Education Technical Notes

Table of Contents

Technical Note I: Estimating Primary Completion Rates and Other Education Indicators[1]

1.1 Primary Completion Rate

Definition: The total number of students completing (or graduating from) the final year of primary education, regardless of age, expressed as a percentage of the population at the official (typical) primary graduation age.

Purpose: This is a **simple** measure that monitors what share of all children complete the basic education cycle (whatever its length in their country), and tracks progress towards the goal of "Education for All" which is to achieve universal primary completion by the year 2015.

Calculation method: Divide the number of students completing (or graduating from) the final year of primary education by the population at the official (typical) primary graduation age, and multiply the result by 100.

Data required: Total number of students completing (or graduating from) the final year of primary education. Population of the primary graduation age.

Data source: School register, school survey or census for data on primary graduates. Population by age normally can be obtained from the Central Statistical Office in the country or from the Edstats, the World Bank education statistical databases.

Types of disaggregation: This indicator can be disaggregated by gender and by geographical location (region, urban/rural). If population and school enrollment data on ethnicity are collected, this can also be calculated.

Interpretation: A high primary completion rate indicates a high degree of coverage, whether the pupils belong to the population of official/typical graduation age or not. Care should be taken when comparing cross-country results since the duration of basic education varies from 4 to 9 years among countries (see table 1. National Education Systems in HIPC/PRSP Countries in this Annex).

Quality standards: Data on population used in deriving this indicator should refer strictly to the official/typical primary graduation age.

Limitations: The completion rate could be over-estimated due to the inclusion of over-aged and under-aged pupils because of early or late entrants. However, this problem will, in most cases, cancel out overtime (apart from in the very few cases where there is a rapid change in the age-structure of new admission).

[1] This annex was prepared by Hongyu Yang, HDNED, the World Bank

1.2 Years-Input Per Graduate

Definition: The estimated average number of pupil-years spent by pupils from a given cohort who graduate from a given cycle or level of education, taking into account the pupil-years wasted due to drop-out and repetition. One school-year spent in a grade by a pupil is equal to one pupil-year.

Purpose: To assess the extent of educational internal efficiency in terms of the estimated average number of years to be invested in producing a graduate.

Calculation method: Divide the total number of pupil-years spent by a pupil-cohort (graduates plus drop-outs) in the specified level of education by the sum of successive batch of graduates belonging to the same cohort.

Data required: Total number of pupil-years spent by the pupil-cohort and the total number of graduates from the same cohort. These data can be derived using cohort reconstructed model, which requires enrolment by grade for two consecutive years (years t and t+1); number of repeaters by grade for year t+1 and number of graduates for year t.

Data source: School register, school survey or census or records.

Type of disaggregation: The years input per graduate can be disaggregated by gender, by geographical location (region, urban/rural) and by type of institution (private/public).

Interpretation: The closer the value of this indicator is to the theoretical number of grades (or duration) of the specified education cycle, the higher the internal efficiency and the lesser the negative effects of repetition and drop-out. A high number of pupil-years per graduate as compared to the normal duration, denotes waste of resources and hence inefficiency.

Quality standards: Since the calculation of this indicator is based on pupil-flow rates, its reliability depends on the consistency of data on enrolment and repeaters in term of coverage over time and across grades. Differences in national regulations concerning the number of repetitions allowed constitute an aspect to be taken into account when using this indicator for inter-country comparisons.

Limitations: From a conceptual viewpoint, having most pupils graduating within the prescribed duration of the cycle is optimal with regard to economic efficiency and resource utilization, but this does not necessarily imply achievement of the expected learning outcomes. Also, according to this calculation method, early drop-outs (i.e. from lower grades) can result in higher internal efficiency than late drop-out (i.e. from higher grades); this means that efficiency from the economic point of view can be in contradiction with educational objectives aiming at retaining pupils in schools until higher grades when they would have acquired the desired knowledge and skills. However, a system cannot achieve high efficiency without all children reaching graduation.

1.3 Survival Rate

Definition: Percentage of a cohort of pupils enrolled in the first grade of a given level or cycle of education in a given school-year who are expected to reach each successive grade.

Purpose: Survival rate measures the holding power and internal efficiency of an education system. It illustrates the situation regarding retention of pupils from grade to grade in schools, and conversely the magnitude of drop-out by grade.

Calculation method: Divide the total number of pupils belonging to a school-cohort who reached each successive grade of the specified level of education by the number of pupils in the school-cohort i.e. those originally enrolled in the first grade of the same level of education, and multiply the result by 100.

Data required: Enrollment by grade for two consecutive years (years t and t+1); number of repeaters by grade for year t+1.

Data source: School register, school survey or census.

Type of disaggregation: Survival Rates can be disaggregated by gender, by geographical location (region, urban/rural) and type of institution (private/public). It can also be disaggregated between survival with and without repetition. If population and school enrollment data on ethnicity are collected, this can also be calculated.

Interpretation: A survival rate approaching 100% indicates a high level of retention and low incidence of drop-out. Survival rates may vary from grade to grade, giving indications of grades with relatively more or less drop-outs. The distinction between survival rates with and without repetition is necessary to compare the extent of wastage due to drop-out and repetition. Survival rate to grade 5 of primary education is monitored by UNESCO since this is commonly considered as pre-requisite for sustainable literacy.

Quality standards: Since the calculation is based on pupil-flow rates, the reliability of the Survival Rate depends on the consistency of data on enrollment and repeaters in term of coverage over time and across grades.

Limitations: Since this indicator is usually estimated using cohort analysis models (defined below) that are based on a number of assumptions, errors in the data available on enrollment and repeater would affect estimates derived from flows.

1.4 The Reconstructed Cohort Method

A "school cohort" is defined as a group of pupils who join the first grade of a given cycle in the same school year, and subsequently experience the events of promotion, repetition, dropout or successful completion of the final grade, each in his/her own way.

The reconstructed cohort method is pertinent and commonly used to analyze the internal efficiency of an education system. It places less demand on the availability of detailed data over time. To apply this method, data on enrollment by grade for two consecutive years and on repeaters by grade from the first to second year are sufficient to enable the estimation of three main flow-rates: promotion, repetition and drop-out. Once obtained, these rates may be analyzed first of all by grade to study the patterns of repetition and drop-out. Then, they are used in a reconstructed pupil-cohort flow to derive other indicators of internal efficiency.

How well these indicators describe the way in which a cohort actually progresses through a cycle of education depends of the validity of the assumptions on which this model is based and the reliability of the statistical data available for estimating the flow rates.

Assumptions behind the cohort reconstruction model: The methodology of the reconstructed cohort flow model is based on the fundamental concept that for pupils enrolled in a given grade at a certain year, there could be only three eventualities: (a) some of them will be promoted to the next higher grade in the next school year; (b) others will drop-out of school in the course of the year; and (c) the remaining students will repeat the same grade in the next school year.

Based on calculated flow-rates, a cohort of 1000 pupils through the educational cycle may be simulated, with a number of important assumptions:

- that there will be no additional new entrants in any of the subsequent years during the life-time of the cohort, other than original cohort of 1000 pupils;
- that, at any given grade, the same rates of repetition, promotion, and drop-out apply, regardless of whether a pupil has reached that grade directly or after one or more repetitions (hypothesis of homogenous behavior);
- that the number of times any given pupil will be allowed to repeat must be well defined;
- that flow rates for all grades remain unchanged as long as members of the cohort are still moving through the cycle.
- It is important to note that since data are not generally directly available on promotion and drop-outs, errors in the data available on enrollment and repeaters would affect the estimates derived for these two flows. Three common errors which may distort the flow rates can be described as follows:

1. Over-reporting enrollment/repeaters (particularly in grade 1): which can be deliberately done by school responsible when there is a financial incentive, for example if the number of teachers paid by the government is related to the number of pupils enrolled. A different type of over-reporting occurs in countries where parents have incentives to register their children at school at the beginning of the school year, but where a large number of those registered do not attend school or only attend for a very brief period.

2. Incorrect distinction between new entrants and repeaters: which leads, other things being equal, to an under-reporting of repeaters in grade one and, like in point 1, to an over-estimation of drop-outs from this grade.

3. Yearly variation in the coverage of the data: Assume that, for one reason or another, the data available for year t are complete while those for year t+1 are incomplete. Disregarding other types of errors, this implies that the number of promotions and repeaters in t+1 will be under-estimated and the number of drop-outs over-estimated. If further the data for school-year t+2 are complete, this will imply that some of the promotions and repeaters that year were not included in the enrolment the previous year, leading to over-estimation of the promotion and repetition rates and under-estimation of the drop-out rate, which may be negative in some cases.

1.5 Apparent Intake Rate

Definition: Total number of new entrants in first grade of primary education, regardless of age, expressed as a percentage of the population at the official primary school-entrance age.

Purpose: It indicates the general level of access to primary education. It also indicates the capacity of the education system to provide access to grade 1 for the official school-entrance age population. This indicator is used as a substitute to the Net Intake Rate (defined below) in the absence of data on new entrants by single years of age.

Calculation method: Divide the number of new entrants into grade 1, irrespective of age, by the population of official school-entrance age, and multiply the result by 100.

Data required: New entrants in the first grade of primary education (or enrolment minus repeaters in the first grade); population of the official primary school-entrance age.

Data source: School register, school survey or census for data on new entrants by age. Population census or estimates for primary school-entrance age population.

Type of disaggregation: The Apparent Intake Rate may be disaggregated by gender and geographical location (region, rural/urban). If population and school enrollment data on ethnicity are collected, this can also be calculated.

Interpretation: A high Apparent Intake Rate indicates a high degree of access to primary education. As this calculation includes all new entrants to first grade (regardless of age), the Apparent Intake Rate can be more than 100%, due to over- and under-aged children entering primary school for the first time.

Quality standards: Data on population used in deriving this indicator should refer strictly to the official school-entrance age. Care should be taken not to include repeaters in grade 1 in the calculation, since this will lead to an inflated Apparent Intake Rate.

Limitations: A high Apparent Intake Rate may be the effect of a backlog of over-aged children who have not entered school when they were at the official primary school-entrance age.

1.6 Net Intake Rate

Definition: New entrants in the first grade of primary education who are of the official primary school-entrance age, expressed as a percentage of the population of the same age.

Purpose: To show the level of access to primary education of the eligible population of primary school-entrance age.

Calculation method: Divide the number of children of official primary school-entrance age who enter the first grade of primary education by the population of the same age, and multiply the result by 100.

Data required: New entrants in first grade of primary education by single years of age; population of official primary school-entrance age.

Data source: School register, school survey or census for data on new entrants by age. Population census or estimates for school-entrance age population.

Type of disaggregation: The Net Intake Rate may be disaggregated by gender and geographical location (region, rural/urban). If population and school enrollment data on ethnicity are collected, this can also be calculated.

Interpretation: A high Net Intake Rate indicates a high degree of access to primary education for the official primary school-entrance age children. For countries which have subscribed to the policy goal of universal primary education, a NIR of 100% will be a necessary condition.

Quality standards: Data on both new entrants and population used in deriving this indicator should refer strictly to the official school-entrance age. NIR in principle should not exceed 100%.

Limitations: This indicator can be distorted by an incorrect distinction between new entrants and repeaters in the first grade. This can be the case especially for under-aged pupils who may repeat the first grade at the official-entrance age.

1.7 Gross Enrollment Ratio

Definition: Total enrolment in a specific level of education, regardless of age, expressed as a percentage of the official school-age population corresponding to the same level of education in give school-year.

Purpose: Gross Enrolment Ratio is widely used to show the general level of participation in a given level of education. It indicates the capacity of the education system to enroll students of a particular age-group. It is used as a substitute indicator to net enrolment ratio (NER) (defined below) when data on enrolment by single years of age are not available. Furthermore, it can also be a complementary indicator to NER by indicating the extent of over-aged and under-aged enrolment.

Calculation method: Divide the number of pupils enrolled in a given level of education regardless of age by the population of the age-group which officially corresponds to the given level of education, and multiply the result by 100.

Data required: Total enrolment for a given level of education. Population of the age-group corresponding to the specified level.

Data source: School register, school survey or census for data on enrolment by level of education. Population censuses for school-age population normally obtained from the Central Statistical Office.

Types of disaggregation: This indicator is to be disaggregated by gender, by geographical location (region, urban/rural) and level of education. If population and school enrollment data on ethnicity are collected, this can also be calculated.

Interpretation: A high GER generally indicates a high degree of participation, whether the pupils belong to the official age-group or not. A GER value of 100 percent indicates that a country is, in principle, able to accommodate all of its school-age population, but it does not indicate the proportion already enrolled. The achievement of a GER of 100 percent is therefore a necessary but not sufficient condition for enrolling all eligible children in school. When the GER exceeds 90 percent for a particular level of education, the aggregate number of places for pupils is approaching the number required for universal access of the official age-group. However, this is a meaningful interpretation only if one can expect the under-aged and over-aged enrolments to decline in the future to free places for pupils from the expected age-group.

Quality standards: GER at each level of education should be based on total enrolment in all types of schools and education institutions, including public, private and all other institutions that provide organized educational programs.

Limitations: GER can be over 100% due to the inclusion of over-aged and under-aged pupils/students because of early or late entrants, and grade repetition. In this case, a rigorous interpretation of GER needs additional information to assess the extent of repetition, late entrants, etc.

1.8 Net Enrollment Ratio

Definition: Enrolment of the official age-group for a given level of education expressed as a percentage of the corresponding population.

Purpose: To show the extent of participation in a given level of education of children or youths belonging to the official age-group corresponding to the level of education.

Calculation method: Divide the number of pupils enrolled who are of the official age-group for a given level of education by the population for the same age-group and multiply the result by 100.

Data required: Enrolment by single years of age for a given level of education. Population of the age-group corresponding to the given level of education.

Data source: School register, school survey or census for data on enrolment by age. Population censuses or estimates for school-age population normally obtained from the Central Statistical Office.

Types of disaggregation: This indicator may be disaggregated by gender, by geographical location (region, urban/rural) and by level of education. If population and school enrollment data on ethnicity are collected, this can also be calculated.

Interpretation: A high NER denotes a high degree of participation of the official school-age population. The theoretical maximum value is 100%. Increasing trends can be considered as reflecting improving participation at the specified level of education. When the NER is compared with the GER the difference between the two ratios highlights the incidence of under-aged and over-aged enrolment. If the NER is below 100%, then the complement, i.e. the difference with 100% provides a measure of the proportion of children not enrolled at the specified level of education. However, since some of these children/youth could be enrolled at other levels of education, this difference should in no way be considered as indicating the percentage of students not enrolled. A more precise complementary indicator is the age-specific enrolment ratio (ASER) which shows the participation of the population of a particular age in education.

Quality standards: NER at each level of education should be based on total enrolment in all types of schools and education institutions, including public, private and all other institutions that provide organized educational programs.

Limitations: For tertiary education, this indicator is not pertinent because of the difficulties in determining an appropriate age-group due to the wide variations in the duration of programs at this level of education.

1.9 Adult Literacy Rate

Definition: Adult literacy rate is defined as the percentage of population aged 15 years and over who can both read and write with understanding a short simple statement on his/her everyday life. A person who can only write figures, his or her name or a memorized ritual phrase is not considered literate. This definition of literacy is widely used in national population censuses and surveys but its interpretation and application may vary to some extent among countries, depending on national, social and cultural circumstances.

Purpose: Literacy is a good measure of educational achievement in developing regions. For young people in developing regions, literacy may be a better measure of education than enrollment since it usually reflects a minimal level of successfully completed schooling.

The adult literacy rate shows the accumulated achievement of primary education and literacy programs in imparting basic literacy skills to the population, thereby enabling them to apply such skills in daily life and to continue learning and communicating using the written word. Literacy represents a potential for further intellectual growth and contribution to economic-socio-cultural development of society. Illiteracy rates indicate the extent of need for policies and efforts in organizing adult literacy programs and quality primary education.

Calculation method: Divide the number of literate by the corresponding age-group population and multiply the result by 100. Alternatively, apply the same method using the number of illiterates to derive the illiteracy rate; or by subtracting literacy rate from 100%.

Data required: Population and number of littermates (or illiterates) aged 15 years and over.

Data source: Mainly national population census; household and/or labor force surveys.

Types of disaggregation: This indicator should be calculated by gender, geographical location (region, urban/rural) and by the following five-year age-groups: 15-19; 20-14; 25-19; 30-34; 35-39; 40-44; 45-49; 50-54; 55-59; 60-64; 65 and above. If census data on ethnicity are collected, this can also be calculated.

Interpretation: A high adult literacy rate indicates a wide coverage of the primary education system and/or literacy programs in that a large proportion of the population have acquired the ability of using the written word in daily life and to continue learning. It is common practice to present and analyze literacy rates together with the absolute number of adult illiterates improvements in literacy rates may sometimes be accompanied by increases in the illiterate population due to the changing demographic structure.

Quality standards: It will be useful to align measurements of literacy with the standard international definition given above, and to administer literacy tests on a sample basis to verify and improve the quality of literacy statistics.

Limitations: It has been observed that some countries apply definitions and criteria for literacy which are different from the international standards defined above, or equate persons with no schooling to illiterates, or change definitions between censuses. Practices for identifying literate and illiterates during actual census enumeration may also vary, as well as errors in literacy self-declaration can affect the reliability of literacy statistics.

Table 1. National Education Systems in HIPC/PRSP Countries

Region	Country	Official starting age		Typical duration (years)		Official graduation age	
		primary	secondary	primary	secondary	primary	secondary
AFR	Angola	6	10	4	7	10	17
AFR	Benin	6	12	6	7	12	19
AFR	Burkina Faso	7	13	6	7	13	20
AFR	Burundi	7	13	6	7	13	20
AFR	Cameroon	6	12	6	7	12	19
AFR	Cape Verde	7	13	6	6	13	19
AFR	Central African Republic	6	12	6	7	12	19
AFR	Chad	6	12	6	7	12	19
AFR	Comoros	7	13	6	7	13	20
AFR	Congo	6	12	6	7	12	19
AFR	Congo, Dem. Rep.	6	12	6	6	12	18
AFR	Cote d'Ivoire	6	12	6	7	12	19
AFR	Ethiopia	7	13	6	6	13	19
AFR	Gambia, The	7	13	6	6	13	19
AFR	Ghana	6	12	6	7	12	19
AFR	Guinea	7	13	6	7	13	20
AFR	Guinea-Bissau	7	13	6	5	13	18
AFR	Kenya	6	14	8	4	14	18
AFR	Lesotho	6	13	7	5	13	18
AFR	Liberia	7	13	6	6	13	19
AFR	Madagascar	6	11	5	7	11	18
AFR	Malawi	6	14	8	4	14	18
AFR	Mali	7	13	6	6	13	19
AFR	Mauritania	6	12	6	6	12	18
AFR	Mozambique	7	12	5	7	12	19
AFR	Niger	7	13	6	7	13	20

AFR	Nigeria	6	12	6	6	12	18
AFR	Rwanda	7	14	7	6	14	20
AFR	Sao Tome and Principe	7	11	4	7	11	18
AFR	Senegal	7	13	6	7	13	20
AFR	Sierra Leone	5	12	7	7	12	19
AFR	Somalia	6	14	8	4	14	18
AFR	Sudan	6	14	8	3	14	17
AFR	Tanzania	7	14	7	6	14	20
AFR	Togo	6	12	6	7	12	19
AFR	Uganda	6	13	7	6	13	19
AFR	Zambia	7	14	7	5	14	19
Total AFR 37 Countries (33 HIPC+4 PRSP)							

Region	Country	Official starting age		Typical duration (years)		Official graduation age	
		primary	secondary	primary	secondary	primary	secondary
EAP	Cambodia	6	12	6	6	12	18
EAP	Indonesia	7	13	6	6	13	19
EAP	Lao	6	11	5	6	11	17
EAP	Mongolia	8	12	4	6	12	18
EAP	Myanmar (Burma)	5	10	5	6	10	16
EAP	Vietnam	6	11	5	7	11	18
Total EAP 6 Countries (3 HIPC + 3 PRSP)							
ECA	Albania	6	14	8	4	14	18
ECA	Armenia	7	11	4	6	11	17
ECA	Azerbaijan	6	10	4	7	10	17
ECA	Bosnia-Herzegov	7	11	4	6	11	17
ECA	Georgia	6	10	4	7	10	17
ECA	Kyrgyz Republic	7	11	4	7	11	18
ECA	Macedonia	7	15	8	4	15	19
ECA	Moldova	7	11	4	7	11	18
ECA	Tajikistan						
Total ECA 9 PRSP Countries							
LCR	Bolivia	6	14	8	4	14	18
LCR	Guyana	6	12	6	5	12	17
LCR	Haiti	6	12	6	6	12	18
LCR	Honduras	7	13	6	5	13	18
LCR	Nicaragua	7	13	6	5	13	18
Total LCR 5 countries (4 HIPC + 1 PRSP)							
MNA	Djibouti	6	12	6	7	12	19
MNA	Yemen, Republic	6	15	9	3	15	18
Total MNA 2 Countries (1 HIPC + 1 PRSP)							
SAR	Bhutan	6	13	7	4	13	17
SAR	Maldives	6	11	5	7	11	18
SAR	Nepal	6	11	5	5	11	16
SAR	Pakistan	5	10	5	7	10	17
SAR	Sri Lanka	5	10	5	8	10	18
Total SAR 5 PRSP Countries							
Grand Total 64 Countries (41 HIPC + 23 PRSP)							

Source: UNESCO Yearbook 1999

Note: Data for the list of countries are from Bank HIPC internal website and PRSP Database. Countries in shade are not HIPC, but need to prepare PRSP.

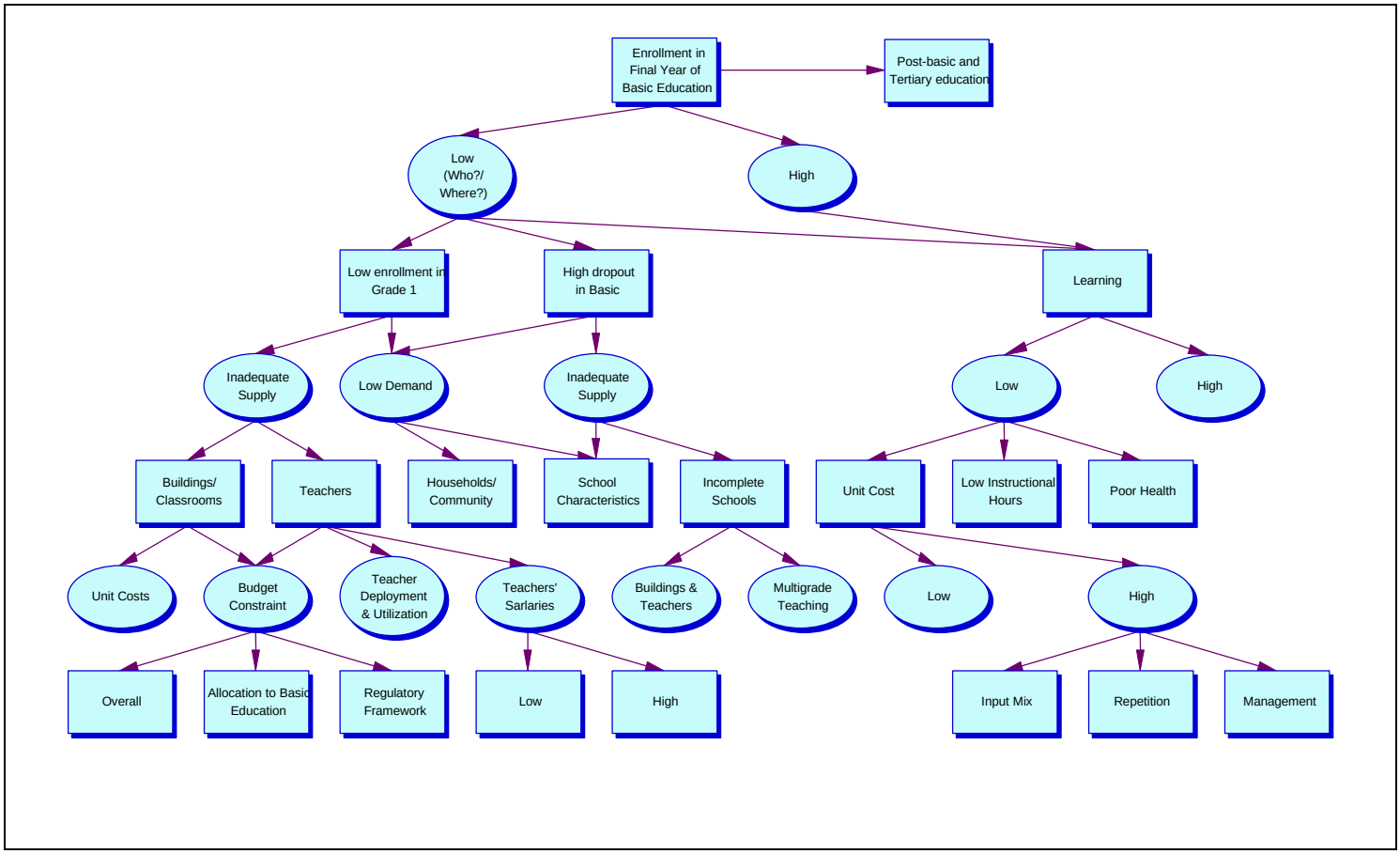
Technical Note II[2]: Template for Disaggregated Enrollment

Sample Template for Disaggregating Education Indicators										
	Gender				Ethnicity			Income		
Region	Average	Boys	Girls	Differential	Indigenous	Others	Differential	Quintile 1	Quintile 2	Quintile 3
Basic Education Completion Rates (%)										
Region 1										
Region 2										
Average										
Years of Schooling Input per Graduate										
Region 1										
Region 2										
Average										
Cohort Completion Rates (%)										
Region 1										
Region 2										
Average										
Primary Intake Ratio (%)										
Region 1										
Region 2										
Average										
Number of Children Out-of-school (%)										
Region 1										
Region 2										
Average										
Gross Enrollment Ratio (%) ***Net Enrollment Ratio (%)*** ***Repetition Rates (%)*** ***Drop Out Rates (%)***										
Region 1										
Grade #1										
Grade #2										
Grade #3										
Grade #4										
Grade #5										
Grade #6										
Average										
Region 2										
Grade #1										
Grade #2										
Grade #3										
Grade #4										
Grade #5										
Grade #6										
Average										

[2] This annex was prepared by Michael Drabble, Education Reform and Management Team, HDNED

Technical Note III: Decision Tree For Analyzing Education Outcomes[3]

Figure 1



1.1 Enrollment Rate in Final Year of Basic Education: A Key Quantitative Indicator

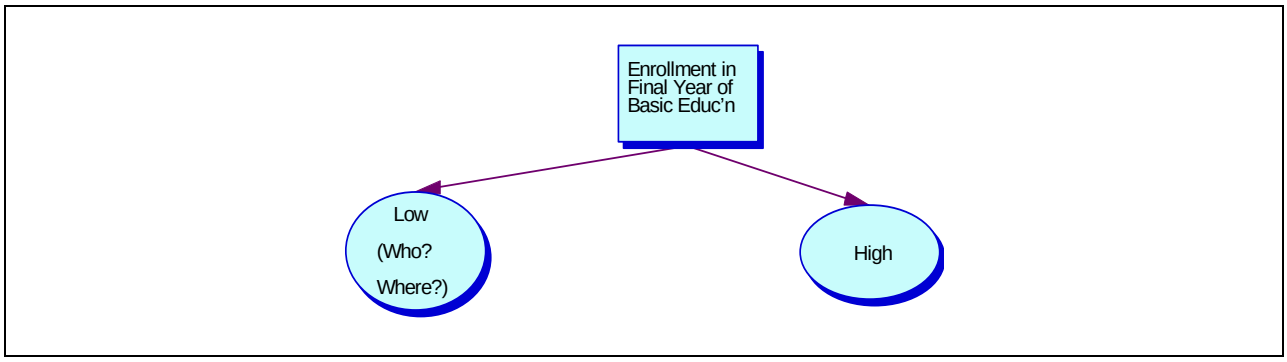
The decision tree starts from the premise that successful completion of basic schooling (7-9 years in most countries) is essential for children in order for them to maintain, throughout their adult lives, the levels of literacy and numeracy needed for productivity and fulfillment at work, at home and as members of society. The use of enrollment in the first analytic step of the decision tree implies nothing about the relative importance of enrollment (a quantitative indicator) versus learning (a qualitative indicator). Enrollment may be a necessary condition for learning to occur (particularly when learning is measured by the achievement of skills such as basic literacy and numeracy, around which the basic education curriculum in nearly all countries is expressly designed), but obviously enrollment is not a sufficient condition for learning. A second reason

[3] Prepared by a Bank-wide Task Team consisting of Peter Moock (EASHD), Alain Mingat (AF2H2), Paud Murphy (AFTH1), Chris Thomas (EASHD), Pierella Paci (PRMPO), Mmantsetsa Marope (AFTH1), Harry Patrinos (HDNED) and Jee-Peng Tan as part of a broader Task Force charged with developing a common framework for producing Poverty Reduction Strategy Papers.

for starting the analysis with enrollment rates is that this indicator can respond relatively quickly to policy interventions, whereas gains in learning are likely to take much longer to materialize. Indicators of learning may remain quite flat for several years while systems to enhance learning outcomes are being designed and put into place. Finally, starting with enrollments rather than learning also reflects the reality that few low-income countries at this time have reliable systems in place for measuring student achievement. It should be re-emphasized, however, that enrollment without learning has no value. For this reason, the cognitive and social achievements of those who enroll in school will receive equal attention as the analysis unfolds below.

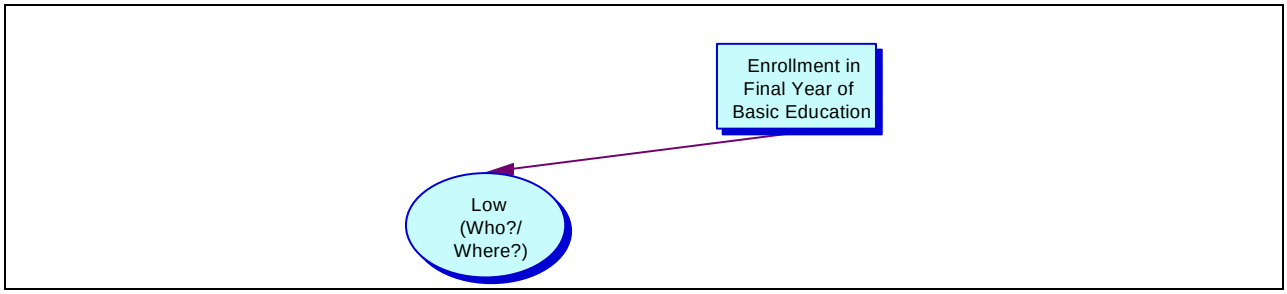
The first question raised by the model, as argued above, is whether the share of the age group reaching the final year of basic education has reached an acceptable level, or whether it is still too low (Figure 2). Countries will need to decide for themselves what constitutes an acceptably "high" enrollment rate: 90 percent? 95 percent? Or must it be every child? The indicator here is the number of pupils in the final grade (excluding those repeating this grade) over the number of children in the relevant age group (as defined b y the average age of the non-repeaters currently enrolled in the final grade). Annual school surveys, the Education Management Information System (EMIS) and/or household surveys will provide the necessary numerator information in most countries. Denominator data will usually be an extrapolation of the most recent population census data collected by the central statistical office. (Annex 1 provides information on the data requirements for the education analysis in a PRSP, and on likely sources for such data.)

Figure 2



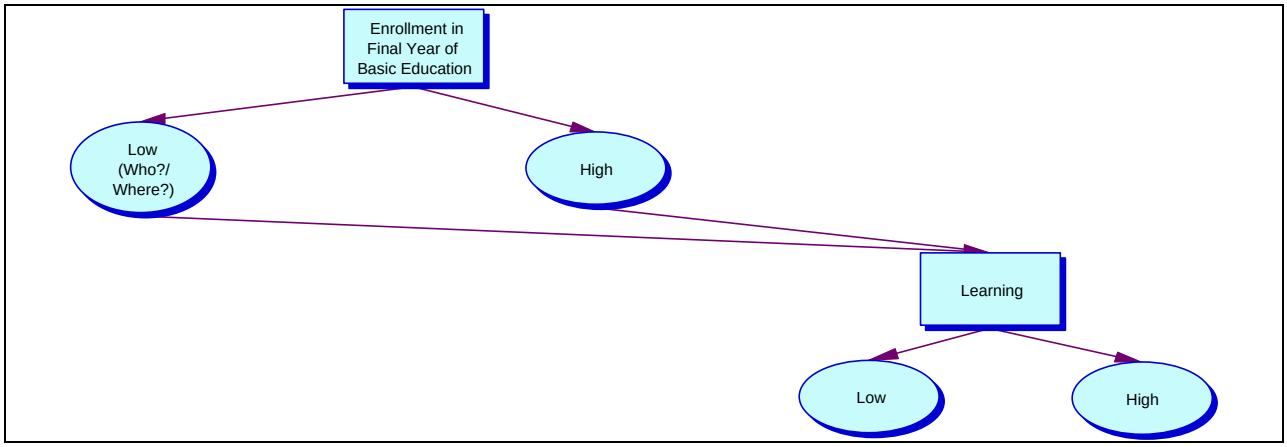
If the assessment is that enrollment in the final grade of basic education is "low," a focus of the analysis (Figure 3) should be on the composition of the excluded population – Who? (the numbers of children not in school by family income level, by gender, by caste and by tribe, for example); Where? (in urban or rural areas, for example), and also, within the broad categories, on whether there are pockets of exclusion (e.g., are there poor groups living within generally well-to-do communities?). This information may be available through the annual school survey, the national EMIS, and (for information on income) household surveys, such as the Living Standards Measurement Survey (LSMS), which many countries now conduct.

Figure 3



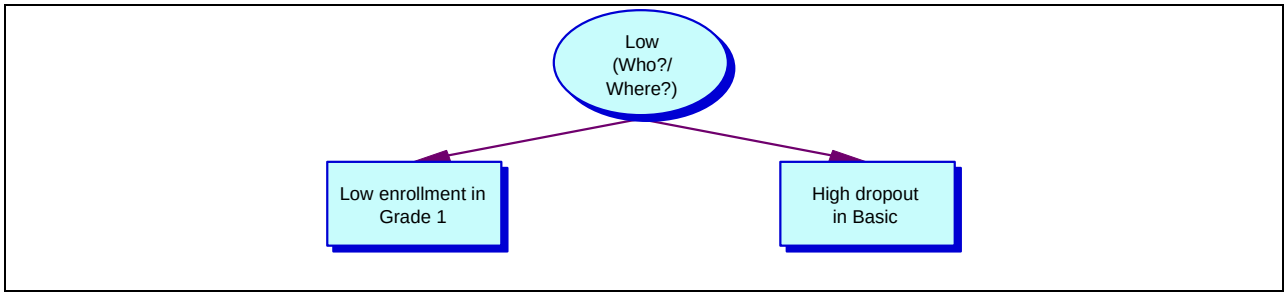
Whether the assessment of enrollment in the final grade is low or high, a critical question is: what proportion of pupils have achieved the appropriate learning outcomes for basic education, as defined in the national curriculum (Figure 4)? If learning is low, it will be necessary to complete the analysis in paragraphs 28-39 below.

Figure 4



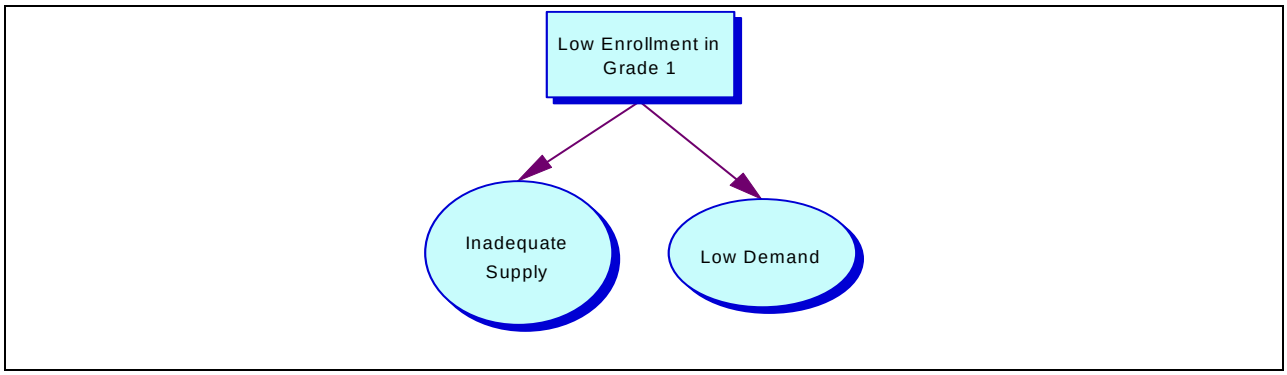
The reason for low enrollment in the final year of basic education (Figure 5) may be low enrollment in grade 1, or it may be high dropout during the basic cycle (or, in many countries, it will be both). If the proportion of young children entering grade 1 is nearly the same as the proportion of older children reaching the final grade, then by definition dropout is low. The annual school survey should provide data on the numbers of boys and girls entering grade 1. The LSMS can be used to identify at-risk children and provide information on their family background. Another rich source of data on children at risk can be found in teachers' records.

Figure 5



If it is found that the proportion of children entering grade 1 is low, the analysis should identify the reasons behind this finding. The causes fall into two broad categories (Figure 6): **low demand** for schooling (there are available school places that children are not filling) and **inadequate supply** of schooling (school places are not available in adequate numbers, and/or what is available is of poor quality).

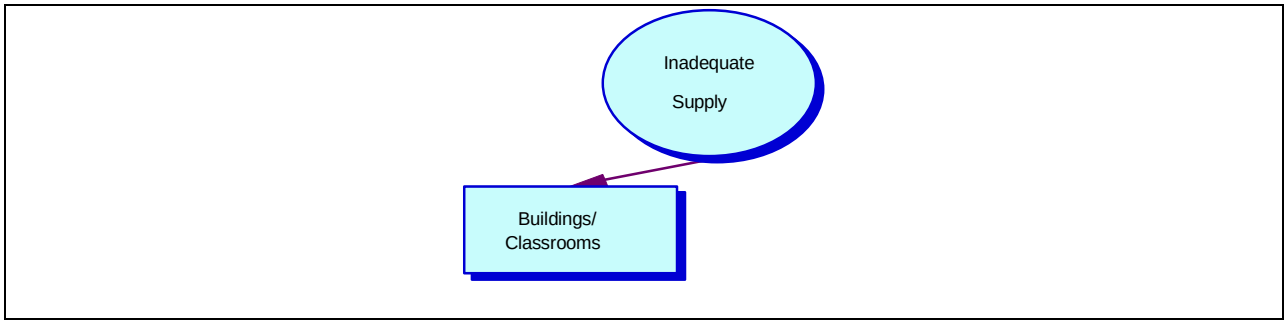
Figure 6



1.1.1 Supply constraints as a cause of low enrollments

A critical dimension of school supply is the quantity of **school buildings and classrooms** (Figure 7). Teachers and children require a setting in which adequate teaching and learning can occur. One measure of this is the pupil-to-classroom ratio. (The data for this should be available through the annual school survey or through the EMIS.) Pupil-to-classroom ratios below 30:1 would usually be a cause for concern on efficiency grounds, whereas ratios above 50:1 raise questions about quality. In most poor countries, a ratio of between 35 and 45 to 1 in basic education is likely to be optimal. However, classroom-to-pupil ratios will vary according to how classrooms and teachers are utilized. In urban areas, multiple-shifting (using the same classroom for more than one class group) may be needed to address a current shortage of classrooms. Where this is the case, classroom-to-pupil ratios could be high without serious impact on the quality of learning. In rural areas, pupil-to-classroom ratios tend to be low because of population scarcity, but alternative teaching arrangements, such as multi-grade classes, can be tried as a way of using costly classrooms (and teachers) more effectively.

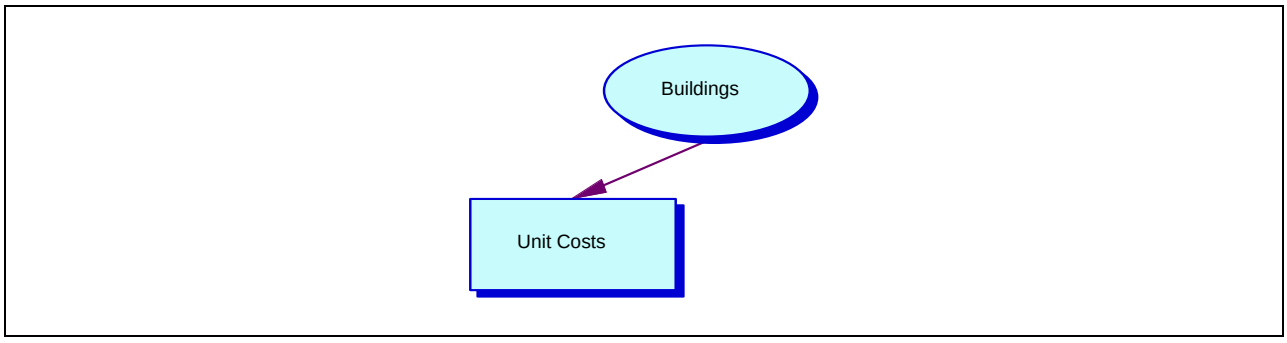
Figure 7



Another aspect of school supply is the **distance from home to school**. One indicator of this could be the proportion of the relevant age group (in different areas of the country) living "far" from school, say, more than three kilometers. This problem can be assessed by merging school survey data with census data, or through a special school mapping exercise. School mapping can identify the magnitude of the problem and also its geographical distribution. Household survey data can also be used, if a question on distance to the nearest school is included in the survey.

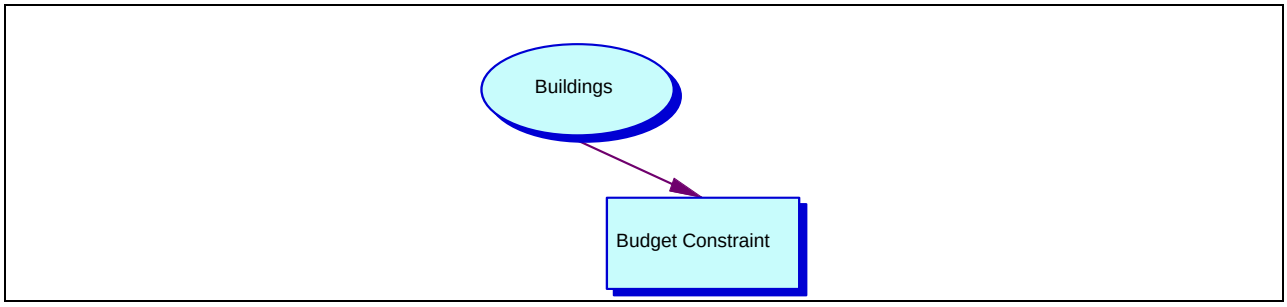
One important reason for shortages of classrooms in poor countries is that prevailing **construction costs** are "too high" (Figure 8) The cost of new classrooms in poor countries varies from as little as $4,000 to as much as $18,000. It is important to determine whether unit construction cost is a factor inhibiting the supply of classrooms nationally and regionally, and to assess whether a different construction modality (large contractors, small contractors, greater reliance on local materials, community involvement) will help to lower costs and alleviate the supply constraint. Patterns of human settlement bear on the solutions identified, with sparsely populated rural areas requiring more imaginative and often, perhaps, more expensive solutions. Information on construction costs may be available through the Schools Building Unit of the Ministry of Education or the Ministry of Works, and sometimes through Social Fund Programs.

Figure 8



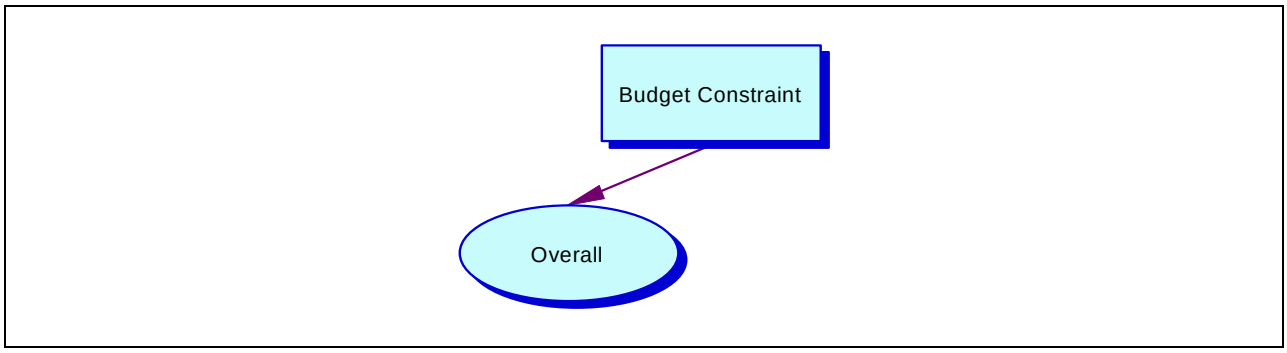
Whereas lowering construction costs is often important, alleviating a supply constraint will also, in most cases, require that **additional resources** be mobilized (Figure 9). Most resources for basic education come from Government and parents. Information on these sources can be found in government budget publications and is collected in household surveys (e.g., LSMS). Foreign aid may be another important source of funding, especially for development expenditures. In many poor countries, community self help also contributes significantly to basic education school construction.

Figure 9



If inadequate budget is identified as a major factor constraining educational expansion, a key question is the extent to which Government, parents and communities might do more than they are already, or foreign aid (Official Development Assistance) can be increased (Figure 10). Information on public spending can be found in the Government Budget (which should, in principle, but may not, show ODA flows). Public spending on education ranges from as little as 1 percent to as much as 10 percent of GDP, and from 10 percent to 40 percent of total government spending. Senegal, for example, allocated 38.6 percent of the budget to education in [**199x]**. Comparative information is available from UNESCO's Statistical Yearbook and from the World Bank's World Development Indicators and educational statistics database (EdStats).

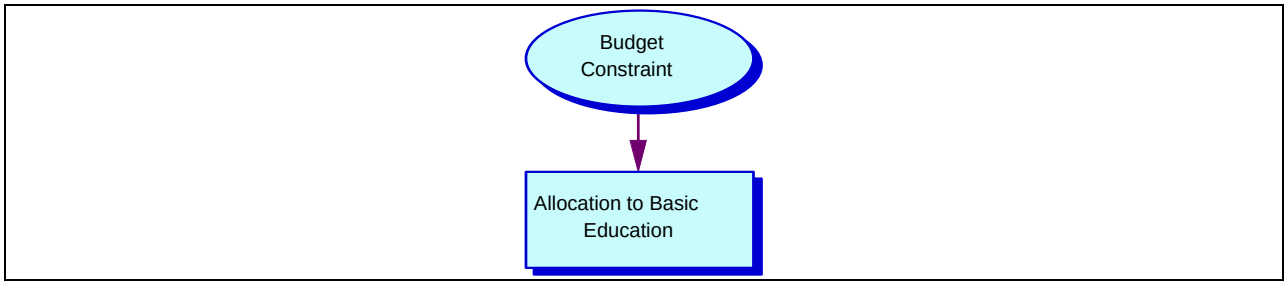
Figure 10



Given what a country allocates from the budget to education in total, the **share of the budget devoted to basic education** can vary a lot from one country to another. In formulating a country's PRSP, basic education's share needs to be examined (Figure 11) to determine whether more can be allocated to this level, in light of (a) the benefits that basic education confers on society in general, and poor families in particular, and (b) the disproportionate share of public education spending appropriated (in many if not all poor countries) by the relatively small number of children who progress beyond basic schooling.[4] Comparative information is available from UNESCO's Statistical Yearbook and from the World Development Indicators and EdStats.

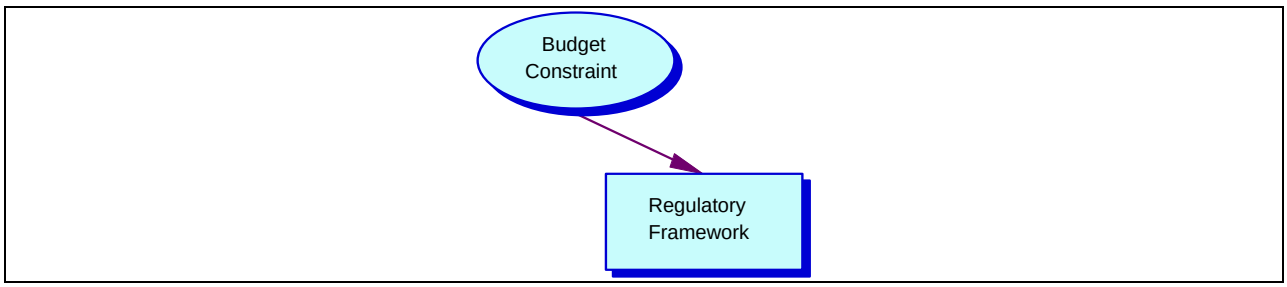
[4] Despite the fact that those who reach secondary and tertiary education tend to come from well-to-do homes, government subsidies at these levels tend to be higher than in primary education, if only because unit costs are higher.

Figure 11



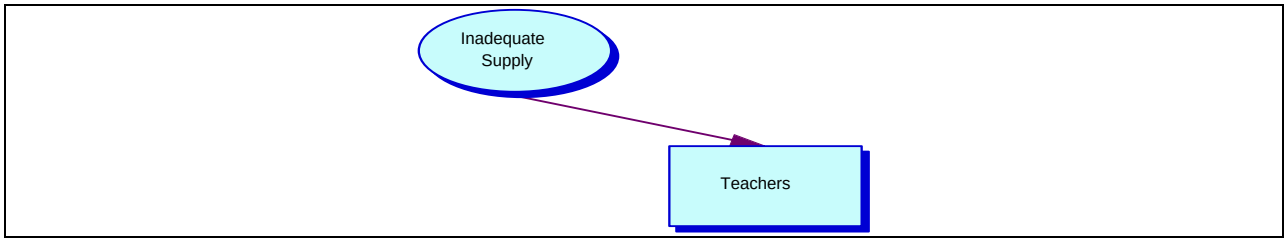
Finally, it should be recognized that public spending on basic education can go further and do more to help alleviate poverty when there is a large and vibrant private education sector serving populations that are willing and able to pay directly for education services. Private spending (which usually covers 100 percent of direct costs in private schools) reduces the burden on the government budget. Private education may also lead to better system-wide quality, by providing choice for families and competition among providers. Nevertheless, some countries restrict unnecessarily the free operation of private schools (Figure 12). PRSPs need to assess the extent to which **government regulations** that restrict private education or community involvement in school construction impact on resource availability in the country. (Annex 2 provides a checklist for assessing a country's regulatory framework for education.)

Figure 12



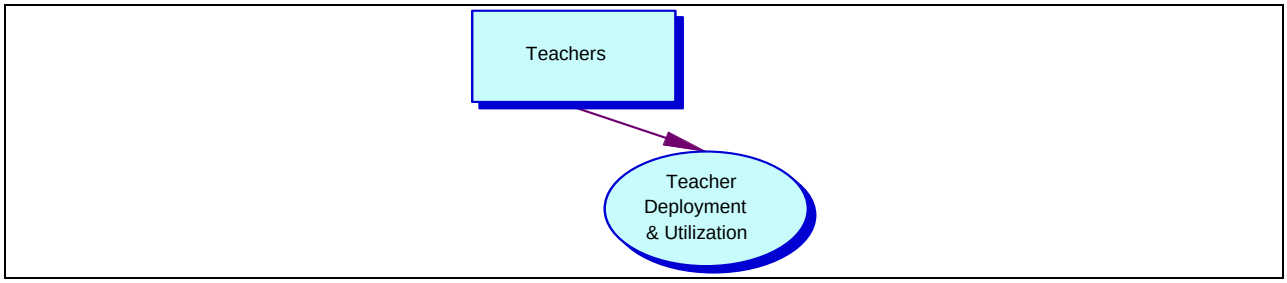
In many countries, the enrollment of pupils is less constrained by the inadequate number and poor location of school buildings and classrooms than it is by an inadequate number and inefficient deployment of **teachers in the system** (Figure 13). In virtually every country, teachers' salaries account for more than 60 percent of the basic education budget and, in some poor countries, over 90 percent. A critical question to ask as part of the PRSP exercise, therefore, is the extent to which low enrollments are linked to an insufficient supply of teachers. A first-level indicator is the national pupil-teacher ratio, found often in EMIS and/or the annual school survey. As with the pupil-to-classroom ratio, the optimal pupil-teacher ratio in many countries will probably be found somewhere between 30 and 40 to 1, but as with classrooms, there are important utilization questions that need to be examined, to ensure that teacher resources are being put to the best possible use and not being squandered.

Figure 13



While teacher supply may be adequate overall, this fact can easily hide an over-supply in some regions and an under-supply in others (Figure 14). Many countries are unable to attract sufficient numbers of teachers (given the current level and structure of salaries) to work in remote rural areas. Female teachers are often the hardest to convince to teach in such areas; young women may not feel secure, and married women do not want to teach there because their husbands work elsewhere. As a result, there may be an over-supply of teachers in urban areas and, concurrently, an under-supply, especially of female teachers, in rural areas. This can impact negatively on the basic education enrollment of girls, particularly beyond the age of puberty. Another problem occurs when large numbers of teachers are assigned to do administrative work and fill other non-teaching positions. The pupil-teacher ratio broken down by district and rural-urban areas provides a rough picture of deployment issues. Data on the availability of teachers in different parts of the country should be available from the annual school survey or EMIS.

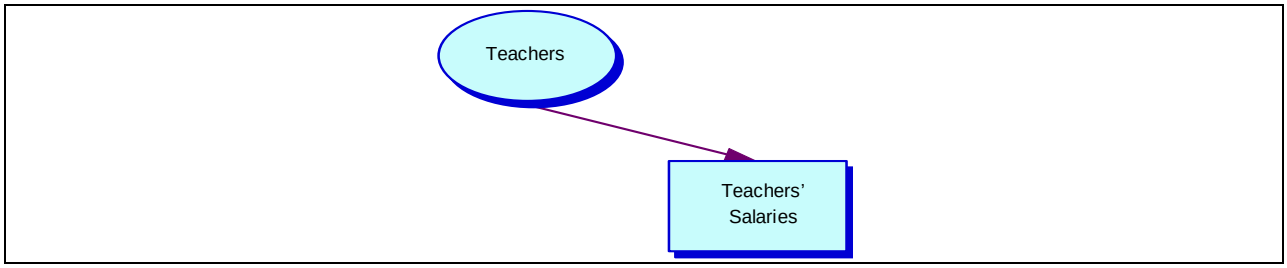
Figure 14



Even if current deployment patterns favor no particular geographic regions or income groups, the level of **teachers' salaries** in the country may be "too high," making it impossible to pay enough teachers from the budget to satisfy overall needs (Figure 15). Whether average teachers' salaries in the public sector are too high, too low, or about what they should be given market forces is not a simple question to answer. Three tests can be used to guide the assessment. First, are many more individuals applying for teacher training and for work as teachers than the number of places in teacher training colleges (TTCs) and established teacher positions? Second, how does the average teacher's salary compare with GNP per capita? In developing countries, it can vary from below one-and-a-half to above ten times the average income. Third, do young teachers in the public sector earn a "living wage" (a salary that is clearly above the poverty level, or enough to support a family of four without the teacher's having to "moon-light")? Obviously, the lower the average teacher's salary, the more teachers a country can afford to hire, all else equal. Very high teachers' salaries comprise a real constraint to educational development, given that budgets are always limited. On the other hand, salaries should be sufficiently high to allow teachers to live comfortably and to give them status and

respect in the community, and salary structures should contain incentives for professional development and good classroom performance.

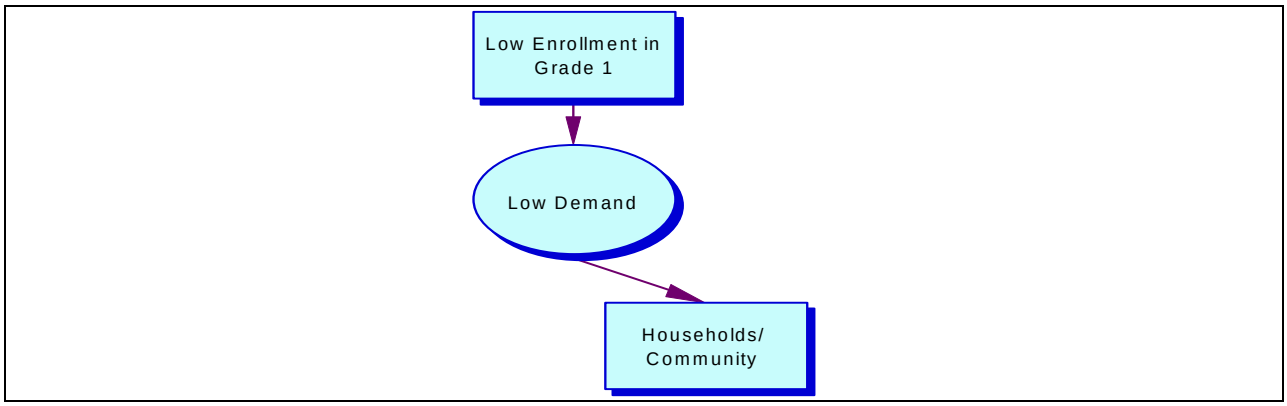
Figure 15



1.1.2 Weak demand as a cause of low enrollments

Low enrollment rates may reflect supply constraints, as discussed in the section above, but **weak demand** can also be a factor limiting enrollments. A demand problem clearly exists when, despite the availability of conveniently located classrooms and schools, significant numbers of families choose, nevertheless, not to send their children to school (Figure 16). There are many factors that can affect the household decision to send a child to school, including the prevailing culture of expectation, household income, the direct costs of school (uniforms, books, transportation, miscellaneous fees), the demand for children's labor, and exogenous but increasingly important factors such as HIV/AIDS and other catastrophic health problems. Variation in demand can be substantial between ethnic groups and across provinces, districts and communities. The same is often true between boys and girls. Parents in some communities, if they need to choose, will send sons to school rather than daughters. They may be unable to afford the direct costs needed to keep all of their children in basic education, they may prefer to keep their daughters at home, for the household chores that girls perform, or because of security risks, or they may decide that educating sons will bring greater benefits to the immediate family than educating daughters. Merging survey data with population estimates at the community level (from the census) is one way to assess the strength or weakness of demand for education in different parts of the country.

Figure 16

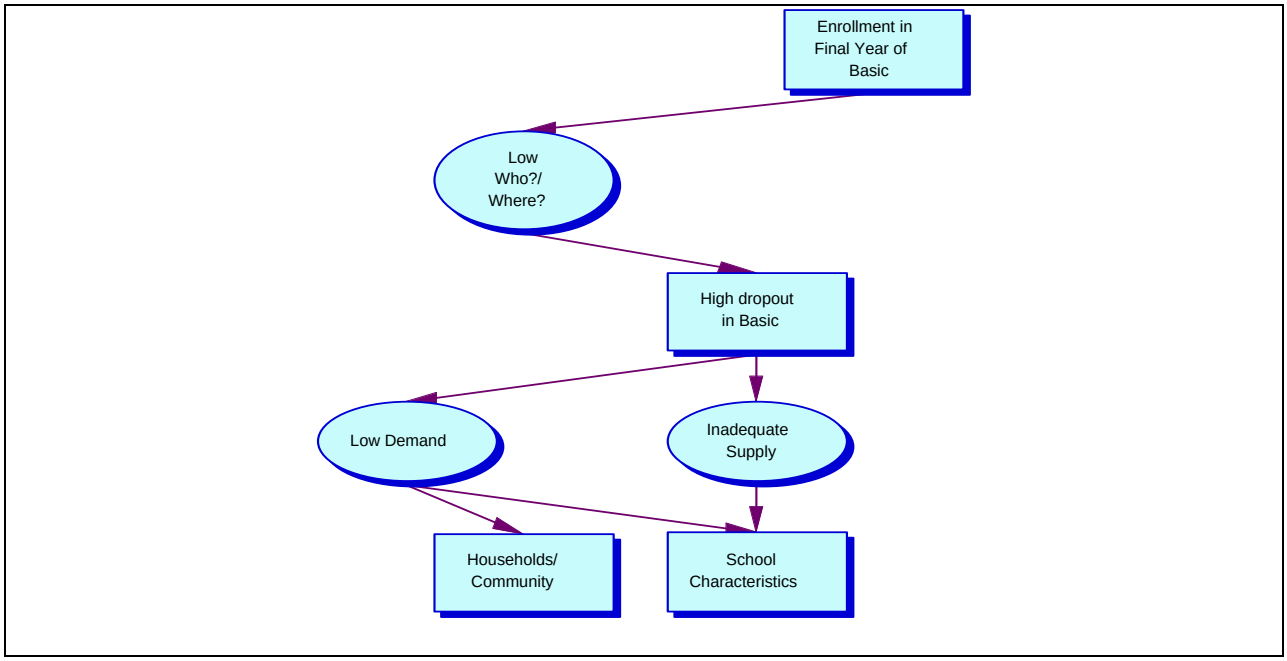


Often, interactions exist between supply factors and household demand for schooling. Parents who do not enroll their children in grade 1 may be reacting to **characteristics of the schools**

that are available to them. For example, an absence of school latrines can be a strong deterrent to enrollment, particularly for girls, and long distances to school, unsafe water at school, and dangerous or inadequate physical facilities may keep boys as well as girls at home.

High dropout rates in basic education. Low enrollment rates in the final year of basic education may also reflect high dropout rates among those who do enter grade 1 (Figure 17). The problem may be caused by the fact or by the perception that the quality of teaching and learning at school is low, or it may stem from inappropriate behavior on the part of teachers (corporal punishment or sexual abuse). School census data often contains information on the availability of books and other instructional materials. Surveys of parents, pupils and teachers can help to identify perceptions about the quality of teaching and learning.

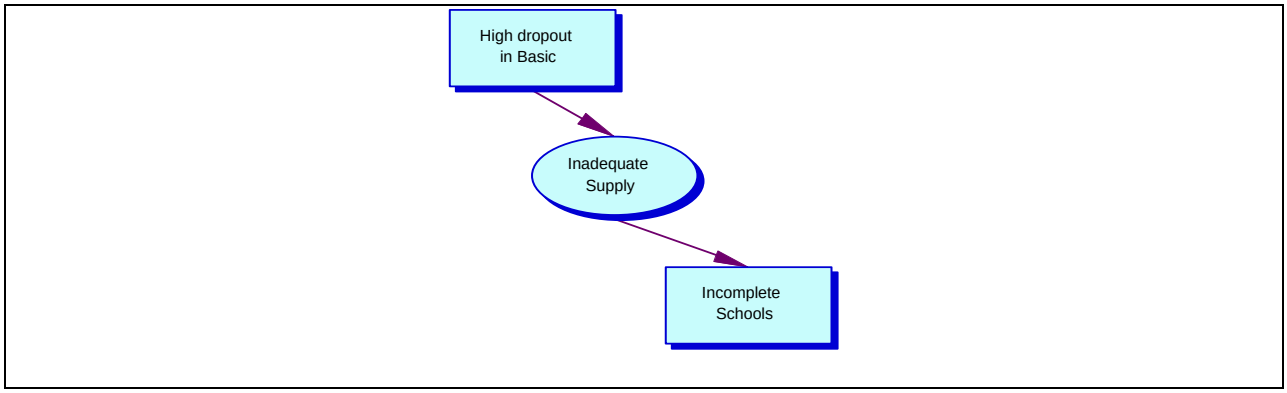
Figure 17



Information on the extent of absenteeism and dropout from school may be available through school surveys. School mapping exercises and school facility inventories can be used to identify problem areas. Key indicators include the relevance and accessibility of the curriculum (especially for children from poor families), the level of teacher qualifications, and the availability of books and supplies. In areas where school places are available, yet children do not attend, or attend only irregularly, special stakeholder surveys can be conducted to ascertain parental and community attitudes. The survey should try to identify alternative solutions that might satisfy parental expectations. For example, altering the daily school timetable to enable children to perform household chores early or late in the day, changing the annual school calendar in areas where children are needed for seasonal work, or introducing into the curriculum subjects of particular value in poor communities may influence parental decisions favorably. Developing safety nets for children from poor households may also help, by enabling the parents of such children to cope with income instability.

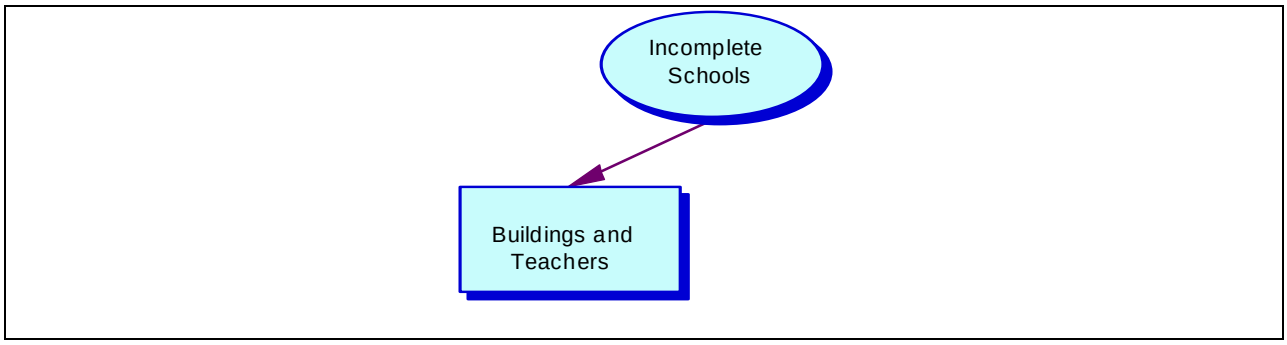
In remote areas, schools may have fewer classrooms than there are grades in the basic education cycle (Figure 18). If each teacher teaches just one grade, pupils may complete grade 3 or grade 4 and then have to look for another school, perhaps some distance away, in order to complete their basic education. Not surprisingly, many children do not succeed in doing so, and they drop out. Large dropout behavior in areas with **incomplete schools** is not uncommon in poor countries, especially in rural areas. An analysis of school survey data can provide an indication of the magnitude of this problem.

Figure 18



The obvious remedy for "fixing" an incomplete school is to build more **classrooms** and recruit more **teachers** (Figure 19). This, however, is an expensive remedy when the number of children in the school's catchment area is small to begin with. Another option is to build **boarding facilities**, which can be used to bring children from different rural areas together in the same school, but this too tends to be a costly option.

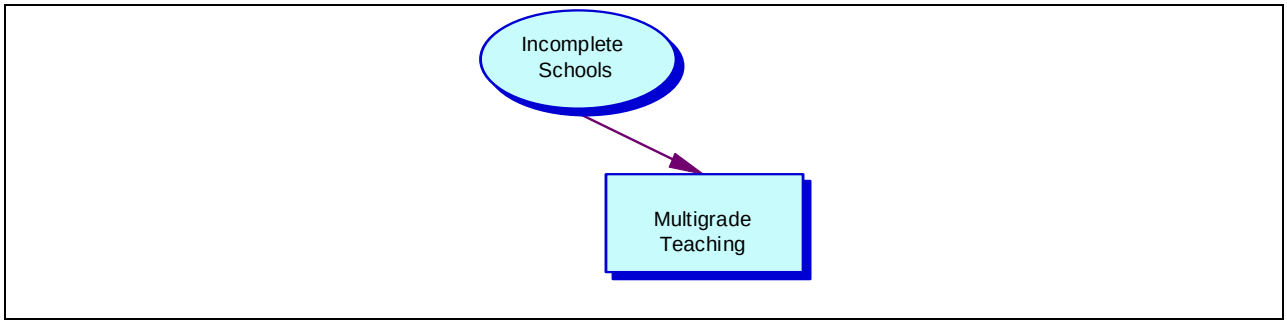
Figure 19



Multigrade teaching (i.e., one teacher teaching more than one grade) is regaining favor as a pedagogically sound and cost-effective solution to the problem of education in sparely populated rural areas (Figure 20). Clearly, there are economies. Multigrade teaching allows each teacher to work with a larger number of children and also makes better use of classrooms. Surprisingly perhaps, there may be pedagogical advantages as well. Although, to be effective, multigrade teachers require special training and close supervision, and special, self-instructional materials are also needed for pupils in such classes, nevertheless, research shows that pupils often do well in a multigrade environment. Apparently, younger children benefit from the presence of older children in the same class, and vice versa. Biennial, or even triennial, intake

of pupils into grade 1 is another option that some countries have tried, and which may be the only option where the development of multigrade teaching is thought to be undesirable or unworkable.

Figure 20



2.1 Student Learning Achievement: A Key Qualitative Indicator

Earlier it was said that every PRSP should include an assessment of, not just the quantitative outcome of basic education (net enrollment rates in different grades), but also (and critically important) the **learning** that children who are enrolled actually acquire. Assessing learning outcomes is tricky, both in terms of what to measure, and how to measure it. In regard to the first question (which learning outcomes?), countries may have different ideas as to the relative importance of different outcomes. This will be reflected in the curriculum. Some may give relatively more emphasis to civic responsibility and social values such as teamwork and respect for the rule of law, while others may give greater weight to cognitive outcomes. Nearly everyone agrees, however, on the importance of basic literacy and numeracy skills for all children in basic education. As a minimum, every country should assess learning achievement in these two areas.

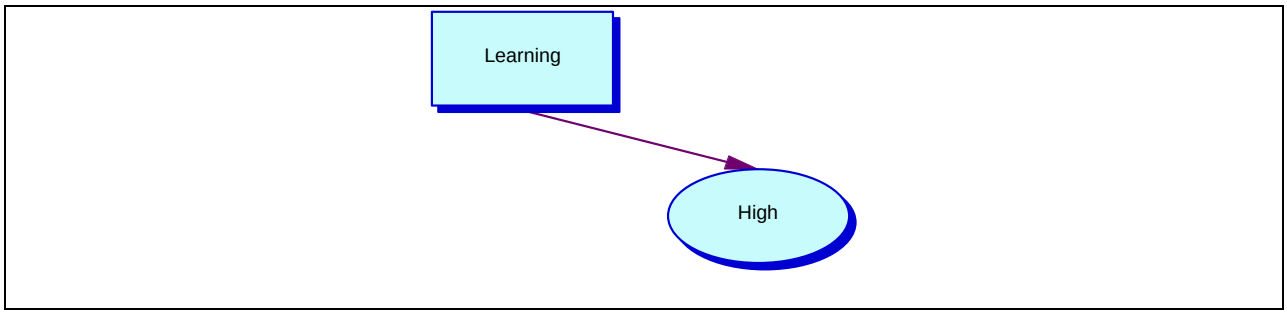
In regard to the second question (how to measure learning outcomes?), the appropriate modality depends on the purposes of the assessment and on the uses to be made of the results. Given that, in a PRSP, the main purpose is to assess, not the performance of individual pupils (for purposes of selection and promotion), but rather, the progress of the system as a whole, and its success in addressing the learning needs of the poor, it is necessary to administer well-designed tests to a random sample of pupils nationwide. The same tests can be repeated over time, and the results compared. Countries implementing "national learning assessments" or participating in international and regional assessments[5] will have more reliable information to use in designing PRSPs than countries not involved in such assessments, where subjective judgments will need to be made.

If a national assessment leads to the conclusion that student learning is "high" on average (Figure 21), a country will still want to determine whether this is equally true for all pupils, or pupils from wealthy families have a clear advantage as compared with pupils from poorer homes. The variance around the average performance of pupils in the sample provides a first

[5] Recent examples include the Third International Mathematics and Science Survey (TIMSS), the Southern African Consortium for the Measurement of Educational Quality (SACMEQ), a UNESCO assessment of learning in Latin America and the CONFEMEN assessment of learning in Francophone Africa

indication of the extent of inequality in learning outcomes. The results may point to the need for further work in order to identify specific populations at risk and then to administer sample-based tests of learning achievement in order to make statistically valid comparisons of performance gaps between these pupils and the rest of the population. . Ongoing national assessments can be designed to satisfy this purpose.

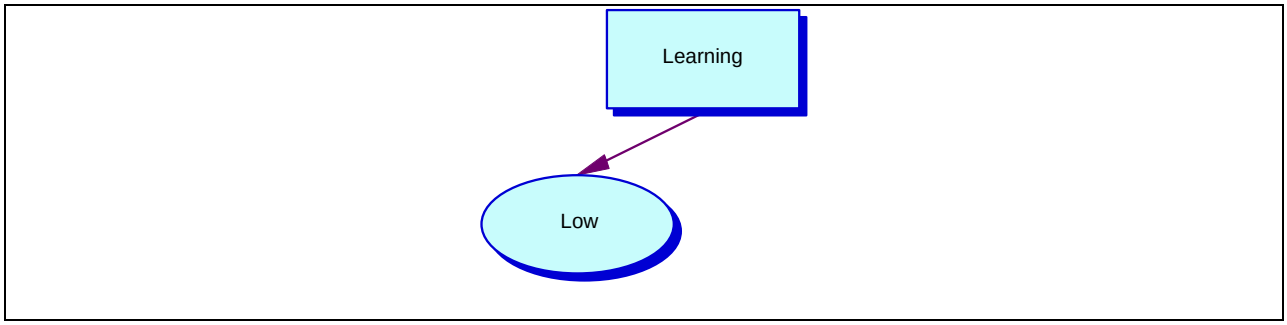
Figure 21



2.1.1 Sources of poor learning outcomes

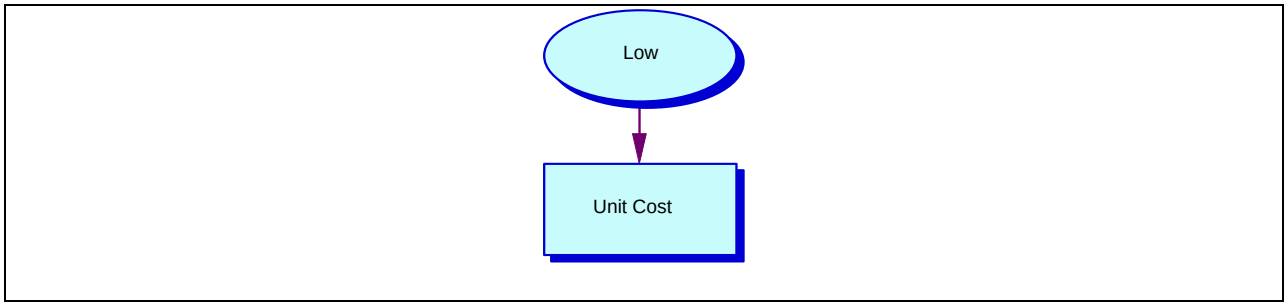
Unfortunately, learning outcomes in many poor countries will be assessed as unsatisfactory on average (Figure 22). Even countries where nearly all children reach the final grade of basic education may find themselves dissatisfied with learning outcomes – as compared with international standards, and/or given the country's own judgment as to what constitutes minimum learning competencies. Even where learning outcomes are satisfactory on average, the country may discover that a large number of poor children are still not acquiring these minimum competencies. The analysis must then focus on why outcomes are unsatisfactory and on what can be done to improve learning. Where there is low access and learning achievement is low (the worst case scenario), an investigation of both the qualitative and quantitative aspects of the problem needs to be made. . The investigation should look at inputs and processes. **Inputs** include irrelevant, poorly articulated, overloaded curricula, inadequate teaching and learning materials and unsuitable learning environments. **Processes** include poor teaching quality, inadequate utilization of curricula and instructional materials, low teacher motivation, inappropriate learning processes, unsuitable languages of instruction, inappropriate student assessment and examination processes, poor school management and instructional leadership, inappropriate curricula implementation and monitoring, and home practices that are not supportive of effective schooling.

Figure 22



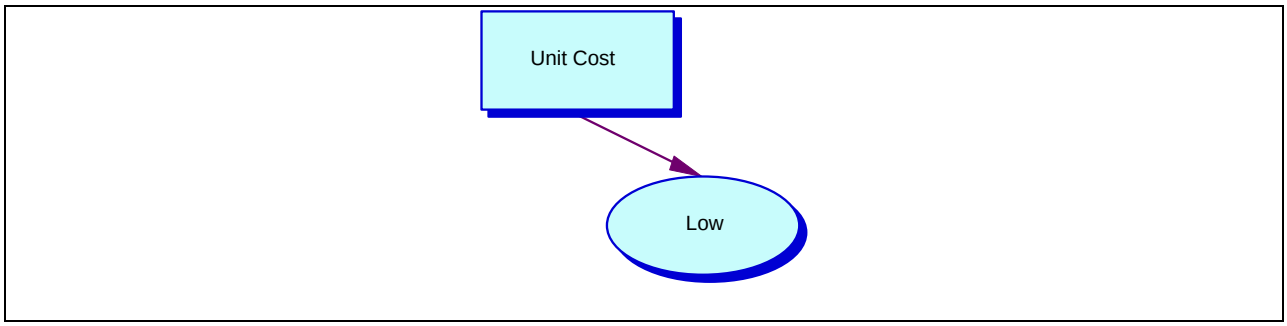
A key variable affecting learning outcomes is the **unit cost** of basic education, defined here as the amount of public spending per pupil per year (Figure 23). This variable is important because it affects the schooling conditions in classrooms, including such factors as class size, teacher qualification, availability of learning materials and so on.

Figure 23



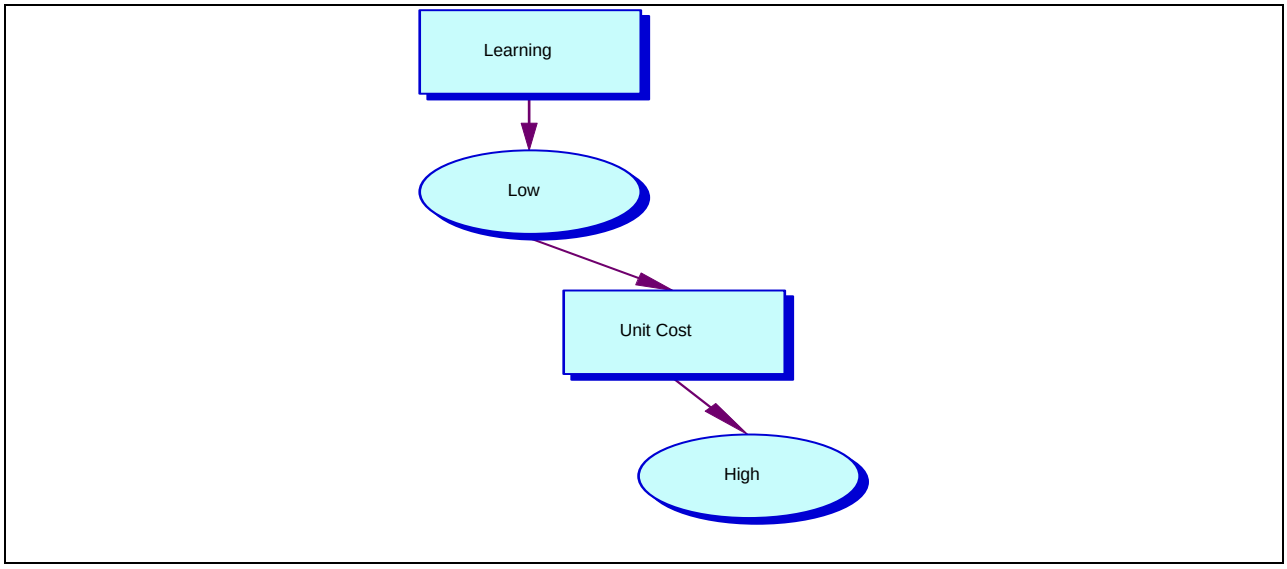
If the unit cost is low (given what other countries at similar income levels, and known to have well-performing education systems are spending – Figure 24), it may be necessary to increase spending in order for learning outcomes to be raised. Analysis is still required, however, to determine the ideal mix of inputs as well as the best utilization of each of these inputs to improve learning outcomes.

Figure 24



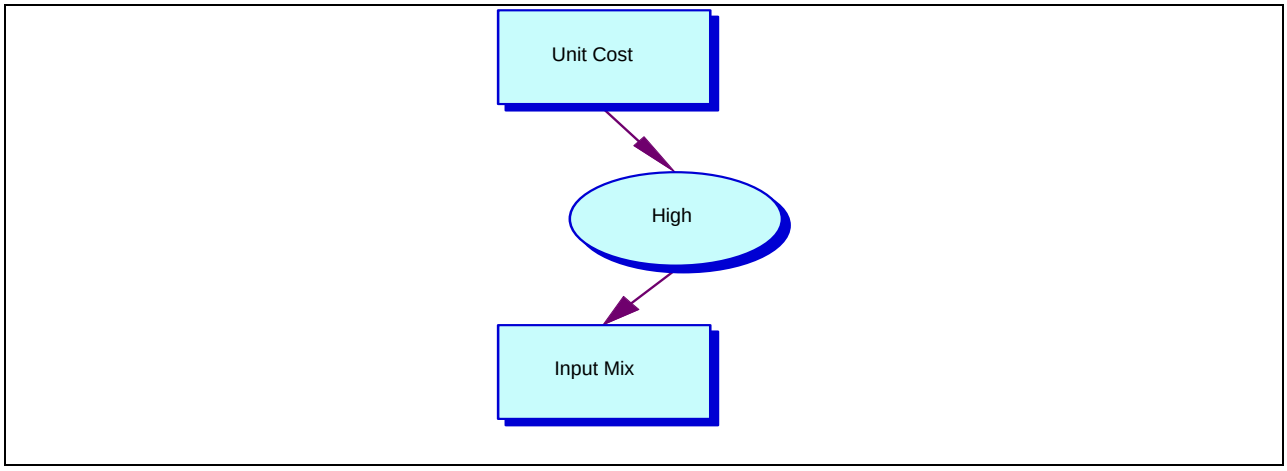
If, on the other hand, the unit cost is high (given what other countries at comparable income levels, and known to have well-performing education systems, are spending) and yet learning in the country is low (Figure 25), this is an indication of **inefficiency in the system**. The next step in the analysis is to determine the reasons for this. For the purposes of this instrument, three main causes of low efficiency are identified: (1) an input mix which does not support learning; (2) high repetition rates; and (3) inefficient management. The distribution of spending should also be investigated, however, as part of the PRSP. If unit costs are much lower in some schools than in others and, in particular, if less is spent on children in poor communities (e.g., because the least qualified and least experienced teachers end up teaching in poor communities, or because schools in poor areas tend to be inadequately equipped), this is inequitable, and it is not consistent with strategies needed for poverty reduction. Therefore, PRSP analyses must examine expenditure by geographical area and by income level. Many World Bank Public Expenditure Reviews and Poverty Reports contain information on the benefit incidence of public spending on education.

Figure 25



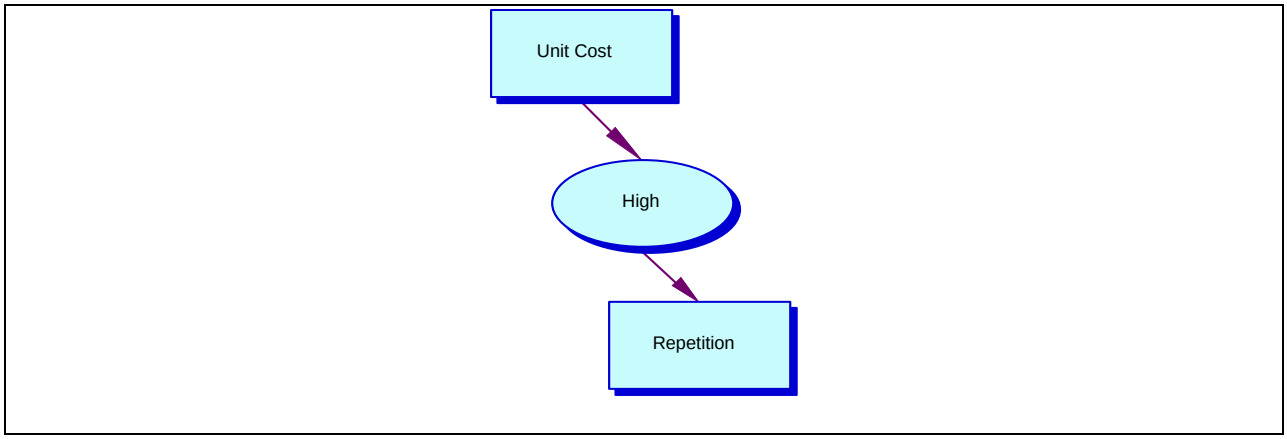
One cause of high unit costs together with low learning outcomes is that the **mix of inputs** is sub-optimal and does not support learning (Figure 26). One possibility is that too much is being spent on administration relative to teaching. Another is that too much is being spent on personnel in general (administrators and teachers), and too little on non-salary pedagogical inputs such as textbooks and other instructional materials. In some poor countries, all of what the Government spends is spent on salaries. In these countries, it is left to parents and external financing agencies to provide the essential instructional materials. Clearly, poor families find it difficult to pay for such things. By the same token, extreme reliance on external funding is never a good choice for Government, as such funding is unpredictable, and relying on it shifts the locus of control for education policy formulation from the country to the external agencies. An analysis of what inputs are being provided, from which sources, may identify where some of the problems are. Analysis of this kind can be found in public expenditure reviews (PERs) or in reviews of public investment plans (PIPs).

Figure 26



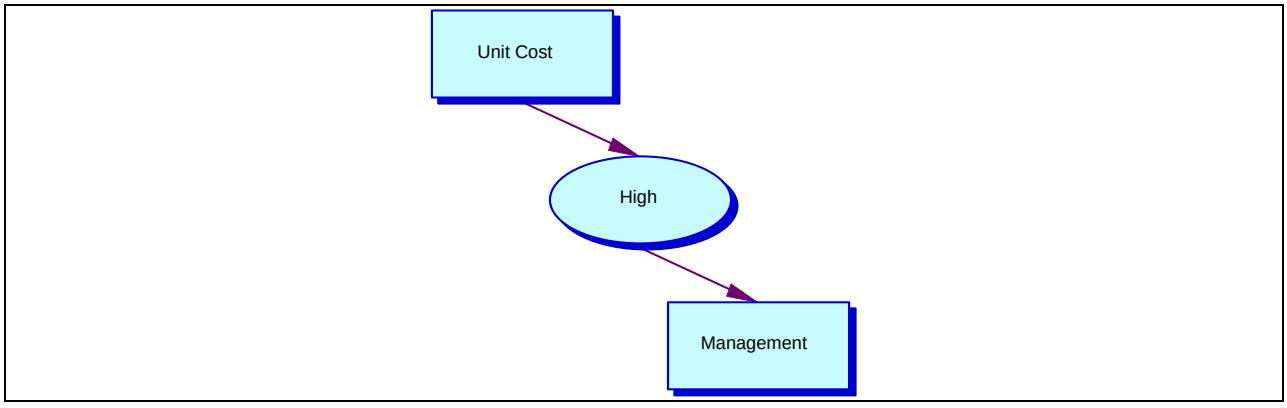
One should hope that most, if not all, children in one grade of basic education will be promoted to the next grade, after only one year. Where many children are held back, or choose to repeat grades, the cost per basic education graduate will be higher – more of all inputs (teachers' time, classroom utilization, instructional materials, etc.) are used up. **Repetition** (Figure 27) clogs an education system, retarding the flow of pupils and making it more difficult and more expensive to bring children currently not enrolled into the system. The annual school survey provides information on repetition rates. The causes of repetition can be determined through investigations at the school level. They can vary widely and might include such factors as teachers' expectations about the number of children who should repeat, rigidities of systems that use examinations for the promotion of pupils, poor quality instruction, poor student health and/or nutritional status, seasonal demands for child labor, and household income insecurity.

Figure 27



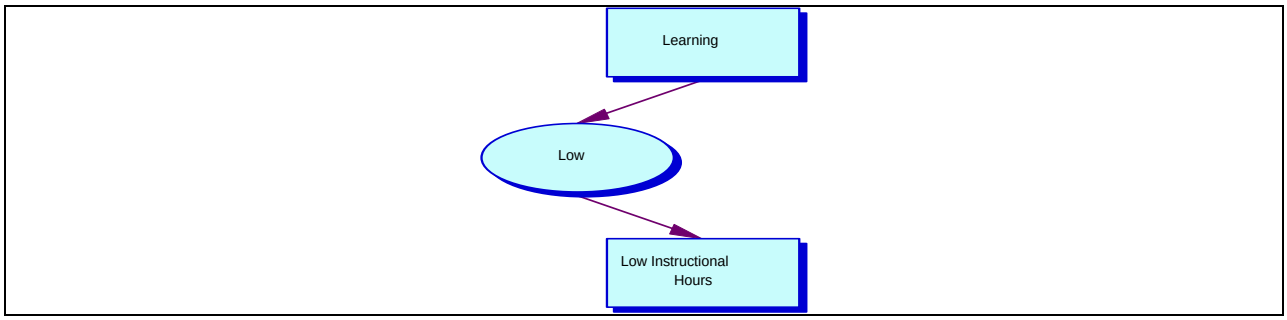
The final cause, identified by the model, of high unit costs combined with poor learning outcomes is that **inputs are poorly managed** (Figure 28). It is important for an education system to focus on learning outcomes and to ensure that inputs are directed to this end. Employing teachers and not training them, or failing to upgrade their skills as they continue in service, is likely to waste a country's limited budget for teachers' salaries. High spending on textbooks without making sure that these are distributed throughout the system and utilized in classrooms as intended is also a waste of resources. Sector reviews sponsored by major bilateral and multilateral donors often contain analyses of management issues.

Figure 28



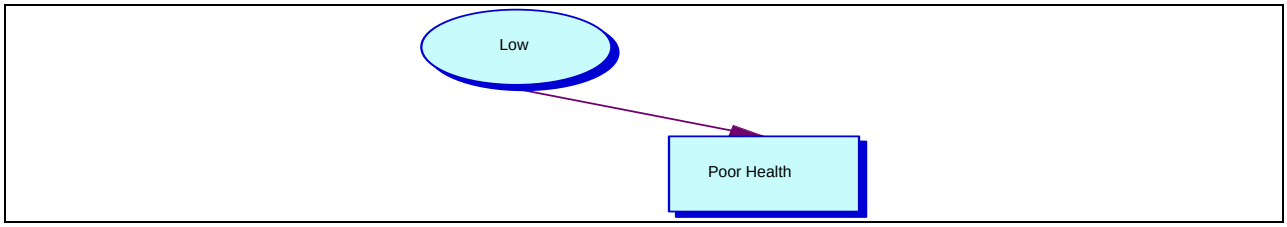
Insufficient instructional time as a cause of low learning achievement. The average OECD country provides more than 800 hours of instructional time per year. Some developing countries (e.g., Indonesia and the Philippines) require even more (1,100 hours), but short school days (in some countries as few as 3-4 hours per day) and short school years (sometimes no more than 160-170 days per year) may result in low learning achievement in many countries (Figure 29). A pupil who is at school only three and a half hours a day for 165 days a year has fewer than 600 annual hours in which to master basic competencies which another pupil in a different country may be given more than 1,000 hours to achieve. The number of hours required to cover the curriculum can be imputed from curriculum guides or official regulations, and the actual number of instructional hours in practice can be measured from school surveys and by direct observation. Increasing the number of instructional hours in order to raise learning achievement is often an expensive policy option, and it may difficult to do it where multiple-shifting is used to achieve acceptable enrollment rates, but this may be the most powerful remedy wherever low achievement is a major concern. If the budget constraint makes it impossible to increase instructional hours throughout the entire system, a strategy for reducing poverty may require that this powerful remedy be targeted to benefit the children who need it most – namely, the poorest of the poor.

Figure 29



Poor health as a cause of low learning achievement. In many poor countries, at least in the poorest regions of the country, the incidence of malnutrition and disease limits the capacity for learning in school. Where malnutrition is prevalent in the earliest years of childhood, many children are physically stunted (below normal in height) by the time that they enter school, and indeed many of those who are malnourished and sick never attend school at all. Those who do enroll tend to be listless from hunger and weakened from frequent bouts with diarrhea and fever; their attendance and academic achievement obviously suffer. The high benefits predicted to accrue from investment in education are never realized in the case of these sick and malnourished children.

Figure 30



3.1 Post-Basic and Tertiary Education

Secondary and higher education provide people with the skills they need to enter formal employment and secure pathways out of poverty. Higher education provides the nation with the critical high level skills needed for development, including trained professionals such as teachers, health workers, and public and private sector managers. The major challenge to Governments is balanced development of the entire education sector within the context of very limited financial and human capacities.

The relatively high private rates of return to secondary and higher education mean that there are many more public policy alternatives to support the development of these levels than for basic education. These include cost-sharing and alternative governance structures in public education and enabling measures for private education. Teams that develop PSRPs should review policies in secondary and higher education to ensure that the regulatory environment encourages high-quality private providers to expand the capacity of upper secondary and especially tertiary education; that cost-sharing arrangements are fair and equitable given the expected private and public returns; that higher education institutions have appropriate degrees of financial, managerial, and academic autonomy; and that there are sufficient safeguards (e.g., scholarships, loans, work-study, fee exemptions) to enable poor students to enroll.

Access to higher levels of education is often an important determinant of basic education completion (Figure 31). This is especially true for poor families, for whom resource constraints force choices to be made between education and other valuable investments. Even where the social rate of return to basic schooling is high, significant private benefits (i.e., to the family) may accrue only where there are good prospects for children to continue beyond basic education and to enroll in good-quality senior secondary and tertiary education. In many countries, entry into the formal labor market depends heavily on whether or not one has completed university or, at least, high schoo.. Investigators should ask to what extent the availability of senior secondary education influences dropout in the higher grades of basic education. A simple answer may be found by looking at the correlation between dropout in basic education (available in EMIS statistics) and the availability of a nearby senior secondary school (available from school mapping exercises). The conclusions from such statistical analysis can be checked by conducting parent interviews. If an adequate supply of secondary and tertiary education places is available, then the analysis should shift and focus on who fills these higher places. If the enrollment patterns clearly discriminate against children from poor families, then policies should be put in place that help poor students to enroll – e.g., scholarships and fee exemptions.

Figure 31

4.1 Data Requirements for Education in PRSPs[6]

The PRSP exercise requires information on student access and flows, the supply and demand for schooling, the quality of education, the characteristics of schools, and the allocation of personnel and financial resources. The value of the exercise is increased by the extent to which data can be broken down to reveal differences in education between wealthier and poorer segments of the society.

The PRSP should provide a basis for monitoring progress toward improving educational opportunities for the poor. It needs to enable policy makers to make decisions, and enable a broad discussion about the causes of and solutions to educational attainment of the poor. Data should therefore be:

- monitorible on a regular basis: timely and consistent;
- grounded in a model of school improvement;
- policy relevant; and
- easy to understand and manipulate

Investigators should identify a few key indicators that will enable policy makers to judge progress. We recommend access to Grade 6 as the main indicator, and a few others to be chosen by investigators after identifying key constraints in the system. Unfortunately, there is no single good source of data for the exercise. Investigators should gather data form a number of sources. Some of the common sources of data are:

Source	Benefits	Drawbacks	Availability
School Surveys	Regular, timely. With proper technology and skills often can be manipulated to provide a wide variety of information.	Often not disaggregated by income group, though some disaggregation by region and gender is usually provided.	National EMIS units.
Household and "Living Standards Measurement Surveys"	Enables a focus on the poor.	Often not regular or frequent, difficult to manipulate.	National Statistics Offices, Multilateral Development Banks, UN organizations
National Assessments			National testing and assessment departments, regional and international testing and assessment organizations.
Special sector studies (civil service survey, stakeholder analyses, public expenditure reviews)	Detailed information and analysis on key aspects of the education system	Not regular	Government ministries, major donors, NGOs.

[6] Compiled by Christopher Thomas, November 1999.

International comparisons: UNESCO, ILO, EdStats, OECD	Consistency. The OECD data very policy relevant and grounded in model of school improvement.	Time lag in reporting. Information is often only reported at the national level. There are currently no HIPC countries in the OECD reports.	World Wide Web.* World Bank (World Development Indicators, EdStats) UNESCO (Statistical Yearbook, World Education Report) OECD (Education at a Glance)
*Useful Websites: UNESCO Statistics: http://unescostat.unesco.org/ OECD Statistics: http://www.oecd.org/statlist.htm USAID Global Education Database: http://www.info.usaid.gov/educ_training/ged.htm TIMMS: http://wwwcsteep.bc.edu/TIMSS			

5.1 Guidelines for Assessing a Country's Regulatory Framework for Education[7]

The regulatory framework for education refers to the set of tools or instruments that Governments use to influence the actions of individuals and firms involved in the education sector. Used in this manner, the regulatory framework definition is broad in two respects. First, the regulatory framework does not simply refer to what is written in legislation. Indeed, the elements of the regulatory framework may be set out in education and other legislation, mandates and regulations such as orders-in-council, departmental policies, etc. The definition is broad in a second respect, in that it includes the rules that govern:

- how providers are established
- the level and manner in which providers are subsidized
- the taxation and customs treatment of providers
- how providers are governed and managed
- the operational flexibility that providers have
- information disclosure requirements on providers
- regulation of the teacher labor market, including teacher registration and contracting arrangements
- the process of review and quality assurance of providers

The regulatory framework for education sets the overall environment in which parents, students, teachers, schools, higher education institutions and the government itself will operate. It represents, in essence, the "rules of the game" for the various stakeholders in the education sector.

5.1.1 Regulatory Framework Design

To be effective, the design of the regulatory framework should be driven off a careful assessment of the appropriate role of government in the sector. This should involve an analysis of:

- whether there is market failure
- the source of that market failure (i.e., is it because of capital market imperfections, information problems, affordability problems, etc)

[7] Compiled by Norman Laroque, Ayesha Vawda and Harry Patrinos, November 1999.

- whether government intervention would produce a better result than the private market, after accounting for the fact that government intervention is itself not cost-free (e.g., there are efficiency costs to raising taxes)

Governments have a range of policy instruments or tools at their disposal to respond to market failure:

- Governments can purchase goods and services for people or subsidize a service or activity. This could include paying living allowances to students, subsidizing a school's operating expenditures or providing vouchers to students to attend public and private schools
- Governments can provide services directly. For example, governments generally own the majority of schools and most universities
- Governments can mandate or require firms or individuals to do or not do certain things. This can include putting in place health and safety requirements for schools, limiting fees that can be charged by schools, requiring particular governance structures for schools, requiring that students attend school between certain ages, etc.

Table 1: Regulatory Framework for Private Education

Governing Legislation	
Entry/Exit regulations	
Fees	
Direct Subsidies	
Subsidized land/buildings	
Tax/Customs Exemptions	
Profit/non-profit regulations	
Land tenure regulations; leasing/renting Conventions and practices	
Curriculum	
Teacher labor market	
School Hours	
School Year	

Table 2: Private Education Summary Statistics

Number of Private Students	
Market Share (%)	
Range of market shares by education level (%)	
Number of Private Institutions	
Types of Private Institutions	

Technical Note IV[8]: Cost-effectiveness of Educational Interventions

Countries aiming at reforming their education system would ideally select educational interventions based on a measure of cost-effectiveness. This means that countries would assess which interventions have the greatest impact, for instance which factors affect more effectively students' learning and compare the unit cost of each specific intervention in order to ensure they can maximize the use of their scarce resources. However, the reality is that too often educational investments are made on the basis of untested or partially tested assumptions about the cost-effectiveness of particular interventions with the risk of wasting limited human and financial resources.

Measuring cost-effectiveness thus requires that countries first adopt some assessment mechanisms to evaluate students' learning (as discussed in section 2.1.3 of the education chapter). The use of a common assessment mechanism among several countries, such as TIMSS or UNESCO/OREALC regional study for Latin American countries enables the comparison of countries' learning scores and as a result can also facilitate the comparison of the cost-effectiveness of countries' educational interventions. The second step is to single out and measure the impact of different inputs or factors on students' learning. For example, the availability and use of textbooks, the provision of pre-schooling, radio-instruction and some in-service training programs (Lockheed and Verspoor, 1991) are often cited as important factors affecting learning and retention. The third step consists in costing these different inputs. This is, however, seldom undertaken and what we find is that the measure of impact is only rarely related to costs.

By making the estimated costs and impacts of educational interventions explicit, the presumptions made by key decision makers about what works and what does not work become clear. The exercise alerts policymakers to the relative value of strategies they are actually selecting, and permits them to revise what their presumptions are (Schiefelbein et al, 1999). Furthermore, estimating the costs of interventions can be used to provide an effective benchmark for the costing of the PRSP components in the education sector.

A recent study[9] conducted in Latin America on cost-effectiveness of primary education policies examined the impact of 40 possible primary school interventions on learning (as defined by the score on a standardized test given at the end of sixth grade) as well as the percentage probability of successful implementation. The latter is another critical element as educational policies cannot only be selected on the premise of cost-effectiveness, but also have to be assessed on the level of technical capacity required for a successful implementation and on the degree of political support available (the latter will be discussed in the section 4.3 below).

The results of this study are presented below. They are not meant to be used indiscriminately, because based on a country's context, the impact of one intervention on students' learning achievement would differ as well as its unit cost which could explain some differences observed in the measurement of cost-effectiveness from one country to the other. However, these results provide a useful framework that countries might want to consider while selecting the appropriate package of educational interventions for their PRSP. Thus, although difficult, time-consuming

[8] This annex was prepared by Michael Drabble, Education Reform and Management Team, HDNED

[9] Schiefelbein E., Wolff L. and Pauline Schiefelbein: "Cost-effectiveness of primary education policies in Latin America: a survey of expert opinion". Bulletin 49, August 1999 – The major Project of Education

and costly, it is recommended that each country undertakes a cost-effectiveness analysis of its proposed educational interventions.

First, from a list of 40, six interventions have been assessed as having the highest estimated impact on a target population in terms of learning achievement if fully implemented and without taking into account their unit cost. The six interventions are as follows:

Interventions with highest estimated impact if fully implemented	Expected increase in test score
Multiple interventions: (1) learning packages; (2) school-based management; (3) training; and (4) testing	26.8%
Assign best teachers to first grade	19.8%
Decentralization with supervision	19.4%
Pay rural teachers 50% more	18.6%
Provide standard textbooks and train teachers in usage	18.4%
Developmentally oriented pre-schooling (100% of primary school cost)	18.3%

The same study taking into account the implementation capacity (based on both technical and political considerations) required resulted in a slightly different list of the six most effective interventions affecting learning achievement. It is worth noting that in this new scenario, both pre-schooling and decentralization were considered so difficult to implement that they fell out of the prior list of the best six interventions.

Interventions with highest estimated impact taking into account implementation feasibility	Probable increase in test score
Provide standard textbooks and train teachers in usage	12.1%
Multiple interventions: (1) learning packages; (2) school-based management; (3) training; and (4) testing	12.1%
Pay rural teachers 50% more	12.1%
Provide learning materials for individualized instruction	12.0%
Assign best teachers to first grade	19.8%
Extend daily schedule by one hour	11.4%

Finally, taking into account both the highest impact on learning achievement, the implementation feasibility and the unit cost, a final list of six interventions emerged as being the most cost-effective.

Interventions with highest expected cost-effectiveness	Cost-effectiveness score
Assign best teachers to first grade	1531.2
Enforce regulation on official length of school year	699.6
Policy not to switch classroom teachers during school year	480.0
Test 10% percent of the 4th graders and distribute results to teachers	60.3
Decentralization (without strengthening supervision)	59.2
Media campaigns for parents to read to children	59.2

As expected, this last list is quite different. This results from the presence among the list of 40 interventions of a number of almost cost-less interventions which have at least some impact.

The authors of this study reached a set of recommendations with regard to the cost-effectiveness of educational interventions which are as follows:

- Undertake interventions with a significant impact, especially those related to multiple interventions, teaching materials and differential support for rural education, but are of moderate to high cost. In spite of their cost, these interventions should be implemented because of their potential high impact. But be aware of implementation problems.
- Undertake interventions which do not cost much but have an impact and are often overlooked (e.g.: enforcing school year regulation, putting good teachers in first grade).
- Some interventions are expensive and, by themselves, without ancillary activities or other objectives, are not good investments. This is especially the case of increased salaries, computers, and school feeding programs.
- Implement packages of interventions rather than isolated ones.