding of Education Systems, 2008 or MRY

Source: Adapted and Translated from the Mauritania CSR, 2010.

Figure 3.4 shows how Mauritania compares to other African countries of similar income levels, in terms of external aid.

FIGURE 3.4 - Comparison of the Contribution of External Funding to Education Expenditure, for Countries with GDP per Capita between US$500 and US$1,500, 2008 or MRY



Findings

In 2008, external funding represented 13.5 percent of total education sector expenditure and 0.6 percent of GDP in Mauritania, against 22.7 percent of total expenditure and 0.9 percent of GDP in 1995 (based on data not displayed in the figure). Mauritania's dependency on international aid for the education sector therefore appears to be relatively weak.

External funding's contribution to education expenditure varies between 0.03 percent of GDP (Nigeria) to 4.6 percent of GDP (São Tomé and Príncipe) for comparable countries. For Mauritania, external funding's contribution to education expenditure represented 0.6 percent of GDP in 2008, considerably below the average of African countries whose GDP per capita is between US$ 500 and US$ 1,500 (1.3 percent of GDP).

SECTION 2 PUBLIC EDUCATION RECURRENT UNIT COSTS

The information on total expenditure does not enable an understanding or assessment of education policy in as much as it is not related to the number of pupils the system caters for. To step from total expenditure to per student spending (unit costs) will thus enable a more detailed analysis of the structure of spending among education levels, but also for each level through the review of the distribution of spending among the various factors of recurrent unit costs.

2.1 MACRO ESTIMATION OF PUBLIC RECURRENT EXPENDITURE PER PUPIL

On the basis of aggregate expenditure by level and the number of pupils enrolled, unit costs (spending per student per year) can be computed. The types of spending considered here are those related to recurrent costs (teaching and non-teaching staff, pedagogical materials, administration, scholarships and other welfare and so on).

Unit cost UC_i for a given level $_i$ is obtained by dividing total recurrent expenditure RE_i for the level by the number of pupils enrolled at that level NP_i:

$$UC_i = \frac{RE_i}{NP_i}$$

It is most common to compute unit costs for government education, by dividing public recurrent expenditure for a given level by the number of pupils enrolled in government schools at that level. As much as possible, as this analysis focuses on the cost of public education, the possible subsidies to private or community schools, as well as the cost of publicly paid personnel posted in these schools, should be excluded from the public expenditures for the purpose of this analysis.

2.1.1 A NATIONAL PERSPECTIVE

A national perspective of unit costs will calculate unit costs by level and type of school, comparing unit costs for different levels. Example 3.8, drawn from the Côte d'Ivoire CSR, 2010, analyses the variation of public unit costs among different cycles.

EXAMPLE **3.8**

(Analysis of Unit Costs by Cycle): Unit Costs and their Relative Value, by Level, Côte d'Ivoire, 2007

Source: Adapted and Translated from the Côte d'Ivoire CSR, 2010.

To facilitate the comparison, unit costs are indicated not only as monetary values, but also as a share of GDP per capita, and as multiples of the primary education unit cost. In using the unit cost for primary, where enrolment is highest, it is possible to highlight the level of disparities that exist in unit costs among levels and fields of study.

TABLE 3.7 - Public Unit Costs, by Level and Field of Study, Côte d'Ivoire, 2007

	Thousands of CFAF	% of GDP per Capita	Multiple of Primary education UC
Preschool	242	51	2.8
Primary	86	18	1.0
General Secondary	191	41	2.2
Lower	148	31	1.7
Upper	339	72	3.9
TVET	1,254	267	14.6
Classic Technical Education	2,428	517	28.2
1st Cycle	1,933	412	22.5
2nd Cycle	2,815	600	32.7
Modern Apprenticeships	1,699	362	19.8
Traditional Apprenticeships	425*	90	4.9
Higher Education at Home	786	168	9.1
University	607	129	7.1
Law and Economics	308	66	3.6
Arts and Humanities	331	71	3.8
Sciences	825	176	9.6
Medicine	2,741	584	31.9
Non-University ("*Grandes Ecoles*")	2,969	633	34.5
Training for Industry	5,530	1,178	64.3
Training for Services	3,613	770	42.0
Teacher Training	1,667	355	19.4
Higher Education Abroad	7,447	1,586	86.6

Note : * In the current context, this type of education does not absorb public resources; the figure provided here is an estimation of what an improved approach might cost with the support of public funding.

Findings

The data in Table 3.7 shows that public unit costs tend to increase with each successive education level and that they vary within each level according to the field of study or approach to training. Unit costs are CFAF 86,000 for primary, CFAF 191,000 for secondary (CFAF 148,000 for lower secondary and CFAF 339,000 for upper secondary), CFAF 1,254,000 for TVET and CFAF 786,000 for higher education.

Within TVET, the variety of fields of study is matched by diverse unit costs. In the Côte d'Ivoire context, these courses enlist fairly reduced numbers, hence explaining the high unit costs. It will

be difficult to anticipate any great expansion of such courses at such unit cost levels. On the other hand, apprenticeships are less expensive, in particular traditional apprenticeships that provide training opportunities to many youth. This last training option is likely to be improved to introduce modern technical elements that are currently lacking, at reasonable cost (See the table note).

In terms of higher education, academic training offered by universities costs approximately five times less than vocational training offered in non-university institutions ("Grandes Ecoles"*). In Universities, education in arts, humanities, and social sciences is provided at at public unit cost that is similar to that of upper secondary. If the amounts spent on scholarships and on other social spending were deducted from this unit cost, the pedagogical unit cost would in fact be even lower on average than that of upper secondary. Furthermore, a student of medicine costs nine times more on average than a student of law or economics.*

Training for jobs in industry tends to cost significantly more than training for jobs in the tertiary sector (services). Finally, the annual cost of training an Ivorian student abroad is equivalent to just over twice the cost of training a student in a "Grande Ecole" *training for services, the cost of training 12 students in a national government university, or the cost of enrolling 87 pupils in primary government schools.*

2.1.2 A COMPARATIVE HISTORICAL PERSPECTIVE

A further option, as per Example 3.9 drawn from the Mauritania CSR, 2010, is to analyse the evolution of unit costs over recent years in both constant monetary terms and as a share of GDP per capita, which enables the evaluation of the sustainability of unit costs by measuring the burden of a year of education at a given level in reference to the average economic production of the country's inhabitants.

EXAMPLE 3.9 **(Historical Trends in Unit Costs): Evolution of Public Unit Costs by Level, Mauritania, 1998-2008**
Source: Adapted and Translated from the Mauritania CSR, 2010.

To carry out a direct estimation of education unit costs, the amount of public recurrent expenditure effectively disbursed for a given year and education level must be divided by the number of students enrolled at that level for the given year in public institutions. Table 3.8 shows the results by level for three years: 1998, 2004 and 2008. Unit costs are presented both in monetary terms (constant 2008 Ouguiyas) as well as in units of GDP per capita, for each of the three years considered.

Findings
Public recurrent expenditure per pupil enrolled in general education varies between UM 39,388 for basic education to UM 915,841 for the Ecole Normale Supérieure *(Secondary Education*

Teachers' training) in 2008. The historical perspective and the evolution of unit costs over the decade (1998-2008) shows that in real terms (constant 2008 Ouguiyas) unit costs increased for basic education (from UM 26,313 in 1998 to UM 39,388 in 2008) and both cycles of general secondary (from UM 94,511 on average in 1998 to UM 103,712 for the first cycle and UM 121,735 for the second in 2008). Unit costs dropped for technical education (from UM 299,300 in 1998 to UM 276,609 in 2008) and higher education (from UM 271,075 in 1998 to UM 238,917 in 2008). On the other hand, public unit costs for scholarship students abroad (including both grants and travel) increased considerably, from UM 500,700 in 1998 to UM 728,770 in 2008.

TABLE 3.8 - Evolution of Public Education Unit Costs, Mauritania, 1998-2008

	Number of Students	Unit Costs (Constant 2008 Ouguiyas)			Unit Costs (% of GDP per Capita)		
	2008	1998	2004	2008	1998	2004	2008
Preschool	2,948	—	—	51,764	—	—	18.1
Basic	427,804	26,313	28,828	39,388	11.4	11.3	13.7
Lower Secondary	51,984	94,511	92,534	103,712	40.9	36.2	36.2
Upper Secondary	22,914			121,735			42.5
Technical	3,983	299,300	334,297	276,609	129.0	131.0	96.5
Teacher Training	699	811,721	350,886	689,267	351.0	137.0	240.4
École Normale Supérieure	310			915,841			319.4
Higher (Home)	14,368	271,075	242,263	238,917	117.0	95.0	83.3
Higher (Abroad) *	2,303	500,700	383,951	728,770	217.0	150.0	254.2

Note: * Only scholarship students

2.1.3 AN INTERNATIONAL PERSPECTIVE

It is also interesting to put these unit costs in international perspective. Per student spending should be expressed as a percentage of GDP per capita. As in Example 3.10 drawn from the Burkina Faso CSR, 2010, not only the value of unit costs can be compared, but also their variation among education cycles.

EXAMPLE 3.10 **(Unit Costs in International Perspective): International Comparison of Unit Costs, 2006 or MRY**

Source: Adapted and Translated from the Burkina Faso CSR, 2010.

Table 3.9 enables the comparison of the structure of unit costs in Burkina Faso with that of a certain number of comparable countries.

Findings

From Table 3.9, compared to other countries, Burkina Faso's unit costs are particularly high for primary (51 percent higher than the average), for technical education (45 percent higher) and to a lesser extent for upper secondary (8 percent higher). The cost of lower secondary on the other hand appears to be particularly low compared to other countries, whose average is 26.1

TABLE 3.9 - International Comparison of Public Unit Costs by Level, 2006 or MRY					
Share of GDP per Capita	**Primary**	**Lower Secondary**	**Upper Secondary**	**TVET**	**Higher**
Burkina Faso - 2006	16.6	19.3	62.5	180.7	215.2
Burkina Faso - 1999	25.0	30.0	84.0	n.d.	550.0
Benin	13.1	10.9	31.9	120.7	133.5
Cameroon	7.1	31.6	37.1	61.0	83.0
Côte d'Ivoire	13.0	35.0	72.0	111.0	126.0
Guinea	8.7	13.4	15.7	121.0	220.0
Madagascar	11.0	26.7	64.4	83.0	190.0
Mali	11.1	26.5	117.1	202.6	192.9
Mauritania	12.0	39.6	33.8	188.0	120.0
Niger	20.0	49.0	157.0	n.d.	515.0
CAR	7.2	17.3	28.0	91.0	225.0
Senegal	10.7	14.7	70.3	95.0	257.0
Chad	7.0	26.8	35.8	192.1	412.1
Togo	11.0	22.0	34.1	104.0	215.0
Average of Comparable Countries	11.0	26.1	58.1	124.5	224.1
Burkina Faso / Average Ratio	1.51	0.74	1.08	1.45	0.96

percent of GDP per capita, or seven percentage points higher. Higher education is close to the average of comparable countries.

Another approach to the analysis of unit costs, without referring to national wealth, consists in comparing their structure and amount to those of primary education. This approach is adopted in Table 3.10, and consists in attributing the value of 1 to primary unit costs, and calculating the multiplier, relative to those primary unit costs, for each level. To obtain each multiplier, the unit cost for that level as per Table 3.9 (19.3 percent of GDP per capita for lower secondary in Burkina Faso in 2006, for instance) is divided by the unit cost for primary for the same year (16.6 percent of GDP per capita). Thus, 19.3 / 16.6 = 1.2. Lower secondary unit costs for Burkina Faso in 2006 are 1.2 times primary unit costs.

TABLE 3.10 - Structure of Unit Costs in Relation to Primary Unit Costs, Various African Countries, 2006 or MRY					
Multiplier	**Primary**	**Lower Sec.**	**Upper Sec.**	**TVET**	**Higher**
Burkina Faso	1	1.2	3.8	10.9	13.1
Benin	1	0.8	2.4	9.2	10.2
Cameroon	1	4.5	5.2	8.6	11.7
Côte d'Ivoire	1	2.7	5.5	8.5	9.7
Guinea	1	1.5	1.8	13.9	25.3
Madagascar	1	2.4	5.9	7.5	17.3
Mali	1	2.4	10.5	18.3	17.4
Mauritania	1	3.3	2.8	15.7	10.0
Niger	1	2.5	7.9	n.d.	25.8
CAR	1	2.4	3.9	12.6	31.3
Senegal	1	1.4	6.6	8.9	24.0
Chad	1	3.8	5.1	27.4	58.9
Togo	1	2.0	3.1	9.5	19.5
Average of Comparable Countries	1	2.38	5.29	11.33	20.39

Findings

It is apparent that differences in unit costs by level are slightly less significant in Burkina Faso than in other countries. Burkina Faso's upper secondary unit costs are 3.8 times primary unit costs (against 5.3 times on average) and unit costs for TVET are 10.9 times primary unit costs (against 11.3 times on average). The cost difference between primary and lower secondary is indeed considerably less in Burkina Faso than in the comparable countries (lower secondary per student costs are 1.2 times those of primary, against 2.4 times on average). This tends to confirm the relative weakness of lower secondary unit costs in Burkina Faso.

2.2 BREAKDOWN OF PUBLIC RECURRENT UNIT COSTS

Here the estimation of unit costs will be carried out on the basis of teaching conditions and average spending at the student level. These micro estimations of unit costs enable one to easily develop an analytical approach to the determinants of spending and to carry out straightforward simulations based on the anticipated future variations of these determinants.

2.2.1 FORMULA FOR THE BREAKDOWN OF UNIT COSTS

The breakdown of unit costs into its different components is based on the following formula (See Box 3.2). Unit costs are:

$$\frac{\text{Average Teacher Salary}}{\text{Pupil - Teacher Ratio}} + \frac{\text{Average Non - Teacher Salary}}{\text{Pupil - Non - Teaching Staff Ratio}} + \frac{\text{Operational Costs}}{\text{Enrolment}} + \frac{\text{Social Spending}}{\text{Enrolment}}$$

The components of unit costs for each level can be presented as an overview, as per Example 3.11 drawn from the Benin CSR, 2009, which enables a better understanding of their diversity.

BOX 3.2
BREAKDOWN OF RECURRENT UNIT COSTS

Total public recurrent expenditure *RE* for a given level is broken down between salary (*SE*) and non-salary (*NSE*) expenditure:
$RE = SE + NSE$

In turn, salary expenditure is composed of teaching salaries (RE_{TS}) and non-teaching salaries (RE_{NTS}), and non-salary expenditure is composed of operational costs (RE_{OC}) and social spending (RE_{SS}), so:
$RE = RE_{TS} + RE_{NTS} + RE_{OC} + RE_{SS}$

Furthermore, unit costs (*UC*) are the relation between total public recurrent expenditure (*RE*) and the number of pupils (N_P) enrolled in government schools (See Section 2.1). Unit costs are therefore the sum of these four expenditure types, by pupil:

$$UC = \frac{RE}{N_P} = \frac{RE_{TS}}{N_P} + \frac{RE_{NTS}}{N_P} + \frac{RE_{OC}}{N_P} + \frac{RE_{SS}}{N_P} = UC_{TS} + UC_{NTS} + UC_{OC} + UC_{SS}$$

Each of these unit costs can, in turn, be broken down into their respective components. If N_T and N_{NT} respectively designate the number of teaching and non-teaching staff for the chosen level and AS_T and AS_{NT} the average salaries for each:

$$UC_{TS} = \frac{N_T \text{ x } AS_T}{N_P} \text{ et } UN_{NTS} = \frac{N_{NT} \text{ x } AS_{NT}}{N_P}$$

Knowing that $\frac{N_T}{N_P} = \frac{1}{PTR}$, where the pupil to teacher ratio is $PTR = \frac{N_P}{N_T}$,
UC_{TS} can be estimated as the relationship between the average teaching salary AS_T and the *PTR*:

$$UC_{TS} = \frac{AS_T}{PTR}$$

Similarly, where PNTR is the pupil to non-teacher staff ratio:

$$UC_{NTS} = \frac{AS_{NT}}{PNTR}$$

Overall, the following global formula for unit costs is therefore reached:

$$UC = \frac{AS_T}{PTR} + \frac{AS_{NT}}{PNTR} + \frac{RE_{OC}}{N_P} + \frac{RE_{SS}}{N_P}$$

The first term of the formula can be refined by adding class size (*CS*), the weekly workload of pupils (in hours – H_P) and the weekly workload of teachers (H_T). In addition, the teacher replacement rate *RR* (the share of teachers needed to replace those absent due to illness, pregnancy and so on) can be added to the formula. Then the formula is adjusted as follows:

$$\frac{AS_T}{PTR} = \frac{AS_T}{CS} \text{ x } \frac{H_P}{H_T} \text{ x } (1 + RR)$$

EXAMPLE **3.11**

(Breakdown of Unit Costs): Breakdown of Public Expenditure per Pupil, Benin, 2006

Source: Adapted and Translated from the Benin CSR, 2009.

Table 3.11 illustrates the breakdown of unit costs in Benin by level, for 2006. Although the data is relatively aggregated, it illustrates the factors that determine the structure and variation of unit costs from one level to another.

TABLE 3.11 - Breakdown of Public Recurrent Expenditure per Pupil in Government Schools, Benin, 2006

		Literacy	Preschool	Primary	Lower Secondary	Upper Secondary	TVET 1	TVET 2	Higher
SCHOOL LEVEL	**School Level (Unit cost)**	280	**50,734**	**26,793**	**24,182**	**72,501**	**108,949**	**112,205**	**158,579**
	Teaching Staff (Unit cost per pupil)		**45,592**	**23,019**	**16,841**	**58,487**	**57,933**	**84,223**	**84,907**
	Average Salary (Civil Servants)	-	1,920,836	1,525,660	1,829,128	2,506,084	1,742,008	2,373,604	3,952,291
	Share of Local Contract or Temporary Teachers (Full-Time Equivalent)	100	29.8	36.0	81.8	69.8	57.2	63.9	Nd
	PTR *	15.1	31.5 (45)	47.0 (73)	36.3 (200)	19.3 (64)	14.6 (34)	11.6 (32)	43 (47)
	Average Transfer by Local Contract Staff Member (Full-Time Equivalent) **	-	289,038	289,038	340,927	529,604	176,993	186,955	-
	Non-Teaching Staff (Unit cost per pupil)				**5.934**	**9,868**	**27,817**	**15,054**	**14,363**
	Average Salary (Civil Servants)	-	-	-	1,562,086	1,559,090	1,550,658	1,549,339	1,374,934
	Share of Local Contract Staff	-	-	-	15.6	18.7	61.6	46.3	48.9
	PTR *	-	-	-	231.0	138.5	25.3	61	48.9
	Average Transfer by Local Contract Staff Member (Full-Time Equivalent) **	-	-	-	340,927	529,604	176,993	186,955	-
	Operational Costs (Unit cost)	**280**	**5,142**	**3,774**	**1,407**	**4,147**	**23,200**	**12,928**	**59,308**
SECTOR-WIDE	**Sector-Wide (unit cost)**	**9,229**	**18,763**	**12,549**	**8,159**	**25,667**	**240,764**	**267,840**	**251,329**
	Salary Unit Costs	5,893	10,135	6,489	4,537	14,793	109,985	119,248	36,582
	Administrative Unit Costs	3,336	8,628	6,060	3,622	10,874	112,707	130,035	45,648
	Social Spending Unit Costs	-	-	-	-	-	18,073	18,557	169,100
	Percentage benefiting from scholarships	-	-	-	-	-	28.8***		33.6
	Average Scholarship per Beneficiary	-	-	-	-	-	63,811***		285,932
	Unit Costs of Other Social Spending	-	-	-	-	-	-		72,898
	TOTAL UNIT COST (RECURRENT)	**9,509**	**69,496**	**39,342**	**32,786**	**95,854**	**349,713**	**380,045**	**409,908**

Note: Only recurrent expenditure is considered. Figures are in CFAF unless otherwise indicated.

* Figures in parenthesis are ratio estimations assuming no teachers are temporary or on local contracts.

** This ratio is an average for all personnel (teaching or not) that is temporary or on local contracts, or their full-time equivalent. Government contributions to parent-teacher associations are divided by the number of such staff. The calculation takes the differences in the average subsidy amount into account according to the education level (one average is used for preschool and primary, and other averages for are used for lower and upper secondary). For TVET, the estimation is based on the distribution of expenditure carried out by the planning division of the subsector.

*** Estimated average for both levels combined.

Findings

The relatively high level of preschool unit costs in comparison to primary unit costs is mostly due to lower pupil to teacher ratios at this level. The relatively lower unit costs for lower secondary, in comparison to primary unit costs, are basically due to the predominance of less paid teachers.

The following sub-section focuses on the analysis and trade-offs associated with the pupil to teacher ratio (PTR). The other key component of the unit cost, namely the issue of teacher remuneration, because of its complexity and its importance in terms of policy and management, is examined in its own section 2.3.

2.2.2 PUPIL TO TEACHER RATIOS

Where PTRs and their impact on unit costs are concerned, a trade-off must be made between: (i) ensuring the best possible working conditions for both pupils and teachers, implying a low PTR; and (ii) offering education to the greatest number of children, which in a context of human and financial resource constraints, would imply higher PTRs. Two approaches can contribute to the debate: (i) as above, an international comparison of PTRs; and (ii) a review of the effect of PTRs on pupils' learning outcomes, which will be dealt with in Chapter 4.

Example 3.12 drawn from the Côte d'Ivoire CSR, 2010, analyses the evolution of the PTRs at each level over a decade, and compares them to those of other countries in the region.

EXAMPLE 3.12 (Analysis of Pupil to Teacher Ratios): Pupil to Teacher Ratios, Côte d'Ivoire, 2007

Source: Adapted and Translated from the Côte d'Ivoire CSR, 2010.

Table 3.12 places the PTRs for each level in international perspective.

TABLE 3.12 - Public Pupil to Teacher Ratio in International Perspective, Côte d'Ivoire, 2007

	Pupil to Teacher Ratio			
	Primary	**Lower Sec.**	**Upper Sec.**	**Higher**
Côte d'Ivoire - 2000	42	38	24	—
Côte d'Ivoire - 2007	**39**	**45**	**21**	**33**
Benin	54	38	17	30
Burkina Faso	55	86	26	39
Cameroon	63	31	29	28
Guinea	47	40	36	14
Madagascar	50	22	12	23
Mali	63	46	23	60
Mauritania	42	36	23	33
Niger	43	40	13	13
Chad	72	39	48	48
Togo	44	47	52	30
Average of the 10 Comparable Countries	**47**	**34**	**29**	**32**
Côte d'Ivoire / Comparable Countries	0.83	1.32	0.72	1.03

Findings

Côte d'Ivoire's position in terms of pupil to teacher ratios is quite striking compared to its neighbours, depending on the education level considered:

Paradoxically, recent events have not led to an increase in the primary PTR, rather to a decrease. Indeed, it has dropped from 42 to 1 in 2000 to 39 to 1 in 2007, in particular due to the recruitment of teachers paid by parents in the center and north east zones. The international perspective shows that Côte d'Ivoire's situation is relatively favourable, as the average of comparable countries is 47 to 1, and its PTR is close to the GPE benchmark of 40 to 1.

For general secondary, the PTR merits critical consideration, as class size has a direct impact on pedagogical approaches and the quality of teaching. PTR and class size are not independent of course, but the average class size is generally greater than the PTR as the number of hours of teaching that a pupil receives is usually greater than the number of teaching hours that each teacher provides, due to teachers' subject specialisations. For instance, for Côte d'Ivoire in 2007, the PTR for lower secondary is estimated at 45 to 1 on average, whereas class size is estimated to be of 66 pupils on average.

The comparative analysis of PTRs shows significantly different situations for the two secondary education cycles. Lower Secondary witnessed an increase of the indicator between 2000 and 2007, rising from 38 to 1 to 45 to 1 despite accounting for teachers paid by parents. Côte d'Ivoire's situation is unfavourable when compared to the average level of the indicator for comparable countries, of 34 to 1. Côte d'Ivoire's PTR for lower secondary would have to decrease by a third to reach the regional average. At upper secondary, the situation quite different, the indicator improved between 2000 and 2007, from 24 to 1 to 21 to 1, which is considerably better than the average of comparable countries (29 to 1).

For higher education, the average student to teacher ratio (33 to 1 on average, although significant variations exist according to the type of institution and field of study) are in line with the average of other countries.

2.3 ANALYSIS OF THE STATUS AND REMUNERATION OF TEACHERS

When carrying out the analysis of salaries, a fair balance must be found between two conflicting objectives: (i) to recruit and retain the qualified teachers that the system requires (with adequate academic levels and initial training), which implies offering sufficiently attractive work conditions, both in terms of salary and status; and (ii) to recruit a sufficient number of teachers to ensure the system's development, which implies a relatively low payroll burden in a context of scarce resources. There is no norm in the matter, but national and international comparisons help to assess whether different teachers' salaries are

comparatively low or high. The following approaches provide an idea of the degree of flexibility at countries' disposal in terms of their teacher salary policies.

The comparative analysis of teachers' working conditions can be carried out from three different perspectives, dealt with successively: (i) according to different teacher status; (ii) in comparison with other national non-education staff; and (iii) in comparison with teaching staff from other countries.

These different approaches, illustrated by the examples drawn from the Mali CSR, 2010 and the Burkina Faso CSR, 2010 (see Examples 3.13 and 3.14), will aim to highlight issues related to the sustainability of salaries in a context of scarce resources and the competitivity of salaries for education systems that seek to attract more teaching and non-teaching staff.

Analysis by Teacher Status

Teacher salaries are compared according to their status, differentiating between civil servants, temporary or contract teachers and school directors with teaching responsibilities. Further distinctions can be made by level, grade, seniority and so on.

EXAMPLE 3.13 (Analysis of Teaching Salaries by Status): Comparison of Teacher Remuneration by Status and Cycle, Mali, 2008

Source: Adapted and Translated from the Mali CSR, 2010.

One of the characteristics of the Malian education system is the great variety of teaching status and remuneration levels, at every education level.

TABLE 3.13 - Distribution of Personnel and Average Remuneration, by Status and Level, Mali, 2008

Units of GDP per Capita	Basic 1		Basic 2		Secondary		TVET		University	
	% Staff	Average Salary	% Staff	Average Salary	% Staff	Average Salary	% Staff	Average Salary	% Staff	Average Salary
Civil Servants	20.9%	7.7	29.2%	7.8	43.4%	8.7	38.5%	8.0	79.4%	17.1
State Contract Staff	8.7%	5.7	7.9%	5.7	23.8%	5.5	23.8%	5.6	20.6%	7.4
Subtotal	**29.6%**	**7.1**	**37.1%**	**7.4**	**67.3%**	**7.7**	**62.2%**	**7.1**	**100.0%**	**15.1**
Local Contract Staff (HIPC Resources)	33.2%	4.4	37.6%	4.4	32.7%	5.5	37.8%	5.5		
Local Contract Staff (Local Resources)	2.8%	0.0	3.1%	0.0						
Community Teachers (Subsidised by HIPC Resources)	27.1%	0.8	9.6%	0.8						
Community Teachers (Unsubsidised)	3.7%	0.0	9.4%	0.0						
Student Teachers	3.6%	0.0*	3.2%	0.0						
Total	**100.0%**	**3.8**	**100.0%**	**4.4**	**100.0%**	**6.2**	**100.0%**	**6.5**	**100.0%**	**15.1**

Note: * Student teachers receive a scholarship to attend Schoolmaster Training Institutes, equivalent on average to 1.1 units of GDP per capita.

Findings

Generally speaking, average remuneration increases not only with each education level but also according to status. In basic education, civil servants represent 20.9 percent and 29.2 percent of the teaching staff of the first and second cycles, and respectively earn the equivalent of 7.7 and 7.9 units of GDP per capita. State contract teachers represent 8.7 percent and eight percent of teaching staff at these levels, and earn 5.7 units of GDP per capita on average. Local contract staff paid on HIPC funds are the main type of teaching staff, and earn an annual equivalent to 4.4 units of GDP per capita on average for the two basic education cycles, and 5.5 units of GDP per capita at the secondary level, be it general or technical. The basic level also relies on teachers paid by local authorities and community teachers that receive a government subsidy of CFAF 25,000 per month (over nine months, equivalent to 0.8 units of GDP per capita), community teachers paid for by families, and student teachers in their last year of training who receive an annual scholarship of 1.1 units of GDP per capita.

In secondary, teacher status and remuneration are also variable. The annual average salary ranges from 5.5 units of GDP per capita for teachers contracted by local authorities with HIPC funds, to 8.7 units of GDP per capita for civil servants.

It is however important to underline that the gaps in the remuneration of civil servant, state contract and local authority contract staff on HIPC funds are mainly due to seniority in the system, civil servants being those with most seniority. Indeed, over recent years, status-related remuneration gaps have been reduced and differences in salaries according to status for teachers with similar levels of seniority are extremely weak. On the other hand, subsidies given to community teachers are the same for all, regardless of their seniority.

Generally speaking, the share of civil servants in the teaching profession has dropped, especially at the lower levels of the education pyramid. Civil servants only represented 21 percent of first cycle basic education staff in 2008, against 34 percent in 2004 (data not shown in the table); 29 percent of second cycle basic education staff, against 51 percent in 2004 (data not shown in the table); 43 percent of secondary staff, against 55 percent in 2004 (data not shown in the table); and 38 percent of TVET staff, against 47 percent in 2004 (data not shown in the table). However, they still represent more than three-quarters of university teaching personnel.

Comparative National Analysis

Here the salaries of teaching staff are compared to those of civil servants working for other sectors and to private sector workers with similar qualifications. This analysis is generally performed on the basis of employment survey data or any other household survey data providing information on individuals' activities and income.

EXAMPLE 3.14

(Teaching Salaries in the National Context): National Comparison of Teacher Remuneration, Burkina Faso, 2003

Source: Adapted and Translated from the Burkina Faso CSR, 2010.

Over the coming years it will be necessary to recruit a substantial number of new teachers. This is because of: (i) current teaching conditions that are unsatisfactory (pupil to teacher ratios are too high); and (ii) the expectation of fast-growing enrolment in response to the universal primary education objective. Two elements must therefore be considered. Firstly, Burkina Faso must ensure that there is a sufficient pool of potential candidates with the required qualifications. Secondly, they must be offered adequate pay to make the profession attractive.

The analysis of the Burkina Faso household survey is instructive, as it offers a view of the national labour market and some of its characteristics, both in terms of occupation and remuneration. Table 3.14 provides information on these points for the population aged 25 to 35 years.

TABLE 3.14 - Occupation and Annual Income of Individuals Aged 25 to 35 years, by Number of Years of Training Received and Job Sector, Burkina Faso, 2003

	Number of Years of Training Received							
	0-9 Years		10-12 Years		13 Years		16 Years	
	Income (CFAF)	Number	Income (CFAF)	Number	Income (CFAF)	Number	Income (CFAF)	Number
Unemployed/Inactive	—	50,600	—	17,771	—	7,098	—	8,429
Formal Private Sector	511,112	51,194	714,096	12,988	885,320	4,701	2,123,651	3,398
Informal Private Sector	384,258	147,853	628,009	15,317	733,881	1,921	1,574,616	1,180
Civil Service	552,061	6,315	918,932	13,032	1,039,923	8,615	1,561,560	6,565
Of which Education Sector	680,567	641	769,837	11,674	827,818	6,110	1,227,226	5,435

Findings

In terms of employment, a significant number of individuals with 10 to 13 years of training (having completed between Grade 4 and Grade 7 of secondary) are inactive or unemployed. Of those with just 10 to 12 years of training (lower secondary leaving examination level), equivalent to the level required of assistant contract primary teachers, 30 percent [=17,771/(17,771+12,988+15,317+13,032)] are unemployed or inactive and 26 percent work in the informal sector. Furthermore, about 39 percent of individuals having completed 13 years of training (baccalaureate level) work in the civil service, 21 percent work in the formal private sector, and close to 32 percent are unemployed or inactive. It is interesting to note that the shares of individuals having completed 16 years of education working in the civil service (34 percent) and the private sector (23 percent) are comparatively lower, whereas 43 percent of them are unemployed.

This group of unemployed or inactive youth therefore constitutes a pool of future candidates for the teaching profession that should a priori *be sufficient.*

Table 3.14 also indicates that the level of income (from work only) is significantly better in the public sector than in the private sector for youth with a baccalaureate or less. The private sector however, be it formal or informal, appears to offer higher pay to youth having completed 16 years of study.

This analysis confirms that in Burkina Faso, the income of civil servant teachers without a baccalaureate is slightly better than for other private sector workers, although slightly lower than the income of other civil servants. The income declared by teachers having completed 13 years of education is only higher than that of youth with similar education working in the informal sector. Teachers having completed 16 years of study benefit from lower income levels than individuals working in other sectors, public or private.

These various factors suggest that: (i) numerous men and women have academic qualifications that are adequate to teach primary and secondary classes; and (ii) the income of civil servant teachers is lower than that of other civil servants on average, but is generally higher than the income of private sector workers having completed 13 years of education or less.

Comparative International Analysis

Here the average teacher salary, or the average salaries of the main categories of teachers, are compared to the average salaries of teachers in countries with similar levels of economic or educational development. This analysis often relies on the average salary expressed in units of GDP per capita, which places remuneration in the context of each country's average income level.

SECTION 3 HOUSEHOLD CONTRIBUTIONS TO EDUCATION

The issue of private education financing is an important one in as much as the achievement of universal primary education implies that the poor also gain access to education. However, even in education systems that are fully governmental, some expenses induced by schooling must still be supported by families, such as the purchase of textbooks of stationery, school transport, private tuition, school uniforms and so on (See Table 3.15). There is also an indirect cost for families, usually named by economists the opportunity cost or foregone earnings, which relates to the income lost as a result of enrolling children in school rather than having them work and contribute to the family income. These opportunity costs can constitute an obstacle to the enrolment of children from the poorest strata of society.

The objective of this section is to document the education expenses supported by families, estimating the average private unit cost of education by level, and how this may vary according to the type of school attended, gender and family income. This will later enable the comparison with public unit costs, from an equity perspective.

TABLE 3.15 - Types of Household Education Spending

	Direct Spending	**Related Spending**	**Other Spending**
Payments made to school	- School Fees - Administrative Charges - Contributions to Parent-Teacher Associations	- Boarding Fees - School Meals	
Expenditures by families	- Textbooks - Exercise Books - Other Materials and Supplies - Uniforms	- Room Rental - Food/snacks - School Transport	
Other Education Spending		- Private Tuition - Home Tutor - Apprenticeship Costs	- Artistic Training - Other Books - Newspapers, Magazines - Pocket money - Bicycle

For this estimation, household surveys with both education and spending components are generally used. Most such surveys provide information on each individual's enrolment status at the time of the survey, and when enrolled, on their level, class and type of school attended. The spending component of the questionnaire often provides information on enrolment and school fees, and the cost of books, school supplies, uniforms and sport-wear, school transport, school meals, private tuition, contributions to parent-teacher

associations, extra-curricular activities and so on. This information is generally collected during the previous 12 months. Some household surveys have however a very wide comprehension of education expenditures when collecting data from parents, including for instance pocket money or an "other expenses" category with few restrictions. It can thus be useful to refer to the UNESCO Institute for Statistics guidebook for a more precise definition (the "Other expenses" column in Table 3.15 above gives examples of expenses that are too remote to be considered as education expenses).

3.1 PRIVATE UNIT COSTS BY EDUCATION LEVEL

Data is available for each enrolled child in some surveys, or as aggregate data for all of the households' enrolled children in others. When data is available per child, the estimation of average spending by child and level is obtained by crossing spending data with enrolment data. Data can also be provided according to the type of school attended, gender and household income.

When disaggregated data per child is available, the calculation of average spending per pupil at each education level is fairly simple. For each level, the sum of the amounts spent for each child enrolled at a given level (all households) is divided by the number of children concerned. This global amount must then take into account the survey's sampling procedure, to extrapolate the result obtained to the scale of the total population.

However, disaggregated data per child is not always available, or may contain errors or omissions due to the difficulty of retracing detailed past spending for each household member. In this instance, econometric models can be used to estimate the breakdown of total household education spending by spending item, pupil and education level, based on total household education spending and the number of children enrolled at each level. This is carried out with the help of linear regressions.

Total household education spending (*TS*) indicated in the survey is broken down according to the number N_i of children enrolled at each level *i*, where *i* is given a value for each level (1 for preschool, 2 for primary, 3 for lower secondary, 4 for upper secondary, 5 for TVET and 6 for higher education) and the private unit costs for each level (UC_i). Thus an equation is obtained for each household:

$$TS = (UC_1 + N_1) + (UC_2 \times N_2) + (UC_3 \times N_3) + (UC_4 \times N_4) + (UC_5 \times N_5) + (UC_6 \times N_6)$$

The econometric modelisation (linear regression without the constant term) of total spending as a function of the number of children enrolled at each level then enables the computation of the UC_i coefficients that constitute estimations of the average household spending per pupil at each level. Again, it is important to take into account the survey's sampling procedure, to extrapolate the result obtained to the scale of the total population.

The same approach can be applied to average spending by type of school and by pupils' socioeconomic characteristics (gender, income). This carries the advantage of providing a reasonable order of magnitude of average spending by level according to children's socioeconomic characteristics and type of school.

In some cases, the estimations (be they individual or aggregate) carried out for upper secondary, TVET and higher education must be used with caution given the low number of children enrolled at these levels that are surveyed, which constitutes a representativity issue.

EXAMPLE 3.15 **Estimation of Household Education Spending by Level, Congo, 2005**

Source: Adapted and Translated from the Congo CSR, 2010.

TABLE 3.16 - Estimation of Household Education Spending by Level, Congo, 2005

	Number of Pupils (Enrolment)	Household Spending	
		Per Pupil (UCi) (CFAF)	Aggregate (Millions of CFAF)
Preschool	23,320	85,250	1,983
Primary	611,679	6,946	4,249
Secondary	*223,770*	*28,567*	*6,392*
Lower	190,193	28,558	5,432
Upper	33,577	28,610	961
TVET	43,539	45,850	1,963
Higher	11,710	71,359	836
Total	**914,18**	—	**15,423**

Survey data provides total education spending per household. The econometric approach based on explaining total household education spending by the number of children enrolled at each level provides the annual average household spending for the schooling of a child for each level (See Table 3.16). On the basis of these private unit costs and of the actual enrolment by level, an estimation of the aggregate household education spending can then be obtained by level and overall.

Findings

Total Congolese household education spending is estimated at CFAF 15.4 billion for 2005. It is mainly composed of school fees and private tuition fees. Average private unit costs increase with each education level, with the exception of preschool (CFAF 85,250) which is very high due to the fact that most of the supply is private.

3.2 EDUCATION COST-SHARING BETWEEN THE GOVERNMENT AND FAMILIES

On the basis of the analysis of public unit costs carried out in Section 2 of this chapter and the estimation of private unit costs above, the balance between both can be reviewed from an equity perspective (See also Chapter 6). For instance, where the share of household contributions to the cost of higher education is low, the education system reinforces inequities, as this level benefits mainly the wealthiest families and individuals. Ideally, the share of costs supported by the government should be greatest at the lower education levels, which benefit the greatest number of children regardless of their wealth. This analysis also enables one to provide policy arguments in favour of budget reallocations, for instance when basic education is relatively over-funded by households. The question of private education may also be approached here.

EXAMPLE 3.16 (Public-Private Education Cost-Sharing): Cost-Sharing of Education Costs between the Government and Families, by Level, Mauritania, 2008

Source: Adapted and Translated from the Mauritania CSR, 2010.

Computing the share of the recurrent cost of education that is borne by households for each level is the first step of this analysis.

Findings

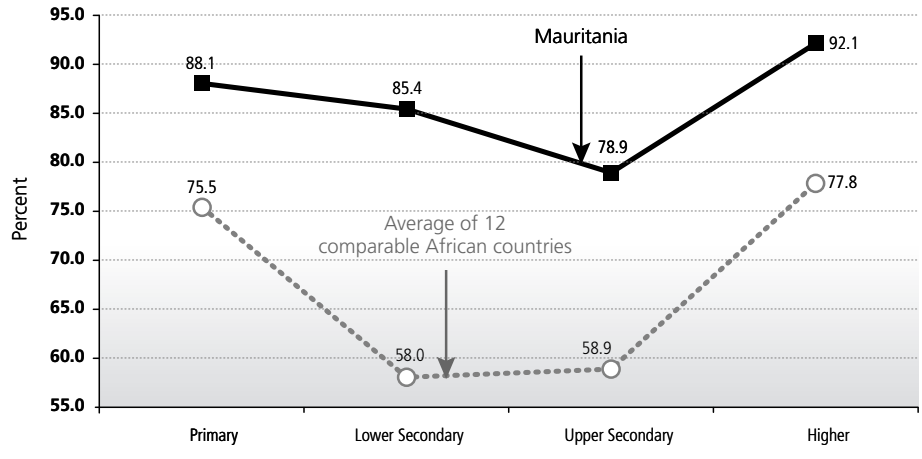
Total household education spending in Mauritania in 2008 was equivalent to 11.5 percent of the total recurrent cost of education on average (public expenditure and household spending). With the exception of preschool to which families contribute 72.3 percent, the greatest household contribution is to secondary (21.1 percent for upper secondary and 14.6 percent for lower secondary). Families contribute less to higher education (7.9 percent) and to primary education (11.9 percent).

TABLE 3.17 - Public-Private Cost-Sharing of Recurrent Education Expenditure, by Level, Mauritania, 2008

	Preschool	Primary	Lower Secondary	Upper Secondary	TVET	Higher	Total
Average Household Spending per Pupil (UM) (a)	27,050	4,803	13,963	24,039	18,475	20,016	—
Enrolment (b)	14,729	473,688	65,896	30,997	4,983	14,699	—
Household Spending (Millions of UM) (c) = (a) x (b)	398	2,275	920	745	92	294	4,327
Public Expenditure (Millions of UM) (d)	153	16,850	5,391	2,789	1,102	3,433	33,182
Total Recurrent Cost of Education (Millions of UM) (e) = (c) + (d)	551	19,126	6,311	3,535	1,194	3,727	37,509
Share Borne by Households (%) (c) / (e)	72.3%	11.9%	14.6%	21.1%	7.7%	7.9%	11.5%

Given the higher return on investment for higher education graduates and the predominance of wealthy students at this level, equity would have households contributing most to this level. The current distribution of public education expenditure is therefore unaligned with an equitable approach in that it penalises the poorest families through failing to offer them a quality basic education. As a second step, the share of the total cost of education that is borne by the government can be compared to the same proportion in comparable countries.

FIGURE 3.5 - International Comparison of the Share of Recurrent Education Expenditure Borne by Governments, by Level, Mauritania, 2004-08



Findings

It is worthy of note that the Mauritanian government contributes more to every level of education (as a share of the total cost borne by the government and families) than the average of 12 African countries for which data is available.

Table 3.17 and Figure 3.5 nevertheless highlight a relative inequity in education funding, as families contribute less to higher education. This should encourage the definition and implementation of a funding system for the higher education levels that points towards a cost-sharing system where households contribute more, in order to free-up more public resources for the lowest levels of education. Higher Education student loan mechanisms (that may be means-tested and reimbursable once students begin work) such as those practiced in South Africa should also be encouraged to facilitate such cost-sharing, as they would also offer children from more modest backgrounds the opportunity to access higher education.

3.3 BREAKDOWN OF AVERAGE PRIVATE UNIT COSTS BY SPENDING ITEM AND LEVEL

The following example, drawn from The Gambia CSR, 2010, illustrates the breakdown of household education spending by type of expense and level of education. This type of analysis is helpful to policy makers when they want to consider making a given education level free for families for instance, to inform them as to the type of costs that should be borne by government funding.

EXAMPLE 3.17 (Breakdown of Private Unit Costs): Breakdown of Average Household Education Spending by Item, The Gambia, 2009

Source: Adapted from The Gambia CSR, 2010.

Table 3.18 shows the shares allocated by households to a number of different categories of spending by level of education.

TABLE 3.18 - Distribution of Household Education Spending, The Gambia, 2009

Percent	School and Registration Fees	Uniforms & Sports Clothes	Textbooks & School Supplies	Transportation	Exam Fees	Private Tuition	Other Expenses
Preschool	39	20	10	20	0	10	2
Lower Basic	48	16	10	10	1	10	4
Upper Basic	35	13	11	18	5	11	6
Senior Secondary	43	8	12	19	6	7	6
TVET	25	11	8	22	19	3	12
Higher	83	10	8	0	0	0	0
Average	43	14	11	14	3	10	5

Findings

Of the total of D 729 million that households spend annually on education in The Gambia, the largest shares cover school tuition and registration fees (43 percent), uniforms and sports clothes (14 percent) and transportation to and from school (14 percent). Other spending includes textbooks and other learning materials, private tuition, examination fees and contributions to parent teacher associations.

TABLE 3.19 - Cross-Country Comparison of the Distribution of Household Education Spending, by Type, 2009 or MRY

Percent	School Fees and Tuition	Textbooks/Other Materials	Other Education Expenses *
Benin	48.4	37.2	14.4
Burkina Faso	63.7	29.4	6.9
Cameroon	45.7	37.4	16.9
Côte d'Ivoire	36.3	40.1	23.6
Gambia, The	**53.2**	**10.6**	**36.2**
Madagascar	33.6	30.9	35.5
Malawi	59.0	18.2	22.8
Mauritania	37.8	37.2	25.0
Niger	48.9	38.2	12.9
Uganda	73.0	13.3	13.7
Sierra Leone	20.9	48.5	30.6
Tanzania	62.4	26.4	11.2
Togo	53.4	37.8	8.8
Average	**48.9**	**31.2**	**19.9**

Note: * Transport, exam fees, uniforms, contributions to parent-teachers associations, etc.

By reclassifying household education spending into three broad categories, namely tuition fees, textbooks and other school supplies and other expenditures, it is possible to better understand how Gambian households prioritise their expenditures in comparison with other countries.

Findings

Gambian households devote a lower share of their education resources to textbooks and other teaching materials (10.6 percent, against 31.2 percent on average), which is understandable given the government's free textbook scheme for lower, upper and senior secondary levels. In contrast, the share of Gambian household education spending devoted to other expenses, which include uniforms and transportation, is higher at 36.2 percent than the African average of 19.9 percent. In the context of rising poverty levels, many households are unable to afford to send their children to school, especially beyond the lower basic level.

SECTION 4

THE COST OF SCHOOL INFRASTRUCTURE

School buildings constitute a significant proportion of education capital expenditure. They merit special attention, in particular with a view to identifying opportunities to free-up budgetary resources through the use of more competitive building types or approaches and procurement methods. General education could be analysed in this perspective. TVET could also be included in the analysis as it usually involves the use of durable equipment that can be expensive.

The goal is to review institutional mechanisms, construction methods and their related costs, as per Example 3.18 below. Infrastructure costs may also be compared to recurrent unit costs, the cost of a teaching post, or analysed by annualising them.

EXAMPLE 3.18 **(Analysis of Building Costs): Primary and Secondary Education Construction Costs and Institutional Mechanisms, Benin 2011**

Source: Adapted and Translated from the Benin CSR, 2012.

In Benin, school infrastructure (and particularly classrooms built by the government with domestic resources) is built according to typical models adopted by the education ministries for both the primary and general secondary cycles. Two models are used for each of these levels, according to whether a storeroom and a school director's office are included. Practice at the primary level has led to modules being composed of three classrooms, each with a capacity of 50 pupils. At the secondary level, modules tend to include four classrooms, which may be complemented by a storeroom and a director's office. These modules are not strictly applied by all stakeholders that finance infrastructure; NGOs and some projects financed with external resources use other approaches, although with similar capacity.

The cost of building these modules varies according to how the construction is executed and the materials used, especially the roofing. Two main execution modes and two variants can be distinguished: execution by task-workers and execution by companies. The execution by task-workers is often used by communities or NGOs. It generally involves the participation of the beneficiaries with cash, in kind, or with unqualified labour. Communities recruit the workers and NGOs recruit public works technicians to control, supervise and direct the workers on the site. Although the cost of building with this method appears to be relatively low, it is important to underline that it escapes taxation and that the contribution of beneficiaries is often underestimated. The execution by companies involves central or decentralised authorities issuing an invitation to tender and signing a contract with the chosen provider. Companies undergo the control, follow-up and supervision of works on behalf of the administrations' technical services.[23]

Table 3.20 illustrates the average cost of a module comprising three classrooms, a storeroom and a director's office, according to the type of roof and source of funding.

The modules of the second IsDB project and of the public investment program are those built by the Beninese education ministries, so this analysis will focus mainly on these.

TABLE 3.20 - Cost of a School Module of Three Classrooms, a Storeroom and Director's Office, by Source of Funding, Benin, 2011

	Cost (Excluding VAT) Thousands of CFAF		Cost (Including Tax) Thousands of CFAF		Observations
	Minimum	Maximum	Minimum	Maximum	
Community-Driven Development Project	14,000	15,000	-	-	Tin Roof (Not subject to VAT)
PLAN BENIN (NGO)	14,000	15,400	-	-	Tin Roof (Not subject to VAT)
BORNEFONDEN (NGO)	14,500	15,400	-	-	Cement Roof (Not subject to VAT)
Second IsDB Education Project	23,700	35,600	24,297	36,497	Corrugated Iron or Aluminum Roof (Beninese funding subject to 14% VAT)
Public Investment Programme (National Funding)	16,000	16,800	18,880	19,824	Tin Roof

Findings

Globally, the cost of an equipped classroom with a capacity for 50 pupils varies according to the type of roof. A classroom with a corrugated iron or aluminum roof is approximately 70 percent more expensive than a classroom with a tin roof.

However, given that corrugated iron or aluminum roofs have a greater life-span, to be comparable, annualised costs must be computed. The next part of this analysis will compute the annualised cost per student of a furnished classroom, and compare that cost with the annual salary of a teacher.

Annualised costs are obtained through the following formula, where *AC* is the annualised cost, *CC* is the cost of a classroom at the time of construction, *n* is the life-expectancy of the classroom, and *i* is the interest that would be earned if the capital required to build the classroom was invested with a financial institution (for the purpose of this analysis, the rate of five percent is used):

$$AC = \frac{CC \times i \times (1+i)^{(n-1)}}{(1+i)^n - 1}$$

TABLE 3.21 - Annualised Cost of a Furnished Classroom, Based on the Type of Roof, Benin, 2011

	Cost Including Tax (Millions of CFAF)	Life-span (Years)	Annualised Cost (Thousands of CFAF)		Annualised Cost per Pupil (Multiple of the Average Annual Teacher Salary)	
			By Classroom	By Pupil *	Primary	Lower Sec.
Corrugated Iron or Aluminum Roof	12,536	35	729,111	14,582	0.633	0.866
Tin Roof	7,324	20	559,701	11,194	0.486	0.665

Note: Considering class capacity of 50 pupils.

Findings

Even when taking the life-span into account in the computation of annualised costs, the tin roof option looks more cost-effective. As an example, in primary education the tin roof option costs the annual equivalent of 48.6 percent of the average annual teacher salary whereas the other option costs 63.3 percent.

NOTES

18 The public expenditure cycle (approval, commitment, payment and so on) is relatively complex and long, and some types of spending cannot be executed for purely technical reasons.

19 These indicators are furthermore part of the indicative framework of the Global Partnership for Education (previously the EFA FTI Fast Track Initiative).

20 In several Anglophone SSA countries, capital expenditure is often referred to as development expenditure in budget documents.

21 When one or several education levels have changed their ministerial affiliation various times over recent years, the evolution of the education ministries' institutional framework over the years covered by the analysis will enable the analyst to establish where to obtain the information required to reconstitute the spending for each education level.

22 Even when this is the case, such funding is often classified as investment expenditure in national budgets.

23 There are two variants to these execution modes: (i) execution by delegated public works agencies, which is similar to the execution by companies, and (ii) community-led development, which combines the approaches mentioned.