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# Use of Data for Educational Planning and Management Training Manual

**Manual**

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# Training Program: Use of data for Educational Planning and Management

## Overview of Training

### Training Objectives:

1. By the end of this training session, the participants are able to accurately and precisely define what types of data is required for educational planning and management. They should be able to demonstrate their understanding by providing examples of each type of data i.e. demographic data, education data, budget, and human resources.
2. The participants are able to demonstrate their knowledge of possible sources of education planning and management data in Afghanistan.
3. The participants are able to differentiate between different types of indicators i.e. access & participation, equity, and quality indicators. They are able to correctly categorize a list of indicators, which is provided to them, according to this classification.
4. The participants are able to correctly compute the key education indicators and exhibit their understanding by computing indicators using EMIS data, which is provided to them.

### Activities:

**Activity – 1 (The Participants are introduced to the main types of data for educational planning and management):** In the beginning, the participants are introduced to the types of data needed for educational planning and management through PowerPoint presentation by the trainer. The participants take part in the discussion related to each topic, and are able to answer trainer's questions to determine their understanding of the topic. The participants are encouraged to discuss their questions with the trainer in order to help enhance their understanding.

**Activity – 2 (Group Work: The Participants undertake the group work on identifying the sources of education data in Afghanistan, and extracting required data/information from these sources, the activity is facilitated by the trainer):** The participants discuss various sources of data and share their experiences. The EMIS representative, present in the training, demonstrates the on-line and off-line sources of data and how to extract the required information from these sources. Participant groups are given the target of extracting different types of data from sources, and present their findings to the audience.

**Activity – 3 (The Participants are introduced to Education Indicators):** The participants are introduced to the education indicators through PowerPoint presentation by the trainer. The participants take part in the discussion related to each topic, and are able to answer trainer’s questions to determine their understanding of the topic. The participants are encouraged to discuss their questions with the trainer in order to help enhance their understanding.

**Activity – 4 (Quiz: The Participants take a quiz related to the purpose and use of various indicators):** The participants provided with list of different indicators, and they are required to express their understanding of utilization of each indicator.

**Activity – 5 (Group Practice Work: The Participants join in the group work on the computation of various indicators, facilitated by the trainer):** The participants groups are provided with data to computer different indicators. The participant groups then present their computation to the audience.

**Activity – 6 (Group work on Case Study: The Participants work on the case study provide to them, and present their solution):** The participants are provided with a case study, details of which are explained by the trainer. They are required to work on the case study and present their solution to the audience.

**Total Time:** 16 Hours (2 days)

## Training Agenda

Duration	Activity	What is needed?
<b>SESSION 1: USE OF DATA FOR EDUCATIONAL PLANNING AND MANAGEMENT</b>		
30 Minutes	Ice breaker, and introduction to the training	-
1 Hour	PowerPoint presentation by the trainer on various types of data needed for educational planning and management.	<ul style="list-style-type: none"> <li>- Overhead Projector</li> <li>- Power Point presentation.</li> </ul>
1 Hour	Discussion Session	<ul style="list-style-type: none"> <li>- Data Examples</li> <li>- Stationary</li> <li>- White Boards / Flip Boards</li> </ul>
1.5 Hours	PowerPoint presentation by the EMIS representative.	<ul style="list-style-type: none"> <li>- Overhead Projector</li> <li>- Power Point presentation on sources of data</li> </ul>
3 Hours	Group Working session extracting data from sources	<ul style="list-style-type: none"> <li>- Overhead Projector</li> <li>- Availability of internet to search data</li> <li>- Stationary</li> <li>- Power Point presentation by participants</li> <li>- White boards / Flip boards</li> </ul>
<b>SESSION 2: USE OF INDICATORS FOR EDUCATIONAL PLANNING AND MANAGEMENT</b>		
2 Hours	A presentation by the trainer introducing education indicators.	<ul style="list-style-type: none"> <li>- Overhead Projector</li> <li>- Power Point presentation on education indicators</li> </ul>
30 Minutes	Quiz on education indicators	<ul style="list-style-type: none"> <li>- Copies of quiz</li> <li>- Stationary</li> </ul>
3.5 Hours	Group practice work on computation of indicators	<ul style="list-style-type: none"> <li>- Required data for indicators</li> <li>- Stationary</li> <li>- Overhead projector</li> </ul>

		<ul style="list-style-type: none"> <li>- Separate tables for groups</li> <li>- White Boards / Flip Boards</li> </ul>
<b>SESSION 3: GROUP WORK ON CASE STUDY</b>		
3 Hours	The Participants work in groups on the solving the case study.	<ul style="list-style-type: none"> <li>- Overhead Projector</li> <li>- Case study</li> <li>- Data for case study</li> <li>- Separate tables for groups</li> <li>- Stationary</li> <li>- White Boards / Flip Boards</li> </ul>

# SESSION 1: USE OF DATA FOR EDUCATIONAL PLANNING AND MANAGEMENT

## 1. Use of Data for Educational Planning and Management

In order to prepare plans in education sector and for subsequent management of the sector, the following information should be available. With the availability of this information the education managers will be able to develop concrete and implementable plans.

1. Demographic information
2. Educational statistics
3. Budget allocated for education sector
4. Human resource

### 1.1 Demographic Information

It is vital for education planners and decision-makers to know the structure and distribution of the population at a given date, as well as how it has changed in recent years. In other words, educational planning cannot be divorced from considerations about dynamics of population (i.e., its growth and change), as it deals with a 'target population', which is constantly changing, in number, age and sex composition, and geographic distribution.

Significant variations in the age and gender compositions of the population besides the numerical increase can be observed as a result of population growth. Migration of people determines their geographical distribution and this too, has a significant impact on the needs of the society. All these affect educational development in a direct manner. In fact, the findings of demography are one of the foundations on which educational plans are built and for this reason, planners should have a sufficient knowledge of demographic methods and concepts, their meanings and limitations.

Nearly all quantitative analyses and estimates of the qualitative aspects of education are related to population - its size, structure, location, dynamics and prospects. Hence there is a need to study demographic aspects of educational planning.

### 1.1.1 Population Structure and its Effects on Educational Planning

Educational planners may be concerned with the distribution of the population for various reasons:

- They may be interested in its distribution by age and sex.
- They may be concerned with the distribution of the population by sector of economic activity and, within each of these sectors, by occupation.
- They may be concerned with the geographical distribution of the population, which affects both the cost of education and the choice of types, sizes and locations of schools.

The age structure of the population is very important in demographic analysis because it provides a sort of summary of the demographic history of the nation, and also because, as it governs to some extent the future growth of the population. It also enables to estimate the relative size of the school-age population and to calculate the school enrolment rates which are very helpful for education planners before planning a new project in education sector.

As an example, the projected population figures<sup>1</sup> for Afghanistan are shown here:

Afghanistan ⓘ				
	2014	2015	2016	2017
Population, total	32,758,020.0	33,736,494.0	34,656,032.0	..
Population growth (annual %)	3.2	2.9	2.7	..
Surface area (sq. km)	652,860.0	652,860.0	652,860.0	652,860.0
Population density (people per sq. km of land area)	50.2	51.7	53.1	..

<sup>1</sup> <http://databank.worldbank.org/data/reports.aspx?source=2&country=AFG>

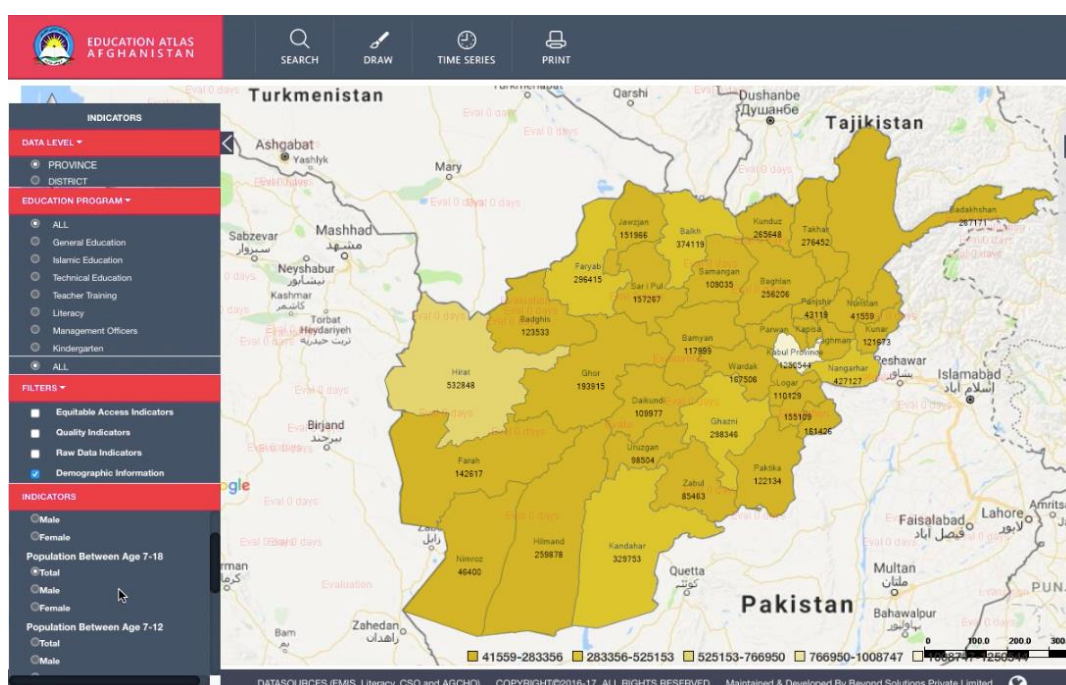


Similarly the population figures, along with distribution<sup>2</sup> is presented in the following illustration:

**Table 3.1: Population, by residence, sex, and by age**  
a. in thousands

Age	Urban			Rural			Kuchi			National		
	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes
0-14	1,335	1,238	2,574	5,048	4,652	9,701	416	358	774	6,799	6,249	13,048
15-24	733	711	1,444	1,698	1,745	3,443	109	110	219	2,540	2,566	5,106
25-39	536	533	1,069	1,637	1,683	3,320	126	134	260	2,299	2,350	4,649
40-64	409	433	842	1,281	1,195	2,476	91	81	172	1,781	1,709	3,490
65+	128	74	202	281	145	426	21	13	34	430	231	662
Total	3,141	2,989	6,130	9,945	9,420	19,365	764	696	1,459	13,850	13,105	26,955

A sample of provincial age group wise population of Afghanistan (Age group 7-18) is presented below<sup>3</sup>:



The above figure provides the distribution of the population according to age. The age structure of a population affects a nation's key socioeconomic issues. Countries with young populations (high percentage under age 15) need to invest more in schools, while countries with older populations (high percentage ages 65 and over) need to invest more in the health sector. The

<sup>2</sup>

<http://cso.gov.af/Content/files/Chapter3%20POPULATION%20STRUCTURE%20AND%20CHANGE.pdf>

<sup>3</sup> Afghanistan Education Atlas, MoE

age structure can also be used to help predict potential political issues. For example, the rapid growth of a young adult population unable to find employment can lead to unrest.

### **1.1.2 Population Growth and Its Impact on Educational Planning**

The educational planners are not content with knowing the current situation; they are also interested in getting an accurate picture of the problems to be encountered in the future. In particular, they must know how the population will change in future years.

The population of any place at a specific time is a function of three types of events - births, deaths and migration and consequently, there are four ways in which the number of people of any area may change; (i) Children may be born in that area; (ii) The inhabitants of that area may die; (iii) People from other areas may move into that area (In-migration); and (iv) Inhabitants of that area may move out (out-migration).

These components of population change namely births, deaths and migration are identified as fertility, mortality and migration respectively and are known as demographic or population variables because the size, growth, structure and distribution of any population are determined by them. A study of any population is made through a study of these demographic variables. The change in population can be measured by (a) The difference between population sizes at different times (known as growth which results in either increase or decrease) (b) The analysis of the 4 components of population namely births, deaths, immigration & emigration.

The growth, birth and death rate of population in Afghanistan<sup>4</sup> is shown below:

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<sup>4</sup> [https://en.wikipedia.org/wiki/Demographics\\_of\\_Afghanistan](https://en.wikipedia.org/wiki/Demographics_of_Afghanistan)

Demographics of Afghanistan	
Growth rate	2.34% (2016)
Birth rate	38.3 births/1,000 population (2016)
Death rate	13.7 deaths/1,000 population (2016)
Life expectancy	60.5 years (2015)

The projected population by age and sex at national and sub-national levels for at least next 10 years are required for effective educational planning and decision-making.

<b>Population</b>	33,332,025 (2016) <sup>[1]</sup>
<b>Growth rate</b>	2.34% (2016)
<b>Birth rate</b>	38.3 births/1,000 population (2016)
<b>Death rate</b>	13.7 deaths/1,000 population (2016)
<b>Life expectancy</b>	60.5 years (2015) <sup>[2]</sup>
• male	59.3 years
• female	61.9 years
<b>Fertility rate</b>	5.33 children born/woman (2015)
<b>Infant mortality rate</b>	66.3 deaths/1,000 live births <sup>[3]</sup>
Age structure	
<b>0–14 years</b>	42.3% (male 6,464,070/female 6,149,468)
<b>15–64 years</b>	55.3% (male 8,460,486/female 8,031,968)
<b>65 and over</b>	2.4% (male 349,349/female 380,051)

In order to demonstrate the importance of demographic information for educational planning we will take an example of a program: “Increase Female Enrolment to 100% in Primary Level of Education by 2025”. In view of demographic aspect the planner must know the expected female population

of age group 7-18 in coming years up to 2025 in all the provinces of the country.

## **1.2 Educational Statistics**

According to Tippest, “Planning is the order of the day and without statistics planning is inconceivable”. Statistics is of prime importance in educational planning. Priorities of planning are determined on the basis of the statistics relating to resource base of the country and the short-term and long-term needs of the country. Success and failure of planning is measured in terms of statistical facts and figures.

Usefulness and importance of educational statistics can be measured by the functions performed by it. Progress in the field of education is measured in terms of the literacy rate of population, number of schools, colleges and universities in the country and the number of students studying therein. Shortcomings of education system are known from the data relating to examination results of the students. Data concerning male and female education, adult education, etc. is necessary for education planning and policymaking. Statistics regarding teacher-pupil ratio, number of students in each class, number of books issued to the students, etc. are of great significance in educational planning for introducing education reforms.

Educational plan should be based on a precise and exact diagnosis if it is to be effective. The diagnosis makes the plan possible to take into account the state of education, and identify the problems through a detailed and critical analysis in order to propose solutions. An accurate diagnostic of the education system is possible with the help of timely and transparent data as well as sound statistical analysis. One of the systems designed to make educational planning better is Education Management Information System (EMIS).

EMIS is a data collection, storage, retrieval, processing and dissemination system specially designed for use by decision makers and administrators to plan and administer education system more efficiently and effectively.

Lets take our example of “Increase female enrolment to 100% in Primary Level of Education by 2025” to demonstrate how prior knowledge of educational statistics plays a vital role in education planning. Before development of plan, the planner should know the current status of female enrolment in primary level of education. As mentioned earlier the major source of educational statistics in Afghanistan is EMIS.

The educational planners can plan new schools to capture female students with the help of prior demographic information and available educational statistical. The time series data for educational planning is also available in EMIS.

Educational statistics is also very helpful for educational planners in opening new education institutions. For example, if the Government is planning to open new primary schools, the planner should take data of existing primary schools then plan new institutions in the area where no primary schools are available.

Data of teachers is also very important in planning for the transfer of teachers or for the appointment of new teachers. With the help of availability of data the planners can plan the need of new teachers in future and transfer of existing teachers where teachers are required.

Education for All (EFA) is a global movement led by UNESCO, aiming to meet the learning needs of all children, youth and adults by 2015. Unfortunately most of the goal targets were not met for Afghanistan by 2015; therefore an extension has been given for meeting the goals. The EFA goals also contribute to the global pursuit of the six Millennium Development Goals (MDGs). A comprehensive plan is required to achieve targets of EFA goals. The planners must know the current situation of the EFA indicators for future planning. For example the NER in primary education, by using this information the planners can develop a concrete plan to achieve goals.



Similarly, data for other EFA indicators is also available in EMIS for planning purposes.

### **1.3 Budget Allocated for Education Sector**

Budget plays an important role in the planning process. The budget is a tool that helps to achieve the projects or programs goals. Proper financing is essential for overall planning of education. Education consumes large sums of money and especially in developed and in some developing countries, it receives a higher proportion of public budgets than other services. No educational plan can be implemented unless adequate funds are made available for the purpose. It is therefore necessary to assess the financial implications of an educational plan before marking upon implementation process.

Planning involves work out how to achieve the maximum possible with the available budget. Educational planning is essentially concerned with the problem of how to make the best use of budget allocated for education. An assumption, therefore, is that financing of education is not only central but inseparable from educational planning.

The educational planners may have a prior knowledge of following allocation of budget for formulation of a successful educational plan:

- Total Education Budget
- Distribution of education budget at national, provincial and district levels
- Education Budget by sub-sector
- Development and recurring (non-development) budget
- Distribution of non-development budget by salary and non salary items

With this knowledge the planners will be able to budget for upcoming projects without any uncertainty. In Afghanistan, significant investment in education has made to improve the prevailing situation. However, the non-availability of

adequate financial resources has made it difficult for Governments to launch and sustain large-scale interventions and programmes in education sector.

The collection of statistical data on educational finance and expenditure can be looked at in two ways: firstly, from the view of the source of educational expenditure, secondly from the view of the distribution of funds dedicated to education. The distribution of funds, again, can be classified under two aspects: educational expenditure by purpose on the one hand and expenditure by level or type of education on the other hand.

### **Source of Finance:**

Education is the main public enterprise, which is financed mostly from public and donor resources.

### **Expenditure by purpose:**

A detailed breakdown of educational expenditure by purpose is necessary for three major purposes: for analysis, for forecasting and for unit cost calculations. The degree of differentiation of expenditure statistics depends on the national requirements for educational planning and the availability of data.

Before using education finance statistics for analytical and forecasting purposes certain choices have to be made clear such as distinction between capital and recurring expenditure which often not clear. What is basically required is the calculation of expenditure at each level for each type of education, per unit cost of students, teachers' salaries, non-teaching staff salaries and building etc. distinguishing between recurrent expenditure and its major components on the one hand and capital expenditure on the other. Further, the data on privately managed institutions is not available. Hence, in the absence of private sector education finance data the complete national picture is not emerged.

Ideally, statistics of educational expenditure should be closed accounts and thus provide data on actual expenditure. In the absence of these statistics, data on budget allocations can be used to assess the situation. The



information gathered through any source whether in the form of actual expenditure or budget allocations one can made analysis and forecast educational outlay to achieve particular targets of national education plan [20].

Educational planners and policy makers to measure the given country's effort in the field of education currently use international comparisons of educational outlay. Educational expenditure per capita, as a percentage of total government expenditure and as a proportion of some national aggregate as concepts usually found in a comprehensive system of political and social indicators. The allocation of a high proportion of some aggregate is considered as indicating a satisfactory situation whereas the allocation of a low proportion seems to indicate the opposite.

#### **1.4 Human Resources**

Before discussing the role of human resources in planning we will explain the term "human resources". First and foremost, people in work organizations, endowed with a range of abilities, talents and attitudes, influence productivity, quality and profitability. People set overall strategies and goals, design work systems, produce goods and services, monitor quality, allocate financial resources, and market the products and services. Individuals, therefore, become 'human resources' by virtue of the roles they assume in the work organization. Employment roles are defined and described in a manner designed to maximize particular employees' contributions to achieving organizational objectives.

In theory, the management of people is no different from the management of other resources of organizations. In practice, what makes it different is the nature of the resource, people. One set of perspective views the human being as potentially a creative and complex resource whole behaviour is influenced by many diverse factors originating from either the individual or the surrounding environment. Organizational behaviour theorists, for example, suggest that the behaviour and performance of the 'human resource' is a function of at least four variables: ability, motivation role, perception and situational contingencies. Another set of perspectives emphasizes the

problematic nature of employment relations: (Watson, 1986). The human resources differ from other resources the employer uses, partly because individuals are endowed with varying levels of ability (including aptitudes, skills and knowledge), with personality traits, gender, role perception and differences in experience, and partly as a result of differences in motivation and commitment. In other words, employees differ from other resources because of their ability to evaluate and to question management's actions and their commitment and co-operation always has to be won. In addition, employees have the capacity to form groups and trade unions to defend or further their economic interest. Human resource is often referred to as personnel, staff or workers.

A prior knowledge of available human resources with their skills, area of expertise, experience etc. is a key for development of educational plan. Every educational system at every level depends heavily on teachers for the execution of its programmes. For example, maintaining and improving educational standards is only possible through teachers. The teacher, therefore, is the most indispensable entity in the school. The teacher's information is available in EMIS for planning purposes. An educational planner can get this information directly from EMIS or from online resources. For example, if Government starts a program to increase female enrolment in primary level of education, the planner must also know the number of female teachers working in primary level of education.

## SESSION 2: USE OF INDICATORS FOR EDUCATIONAL PLANNING AND MANAGEMENT

### 2. Education Indicators

The English Language Dictionary describes an indicator as: “An instrument which gives you information”

“A quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect changes connected to an intervention, or to help assess the performance of a development actor”<sup>5</sup>

#### 2.1 Introduction to Education Indicators

Indicators are quantities describing specific aspects of a system, important means of conveying information based on available data, quantities making it easier to compare different parts of a system or to track changes over time and useful parameters used in planning calculations.

Indicators are calculated from raw data and in most cases quite simple calculations are used for calculating indicators. Indicators are used for presenting information in a way, which is easily understood, for example, the ratio between pupils and teachers. Indicators focus on important issues. Analyses are made much easier using indicators. Many norms in education are expressed as indicators, for example the desired average class sizes, and the number of textbooks per pupil. In short most indicators are easily calculated quantities, powerful in conveying information and very useful for analyses, quantifying norms and several other purposes. Indicators are actually very simple quantities intended to make it easier to see the information contained in the data.

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<sup>5</sup> (DAC Glossary of Key Terms in Evaluation, May 2002)

In education like in many other fields indicators are internationally standardized, allowing a comparison across countries and between units within a country. The indicator that everyone in education knows is the marks in the final examination. It allows comparing school leavers across a whole country and is used for a number of decisions on the student's future.

Formal definitions of the concept 'indicator' tend to make the simple concept look very complex. The reader should not be confused by a definition of indicator such as the following: "Indicator: An event, entity or condition that typically characterizes a prescribed environment or situation; indicators determine or aid in determining whether or not certain stated circumstances exist or criteria are satisfied."

With the renewed interest in education as a major investment in human resources and its value in the globalized market, lists of indicators, which are generally used, have been developed. They cover participation in education, efficiency and output (achievements), quality of process and output, costs and financing etc. The UNESCO Institute of Statistics (UIS) has produced an authoritative compilation of internationally agreed education indicators complete with formulae and references.

## **2.2 Access and Participation Indicators**

The following indicators related to access and participation needs to be understood and used for effective planning and management of education system.

### **2.2.1 Gross Intake Rate (GIR) in Primary Education**

#### **Definition and Purpose**

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

## Method of Calculation and Data Required

$$\text{GIR}_{\text{Pri}, t} = \frac{\text{Number of new entrants to Grade 1 (all ages) in school-year } t}{\text{Population of the official primary school-entrance age in school-year } t} \times 100$$

The above formula assumes that data on new entrants is available. If data on new entrants is not available, the new entrants to Grade 1 can be estimated by subtracting the number of Grade 1 repeaters from the total enrolment in Grade 1. This is shown below:

$$\text{GIR}_{\text{Pri}, t} = \frac{\text{Number of pupils in Grade 1 in school-year } t) - (\text{Number of repeaters in Grade 1 in school-year } t)}{\text{Population of the official primary school-entrance age in school-year } t} \times 100$$

### Interpretation

A high Gross Intake Rate indicates in general a high degree of access to primary education. As this calculation includes all new entrants to first grade, including over-aged and under-aged children entering primary school for the first time, the GIR can be more than 100 per cent.

### 2.2.2 Net Intake Rate (NIR) in Primary Education

#### Definition and Purpose

The net intake rate is the ratio of new entrants in the first grade of primary education who are of the official primary school-entrance age, to the total population of the same age expressed as a percentage.

## Method of Calculation and Data Required

$$\text{GIR}_{\text{Pri}, t} = \frac{(\text{Number of pupils in Grade 1 in school-year } t) - (\text{Number of repeaters in Grade 1 in school-year } t)}{\text{Population of the official primary school-entrance age in school-year } t} \times 100$$

### Interpretation

A high NIR indicates a high degree of access to primary education for the official primary school-entrance age children and a high proportion of pupils of

the same age in the first primary grade. It is a measure of how close countries are to universalizing primary education.

Note also the difference between the apparent intake rate and the net intake rate. The numerator for the apparent intake rate is the total number of new entrants regardless of age. The numerator for the net intake rate is the total number of new entrants for a specific primary school-entrance age. The denominator for both rates is the total population of the official primary school-entrance age. The net intake rate is always less than or equal to the apparent intake rate.

### 2.2.3 Gross Enrolment Ratio (GER)

#### Definition and Purpose

The GER is the total enrolment for a particular education level (primary or secondary), regardless of age, expressed as a percentage of the eligible official school-age population of that particular education level in a given school year.

#### Method of Calculation and Data Required

$$\text{GER}_t = \frac{\text{Total enrolment at the specific education level in school-year } t}{\text{Population of the official age group of specific education level in school-year } t} \times 100$$

#### Interpretation

The GER is the most commonly used indicator to measure coverage. It shows the overall coverage of an education system in relation to the population eligible for participation in the system. It is useful for those who are interested in the overall participation of the school-age population in a particular education level. It can be used for comparing different districts, provinces, regions, urban and rural provinces, boys and girls, etc.

The GER can be over 100 per cent, where the number of over-aged children in schools is high relative to children of the official age for the level. A

high GER indicates a high degree of participation, whether the students belong to the official age group or not. A GER value approaching or exceeding 100 per cent indicates a country is, in principle, able to accommodate all of its primary school-age population. It does not, however, indicate the proportion of that population actually enrolled.

#### 2.2.4 Net Enrolment Ratio (NER)

##### Definition and Purpose

The enrolment in a particular education level of the official school age group expressed as a percentage of the corresponding population. The NER gives a more precise measurement of the extent of participation in primary education of children belonging to the official primary school age.

##### Method of Calculation and Data Required

$$\text{NER}_t = \frac{\text{Enrolment of official age group in the in school-year } t}{\text{Population of the official school age group in school-year } t} \times 100$$

##### Interpretation

A high NER in primary education denotes a high degree of participation in primary education of the official primary school age group. The NER's maximum value is 100 per cent. An NER in primary education that increases over time reflects improving participation at the primary level of education. The difference between the GER and the NER measures the incidence of under-age and over-age enrolment.

#### 2.2.5 Repetition Rates (RR) by Grade in Primary Education

##### Definition and Purpose

The repetition rate is the proportion of pupils who repeat a grade. It measures the rate at which pupils repeat grades. A high repetition rate implies high wastage ratio. It blocks access to schooling for other children since repeaters occupy the school space.

## Method of Calculation

$$RR_{g,t} = \frac{\text{Number of pupils repeating grade } g, \text{ in school-year } t+1}{\text{Number of pupils enrolled in grade } g, \text{ in school-year } t} \times 100$$

As a particular example, if you would like to find out the repetition rate of grade 3 in school year of 2004, the formula would be:

$$RR_{3,2018} = \frac{\text{Number of pupils repeating grade 3, in school year 2019}}{\text{Number of pupils enrolled in grade 3, in school year 2018}} \times 100$$

## Interpretation

Repetition rates should ideally approach zero percent. High Repetition Rates indicate problems in the internal efficiency of the education system and possibly a poor level of instruction. When compared across grades, the patterns can indicate specific grades with relatively higher repetition rates. In some cases, low repetition rates merely reflect policies or practices of automatic promotion. The maximum repetition rate and the number of grade repetitions allowed may in some cases be determined by the education authorities in order to cope with limited capacity at certain grade levels and to increase the flow of pupils through the education cycle.

### 2.2.6 Survival Rate to Grade 5

#### Definition and Purpose

Survival Rate to Grade 5 is the proportion of a cohort of pupils who reached Grade 5 expressed as a percentage of pupils enrolled in the first grade of a given cycle in a given school year.

#### Method of Calculation

There are two methods of calculating this indicator, and results are significantly different for each method. The first method provides the actual number of students surviving to grade 5 (or any other desired grade). Whereas the Second



Method uses the predictive algorithm to determine the likelihood of what percentage of students reaching grade 5.

### **First Method**

Divide the total number of pupils belonging to a pupil cohort who reached Grade 5 of primary education by the number of pupils in the original pupil cohort, i.e. those pupils who enrolled together in the first grade of primary education, and multiply by 100.

### **Second Method**

Usually this indicator is derived using reconstructed student cohort flow model. It requires the following data.

- Number of students enrolled by grade for two consecutive years
- Number of repeaters by grade in the second school year
- Number of graduates (successful completers) in the first school year
- Number of net transfer students (optional)

### **Interpretation**

A Survival Rate approaching 100 per cent indicates a high level of retention and low dropout incidence. Survival Rate may vary from grade to grade, giving indications of grades with relatively more or less dropouts. The distinction between survival rate with and without repetition is necessary to compare the extent of wastage due to dropout and repetition.

## **2.2.7 Transition Rate (TR) to Secondary Education**

### **Definition and Purpose**

Transition Rate is the proportion of students that progress from the final grade of one level to the first grade of the next level, expressed as a percentage of those enrolled in the final grade of the preceding school year.

### **Method of Calculation**

$$TR_{\text{Pri to Sec, t}} = \frac{\text{New entrants to the first grade of the next higher level at school year t}}{\text{Number of pupils in the last grade of the previous level at school year t-1}} \times 100$$

When data on new entrants to the next higher grade is not available, subtract the number of repeaters from the total enrolment of the first grade of the next higher level to get the number of new entrants into the first grade of the next higher level. Divide the result by the total number of pupils in the last grade of the first level in the previous year.

$$TR_{\text{Pri to Sec, t}} = \frac{E - R}{\text{Number of pupils in the last grade of the previous level at school year t-1}} \times 100$$

1. E = Enrolment of the first grade of the next higher level at year t
2. R = Repeaters of the first grade of the next higher level at year t

### Interpretation

High Transition Rates indicate high access or transition from one level of education to the next. It also reflects the intake capacity of the next level of education. Inversely, low transition rates indicate problems in bridging between two cycles or levels of education, due to either deficiencies in the examination system or inadequate admission capacity in the higher cycle or level of education, or both.

### 2.2.8 Public Expenditure (PEx) on Primary Education as a Per cent of Total Public Expenditure on Education

#### Definition and Purpose

Public expenditure on primary education expressed as a percentage total public expenditure on education. It indicates government emphasis given to investments in primary education.

#### Method of Calculation and Data Required

$$\% \text{ of P.Ex.}_{\text{pri, t}} = \frac{\text{Public expenditure on primary education programmes}}{\text{Total public expenditure on education at year t}} \times 100$$

## Interpretation

A high percentage of public expenditure on primary education program as a proportion of the total education budget indicates a high degree of government interest and priority for this area.

## 2.3 Indicators for Gender Parity and Equality

### 2.3.1 GPI for Gross Intake Rate (GIR) in Primary Education

#### Definition and Purpose

The GPI for Primary GIR is used to assess gender differences in intake rates between boys and girls. It is calculated as the ratio of the primary intake rate for girls divided by the indicator for boys. It would be wrong to mention as GPI for the ratio of absolute numbers such as number of teachers, number of enrolment.

#### Method of Calculation and Date Required

$$\text{Gender Parity Index for GIR in Primary Education} = \frac{\text{GIR in Primary Education (Female)}}{\text{GIR in Primary Education (Male)}} \times 100$$

#### Interpretation

A value of less than one indicates a difference in favor of males; a value above one indicates a difference in favor of females; a value close to one indicates gender parity. However, it can be assumed that there is no disparity if GPI value ranges between 0.97 and 1.03.

### 2.3.2 GPI for Net Intake Rate (NIR) in Primary Education

#### Definition and Purpose

The GPI for Primary NIR is used to assess gender differences by appropriate age of intake. It is calculated as the ratio of the female primary NIR divided by the NIR for males.

#### Method of Calculation and Date Required

$$\text{Gender Parity Index for NIR in Primary Education} = \frac{\text{NIR in Primary Education (Female)}}{\text{NIR in Primary Education (Male)}} \times 100$$

### **Interpretation**

A value of less than one indicates a difference in favor of males; a value above one indicates a difference in favor of females; a value close to one indicates gender parity. However, it can be assumed that there is no disparity if the GPI value ranges between 0.97 and 1.03. The use of the NIR gives deeper insight into age differences in boy and girl intake with obvious advantages and disadvantages this can provide to one sex or the other.

### **2.3.3 GPI for GER**

#### **Definition and Purpose**

The GPI for GER in Primary or Secondary Education is commonly used to assess gender differences in gross enrolment at the primary or secondary level.

#### **Method of Calculation and Date Required**

$$\text{Gender Parity Index for GER in Primary Education} = \frac{\text{GER in particular education level (Female)}}{\text{GER in particular Education Level(Male)}} \times 100$$

### **Interpretation**

A value of less than one indicates a difference in favor of males; a value above one indicates a difference in favor of females; a value close to one indicates gender parity.

### **2.3.4 GPI for NER**

#### **Definition and Purpose**

The GPI for NER in Primary or Secondary Education is used to assess gender differences in primary and secondary net enrolment.. The indicator measures progress towards gender parity in enrolment at the primary and secondary level.

#### **Method of Calculation and Date Required**

$$\text{GPI for NER in Primary Education} = \frac{\text{NER in Particular Education Level (Female)}}{\text{NER in Particular Education Level (Male)}} \times 100$$

### **Interpretation**

A value of less than one indicates a difference in favor of males; a value above one indicates a difference in favor of females; a value close to one indicates gender parity.

### **2.3.5 GPI for Survival rate to Grade 5**

#### **Definition and Purpose**

The GPI for Grade 5 survival rates is used to assess gender differences in primary completion. It is calculated as the ratio of primary survival for females divided by the survival rate for males.

#### **Method of Calculation and Date Required**

$$\text{Gender Parity Index for Survival rate to Grade 5} = \frac{\text{Survival rate to Grade 5 (Female)}}{\text{Survival rate to Grade 5 (Male)}} \times 100$$

### **Interpretation**

A value of less than one indicates a difference in favor of males; a value above one indicates a difference in favor of females; a value close to one indicates gender parity.

### **2.3.6 GPI for Transition Rate to Secondary Education**

#### **Definition and Purpose**

The GPI for Secondary Transition Rates is calculated as the ratio of transition rates for girls divided by the transition rates for males.

#### **Method of Calculation and Date Required**

$$\text{Gender Parity Index for Transition rate to Secondary Education} = \frac{\text{Transition rate to Secondary Education (Female)}}{\text{Transition rate to Secondary Education (Male)}} \times 100$$

### **Interpretation**

A value of less than one indicates a difference in favor of males; a value above one indicates a difference in favor of females; a value close to one indicates gender parity.

### 2.3.7 Percentage of Female Enrolment

#### Definition and Purpose

Number of female enrolment expressed as a percentage of total enrolment in one particular education level such as primary, secondary, vocational and technical.

#### Method of Calculation and Data Required

$$\text{\% Female Enrolment}_t = \frac{\text{Number of female enrolment in particular education level in school-year } t}{\text{Total number of enrolment in particular education level in school-year } t} \times 100$$

#### Interpretation

This indicator shows the degree of female participation in these education levels. However, one may need to look at population structure of those particular age groups to interpret correctly.

### 2.3.8 Percentage of Female Teachers

#### Definition and Purpose

Number of female teachers expressed as a percentage of total number of teachers in one particular education level such as primary, secondary, vocational and technical.

#### Method of Calculation and Data Required

$$\text{Per cent Female Teachers} = \frac{\text{Number of female teachers in particular education level in school-year } t}{\text{Total number of teachers in particular education level in school-year } t} \times 100$$

#### Interpretation

This indicator shows the gender composition of the teaching force. It also helps in assessing the need for opportunities and/or incentives to encourage women to participate in teaching activities at a given level of education.

## 2.4 Quality Indicators

### 2.4.1 Percentage of Primary School Teachers Having the Required Academic Qualifications

#### Definition and Purpose

The number of primary school teachers with at least the minimum academic qualifications required by the public authorities for teaching in primary education, expressed as a percentage of the total number of primary school teachers.

#### Calculation Method and Data Required

$$\% \text{ Primary teacher having the required academic qualifications } _t = \frac{\text{Total number of primary teachers with required academic qualification in year } t}{\text{Total number of primary teachers year } t} \times 100$$

#### Interpretation

A high percentage of teachers having the required academic qualifications denote the availability of academically qualified teachers and the general quality of the teaching force.

### 2.4.2 Percentage of School Teachers who are Certified to Teach According to National Standards

#### Definition and Purpose

The number of school teachers who are certified to have received the minimum organized teacher-training (pre-service or in-service) required for teaching at a certain level of education, expressed as a percentage of the total number of school teachers at that level.

## Calculation Method and Data Required

$$\% \text{ Of Teachers who are certified to teach according to national standards } t = \frac{\text{Total number of teachers who are certified to teach according to national standards in year } t}{\text{Total number of teachers in year } t} \times 100$$

### Interpretation

A high percentage of teachers certified to teach in primary schools imply that a majority of the teaching force is trained and has the necessary pedagogical skills to teach and use the available instructional materials in an effective manner.

### 2.4.3 Pupil-Teacher Ratio (PTR)

#### Definition and Purpose

Pupil-teacher ratio (PTR) is one of the most common indicators used in educational planning. A low number of pupils per teacher indicate pupils will have a better chance of contact with the teachers and hence a better teaching-learning process.

#### Method of Calculation

$$\text{PTR } t = \frac{\text{Total number of pupils in particular education level in school-year } t}{\text{Total number of teachers in particular education level in school-year } t} \times 100$$

### Interpretation

The PTR should normally be compared to established national norms on the number of pupils per teacher for each level or type of education. A high pupil-teacher ratio suggests that each teacher has to deal with a large number of pupils and, conversely, pupils receive less attention from the teacher.

### 2.4.4 Pupils-Class Ratio (PCR)

#### Definition and Purpose



The average number of pupils per class is an important indicator, which gives a rough indication of class size. It is used to assess the efficiency of resource utilization.

### Method of Calculation

$$\text{PCR}_t = \frac{\text{Total number of pupils in particular education level in school-year } t}{\text{Total number of Classes in particular education level in school-year } t} \times 100$$

*\* A group of pupils in one instructional class. Hence, a section is equal to a class. One classroom can be used for a number of sections.*

### Interpretation

The PCR should normally be compared to established national norms on the number of pupils per Class for each level or type of education. A high pupil-class ratio suggests that each Class has to deal with a large number of pupils and that,

- Cause degrading teacher ability to handle the class
- Physical and mental uneasiness of pupils in crowded classes
- Both affect the quality of teaching-learning.

### 2.4.5 Pupil-Textbook Ratio (PBR)

#### Definition and Purpose

The average number of textbooks per pupil is an important indicator, which gives a rough indication of allocation of resources/materials to learners.

### Method of Calculation

$$\text{PBR}_t = \frac{\text{Total number of textbooks distributed to particular education pupils in school-year } t}{\text{Total number of pupils in particular education level in school-year } t} \times 100$$

*\* A group of pupils in one instructional class. Hence, a section is equal to a class. One classroom can be used for a number of sections.*

## Interpretation

The PBR should normally be compared to established national norms on the number of books per pupil for each level or type of education. A high pupil-book ratio suggests that each student is equipped with more materials and resources to support the learning process.

### 2.4.6 Percentage of schools with improved water sources

#### Definition and Purpose

The water sources include the following: piped, public taps and standpipe, tube wells and boreholes, protected dug wells, protected springs and rainwater collection. Without access to water, it is extremely unlikely that sanitation facilities can possibly function for students.

#### Calculation Method and Data Required

$$= \frac{\text{Number of Schools with Improved water sources}}{\text{Total number of schools}} \times 100$$

#### Interpretation

Without access to water, it is extremely unlikely that sanitation facilities and toilets can function properly, if at all. There are some professionals who would say that without the provision of water and toilets, school buildings are simply learning sheds.

### 2.4.7 Percentage of schools with improved sanitation facilities

#### Definition and Purpose

To ensure the provision of improved sanitation facilities, schools must rely on a wide range of technologies and networks, 'improved' sanitation facilities are defined as the following: flush/pour flush to piped sewer, septic tank or pit latrine; ventilation improved latrine; pit latrine with slab and composting toilet.

## Calculation Method and Data Required

$$= \frac{\text{Number of Schools with Improved toilet facilities}}{\text{Total number of schools}} \times 100$$

## Interpretation

It is important that the data presented for this indicator is properly and clearly defined. In some countries, 'adequate' is a standard, which requires toilets to have water, and to be in regular use, while in other countries, there is no distinction between adequate and exists, so that broken or out of use facilities are included in the calculations. This should be made clear in the report.

## SESSION 3: Group Work and Case Study

### Case Study

#### **Problem Statement:**

The Teacher Rationalization concept stipulates that each school should have the right number of teaching staff for its student population using a pupil-teacher ratio (PTR) based formula. Let us assume that as per the PTR, for primary level there will be one teacher provided for 40 students, 2 teachers from 41 to 99 students, 3 teachers from 100 to 139 students, 4 teachers from 140 to 179 students, and so on for every additional 40 students.

Lets assume further that the teacher rationalization policy requires provision of at least two teachers for each primary school regardless of the number of children, and thereafter increase the number of teachers per the PTR formula.

The MoE however, is also cognizant about the importance of having a dedicated teacher for each class to avoid multi-grade teaching. In keeping with this important aspect the MoE plans to have at least 6 teachers in every primary school in the near future.

#### **Group Work**

The training participants are required to develop a rationalization plan for 10 schools of a district by proposing posting/transfer of teachers from surplus schools to deficient schools. The enrollment and teacher related data of all the concerned schools would be provided to the participants. As part of this exercise:

- The participants will calculate PTR for each school.
- Based on the PTR formula provided above, determine the schools, which are either surplus or deficient in terms of teachers
- Prepare a matrix suggesting transfer of teachers from surplus to deficient schools
- Prepare a list of schools where the deficiency cannot be removed after this exercise
- Determine the additional teachers which will be required for these schools
- Determine the number of teachers, which will be required after implementation of the new policy in near future.