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Methodology of national education accounts

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Education financing:

Improving national reporting systems on financial flows

The UNESCO Institute for Statistics (UIS), the UNESCO International Institute for Educational Planning (IIEP), and IIEP Pôle de Dakar have pooled their expertise to provide technical support to partner countries of the Global Partnership for Education (GPE) to develop and implement sustainable methodologies for the collection, production, reporting, and use of quality education finance data.

This activity has been funded by the GPE Global and Regional Activities programme.

Eight GPE countries (five in sub-Saharan Africa, three in Asia) have participated, developing tools to collect and analyse data on expenditure on education in a way which can both inform sector planning and allow for regular reporting at national and international levels.

Partner agencies have worked with the eight countries, focusing on areas of education financing on which there is currently limited data coverage due to a lack of well-defined common methodologies and comprehensive information systems:

1) Allocation of resources within the system (**Guinea** and **Zimbabwe** with IIEP Pôle de Dakar).
2) Household expenditure (**Côte d'Ivoire** and **Viet Nam** with UIS).
3) External resources (**Lao PDR** and **Senegal** with IIEP).
4) In two countries (**Nepal** and **Uganda**), a comprehensive education finance information system was built around the national education account (NEA) approach.

This document on the methodology of NEAs constitutes one of the outputs of the project, in addition to outputs at national level.

Detailed information on the results and the tools developed at national level is available on the UNESCO, UIS, and IIEP websites.

PREFACE

Data on education expenditure are often incomplete due to the complex nature of finance in the sector and the different ways in which institutions report financial information. Consequently, many countries lack a sustainable education financing data collection, dissemination, and analysis system.

To draw a complete picture of education financing in a given country, national statisticians must gather data from various sources. The data are not always compatible in terms of definition and coverage, and are rarely compiled and presented in terms relevant to education policy-makers (for example, by levels of education or by nature of spending). In many cases, such as for household or non-governmental organization (NGO) spending, the data are not compiled, and when they are, they may be collected only occasionally and in aggregate amounts. Significant manipulation, relying heavily on estimation methods, is required before they can be used for analysis. Because of difficulties in tracking in-country donor resources to education, and disentangling these from government sources, the total amount of funding available is often not fully known.

These gaps are critical and are far too common. The production of good-quality data on financial flows is important in helping governments to understand how funds are disbursed, which groups are disadvantaged in terms of access to funding, where the potential leakages are, and what can be done to improve cost efficiency and effectiveness. Currently, it is not possible to calculate accurate unit costs for education in most countries. The lack of detail on the use of the funds also prevents effective policy planning aimed at improving learning outcomes.

The absence of national data results in gaps in international data availability and prevents the effective monitoring of progress towards the Education 2030 framework and Sustainable Development Goal (SDG) number 4, as well as the development of realistic costing exercises, at both national and international levels.

The UNESCO Institute for Statistics (UIS), the UNESCO International Institute for Educational Planning (IIEP), and IIEP Pôle de Dakar have pooled their expertise to address the issue of financial statistics on education, based on the utilization of national accounts techniques, building on the theoretical framework of satellite accounts. UIS has a mandate to collect and disseminate international statistics on education, IIEP has a capacity-building mission in educational planning, including training, research, and technical assistance to countries, and IIEP Pôle de Dakar has a mandate to support African countries in education sector analysis and the preparation and implementation of education policies.

The national education accounts (NEA) methodology presented here elaborates on the principles of existing international standards such as the System of National Accounts (SNA, 2008) and the International Standard Classification of Education (ISCED, 2011), and builds on previous experience in the area.

We are grateful to the Global Partnership for Education, which has made this work possible by providing financial support. With this methodology, our institutions intend to provide countries with relevant tools and to encourage them to organize and improve their information systems in the area of education finance.

Suzanne Grant Lewis
Director of IIEP

Sylvia Montoya
Director of UIS

ABBREVIATIONS

BIA	Benefit incidence analysis
BTVET	Business, technical and vocational education and training
CBOs	community-based organizations
COFOG	Classification of the functions of government (part of the United Nations' family of economic and social classifications)
ECD	Early childhood development
EMIS	Education management information system
FBO	Faith-based organization
GDP	Gross domestic product
GFS	Government Finance Statistics manual
GPE	Global Partnership for Education
IIEP	UNESCO International Institute for Educational Planning
IIEP Pôle de Dakar	A branch of IIEP based in Dakar
ISCED	International Standard Classification of Education
MICS	Multiple indicator cluster survey (households survey designed to collect data for monitoring the situation of children and women)
MOE	Ministry of education
NEA	National education account
NEXA	National Education Expenditures Accounts (the name given to the NEA in the Philippines)
NGO	Non-governmental organization
OECD	Organisation for Economic Co-Operation and Development
PTA	Parents and teachers association
QLF	Quality Learning Foundation (Thai institution which has developed an NEA)
SNA	System of National Accounts (the 2008 version is the latest revision)
TVET	Technical and vocational education and training
UIS	UNESCO Institute for Statistics
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNSC	United Nations Statistical Commission
UPE	Universal primary education
USE	Universal secondary education

INTRODUCTION: THE VALUE OF A NATIONAL EDUCATION ACCOUNT

Statistical understandings of the financing of education generally rely on the availability of finance ministry information on the budgets of the ministries in charge of education and on statistical surveys, such as those on household expenditure. This set of available information is certainly useful and can help in providing answers to specific questions.

However, problems arise when a more global, consolidated picture of the economy of the education sector is sought. This requires the use of data from many different sources. However, the inconsistency of these sources, the lack of common definitions and classifications, the diversity of format, and the difficulty of accessing those sources (or, in some cases, their non-existence), prevent easy consolidation.

A **national education account (NEA)** addresses these difficulties by organizing multiple data according to a structured methodology and using a common set of definitions. Its aim is to capture and gather all financial flows within a coherent accounting framework to enable the education sector's economy to be analysed, covering both the funding and the production costs of activities.

A component of the statistical information system on education

Information systems on education are, in many cases, well developed, providing abundant data on educational institutions, the numbers of students enrolled at various levels and grades, the human resources mobilized, and the infrastructure and equipment employed. In addition to raw statistics, information systems on education also produce indicators useful for analysis of the sector.

An NEA represents an additional but, nevertheless, essential component of information systems on education financing and expenditure, gathering into a coherent framework all the financial flows in a given system.

Various tools and methods have been developed to analyse education systems. The education sector analysis methodology[1] includes a component on costs and financing. In the absence of comprehensive and harmonized financial statistics, sector analyses are built on budget data and household surveys. Information provided by an NEA facilitates all analytic work on the functioning of the system and contributes to all information-based processes, such as sector planning or the design of education reforms or programmes.

A comprehensive picture of the financing of the system is important for countries committed to offering fee-free basic education, enabling them to estimate the right level of compensation for lost school revenues. This is in line with the Sustainable Development Goals (SDGs), set by the international community (specifically SDG4 and Target 4.1), to ensure, by 2030, that all girls and boys complete free, equitable, and quality primary and secondary education leading to relevant and effective learning outcomes. Monitoring progress against this objective requires knowledge of the costs borne by families.

Coherence with the national accounts system

NEAs are based on the principles of satellite accounts, linked to the central national accounts system, which implies that rigorous principles and definitions must be followed to ensure coherence with other economic analyses. In addition, although an NEA is intended, first and foremost, to be a national planning tool, the methodology is also designed to facilitate international comparison.

Organization and structure, classifications, and definitions of NEAs are, therefore, based on three main international standards, referred to throughout the text:

- The 2008 version of the System of National Accounts (SNA), which is the internationally agreed standard on how to compile measures of economic activity. The SNA provides an overview of economic processes, recording how production is distributed among consumers, businesses, governments, and foreign countries. It provides an overarching framework for standards in other domains of economic statistics, facilitating the integration of these statistical systems to achieve consistency with national accounts.

[1] See ***Education Sector Analysis Methodological Guidelines,*** referenced on page 66.

- The 2014 version of the Government Finance Statistics manual (GFS), which is the internationally agreed standard for the compilation of internationally comparable statistics for the general government sector, the public sector, and their sub-sectors. The GFS is compatible with the SNA.
- The 2011 version of the International Standard Classification of Education (ISCED) is part of the United Nations' international family of economic and social classifications. ISCED is the reference classification for organizing education programmes and related qualifications by education levels and fields, and is designed to serve as a framework to classify educational programmes into internationally agreed categories. ISCED is a product of international agreement and has been adopted formally by the General Conference of UNESCO Member States.

A reference document for NEA developers

This methodology of national education accounts aims to provide a common framework of concepts and principles, and to serve as a reference document for those who are developing or intend to set up an NEA in their country.

By referring to a common methodology, countries can guarantee that they are employing internationally agreed methods and standards for organizing financial information on education, while providing useful data for national use and international statistics.

This account of NEA methodology begins by describing the principles of satellite accounts and the specificities of the education domain, as well as reflecting on previous national experiences (*Chapter 1*). It continues in *Chapter 2* with a discussion of the scope of the education domain.

The following two chapters concern the structure of an NEA, the organization of information, and how financial flows are recorded and analysed. In *Chapter 3*, the various dimensions of an NEA are reviewed, setting out principles for classification, while *Chapter 4* presents both the structure and analyses of financial flows within the domain.

The final three chapters deal with sources of information, the organization of data processing, and the arrangements that must be put in place to establish an NEA. *Chapter 5* and *Chapter 6* discuss the sources of information and the various steps in mobilizing data and processing them, up to the reconciliation stage and the finalization of tables. *Chapter 7* deals with issues of implementation, institutional anchorage, and sustainability.

Annexes include practical examples on how to process government and household expenditure data, and references to national NEA experiences.

1 Chapter

A SATELLITE ACCOUNT WITHIN THE NATIONAL ACCOUNTS SYSTEM

National accounts provide a global and comprehensive picture of the entire economy of a country, enabling analysis of financial flows across its different branches, and the estimation of macro-economic aggregates, such as GDP.

While they cover all sectors, including education, central accounts do not provide the level of detail required by decision-makers, managers, or economists interested in a specific area, such as education. Central accounts use functional classifications to describe transactions for a specific sector. When an economic agent has several activities contributing to different functions, the classification is based on the main activity of the economic agent. The functional classification does not indicate expenditure on education where education is not the main activity of the economic agent. For example, a training centre for police would be classified as part of the security function and not as part of the education function.

Satellite accounts were created to fill these gaps. A satellite account is developed to facilitate detailed study of a specific sector/area while maintaining consistency with the central framework of national accounts. As the name suggests, satellite accounts are linked to, but distinct from, the central system.

As it is anchored in a national accounts system, an NEA benefits from unified concepts in terms of economic territory, the classification of economic agents, and definitions of economic transactions. It can be readily related to other satellite accounts with which it has areas in common.

1.1 The satellite accounts and the SNA 2008

The 2008 *System of National Accounts* (SNA, 2008) is the latest version of the international statistical standard for national accounts, updating the 1993 SNA, and has been adopted by the United Nations Statistical Commission (UNSC).

On satellite accounts, the document says:

> The main reason for developing such a satellite account is that to encompass all the detail for all sectors of interest as part of the standard system would simply overburden it and possibly distract attention from the main features of the accounts as a whole. Many elements shown in a satellite account are invisible in the central accounts. Either they are explicitly estimated in the making of the central accounts, but they are merged for presentation in more aggregated figures, or they are only implicit components of transactions which are estimated globally.[2]

Satellite accounts are based on a definition of the key activities and products of a domain. They make a distinction between characteristic products and connected products. Education products will be further discussed in *Chapter 2*, which addresses the scope of the education domain.

> For characteristic products, the satellite account should show the way these goods and services are produced, what kind of producers are involved, what kinds of labour and fixed capital they use and the efficiency of the production process, and, hence, of the allocation of resources. For connected products, there is no particular interest in their conditions of production because they are not typical of the field of interest. If the conditions of production are important, then the items should be considered characteristic products and not connected products.[3]

The providers of the characteristic products are the producing units of the domain.

Satellite accounts organize information according to the specific features of their domain. For education, this means including dimensions such as education levels and categories of school, as well as a list of products specific to the education domain. The accounts also distinguish between financing units and producing units, allowing the analysis of financing patterns as well as of production patterns of education delivery.

In contrast with the functional classifications in the central accounts, satellite accounts can identify ancillary services within producing units. In education, a school can offer boarding facilities as well as delivering teaching activities. The accounts can also identify training activities within bodies for which the main activity is not education.

Satellite accounts can include non-financial data. In the case of an NEA, the non-financial data are related to the main beneficiaries of the system, the students. The relationship between financial figures and the number of students allows for the calculation of average unit cost or financing per student.

Other non-financial information can be added, such as the number of schools, classes, or students, or the results of exams or tests. In most countries, there is no shortage of data on education, with information on schools, classes, students, teachers, infrastructure, and exams, and there are already well-established indicators with which to analyse enrolment or the conditions of schooling. An NEA does not aim to cover the full scope of analyses, but to complement the existing information system with financial data and analyses.

[2] See *Chapter 29* on satellite accounts: http://unstats.un.org/unsd/nationalaccount/sna2008.asp

[3] See *Chapter 29* on satellite accounts: http://unstats.un.org/unsd/nationalaccount/sna2008.asp

1.2 Specificities of national education accounts

The specificities of an NEA stem from the particular way in which an education system is organized.

Education is first and foremost about teaching, and the school system is intended to enable teaching. The precise definition of teaching and the limits of the education domain will be discussed in the following chapters. It is clear though that teaching is the core activity for an NEA.

Formal education systems are typically organized in terms of levels, such as preschool, primary, secondary, and higher education. Each level is usually divided into a number of successive stages, with students moving up in the system year on year. This dimension of education systems is therefore central to the management of the system, with specific curricula, norms, learning conditions, and staff qualification at each level. Most of the analyses and indicators on education are based around this central dimension.

The producing units for teaching activities are mainly educational institutions. They can deliver teaching activities at one or more educational levels. However, schools, universities, and other types of educational institution are not only involved in teaching activities, they also manage ancillary services such as school meals, boarding facilities, and school health. Those ancillary activities are offered by schools, alongside teaching activities and the general administration and supervision of the system, with the aim of facilitating school attendance. They are therefore part of the economy of the education domain.

Educational institutions are identified according to the criteria of the education system in question rather than the criteria of legal and financial autonomy. While some educational institutions may enjoy legal and financial autonomy, others may have the status of an administrative unit within a broader entity and are not, therefore, visible in central accounts. Those non-autonomous units are identified as separate entities within an NEA.

Education systems are under the direct control of governments, which are also most often the primary funders of the system, managing a large network of public institutions as well as setting policies, regulations, delivery agreements, and diplomas. Ministries in charge of education have a responsibility for planning the development of the system, and need a reliable information base in order to formulate policies, establish organizational features, and properly deploy resources.

With those considerations in mind, an NEA could be regarded as an account of educational institutions, with analyses of both the funding of institutions and the production costs, organized in terms of levels of education and the domain's characteristic activities.

However, any account given simply in terms of educational institutions is bound to be incomplete, as some typically educational products are not produced by educational institutions, for example school supplies or transport to school. Spending on those connected products should be included as part of the economy of the domain, irrespective of their particular production features. They complement the core activities of the producing units.

Connected products are, for the most part, purchased by the users of the education system and represent expenditures required for attending school. An NEA could then be seen as providing an extended functional vision of educational institutions.

Another characteristic of education systems is that most institutions operate on a school or academic year basis, which is often different from the fiscal or budget year, or, indeed, the calendar year. NEAs have to deal with this issue, adjusting reported data to the annual period of national accounts.

Regarding non-financial data, the high involvement of government means that education is an area in which available statistics are many, on students, classes, teachers, infrastructure, and equipment. Much of this data can be compared with financial data, such as costs per student or per class, and average salary costs.

The number of students by level of education and category of provider is the more important non-financial information. Students are considered to be the beneficiaries of expenditure on education; unit costs per student are largely used to analyse the economy of the domain and must be calculated as part of an NEA.

1.3 Relation with the central accounts of the national accounts system

As well as maintaining internal consistency, an NEA must make efforts to remain consistent with the central accounts of the national accounts system. Consistency with the central accounts is reflected particularly in the use of identical definitions and classifications:

- The recording period is the annual period used for the central accounts. It often corresponds to the fiscal year, but could be different for some countries.
- Education expenditures are those made for educational activities within the economic territory of the country, whatever the source of funding, domestic or external. A country can decide to record in the NEA expenditure on studies abroad, but this expenditure should be recorded separately and is not usually considered for comparison with GDP.
- Financing units are grouped together into institutional sectors: general government, the private sector, and the rest of the world, in the same way as in the central framework. Institutional classification criteria are the same as in the central framework.
- Economic transactions are recorded using the same principles employed in the central framework. Compensation of staff includes base salaries, allowances, employers' social charges, and social contributions corresponding to the benefits paid. Capital expenditure corresponds to the concept of formation of gross capital in the central accounts.

Due mainly to differences in the delimitation of the education domain, it is difficult to reconcile fully the estimates recorded in both central accounts and education accounts. However, it is possible to explain and quantify the differences. The two systems can also feed into each other through exchanges of data. An NEA can enrich information on the education sector used for central accounts and can use some data processed for national accounts.

Another requirement is full coverage of the domain of the satellite account. Ideally, an education account should

have a full coverage of the education sector. An education account cannot limit itself to public institutions only, or simply to educational institutions overseen by the ministry of education. It must cover all educational activities carried out in a national territory. The consequence of this is that accounts gather data which do not always meet the same quality requirements. Simple estimates, in particular data taken from surveys or trend indices, can in some cases be found alongside perfectly calculated accounting data (as for example, in government budgets or the audited accounts of educational institutions).

However, an NEA can be developed for only one part of the education sector, such as for formal education, and gradually extended to non-formal education. Some experiences limit the domain to school education, and do not include higher education. This would be considered a first step in developing a full NEA.

As for national accounts, it is important to use the same methodology every year to assure the reliability of the variations over time. An NEA may not have a precise base year, as central accounts do. However it is important to maintain a stable methodology, and to document the changes made.

1.4 NEAs and information systems on education

At national level

An NEA is an information system on the financial flows of the education sector, complementing the existing set of information on schools, students, classes, teachers, infrastructure, and equipment.

An NEA will help to answer questions such as: How much does education cost? Who is funding the education system? What funding is provided and what are the costs at the various levels of education? What are the differences between categories of education providers? What is the average amount of financial support and cost per student? Who pays for what?

The information provided can be used for analyses of distributive equity among the beneficiaries of the education system by combining education costs with information on the social and economic background of students. The efficiency of the system can also be assessed by comparing financial investment in education and the results. However, those analyses require much more information than financial statistics at national or regional level. Non-financial data on individual schools may be necessary, for example. An NEA can provide some of the information required but does not propose a response in itself. These potential analyses are discussed in *Chapter 6*.

An NEA provides comprehensive financial information on the system, enriching the existing set of planning and monitoring indicators on education. An indicator such as the proportion of GDP spent on education calculated from NEA data would include all sources of funding rather than just government funding. The comparison of the share borne by government or households at each level of education, or the comparison of unit costs by level and type of institution, can be part of an indicator system for the education sector, together with indicators such as students per teacher or hours per student, thus supporting understanding of the factors which determine the level of spending at each level.

To be useful at national level, an NEA should reproduce a statistical vision of the system, and reflect the organizational structure and funding patterns of the national education system.

At international level

The UNESCO Institute for Statistics (UIS) is the primary source of cross-nationally comparable statistics on education, science and technology, culture, and communication for more than 200 countries and territories. Its annual education data collection is the most comprehensive in the world, covering all education levels and a range of issues, such as gender parity, teachers, and financing.

To implement its mission, UIS annually sends a survey on formal education to all countries, including three questionnaires about: (i) data on pre-tertiary education; (ii) tertiary education (as with pre-tertiary education, covering students, teachers, and graduates); and (iii) education financing for all levels of education. Countries that are members of the Organisation for Economic Co-operation and Development (OECD) and the European Union complete a questionnaire implemented jointly by the UIS, the OECD, and Eurostat, known as the UOE questionnaire. The remaining countries receive the UIS questionnaires. Typically, the survey is sent to the ministry of education, which often works with the ministry of finance to obtain and process data on financing. Although there are some small differences between the two finance questionnaires, they are fully compatible and can produce comparable data and indicators for all countries of the world. The questionnaire covers financing by source (government, international, private), by educational institution (public, private) and by economic transaction (teacher and non-teacher compensation, current and capital expenditure). The data received from national governments are then processed and reviewed in terms of quality by UIS before being disseminated widely through the UIS Data Centre and published by a wide range of partners, notably international organizations.

The coverage of finance data includes the products of educational institutions, connected products purchased outside educational institutions, and public subsidies paid to students to cover living costs, irrespective of where or how the student spends these subsidies. It excludes explicitly:

- research and development outside educational institutions;
- private, non-subsidized expenditure on student living costs outside educational institutions;
- expenditure on educational activities outside the scope of UOE data collection, such as adult evening courses provided by schools or universities that are classed as leisure courses and do not fall under the scope of UOE data collection.

UIS also maintains the International Standard Classification of Education[4] (ISCED) and supports countries in their efforts to implement it. In 2011, a revision to ISCED was formally adopted by Member States at the UNESCO General Conference. The update reflects the diversification of education systems worldwide.

The NEA methodology and classification system is designed to be compatible with UIS data collection and international

[4] http://www.uis.unesco.org/Education/Pages/international-standard-classification-of-education.aspx

standards, and therefore facilitate reporting in UIS questionnaires. The coverage and structure will be discussed in the following chapters. However, the limits set for the UIS questionnaire are compatible with the concept of a satellite account providing a functional vision of the accounts of educational institutions.

1.5 History of national education accounts

National education accounts have existed for several decades. However, only a few countries (around 12) have implemented NEAs to date, and these have often been limited to a few years.

The methodologies used differ, with various degrees of connection to the definitions and concepts of national accounts, or to the functional classification of central accounts. Some address only the financing side of educational activities and institutions, while others analyse also the production costs of educational institutions.

The **earliest experience of NEA is in France**,[5] dating back to the late 1970s, with an annual data series that began in 1974 and continued until 2013. The education account in this case is clearly anchored in the national accounts system as a satellite account, using the same concepts of territory, institutional sectors, and economic transactions, but making a clear distinction between the financing and production of education delivery. The definition of education refers to ISCED, and, in addition to the formal education system, the French NEA covers forms of training such as in-service training and second-chance programmes.

The French NEA is structured around five dimensions: levels of education (aligned with ISCED levels), activities, financing units, producing units, and economic transactions. Transfers between financing units are recorded, giving rise to the concept of initial financing and final financing. The initial structure was revised in the early 2000s to adjust to changes in central accounts, but also to provide information required for national and international indicators within the framework expected by users. In the revised structure, the level of education is dominant, the education account being a combination of accounts for each level.

Every year, final NEAs are published for the year n-2 (for example 2012 published in 2014) together with a provisional account for the year n-1 (2013 in the example).

The NEA is institutionalized, with a specific structure of oversight within the statistical department of the Ministry of Education. NEA data are used to inform indicator systems on education. Regular data collection processes are in place, using available accounting databases for central government, local authorities, and public educational institutions enjoying financial autonomy, as well as some data collection for central accounts and some specific surveys, such as those for household education expenditure.

The **UNESCO International Institute for Educational Planning** (IIEP) has been working with several countries for the establishment of education accounts, using a method inspired by the French accounts, customizing the scope of the domain and classifications to the circumstances of each country.

Account series covering periods of between five and 10 years have been established in each of the following countries:

- **Madagascar,**[6] covering the years 1990 to 1995;
- **Benin,**[7] for the period 1993 to 1996, followed by an update for the years 1997 and 1998;
- **Mauritania** covering the period 1995 to 1999;
- **Dominican Republic** for the period 1996 to 2005;
- **Kenya** for the period 2006 to 2010.

The scope of education generally includes the formal education system, from preschool to higher education, non-formal education, and literacy programmes. The domain thus approaches the contour of expenditure required by UNESCO's international questionnaires.

The five dimensions of levels of education, activities, financing units, producing units, and economic transactions are present in these NEAs, though they are combined to simplify data processing. General administration is considered in the same dimension as levels of education.

Financial data cover both the financing and the expenditure of educational institutions, showing the use of the funding received. Data on average financing per student and average cost (expenditure of producing units) are produced.

The NEAs follow national accounts definitions regarding period, economic territory, institutional sectors, and economic transactions. In accordance with the definition of personnel costs, salaries of established civil servants are topped with a social charge for pensions when they are not included in the ministries' budgets.

In **Benin**, there was an attempt to set up NEAs at regional level.

In the **Philippines,** the initiative came from the National Statistical Cooperation Board, now part of the Philippines Statistics Authority, with a first attempt made in 2001, covering the period 1991 to 1998. The National Education Expenditure Accounts (NEXA) framework is used for the compilation of information on the country's education sector financing.[8]

NEXA seeks to be exhaustive. Thus, it includes expenditure for all forms of education that satisfy the standards and definitions outlined in the Updated Philippine Standard Classification of Education (NSCB, 1998) and prescribed by the 1982 Education Act. The definition of education is consistent with the one adopted by UNESCO (ISCED).

NEXA derives from the functional classification of central accounts. It uses the typology of economic transactions prescribed by the 1993 UN System of National Accounts (SNA). They are referred to as economic units or institutional units. In addition to being the centres of legal responsibility, these institutional units are also centres for decisions on all aspects of economic life. When grouped together according to their principal functions, they form the institutional sectors of the economy.

[5] http://cache.media.education.gouv.fr/file/199/02/6/DEPP-Dossier-2011-199-compte-education_english_239026.pdf

[6] http://publications.iiep.unesco.org/Economics-education/Costs-financing/financement-enseignement-primaire-secondaire-malgache (in French only)

[7] http://publications.iiep.unesco.org/Economics-education/dépense-éducation-Bénin-1993-1996 (in French only)

[8] http://www.nscb.gov.ph/stats/nexa/default.asp

The main matrix of NEXA uses a functional classification (i.e. according to purpose or objectives) of the educational expenditure, including:

- basic education;
- middle-level skills development, including post-secondary;
- higher education;
- job-related training programmes, which refer primarily to staff and employee training programmes designed to upgrade work-related skills and knowledge;
- ancillary activities, which include activities that support, promote, and facilitate the production/provision and consumption of education services, e.g. general administration, education research, library services, and school transport services;
- other uses of funds, which is a 'catch-all' category for education expenditure that cannot be classified elsewhere.

Some countries initiated national education accounts using the methodology of **health accounts**.

This is the case in **Turkey**, which conducted an NEA exercise in 2004/05 covering the years 2001 and 2002, with the support of the World Bank. Its NEA framework closely follows its national health account framework, mapping flows from sources to intermediary or financing agents and finally to the providers of services. The utilization of resources by the service providers is also described.

Other countries have undertaken similar exercises with the support of **USAID**, through either Creatives Associates or RTI International. These include:

- **Morocco**, for years 2003 and 2004;
- several states in **Nigeria**, namely **Kano** (school year 2005/06), **Zamfara** (2006/07), **Bauchi** (2010/11 and 2011/12) and **Sokoto** (2010/11 and 2011/12);
- **El Salvador**, for the years 2006 to 2009.

In these countries, the domain covers the system under the supervision of the ministry of education, from pre-school to post-secondary, but doesn't include non-formal education or higher education, which could be considered in a future education account exercise. Financial flows are described, from sources of funding to financing agents and from financing agents to providers, with the use of funds also described.

The Moroccan NEA provides information on the use of funds at AREF (Academie Régionale d'Education et de Formation, the regional administration for education) level and by rural/urban area.

In Nigeria, the work was conducted as a snapshot exercise for one year, taking one academic session as its basis. The domain covered includes informal religious education (Almajiri), but not higher education. NEAs were developed in a context of a complex financing architecture, poor availability of indicators, and evidence that actual expenditures were lower than budget provisions and of unclear use of funds.

Methodologies derived from health accounts place emphasis on financing flows from the sources to the providers.

Thailand has the newest NEA, with its first attempt, covering the period from 2008 to 2010, finalized in 2014. The exercise was initiated and funded by the Quality Learning Foundation (QLF), an autonomous public organization supervised by the Prime Minister's office, and implemented by a group of researchers from Thammasat University and the University of Thai Chamber of Commerce. The initial objective of the first Thai NEA was to improve understanding of how the investment of nearly a quarter of the total government budget in education had shown such limited outcomes in the decade following the landmark education reforms of the early 2000s. The second round of Thailand's NEA was completed in 2015, extending its coverage to the period from 2008 to 2013.

Derived from the methodology of health accounts, Thailand's NEA follows the flow of funds from source to service provision using a set of matrices, tables, and charts. Sources of education finance include both central and local government, the business sector, household spending, and non-governmental organizations (NGOs). The Thailand NEA also disaggregates educational expenses by functions, expenditure categories, financial sources, and the socio-economic levels of households which had educational expenditure. The update of NEA will take place every three years. The next update is scheduled for 2017, with the possible collaboration of the national health account team in conducting a joint household survey on health and education expenditure to achieve more comprehensive information on household spending.

The institutional anchorage is being debated. The current arrangements were helpful in launching the first series of accounts. However, responsibility for the NEA could be transferred to the Ministry of Education, raising the issue of the technical capacity for sustaining it.

In 2014 and 2015, NEAs were developed in **Nepal** and **Uganda,** with the support of the Global Partnership for Education (GPE) and UNESCO institutes, UIS, IIEP, and IIEP Pôle de Dakar. The methodology employed in these countries drew on previous experience and has been largely used for this document.

With the exception of France, where the NEA is institutionalized, the exercise of setting up an NEA has not been renewed in the featured countries. This is mainly due to the technical complexity of the process and the difficulty of reproducing it without external support. The expertise available at international and national levels is limited to a small number of institutions, and one objective of this methodology is to disseminate the methods on a larger scale. The difficulty of mobilizing a large amount of information from a wide range of sources represents an important factor in the development of NEAs. Data on households, private providers, and external funding, as well as on income and expenditures at school level, are the most difficult to mobilize.

2 Chapter

THE SCOPE OF THE NATIONAL EDUCATION ACCOUNT

An NEA is a framework for measuring the economy of the education sector, within the national economy of a country, through a set of statistical tables recording, in an organized way, financial data on the domain. The primary purpose is to measure the effort engaged in by a country in the acquisition of knowledge through its 'education system'. Therefore, prior to any action of this nature, the scope of the education domain must be precisely determined.

2.1 The product: education

Since education is the product to which the production process accounted for in an NEA is aimed, defining what can or cannot be included within the scope of education is essential. As with other issues of classification, the scope of an NEA should be defined in a way that allows comparability between countries, while retaining a degree of flexibility to reflect national realities.

When thinking about education, the mind turns first to school-based teaching activities, the common feature of which is the existence of a curriculum divided into annual cycles and implemented in institutions specialized in the delivery of education. These activities are undoubtedly at the heart of the education system and involve a large number of pupils and students.

A definition of education is provided by the International Standard Classification of Education (ISCED), established by UNESCO and revised in 2011. It defines an education programme as:

> a coherent set or sequence of educational activities or communication designed and organized to achieve pre-determined learning objectives or accomplish a specific set of educational tasks over a sustained period. Objectives encompass improving knowledge, skills and competencies within any personal, civic, social and/or employment-related context. Learning objectives are typically linked to the purpose of preparing for more advanced studies and/or for an occupation, trade, or class of occupations or trades but may be related to personal development or leisure. A common characteristic of an education programme is that, upon fulfilment of learning objectives or educational tasks, successful completion is certified (UIS, 2012).

The definition provides further detail on a number of key terms:

EDUCATIONAL ACTIVITIES: *Deliberate activities involving some form of communication intended to bring about learning*.

COMMUNICATION: *A relationship of two or more persons or an inanimate medium and persons, involving the transfer of information (messages, ideas, knowledge, strategies, etc.). Communication may be verbal or non-verbal, direct/face-to-face or indirect/remote, and may involve a wide variety of channels and media.*

LEARNING: *Individual acquisition or modification of information, knowledge, understanding, attitudes, values, skills, competencies, or behaviours through experience, practice, study, or instruction.*

ORGANIZED: *Planned in a pattern or sequence with explicit or implicit aims. It involves a providing agency (person[s] or body) that facilitates a learning environment, and a method of instruction through which communication is organized. Instruction typically involves a teacher or trainer who is engaged in communicating and guiding knowledge and skills with a view to bringing about learning. The medium of instruction can also be indirect, e.g. through radio, television, computer software, film, recordings, internet, or other communication technologies.*

SUSTAINED: *The learning experience has the elements of duration and continuity*.

The communication criteria exclude simple improvements in skills resulting from practice and experience.

The rather broad definition of education activities and learning is, however, limited by the criteria that they be both organized and sustained. Observational learning, self-learning, participation in isolated seminars or conferences, or non-organized training carried out during work time, are not considered as education, even if they bring about learning. Courses or training lasting less than six months (full-time equivalent) are also not usually considered as education under international definitions. Therefore, an NEA will not aim to quantify the economic value of those activities. The economic equivalent of the time spent by parents on informal training of their children is not included in an NEA either.

The definition is largely suited to classroom instruction, special classes, training courses, distance learning courses, or courses offered in the context of other forms of communication technology.

Limits to the education domain may result also from conventions, as some activities can satisfy the definition but still not be considered part of national expenditure on education. The reference point for decisions here could be the manual used by UIS in its international questionnaire on education expenditure. Among the excluded activities are:

- Training provided by driving schools or pilot schools, unless it forms part of a school training programme.
- Education essentially corresponding to sporting or leisure activities.

- Military service, equivalent national service, or training sessions organized for defence purposes. Only military colleges and academies which are delivering initial or continuing training to army staff are considered to be part of the education domain.

2.2 Producing units, characteristic activities, and connected products

The education sector is viewed in economic terms, meaning that the provision of education services in a country is seen as a production process. Within this vision, the delimitations of education products and of producing units have to be made explicit.

Producing units

All education activities corresponding to the definition of education programmes are included as characteristic activities within the NEA, and all institutions carrying out those activities are among the **producing units** of the system, including schools, universities, training centres, and administrative offices.

Whatever the legal or financial status of the entity carrying out the educational activity, it must satisfy a number of criteria to be considered a producing unit:

- Educational institutions may be clearly identified as autonomous bodies, enjoying full or partial legal and financial autonomy.
- They may also be easily identified entities, albeit operating legally and financially under a broader entity. This is often the case for public primary schools that could be identified as administrative units, with a distinct location, infrastructure, and staff, while being legally part of the central government administration or a local authority, often without financial autonomy. Those entities are considered as separate producing units.
- Some education programmes are carried out by non-educational entities. This could be the case for literacy or non-formal programmes or for in-service training activities. The NEA identifies separate producing units within those non-educational entities.

This definition of a producing unit in an NEA differs from the ways in which those entities are considered in central accounts. The purpose is to make it possible to analyse the economy of the education domain following the organizational patterns of the education and training system.

Characteristic activities

Educational activities refer to teaching or training. However, the economy of the education domain cannot be limited to the production of teaching activities. It also includes the definition of content, the general administration and supervision of the system, educational guidance systems, canteens and boarding schools, transport between home and schools, and school supplies and textbooks.

Some of these activities, such as school meals and board, are intended to accompany and facilitate school attendance and are often ancillary services carried out by or within educational institutions. The identified producing unit is then the educational institution.

Administrative work at school level is not considered separately from teaching activities. The definition of teaching activities refers typically to the activity of a day school.

Research carried out by higher education institutions is linked to teaching activities, as academic staff can be both lecturers and researchers. The research activities of these institutions are either included and merged with teaching activities or recorded separately, where possible.

Administration and supervision of the system is carried out by administrative offices at the central, regional, or local level. The NEA identifies administration offices as a separate producing unit for those activities. They are considered as non-instructional educational institutions for the purposes of international data collection (UIS).

Sometimes, specific bodies are in charge of specific non-teaching activities aimed at providing support to school attendance, such as students' welfare facilities in higher education, or the guidance system. The NEA identifies them as producing units for those activities.

Connected products

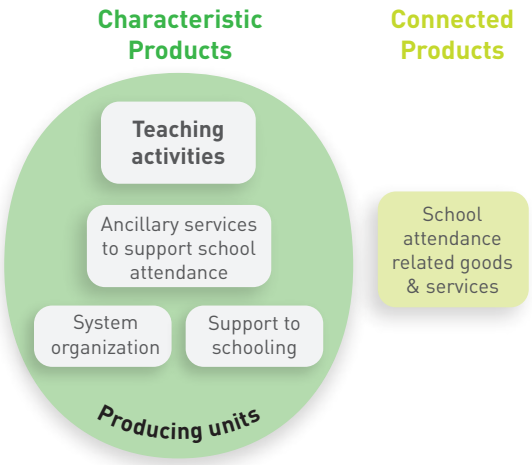
In addition to the previously mentioned education services provided by its producing units, an NEA also includes in its scope goods or services produced outside of these institutions, but nonetheless related to the economy of the education system. They are considered as connected products. This is typically the case for textbooks, uniforms, or school supplies purchased by parents and students in the general marketplace. In cases where school transport is the responsibility of local authorities rather than of educational institutions, this expenditure should also be included in the NEA. The account will show the financing of these connected products but will not describe the way they are produced.

Private tuition could be regarded as a specific category of teaching activity, as defined by ISCED. However, the consumption of private tuition is associated with attendance on a main education programme and private tuition is, for this reason, considered a connected service.

For the purposes of an NEA, the scope of the education domain is organized around a set of characteristic activities produced by the educational institutions, complemented by a set of connected products related to school attendance.

Precise contents and classification principles for producing units, activities, and products are provided in *Chapter 3*.

Figure 1. Producing units, characteristic activities, and connected products



2.3 The central dimension of education levels

The level of education programmes is a central dimension in the analysis of education systems. One important and expected result in the analysis of the economy of the education domain is the funding and production costs for each education level. Decision-makers and various users of educational statistics expect to derive information such as the share of expenditure for each level, or the unit cost per student at different levels.

Classifying expenses by level of education may be challenging, as it is often not the way the organization and administration of the education system is structured. Financial data in particular may not be collected in this way at all.

It is not uncommon, for example, for data on compensation of employees to be available in bulk for an entire ministry. If the ministry covers several levels of education, it will present a difficulty since compensation of employees is usually the largest spending item in an education budget.

Educational institutions can offer education programmes at different levels. In the example of Nepal, community schools offer education at pre-primary, primary, lower secondary, secondary, and sometimes higher secondary levels. In order to provide a description of the funding and costs at the various levels, educational institutions offering two or more levels of education have to be separated into homogeneous producing units at each level.

Some education activities also benefit more than one level, as is often the case with regard to administrative and support services. In the *Government Finance Statistics* manual (GFS), the classification of functions of government (COFOG) follows ISCED levels, but also includes four categories not defined by education level. Some programmes which would often be considered non-formal can be included under 'education not definable by level'. Subsidiary services to education (equivalent to ancillary services), research and development for education, and all general support and administration services are also not required to be classified by level. The NEA differs in that regard to the GFS and COFOG, in that it requires *all* expenditure to be classified by education level, including administration costs of a more general nature. Administration is classified separately from teaching activities, but this distinction exists for the dimensions of producing units and activities only, and *not* for the level dimension.

There are two main reasons for that methodological choice. The first is that key users of education financing data (such as national policy-makers and the global education community) are often interested in seeing the education domain as a sum of levels. Administration costs are part of the real cost of education, and in order to evaluate how much it would cost to educate a child at primary level, for example, these must be included in some way. The second reason is that a classification by level is more useful in terms of comparability, either over time or between countries. What expenses can be readily separated by level will vary from time to time and between countries, and it can be very tempting to put many things under an 'unallocated' category. For example, if curriculum development is specific to primary education in a country, it could be classified as such, while in another it would fall under an unallocated administration category, creating some problems of comparability.

Nonetheless, separating all expenses by level of education means introducing more estimates to the account and has implications for classification and data processing, as will be discussed in the following chapters.

This is an important respect in which an NEA may differ—and go further than—other statistics on education financing in existing data systems (such as the financial tracking system of the ministry of finance), as many financial tracking systems do not collect education financing data disaggregated by level of education.

In considering the level of education as a key sub-component, an NEA can be seen as a sum of smaller accounts covering each level of education (primary, secondary, or tertiary education, vocational training, and so forth).

2.4 Territory

The scope of an NEA must also be defined in geographic terms. In line with what is considered the territory of the national economy in the central accounts, it should include education activities taking place **within the national territory of the country**, even if, in some cases, management or funding may come from abroad.

This means that the financing of international or embassy schools operating on the national territory should normally be included in an NEA.

On the other hand, education activities funded by national government but taking place outside the country's borders should be *excluded* from the common core (though they could be included in a country's account but classified separately, as indicated below). For example, government financial aid for students studying abroad, or funding for national schools operating outside the country, should either be excluded from the NEA, or classified separately.

In the Caribbean and the Pacific, some small island countries have pooled their resources to fund regional universities, the University of the West Indies, and the University of the South Pacific, for example. Campuses are physically located in one country while receiving students from the various member states. From a country point of view, these institutions, even though they are located outside the national territory, are part of the education system and their funding by the government is part of national expenditure on education. To reconcile this with the territorial principle, it is advisable to record expenditures with a specific separate activity that could be included for national analyses and excluded when reporting at international level.

A similar situation occurs when countries are pooling resources to fund educational institutions.

2.5 Recording period

In most cases, education programmes are delivered annually. The school or academic year may differ from the calendar year or from the fiscal year of government.

As a satellite account of the national accounts system, an NEA should follow the annual period set for the central accounts.

However, some NEAs have used the academic year to record expenditure.

Financial information could be available following various periods, the fiscal year, academic year, or calendar year. This could lead to translating financial information from accounting and survey sources into estimates for the NEA period, or translating educational data into average numbers of students for the NEA year.

The adjustment to the NEA period is usually made by weighting annual data with the number of months, or terms, included in the NEA period.

2.6 Flexibility in setting NEAs

- At a minimum, the scope of an NEA should cover the **formal education system**, irrespective of who is paying for its associated goods and services. Formal education is defined by ISCED as 'institutionalised, intentional and planned through public organizations and recognised private bodies'. Formal education consists mostly of initial education from pre-primary to tertiary but can also include vocational education, special needs education, and some programmes of adult education.[9]

The domain of an individual NEA can vary from the international core to a set of activities better reflecting national realities and policy interest. For countries with a practice of forming education sector plans, often including non-formal and literacy programmes, it would be advisable to develop an NEA following the same delimitation of the education sector. However, the classification and organization of data must, from the onset, allow for an easy separation of items which may be in the national account, but should not be included when reporting at international level.

In addition to the common core, an NEA may include other areas, recorded as separate levels of education, such as:

- non-formal education and/or alternative, second chance, and literacy programmes;
- specific education programmes, such as for young offenders or detainees;
- training for the unemployed and/or training for employees;
- other types of learning, such as driving schools or music/art courses outside of schools;
- education activities taking place outside the country, for example schools operating in foreign countries or financial support for students studying abroad.

Past NEAs have, in some cases, limited the domain to the education system under the responsibility of the ministry of education, sometimes excluding higher education. This could be considered as a first step towards setting up an NEA with full sector coverage.

[9] For all international definitions of formal and non-formal education, please see UIS, 2012.

Figure 2. Agreement on harmonized principles and flexibility

	Harmonized principles	Flexibility at national level
AREA OF COVERAGE AND SCOPE OF ACTIVITIES	Should cover at least formal education	Possibility to add other forms of education, such as non-formal education, lifelong learning When relevant, it is advisable to align with the delimitations of the education sector plan *Additional areas to be recorded as separate levels*
	All activities within the national territory	Possibility to add expenditure on education outside the national territory *Education abroad to be recorded separately if included*
	Activities of educational institutions ⊕ connected products purchased outside producing units, when directly related to school attendance ⊕ private tuition *As per international data collection*	Possibility to add other activities or products *Additional areas to be recorded as separate or sub-categories of activities or goods & services*

3 Chapter

DIMENSIONS AND CLASSIFICATIONS

As with any information system, a key element of an NEA is the classification system which facilitates the compilation and consolidation of data on education financing into a coherent whole. Data on education financing typically come from different sources using different classifications, making consolidation difficult. A good deal of the work in establishing an NEA involves fitting data from these different sources into common categories, which should be grouped together by *dimensions*.

This chapter discusses the various dimensions of an NEA, as presented in *Figure 3*. The figure indicates the ways in which dimensions are articulated to describe the financing flows in the education system. The recording of financial flows is discussed in *Chapter 4*.

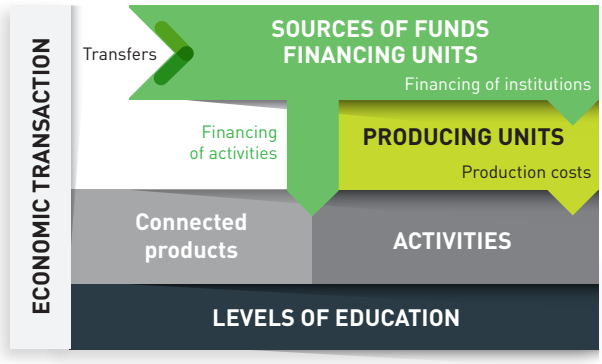
The education domain is defined through two dimensions: **education levels** and **activities,** denoting the activities and products of the domain.

Two other dimensions refer to the two sets of institutional units (organizations, agencies, or individuals) of the education financing domain: the **producing units** and the **financing units**. The financing units are those funding the activities in the domain, and the producing units are those actually carrying out the educational activities, using the resources provided by the financing units.

A fifth dimension is related to the nature of the **economic transactions** in the domain.

Figure 3 presents the ways in which the dimensions are articulated to describe the financing flow in the system.

Figure 3. The dimensions of a national education account



As for its scope, the classification of dimensions in an NEA should follow a set of core principles and categories, while allowing some flexibility to reflect national conditions. In concrete terms, this means that the dimensions and categories described here should be seen as common boxes in which other sub-categories should either fit or be classified separately. An NEA should cover at least the five dimensions described below. However, a specific account could add other dimensions, for example **geographical subdivisions** or type of beneficiaries, as national policy requires.

Beneficiaries, namely the students and their families, are classified in terms of levels of education and categories of education provider (the producing units). However, further detailed information profiling the beneficiaries could be useful.

Definitions for categories within each dimension of this core set are consistent with existing international standards and definitions. Unless otherwise specified, they refer to SNA, the GFS, and/or ISCED definitions.

3.1 Levels of education

Levels of education should reflect the way in which the national education system is organized, and an NEA should use accepted national terminology to identify the various education cycles.

However, as with other dimensions, each national level in formal education should link easily to an ISCED level for international comparability and reporting.

ISCED 2011 education levels are shown in *Figure 4*. The main classification divides education programmes into six major levels: early childhood education, primary, lower secondary, upper secondary, post-secondary non-tertiary, and tertiary education.

In some cases, this mapping will mean creating sub-categories of the national levels. For example, while vocational training may be considered one level in the national system, ISCED requires these programmes to be classified as either lower secondary, upper secondary, post-secondary non-tertiary, or short-cycle tertiary education. *Figure 4* shows the ISCED 2011 classification, to which a national classification by level would have to relate without having to recalculate data.

Figure 4. ISCED 2011

Minimum ISCED disaggregation	Additional disaggregation (optional)
ISCED 0 – Early childhood education	ISCED 01 - Early childhood educational development
	ISCED 02 - Pre-primary education
ISCED 1 – Primary education	n/a
ISCED 2 – Lower-secondary education	ISCED 24 - General lower-secondary education
	ISCED 25 – Vocational lower-secondary education
ISCED 3 – Upper-secondary education	ISCED 34 - General upper-secondary education
	ISCED 35 - Vocational upper-secondary education
ISCED 4 – Post-secondary non-tertiary education	ISCED 44 - General post-secondary non-tertiary
	ISCED 45 – Vocational post-secondary non-tertiary
ISCED 5 to 8 – Tertiary education	ISCED 5 - Short-cycle tertiary education
	ISCED 6 - Bachelor's or equivalent level
	ISCED 7 - Master's or equivalent level
	ISCED 8 - Doctoral or equivalent level

n/a not applicable

Note: For more detailed descriptions and further disaggregation of ISCED levels, please refer to the ISCED 2011 manual.

For the purposes of international education data reporting, countries classify all their national formal educational programmes and related qualifications in terms of ISCED. Such classification is called an ISCED mapping.[10]

The classifications established for the NEAs of the two countries in *Figures 5 and 6* provide examples of ways to classify levels in an NEA, referring to the country's organization of education levels, while maintaining the relation between national organization by levels and international standardization.

Figure 5. Example of classification levels, Nepal

Classification of levels: Example of the NEA in Nepal	
Levels of education	**ISCED level**
1. **Pre-primary education**	ISCED 0
2. **Primary education**	ISCED 1
3. **Lower secondary education**	ISCED 24
4. **Secondary education**	ISCED 34
5. **Higher secondary education**	ISCED 34
6. **Technical education**	ISCED 35
7. **Higher education**	ISCED 5 to 8
8. **Non-formal education**	n/a

Figure 6. Example of classification levels, France

Classification of levels: Example of the NEA in France		
Levels of education		**ISCED Level**
1. **FIRST LEVEL**	11. Preschool	ISCED 0
	12. Primary	ISCED 1
	13. Special primary	ISCED 1
2. **SECONDARY LEVEL**	21. Lower secondary	ISCED 24
	22. Special secondary	ISCED 24
	23. Upper secondary general/technological	ISCED 34
	24. Upper secondary vocational	ISCED 35
	25. Apprenticeship secondary level	ISCED 35
3. **HIGHER EDUCATION**	31. Post-secondary	ISCED 44
	32. Higher ed. short technical courses	ISCED 5
	33. Higher education long courses	ISCED 6 to 8
	34. Apprenticeship higher education level	ISCED 5 to 8
4. **TRAINING**	41. Continuing training	n/a
	42. Other non-school based	

[10] Most countries' ISCED mappings can be found here: http://www.uis.unesco.org/Education/ISCEDMappings/Pages/default.aspx

BOX 1. EXAMPLE OF CATEGORIES NOT ALLOCATED BY LEVEL

Some education accounts include one or several categories of activities not allocated by level, as shown in the following example from Morocco:

- Pre-primary
- Primary
- Central administration
- Regional and provincial administration
- Support to schooling
- Lower secondary
- Upper secondary
- Post-secondary
- Training of education staff
- Other, not allocated

This type of classification is closer to financing patterns and the way data are often presented in government accounts. It facilitates the processing of data as it is not necessary to disaggregate all expenditures by level.

However, additional disaggregation work will be required to calculate full unit costs which include administrative costs, or when statistics have to be reported internationally according to ISCED. Integrating this constraint when building an NEA by avoiding categories not allocated by education level meets these additional requirements while providing a picture of the education domain as the sum of education levels.

3.2 Educational activities and products

This dimension was discussed in the previous chapter. The main distinction for classification is between the characteristic activities that are carried out by the producing units of the domain and the connected products not produced by the producing units.

Activities of the producing units of the domain

- They include teaching activities, ancillary services, and general administration of the system.
- **Teaching activities** include everything related to what happens in the classroom, including administrative work done at school level. Teaching activities correspond to the activities of a day school.
- **Ancillary services** are activities which support schooling without being teaching activities, such as school meals/canteens, board for students, transport to and from schools organized by the school, health services for students, and so forth. They can be grouped into a single category or divided into a set of more detailed activities.
- **General administration** and organization of the system. This category includes all general administration and support activities taking place in the central, regional, and local offices of the ministries and agencies supervising the education system, such as school supervision and inspection, education statistics, examinations, curriculum and policy development, and so forth. Activities can be grouped into a single category or divided into a set of more detailed activities, such as general administration or educational guidance.

Connected products

They are not produced by the producing units of the domain, though they are related to attendance on an education programme.

The main example is spending by students and their families on goods and services not produced by schools, administrative offices or any producing unit in the domain. These should include only the goods and services required for school attendance, such as textbooks, uniforms, school supplies, and transportation purchased in the general marketplace. Extra tuition linked to the official curriculum to help improve student performance within the formal education system is also included.

Classification is often linked to the categories available in the household surveys used as the basis for estimates. Some items considered part of education expenditure in households surveys may not be considered if the purchased goods and services are not required for attending an education programme, such as pocket money given to children.

However, decisions have to take into consideration the specific situation. In several countries, school canteens are not organized directly by the school, but the school provides a meals facility by authorizing food to be retailed to students upon payment by the user from the pocket money provided by the parents. In these situations, an NEA could include those transactions. A similar situation can obtain in the case of transport to school.

In some countries, transport to school is funded by public bodies, though it is carried out by private companies. The NEA does not analyse the production of transport, only the funding by public bodies and user fees. In such a situation, school transport is considered as a connected product funded by public bodies and households.

Figure 7. Classifications of activities, functions, or products

Thailand: Functions of services

Education provision and supports
- Basic provision
- Extra support for school attendance
- School support for learning activity

Activities for student development

Teaching materials/curriculum development

Development of teaching personnel

Administration

Research and development

Other activities

Investments

Training for non-teaching staff

Student loans /scholarship

Total

Côte d'Ivoire: Activities and products

Activities of educational institutions
1. Teaching activities
2. Meals and board
3. General administration

Goods and services required for school attendance
41. Uniforms, sport clothing, other
42. Textbooks, supplies
43. Transportation
44. Private tuition

France: Activities and products

Activities of educational institutions
1. Teaching activities
2. Support to schooling
   - 21. Canteens & boarding
   - 22. School health
   - 23. School guidance
3. System organization
   - 31. General administration
   - 32. Remuneration of trainees

Purchase of connected products
- 41. School transport
- 42. Books, supplies
- 43. Private tuition
- 44. Clothing & others

3.3 Producing units

Producing units are institutional units which form the basis of the NEA. They receive funding from the financing units and carry out education activities for the benefit of students. In the education sector, producing units are the public and private schools, colleges, universities, and training centres operating in the country, but they also include administrative offices providing education supporting services or any entities carrying out the characteristic activities of the domain, such as campus management bodies or autonomous education research units.

In practice, because every financial flow should be classified according to the level of education, educational institutions providing services at more than one education level will need to be split into producing units for each level. A list of producing units is therefore defined for each education level.

Classification should follow the organizational patterns of institutions involved in the education delivery in the country. However, common criteria for the determining categories are the public or private status of the institutions, the ways in which they are managed and funded, and their educational specificity.

Figure 8. Classification of levels and producing units

Uganda Levels and producing units

Public institutions	Private institutions
11. ECD centres[1]	21. Private schools
12. UPE schools[2]	22. Private USE schools[3]
13. Public USE schools[3]	23. Private non-USE schools[3]
14. Public non-USE schools[3]	24. Private primary teachers' colleges
15. Public primary teachers' colleges	25. Private BTVET[4]
16. Public BTVET[4]	26. Private universities
17. Public universities	31. Non-formal centres
18. Public colleges	41. Administrative offices

[1] *ECD = Early childhood development*
[2] *UPE = Universal primary education*
[3] *USE = Universal secondary education*
[4] *BTVET = Business, technical and vocational education and training*

Kenya Levels and producing units

Public institutions	Private institutions
11. Public pre-primary schools	31. Private schools
12. Public ordinary primary schools	32. Private ordinary primary schools
13. Public special primary schools	33. Private special primary schools
14. Public ordinary secondary schools	34. Private ordinary secondary schools
15. Public special secondary schools	35. Private special secondary schools
16. Public teacher colleges	36. Private teacher colleges
17. Public technical colleges	37. Private technical colleges
18. Public youth polytechnics	38. Private universities
19. Other middle-level colleges	41. Non-formal centres
20. Public universities	51. Adult education centres
	61. Administrative offices

Public educational institutions

Public educational institutions provide core educational services such as teaching activities and ancillary services. They include schools, colleges, universities, and training centres which are controlled and managed directly by a public education authority, or by a governing body (council, committee, etc.) the majority of whose members are appointed by a public authority.

Private educational institutions

Private educational institutions provide core educational products such as teaching activities and ancillary services. They include schools, colleges, universities, and training centres which are either controlled and directly managed by a private organization such as a church, a trade union, or a business enterprise, or have a governing board which consists mostly of members who have not been selected by a public authority. Whether or not an institution is private is therefore a matter of *management*, not funding, as a school could, in theory, be entirely publicly funded but still be considered private because it is not managed by the government.

Other forms of educational institution

In some countries, other categories of school may exist, such as schools controlled by foreign or international agencies, and community schools set up by parents or communities without being formally managed by a government authority.

The list of producing units varies from one education system to another. However, as with other dimensions, nationally defined categories should be readily identifiable as either public or private educational institutions following international definitions, as described above. In practice, for international comparability any school not managed by a government institution is classified as private.

Other producing units

Ministries of education, regional or district education offices, curriculum development centres, and other such agencies are producers of peripheral education goods and services, such as supervision, policy orientation, statistics, research, and overall administrative support. An NEA makes the distinction between the financing function of a government budget and the producing role of administrative offices. More often, NEAs consider a single category of administrative offices, however they are divided up, but they could consider a more detailed division, such as central offices and regional or local offices.

These non-teaching activities may be produced by non-government bodies. For example, NGOs may have similar administration and supervision offices, for which expenses should be accounted in proportion to the size of the education activities. They can be identified separately or aggregated with government administrative offices.

Autonomous bodies carrying out only activities classified as ancillary services, such as accommodation for students or school meals, are producing units that could be either classified within the administrative offices category or identified separately as a distinct producing unit.

3.4 Financing units

Financing units are the institutional units which provide financial resources to the domain, though they do not carry out the educational programmes themselves. They can include a ministry of education, a donor, an NGO, or a household.

When an institution has the two functions of funding the system and providing services considered as being part of the education domain, the two functions must be separated:

- The ministry of education, as part of the government budget, funds educational activities, and, as an administrative office, produces characteristic activity of supervision of the domain. In an NEA, the financial flows are described in terms of a financing unit, the *ministry of education,* funding the production unit, the *administrative offices,* for the activity of *general administration.*
- Similar considerations could apply to teaching activities, when a local authority or a company is carrying out an education programme and also funding it. The two functions of financing and producing the programme must be separated and located in a financing unit for the funding function and a producing unit for production.

The number and nature of financing units vary from country to country. They should, at a minimum, be separated into three groups arranged by sectors compatible with the SNA and covering all potential sources of education funding within a country: the general government sector, the private sector, and the rest of the world.

The general government sector

The general government sector consists of institutional units (such as ministries and agencies) that fulfil the functions of government as their primary activity. It refers to all levels of government consolidated (with transfers between levels netted out), and also includes social security funds, which can be considered a separate sub-unit, or included within the central or other levels of government. The general government also includes non-profit institutions which are under government control.

To be considered a government unit, whether at the level of the national economy, a region, or a locality, an institution must have funds of its own either raised by taxes or received as transfers from other government units, as well as the authority to disburse some, or all, of such funds in the pursuit of its policy objectives.

Data on the financing of education by general government should include both budgetary and non-budgetary expenditure. Non-budgetary (or extra-budgetary) entities are part of the government, but their activities might not be covered by the main (or general) budget. They may have their own revenue sources, which may be supplemented by transfers from the general budget or from other sources.

Expenditure data from the general government sector should, where possible, be separated between levels of government within a country. Although in some countries only two levels may exist, in others three or more may fund education, and they should be classified as belonging to the central, state, or local level:

- **Central government** is the level of government the political authority of which extends over the entire territory of the country, such as the federal government. All ministries and agencies which are under the authority of central government and finance education services should be classified as central government.
- **State governments** are responsible for the largest geographical area into which the country as a whole

is divided for political or administrative purposes, such as a state, province, department, or region. They are institutional units whose fiscal, legislative, and executive authority corresponds to the individual 'states' into which the country as a whole is divided. A state government usually has fiscal authority to raise taxes within its territory and should have the ability to spend at least some of its income according to its own policies, and to appoint or elect its own officers.

- **Local governments** are responsible for the smallest geographical area into which the country as a whole is divided for political or administrative purposes, such as a municipality, a city, or a district. The scope of their authority is generally much less than that of central or state government, and they may, or may not, be entitled to levy taxes in their areas. They are often heavily dependent on transfers from higher levels of government. However, in order to be treated as distinct government units, they must have some discretion over how such funds are spent. They should also be able to appoint their own officers.

In considering whether to place expenditure under one or another level of government, the notion of *decentralization*, as opposed to *deconcentration*, should be considered. In the context of education financing, expenditure by a local (or regional) office under the authority of **central government** is considered expenditure by **central government**. For example, expenditure by regional or local offices on behalf of a central ministry in charge of education should be classified as central government, rather than state government, expenditure.

Some countries may have four or more levels of government. This can easily be reflected in classifications used for a national NEA. However, the number has to be reduced to three when reporting for the purposes of international data collection; usually, the second level is categorized as state or region, and the other levels grouped together as local.

The private sector

The second grouping of education financing units is the private sector, which should, at a minimum, be further subdivided between households, corporations, and non-profit institutions:

- **Households**. For the SNA, a household is defined as a group of persons who share the same living accommodation, who pool some, or all, of their income and wealth, and who consume certain types of goods and services collectively, mainly housing and food. Any expenditure by students or their family for their education should be classified as part of the household sector.

  Recording of funding from households should note whether the expense is incurred to the school directly, such as for tuition fees, through contributions to parent-teacher associations (PTAs), or for goods and services purchased outside educational institutions, such as for textbooks, uniforms, or extra classes.

- **Corporations** are broadly defined by the SNA as legal entities separate from their owners, capable of generating a profit or other financial gain, and set up to engage in market production. They may provide funding for education by providing scholarships or grants for students, supplying educational materials, or contributing to the construction of schools. In some countries, corporations may have a legal obligation to fund schools or education programmes through specific schemes such as an apprenticeship tax. Corporations may also provide training in the workplace as part of combined school and work-based programmes. Corporations, in many cases, do not fund education in a given country, and where they do, it may be on an ad-hoc and hard-to-track basis. Nonetheless, to the extent possible, their contributions should be mapped against the general NEA framework, where relevant.

- This category includes both public and private corporations. Private corporations are those controlled by private entities or actors, that is, where the government does not set general corporate policies. Private corporations funding education may include, for example, private banks providing scholarships to students. Public corporations are those that are controlled by government, with control defined as the ability to set general corporate policy. Such institutions often exist, for example, for the management of natural resources such as oil, gas, or hydroelectricity. They are, in a way, hybrids of the public and private sector, but for the purpose of an NEA they fit better within the private sector since, unlike in the general government sector, these institutions can be sources of financial gains or losses and, as such, they behave more like corporations. If desired, a sub-classification can be created to distinguish public from private corporations.

- Non-profit institutions (NPIs) include what are often called non-governmental organizations, private foundations, religious organizations, advocacy groups, unions, or other types of association. They may fund schools directly, or provide funding for supporting activities such as school meals or advocacy. They may raise their own funds but also often depend heavily on transfers from other financing units such as the government or foreign donors. If necessary, NPIs can be further subdivided into those that are national or foreign-controlled, especially in countries where international NGOs play an important role in education. For international comparisons, foreign-controlled NGOs should be classified under the 'rest of the world' category (see below).

  Foundations controlled by companies must be recorded within the corporate sector. Other private foundations are considered to be part of the NGO sector.

BOX 2. FUNDING THROUGH THE TAX SYSTEM

When fiscal regulations include provision for education-related taxes, different situations have to be considered:

- The tax comes as a general income of government and is not earmarked for educational activities. In this instance, the payment of the tax should not be considered as education expenditure and is not recorded as a transfer to government.
- The tax is managed through a specific fund and resources are used for education activities. The payment of the tax is then considered an expenditure for education. The management of the fund, public or private, will determine the categorization of the fund within the financing units.
- Regulations authorize the tax to be paid partially or totally through direct payments to educational institutions. In this case, the part of the tax paid to educational institutions should be considered as expenditure for education, while the part paid to the treasury becomes a general income of government and is not considered as education expenditure.

These considerations are for education-related taxes paid by financing units. All taxes paid by educational institutions are recorded as a recurrent expenditure of the producing unit.

The rest of the world

All education activities taking place within a national territory are recorded in the NEA, including those activities funded by non-resident units such as international donors. Similarly, as is done in central accounts, those non-domestic financing units are recorded under the category of 'rest of the world'.

The rest of the world includes development partners of government (or international donors), which are supporting national education through cooperation agreements. It could include supranational organizations, such as the European Union, and private entities such as international NGOs or international private foundations.

The category of development partners can be further subdivided in terms of bilateral or multilateral donors or international organizations, and even by each type of donor, if desired. However, for the analysis of the economy of the education domain, it is important to identify whether the support is given through loans or grants. Loans should be reimbursed and could be understood as part of national government funding, while grants are clearly funding from external sources.

Development partners fund education institutions through agreements for loans or memoranda of understanding for grants, in cash or in kind. Annual disbursements are accounted for each year of the education accounts. Being paid directly by the ministry of finance, the reimbursement of loans, principal and interest, is not captured by the account. The grants correspond in general to appropriations in aid provided by multilateral or bilateral aid agencies. These resources can be made available through budget support via the government budget process, or directly through the funding agency. Grants or loans made through general budget support are not accounted for in an NEA because they are general-purpose transfers and hard to identify within education resources.

The issue of how to separate external funding and government funding within government budgets is further discussed in *Chapter 4*.

Sources of funds and financing units

Several NEAs, specifically those built with reference to the experience of health accounts, consider two separate dimensions within the financing units category, marking the difference between the sources of funds and the financing agents. Financing units receive resources from sources of funds to finance educational activities. Those two dimensions have separate classifications, with, for example, the ministry of finance or government budget classified as a source of funds while the line ministry in charge of education is classifieds as a financing agent.

Other NEAs (and this methodology) use the notion of transfer between financing units to record the financial flows between financing units. A single classification is used to record both initial and final financing.

The two approaches are, in some ways, similar, though they are based on different views of the financial flows within the domain.

The categories can be combined to provide different perspectives on financing sources. In the case of Nepal (see *Figure 9*), two groups were added and displayed in some of the NEA tables: Government of Nepal funding, created by adding together ministries, local government, loans, and on-budget grants from development partners; and development partners, created by together adding loans, on-budget grants, technical assistance through off-budget grants, and international NGOs.

Figure 9. Classification of financing units

Nepal: Financing units

Detailed classification

- 11. Ministry of Education
- 12. Other ministries
- 13. District and village development committees
- 21. Households
- 22. Local NGOs
- 22. International NGOS
- 31. Loans
- 32. On-budget grants
- 32. Off-budget grants

Groups

Government of Nepal (11+12+13+31+32)

Development partners (22+31+32+33)

In Nepal, the same classification is used for initial financing and final financing

Morocco: Source of funds

Public sources

- Government
- Local authorities

Private sources

- Local NGOs
- Households
- Private investors
- Other

External sources

- International NGOs
- Development partners

In Morocco, *the NEA makes a distinction between sources of funds and financial agents and makes use of two separate classifications*

Morocco: Financial agents

Public administration

- Ministry of Education
- Other ministries
- National agencies
- Regional and provincial offices
- Local authorities
- Educational institutions
- Management committees

Private sources

- Private investors
- Foundations
- Local NGOs
- Parents associations
- Households

Rest of the world

- Development partners
- International NGOs
- Others

3.5 Economic transactions

The type of economic transaction is the fifth and final core dimension of an NEA. The definitions used for each of the categories articulate with those of the SNA and the GFS (which are meant to be compatible). However, an NEA usually uses a simplified classification of economic transactions, built around distinctions between compensation of staff, purchase of goods and services, formation of capital, and the differentiation between pedagogical goods and others.

Compensation of employees

Compensation of employees has two main components, which can either be grouped together, or separated into sub-categories, depending on the interests of policy-makers:

- **Wages and salaries** payable in cash or in kind. These include the basic salaries of employees within the education system, but also all bonuses and allowances, such as for overtime, working away from home in hard-to-reach areas, housing and travel allowances, and so forth. Wages payable in kind should also be included in this category, for example, expenses for housing and transportation to and from work for employees.
- **Contributions by the employer to social security schemes, pensions, and other employment-related benefits**. Expenditure on retirement or pension schemes means actual or imputed expenditure by employers or third parties to finance retirement benefits for current education employees. This expenditure does not include pension contributions made by the employees themselves, or deducted from their gross salaries. Third parties can be public authorities, other than the ministry of education, which finance or administer civil servants' (including teaching staff) pension schemes, such as social security or pension agencies or finance ministries. Social insurance for employees, such as health insurance, disability insurance and other forms of social insurance, should also be included in this category.

BOX 3. SOCIAL CONTRIBUTIONS FOR PENSIONS

Depending on the type of public pension scheme that exists in a country, it should be integrated into an NEA as follows:

In a *fully funded*, contributory pension fund system, the employer's (i.e. the government's) current contribution to the pension fund should be included.

In a *completely unfunded* or 'pay as you go' system, the government's contribution to the cost of retirement as it arises should be included.

In a *partially funded* system where employers contribute to a retirement system but the contributions are insufficient to cover the full costs of future pensions, the contributions which make up the shortfall should be imputed. Therefore, the sum of actual government (employers or third party) contributions, plus the imputed contribution necessary to cover the projected funding gap, should be included as retirement expenditure.

In all cases, the contributions or their equivalent should be classified as staff cost.

Compensation of employees does not include remuneration for contractors, consultants, and other workers who are not employees of the institution. Any such amounts should be recorded under 'goods and services'. Similarly, reimbursement of travel or travel allowances for employees who need to move within the country or abroad to carry out their duties should be classified under goods and services rather than compensation of employees.

Data on the compensation of employees rarely come disaggregated in terms of whether the compensation is for teachers, or for other employees of schools, universities, or ministries. From an education policy perspective, however, it is important to know how much compensation goes to teachers as opposed to non-teachers. An NEA will further disaggregate data in this way, often requiring estimations using data from human resources departments on staff numbers, categories, grades, and wages:

- **Compensation of teachers/academic staff**. This category includes compensation for classroom teachers, who are employed in a professional capacity to guide and direct the learning experiences of students, irrespective of their training, qualifications, or delivery mechanism (i.e. face-to-face or distance). It should, to the greatest extent possible, include only teachers who spend the majority of their time teaching (i.e. 'chalk-in-hand' teachers), rather than employees who hold a teaching qualification but work, for the most part, on administrative tasks. At tertiary level, it should include academic staff whose primary assignments are instruction and/or research.
- **Compensation of non-teachers**. Non-teaching staff are employed by educational institutions or administrative offices but have no instructional responsibilities. Although the definition can vary from one country to another, non-teaching staff generally include head teachers, principals, and other administrators of schools, support staff to teachers, supervisors, counsellors, school psychologists, school health personnel, librarians, curriculum developers, inspectors, education administrators at local, regional, and national level, clerical personnel, building operations and maintenance staff, security personnel, transportation workers, and catering staff.

Purchase of goods and services

Expenditure on goods and services is distinguished from gross capital formation (below) in that it is normally consumed within the current year and would have to be renewed if needed in the following year. Goods and services can also be referred to as recurrent expenditure other than for compensation of employees.

An NEA usually uses a simplified distinction between school books and teaching materials and other goods and services. However, a more detailed classification can be used if required for national considerations.

- **Teaching materials**. This category should include expenses for textbooks following the official curriculum as well as any pedagogical materials and other relevant materials for students, such as notebooks, pens, rulers, and so forth. Although in some countries these expenses may be classified as capital expenditure, when they constitute not-so-durable materials which must be purchased on a regular basis, they should be classified as goods and services.
- **Other goods and services**. This category may include rents paid for school buildings and other facilities, as well as fuel, electricity, telecommunications, water and sanitation recurrent expenses, travel expenses, insurance, and any other non-staff administration costs in schools and administrative offices. Regular maintenance of buildings should also be classified under goods and services, although major repairs and renovations should be recorded under gross capital formation. 'Other goods and services' can be further disaggregated into sub-categories, depending on specific policy and monitoring needs at national level.

Gross capital formation

Gross capital formation, as defined in the SNA, is the cost of acquiring non-financial assets, minus the disposal of assets. Non-financial assets include fixed assets, inventories, and valuables, although as far as education expenditure is concerned, capital formation refers mostly to fixed assets. Fixed assets are those that can be used repeatedly or continuously for more than one year. Gross capital formation can also be referred to as capital expenditure, or gross investment in non-financial assets.

It is 'gross' in the sense that the entire value of the asset is included in the year it is recorded, as opposed to the consumption of fixed capital which estimates the value of the utilization of the asset year by year. For example, if a school building costing $10 million is constructed in 2010, the full $10 million should be included as gross capital formation for 2010, even if the building will be used over 20 years.

Usually, an NEA groups all forms of gross capital formation in a single category. However, if desired, gross capital formation can be divided into the following sub-categories:

- Construction and major renovations of buildings. This includes the costs of school and classroom construction, as well as those for other institutional buildings, such as school canteens, hostels, and administrative offices. Major renovations and refurbishment should also be recorded under gross capital formation, although regular maintenance should be classified under goods and services.
- Durable teaching materials and supplies. These can include desks, chairs, chalkboards, and equipment and machinery necessary for teaching (for vocational training courses, for example), as well as more durable teaching aids, such as pedagogical kits for teachers.
- Computer hardware and software.
- Other gross capital formation. Examples of other types of gross capital formation may include land acquisition, cultivated assets such as trees or animals, as well as intellectual property products. According to the SNA, expenditure on research and development should also be recorded under gross capital formation, but only when it creates a future economic benefit to its owner. Since it is unclear that research and development for education would fit that definition, it should normally be recorded under goods and services rather than gross capital formation.

It should be noted that costs incurred in the acquisition of an asset are treated as a part of its value. This means that expenses such as professional charges, transport costs, taxes, and other costs incurred to purchase the assets are treated as part of the gross capital formation.

Figure 10. Classification of economic transactions

Uganda: Object of expenditure	Côte d'Ivoire: Nature of expenditure
1. Employee costs	Salaries, bonuses, and other payments to teaching staff
11. Teaching staff	Salaries, bonuses, other payments to non-teaching staff
12. Non-teaching staff	Pension contributions, insurance, and other contributions for teaching staff
2. Other recurrent expenditure	Pension contributions, insurance, and other contributions for non-teaching staff
21. Scholastic materials	Textbooks and teaching materials
22. Other recurrent expenses	Other goods and services
30. Capital investment	Canteen, boarding, transport, etc.
	Capital expenditure

3.6 Regions

Generating a vision of the geographical distribution of educational expenditure could be of interest in observing the equity of investment in education between urban and rural areas, between regions, or in countries where the resource distribution is unequal.

One way of achieving this would be to build an NEA for each region, which means including the region as a dimension in a similar way to that in which education levels are included. This would require the ability to mobilize a similarly comprehensive set of information for each region.

Some sources typically used for NEAs at national level are rarely useful in generating information on regions. Expenditure from central government budgets is not often available at this level; expenditure from external sources almost never; and household surveys are often not designed to provide information at regional level since, in many cases, the sample would be too small.

However, some NEAs are addressing the issue and include tables by region. In Benin, the scope of regional accounts was reduced to pre-primary, primary, secondary education, and regional administration. The analysis of technical and higher education is better placed at the national level. For practical reasons, financing sources were limited to government, local authorities, households, and resources generated at school level.

In Morocco, the NEA is built using information coming from regional offices and educational institutions, and provides tables on financing expenditures covering the full scope of the NEA (higher education is not part of the scope of the NEA).

3.7 Additional dimensions and remaining classification issues

There may be some elements of classification which do not clearly fit into one of the dimensions described above. For example, education policy-makers may want to account separately for expenditure on teacher training programmes. In this case, teacher training programmes can be classified separately under producing units, for example by identifying teacher training colleges as a distinct type of educational institution. Teacher training can also be identified as a separate level of education, carried out in one or more types of educational institutions.

Similarly, although students studying abroad fall outside the core NEA scope, they can be included as a separate category in a country where this is of interest. In such cases, expenditure for students studying abroad can be classified as either producing units (for example, educational institutions abroad) or a separate level of education.

As previously discussed, the five dimensions presented are the core dimensions of an NEA, which is to say they are those which should, at a minimum, be included. Other dimensions can be added to this core, depending on national interests and policy-makers' needs. For example, an NEA can include a geographical dimension, such as administrative regions, or rural or urban regions. The degree of disaggregation can be augmented as needed. However, an NEA team should keep in mind that more dimensions and categories will complicate data collection and processing, therefore there is always a trade-off between details and simplicity.

3.8 Flexibility in setting NEAs

Figure 11 sets out some basic principles regarding dimensions and classifications, which have to be common to NEAs in order to ensure comparability.

Harmonized principles aim to ensure coherence with ISCED classification of education levels and SNA classification for institutional sectors or economic transactions.

However, classifications should reflect the organization of the national education system in a country and be relevant to specific education policy concerns.

As a practical consideration, the detailed levels of classification are also influenced by the sources of information and the availability of data.

Figure 11. Harmonized and flexibility principles

Area of	Harmonized principles	Flexibility at national level
DIMENSIONS	› Financing units › Producing units › Levels of education › Activities › Economic transactions	Any additional dimension, such as regions or sub-regions
CLASSIFICATION OF EDUCATION LEVELS	All identified levels must be easily related to ISCED 0–8. Avoid category 'not allocated by level'	Follow the national organization and terminology while making sure the levels of education have a correspondence with ISCED classification
CLASSIFICATION OF ACTIVITIES	Distinction between activities of producing units and connected products. Within activities, distinction between: › teaching activities › general administration › ancillary services	General administration or support to schooling activities can be detailed in flexible lists of activities
CLASSIFICATION OF PRODUCING UNITS	At least the distinction between › public and private educational institutions *(management criteria)* › administrative offices For providers not delivering teaching activity	National classification to fit the organization patterns in the country, but with a correspondence with international (UIS) definitions/classifications or public and private institutions.
CLASSIFICATION OF FINANCING UNITS	Principles of classification of national accounts Financing units should be easily classified into: **General government:** central government, state government, local government **Private sector:** households; corporations; non-profit **Rest of the world** (external funding) Grants; Loans	National classification to fit organizational and financing patterns, but grouped under the common categories Flows between financing units can be recorded as transfers, or through the distinction between sources of funds and financing units
CLASSIFICATION OF ECONOMIC TRANSACTIONS	Classification should be based on the distinction between compensation of staff, goods and services, gross capital formation It should follow the principles of national accounts › Capital = gross capital formation › Staff costs includes all social charges attached to the salary	Possibility for more detailed classification
BENEFICIARIES AND NON-FINANCIAL DATA	At least the number of students enrolled, by level of education and producing unit Calculate per capita funding and cost by level and category of provider	More data on characteristics of beneficiaries, organization of education delivery, graduates, results

4 Chapter

STRUCTURE AND DESCRIPTION OF FINANCIAL FLOWS

4.1 The analysis of financial flows

For the purposes of economic analysis, an NEA organizes the education domain into a list of activities and products, structured by education levels.

The NEA then identifies two types of economic agent acting within the economy of the domain: the financing units, which do not carry out the activities themselves, and producing units to which they provide financial resources to fund the provision of educational products.

The NEA follows the 'money flow' within the domain, from (and between) the financing units to the producing units, to the activities carried out, and to the beneficiaries of the education system, the students. All flows are qualified with a category of economic transaction.

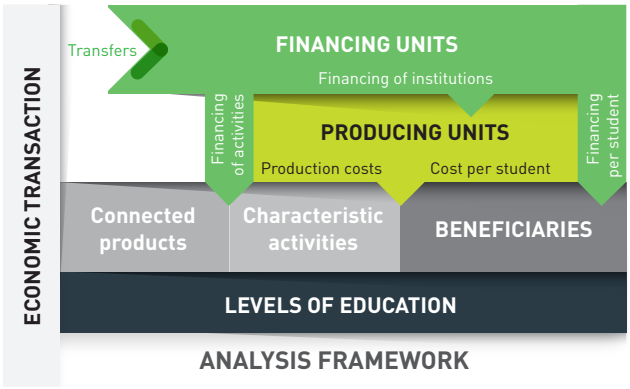
Every expenditure by a financing unit is considered as a payment to a producing unit (except for connected products). For example, when the government is directly paying staff working at school level, or paying for an investment, the expenditure is recorded as an income of the school, even when the funding is not recorded or known by the school.

As seen in *Chapter 2*, the level of education is the key dimension of the domain and an NEA is the sum of sub-accounts for each level in the system.

The organization of financial flows for every level of education is described in *Figure 12*:

- From the financing units to the producing units, flows describe the financing patterns of educational institutions.
- From the financing units to the activities and connected products, flows describe the funding patterns of education levels and activities.
- Between financing units, flows describe the transfers between financing units to determine the funding share of each unit.
- From producing units to activities, flows describe the expenditures of producing units and the production costs of those units.
- From financing units to beneficiaries, flows describe the average funding per student.
- From producing units to beneficiaries, flows describe the average production costs per student.

Figure 12. Analyses of a national education account

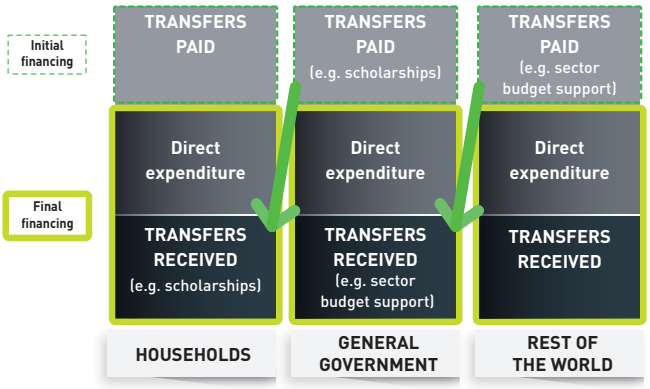


4.2 Transfers: Initial and final financing

When to count the financing flow is an issue in circumstances where funding can pass through intermediate bodies before reaching the producing units. An NEA, like any analysis of financing flows, must take into account the fact that financing units channel funds not only to producing units, but also to each other. Avoiding double-counting is therefore important, and must be taken into account, from the outset, in the conceptual framework. The NEA must classify funds meant as transfers to other financing units separately, so that in the analysis it is possible to distinguish between *initial* and *final* financing.

For example, a local government may have spent $300 million on education in a given year, but also received $100 million from central government for the specific purpose of implementing education programmes. The local government's initial financing of education was therefore $200 million, while its final financing was $300 million. The financing structure can then be analysed by looking either at the initial financing of the domain, showing the real share of funding, or at the final financing showing the funding relation with the producing units. *Figure 13* presents an example of transfers and financial flows between the three main financing units' groupings. When total expenditure from all financing units is consolidated, total initial financing will be equal to total final financing.

Figure 13. Initial and final financing



The SNA defines a transfer as 'a transaction in which one institutional unit provides a good, service or asset to another unit without receiving from the latter any good, service or asset in return' (SNA 8.34). In the case of an NEA, transfers are recorded only if they are specific to education. A general transfer between central government and local governments is not recorded in the NEA, which means the expenditure will appear only at local level. In addition, because a distinction is made between financing and producing units, only transfers *between financing units* are considered as such. When a government unit sends funds to a university it should be considered as direct expenditure for that producing unit rather than as a transfer, even if these funds come with no strings attached.

A transfer is recorded in an NEA when the expenditure of the initial financing unit is identified as *education expenditure*, directed to *another financing unit*, and *received as an income* by this final financing unit to fund an educational activity.

Transfers may exist between all types of financing units and are not specific to the government sector. *Figure 14* gives some examples of the variety of possibilities.

Figure 14. Some examples of transfers between financing units

	Initial financing unit	Final financing unit
Transfer		
The central ministry of education allocates grants for education activities to local governments	Central government	Local government(s)
A central government agency or ministry gives financial aid to students such as scholarships or other type of direct support for education	Central government	Households (private sector)
A central government agency or ministry gives financial support to private schools on a 'per head' basis, to compensate for all or part of the tuition fee	Central government	Households (private sector)
An international NGO delegates implementation of activities to local NGOs	International NGO (rest of the world)	Local NGOs (private sector)
A local government contributes to an education programme carried out by the central government	Local government(s)	Central government
Students' exam or registration fees are collected by directly by the government (as opposed to the school) and become part of the general income of government	Households (private sector)	Central government
A donor/development partner provides funding to government for an education programme which is recorded in the government's budget or financial tracking system, but funds are in block and it is not possible to identify how they were spent (for example sector/education budget support)	External donors/ development partners (rest of the world)	Central government
Direct expenditure (*not* a transfer)		
A donor/development partner provides funding to the government for a programme which is recorded in the government's budget or financial tracking system, the funds are earmarked for specific activities and it is possible to identify how funds were spent (e.g. level of education, economic transaction)	External donors/ development partners (rest of the world)	External donors/ development partners (rest of the world)
A donor/development partner provides funding for a programme which is not recorded in the government's budget or financial tracking system, with the funds going directly to schools	External donors/ development partners (rest of the world)	External donors/ development partners (rest of the world)
A donor/development partner provides funding to the central government or ministry of finance as general budget support, or through a general-purpose loan, where the portion benefiting education cannot be clearly identified	Central government	Central government
A state (or province) receives general-purpose transfers (i.e. not specifically earmarked for education, or going through the central ministry of education budget first) from the central ministry of finance out of which it fund its education programmes	State government	State government

Transfers between financing units can also be taken into account by distinguishing between the source of funds and the financing agents. This method of separating financing units into two dimensions has been used in some NEAs and is also how the national health accounts methodology functions. The source of funds is where the money originally came from, and is more or less equivalent to initial financing. Financing agents are the units carrying out the expenditure and distributing it to producing units (or education providers), which is equivalent to final financing. The result is similar, as in both cases it is possible to show spending by source of funds/initial financing and/or financing agents/final financing in the analysis. Making the distinction between sources of funds and financing units can lead to the definition of two separate dimensions, with distinct classifications in the conceptual framework.

Identifying whether or not a transaction is a transfer between financing units may be difficult in some cases. Since the NEA is primarily an accounting framework, the flow of funds and the ways the transactions are recorded should be the main point of reference. However, the ways in which the financial flows are presented and analysed in the NEA should correspond to the particular logics of the funding schemes. *Box 4* addresses the ways in which scholarship schemes could be recorded.

BOX 4. SCHOLARSHIPS, VOUCHERS, AND AID IN CASH TO FAMILIES

Support to families can cover various different types of scheme, such as scholarships and vouchers, implemented differently from one country to another (or even within the same country).

Often, support is in the form of cash transferred to the students or their families who then use the funds to pay for tuition or other education expenses. The end education service is, ultimately, purchased by the student. This clearly represents a transfer between one financing unit (the government) and another (the student/household).

In some cases, the scholarship is transferred through the university or school (the producing unit) before reaching the student. In such situations, the scholarship is recorded in the school accounts as an income from government and an expenditure of cash to the students. However, the logic of the scheme is still to support families financially and the school accounts are used simply as a support mechanism. The NEA would then describe a direct transfer from the government to households, with the scholarships recorded neither as an income nor as an expenditure of the financing unit.

The scholarship may be directed to the school, but used by the school to exempt, partially or totally, the targeted students from payment of tuition or user fees. In such cases, the school accounts receive the funding from the government directly. A similar case would be a government subsidizing students attending private schools. It could do so by channelling its support directly through the student, either with a scholarship or a voucher, or it could do so by giving the institution a specific amount for each student it subsidizes.

A principle of individualization of funding can be retained. When the funding is channelled to the school account to replace the fee payments of individual students, the amount should be recorded as a transfer to the households and the final payment is made by the households, as if it were a scholarship. If the scheme does not target specified individual students, the flow is considered as direct funding of the school.

The financial relation between the government and the rest of the world is another area where decisions may be difficult, as external donors fund education using various channels:

- Funds can be channelled to the government treasury through general budget support without being earmarked for education. The funding is associated with a formal agreement and may include explicit reference to commitments for education, but the source of funding is not identified in the budget line-items for education. Financial flows are considered as a general income of government and therefore recorded as direct expenditure from the government, and not as transfers from the rest of the world. The same logic would hold for general-purpose external loans to the government.
- The source of funds is identified within the line items of the government budget and it is possible to track how they are used, for example for which level of education, or what type of economic transaction. Funds can be channelled to the government treasury or managed separately. Financial flows are considered as direct expenditure by the rest of the world and not as transfers.
- The source of funds is identified within the line items of the government budget but it is *not* possible to track how they are used, such as for some type of sector/education budget support where donor funds are received as general income by the ministry of education without being earmarked for specific activities. These flows should be considered as transfers from the rest of the world to the government.
- Externally funded projects are not mentioned in the budget, and are managed directly by the development partner. Financial flows are considered as direct expenditure by the rest of the world and not as transfers.
- In all cases, loans should be classified separately from grants.

4.3 Financing and expenditure of producing units

Every financial flow for education services must be captured in the NEA and identified in terms of its economic transaction, the level of education on which it is spent, and its payer, user, and implementer.

Producing units usually receive resources from different sources. They may benefit in kind from some resources paid directly by the financing units, for example in the form of salaries paid directly to teachers that do not, therefore, form part of school accounts. The NEA consolidates all resources in cash or in kind. The expenditures of financing units then become an income for producing units.

The nature of the expense is always analysed from the point of view of the economic agent which pays them. For example, school fees paid by families are a recurrent expense for parents and a recurrent income for schools, no matter how they are used by schools, whether to pay staff salaries, to cover operating expenses, or to fund investment.

When looking at the expenses of financing units or at the resources of producing units, the nature of the economic transaction is described from the financing unit's viewpoint. In

tables showing the expenditures of producing units, it is their final use that is described. *Figure 15* illustrates differences in the recording of economic transactions for school income and expenses. Differences between income and expenditure correspond to the accounting balances of the producing units.

Figure 15. Expenses and resources from different points of view

	Expenses of producing units	Resources of producing units	
	Recurrent expenditure		
Recurrent expenditure of producing units	Staff salaries	Funding from public bodies	**Recurrent expenditure of financing units**
	Purchase of goods & services	Funding from households	
	Balance of current accounts	External funding	
	Investment		
Capital expenditure of producing units	Actual investments Capital grants	Balance of current accounts	**Capital expenditure of financing units**
		Capital grants	
	Global balance		

4.4 Beneficiaries and non-financial data

The beneficiaries of educational activities are students and their families. The number of students is gathered from statistical information systems on education, usually through annual school censuses. They are recorded by educational programmes and categories of institutions, and are easily translated into the two dimensions of levels and producing units.

Relating the financial figures recorded in the NEA to the number of students allows the calculation of average financing per student and average production cost per student. For a category of producing units at a specific level of education it is possible to establish:

- Average financing per student when dividing expenses of financing units or resources of providers by the number of students. This average financing can be detailed by financing unit, activity, and economic transaction.
- Average production cost per student when dividing expenditures of producing units and number of students. Average production cost can be detailed by activity and economic transaction.

Most NEAs remain at the stage of including data on enrolment, without including other non-financial data.

The main purpose of an NEA is to provide financial statistics on education. This can be taken further by including analyses of equity or efficiency issues which require the mobilization of information of a different nature, and the use of different approaches. Going beyond NEA data it may require:

- More information on characteristics of students, such as distribution by income group or social background. Such information can lead to further analysis of equity issues among the beneficiaries of education spending.
- Data on average financing or costs per class could improve understanding of the factors influencing the production costs of the system. The number of classes is often available for school-based education programmes that represent the largest numbers of learners.
- Information on the number of teachers and other staff could also lead to other types of analysis on average salary costs.
- The performance of education systems could be analysed using the results of exams and national and international tests, flow rates and achievement rates, the number of graduates, and so forth. However, analysis of the efficiency and effectiveness of the education system is much more complex than simply comparing costs and results at national level, and requires other approaches and tools.

4.5 Flexibility in setting NEAs

Some NEAs limit the recording of financial flows to the financing perspective of the domain. Producing units are analysed only from their income side. This is often the case for NEAs derived from the experience of health accounts.

This could be considered as a possible starting option in developing an NEA. However, the description of real production costs requires inclusion of the production side in the economy of the education domain.

Figure 16. Agreement on harmonized and flexibility principles

	Harmonized principles	Flexibility at national level
AREA OF FINANCIAL FLOWS	Financing of the domain (expenditure of financing units, income of providers) and expenditures of providers	**Financing side only, as a starting step in developing an NEA**

5 Chapter

SOURCES AND PROCESSING OF INFORMATION

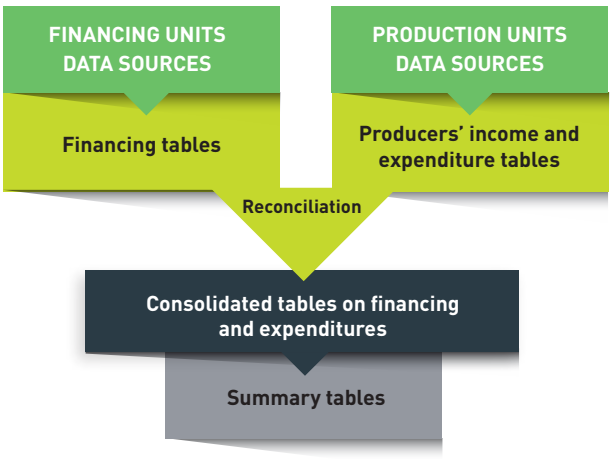
Elaborating an education account requires the collection and processing of a large set of accounting and statistical information from numerous, disparate sources. This can make it a quite challenging exercise. This section discusses some general guidelines related to data prerequisites, where they can be found, and how they can be processed.

First, given the diversity of financing and producing units and a context in which financial reporting may not be centralized or harmonized, data will be gathered from numerous, diverse sources, mostly in formats that are not readily usable.

Second, the quest for comprehensiveness in an NEA exercise requires covering all possible financial flows. In addition, some sources of funding or producing units may be very challenging to collect data on and may require additional surveys. Some providers do not keep track or report on their income and expenditure in a regular way or as a matter of course.

Consequently, any NEA exercise requires a great deal of data collection and processing before the information can be translated into classifications relevant for NEA purposes. Furthermore, ensuring consistency through consolidation and reconciliation is crucial, particularly in cases of discrepancy among sources.

Figure 17. Overview of the working method

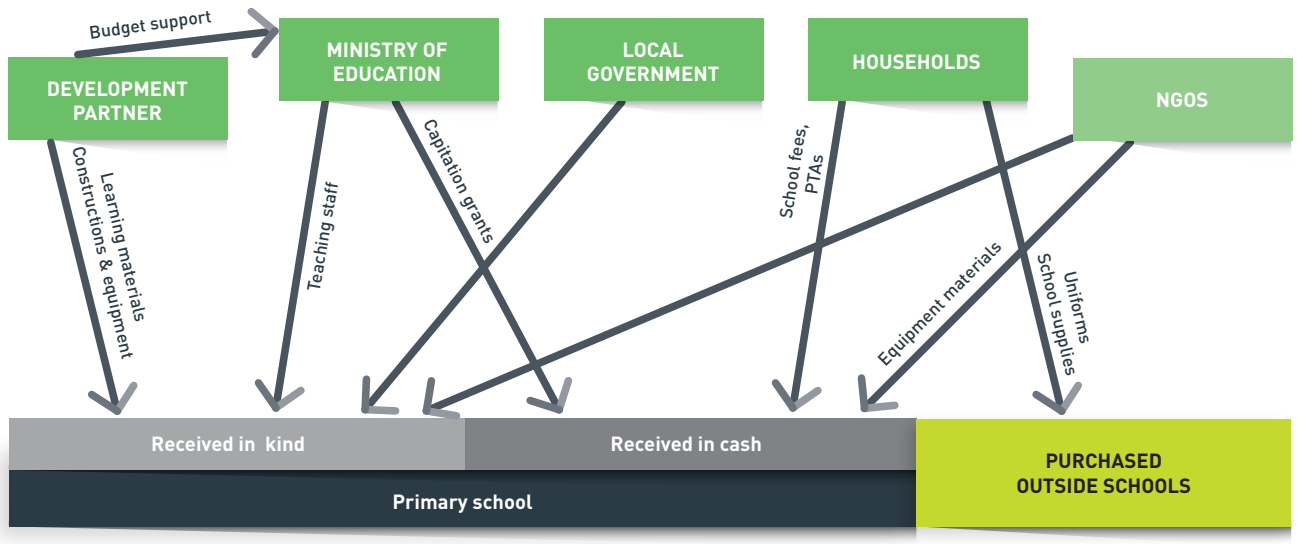


5.1 Identifying sources of information

The data collection exercise will, from the outset, aim at understanding and mapping out all financing and expenditure mechanisms of education funding, along with related financial flows. This will not only help map all financing and producing units and channels through which funding is provided to service providers, but also identify all potential sources of data.

Figure 18 describes a typical situation in the funding of a public primary school, with central government providing the core resources in the form of in-kind allocations for teaching and administrative staff, learning materials, and allocations in cash through capitation grants directly sent to schools, while many other contributors bring in additional resources, in cash or in kind.

Figure 18. Example of financing mechanisms for a public primary school



Private financing of education may come from families (households), non-profit institutions, or corporations. Families usually contribute by paying fees or contributions to PTAs or school management committees. They also purchase connected products such as uniforms, learning materials, and transport to school.

Achieving a comprehensive picture of the production costs of a public primary school requires mobilizing data from all entities involved in funding its activities, as the financial flows may not be consolidated in one single place. At school level, existing financial information will include the income received in cash and the use of this income. Information on the financial value of resources received in kind must be gathered from the relevant financing unit, whether the government budget, externally funded projects, or an NGO. The purchase of connected products by parents can, however, only be found in household surveys.

The ultimate goal is to track all potential sources of information from which data are to be gathered. Consequently, for each and every financial flow that has been identified from the previous mapping exercise, the next step will be to locate where this data can be found. This will help assess whether or not all the required information for the NEA is available, and consequently whether additional surveys are needed.

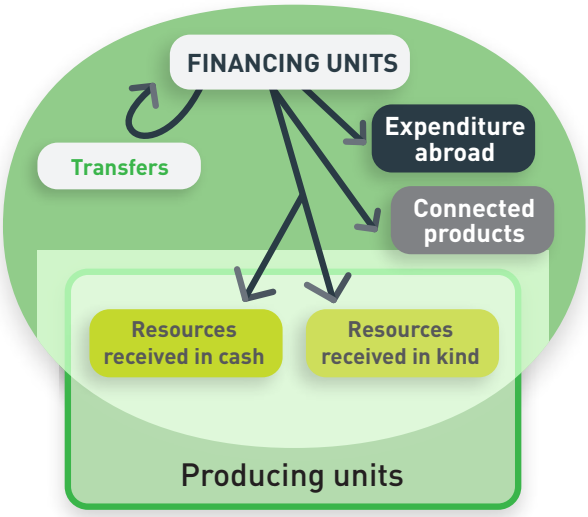
5.2 Two categories of sources: financing units and producing units

As described above, information on financial flows in education comes from the reporting or accounting of activities of the institutional entities involved in the economy of the domain, either financing units or producing units.

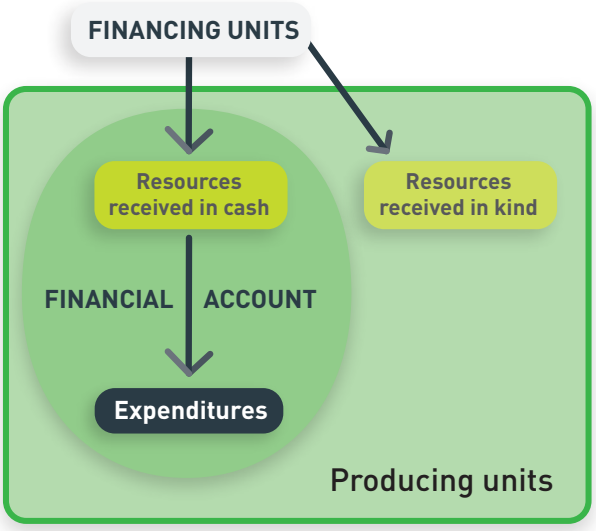
Sources of information fall into two major categories:

- Sources from financing units, describing the funding activities of a specific financing unit. They provide information on the funding of producing units, either in cash or though the direct provision of inputs, on expenditure on connected products, and on transfers with other financing units. They could include expenditure on activities outside the scope of the NEA.
- Sources on producing units, describing both income and expenditure recorded in the financial accounts or statement of the producing unit. Those sources are often limited to the income received in cash and do not provide information on resources received in kind, such as when staff or other inputs are funded directly by the financing unit.

Figure 19. Scope of sources on financing units and producing units



A source on the financial management of a financing unit covers the full scope of the funding of producing units and connected products.



A source on the financial management of a production unit covers only the resources received in cash and their utilization.

The two categories of source have a common point of intersection: the resources received in cash by the producing units.

5.3 Processing information on financing units

Processing of data on financing units' expenditure entails classifying all financial flows according to the five dimensions of the NEA. As the source is related to a specific financing unit, processing consists of codifying expenditures according to the following NEA dimensions: (i) the education level; (ii) the producing units; (iii) the activities (teaching, ancillary, administration, etc.); and (iv) the economic transaction (staff compensation, goods and services, capital, etc.).

Processing could result in the production of standardized financing tables for each financing unit. *Figure 20* provides an example of the structure of the financing table with the dimensions of education levels and producing units in rows, and activities and economic transactions in columns.

Figure 20. Standardized financing table

FINANCING TABLE

Year

Financing Unit:

Activities		Characteristic Activities (Funding of producing units)													Connected Products				Total final financing	Transfers between financing units			Total initial financing
		Teaching activities					Ancillary service			Ancillary service	General administration			All	Product A	Product B	Product C	Product D					
Economic Transaction		Compensation of staff		Other recurrent expenditure		Capital	Compensation of staff	Other recurrent	Capital		Compensation of staff	Other recurrent	Capital	Total provider						Financial aid to families	Other transfers paid	Transfers received	
		Teaching staff	Non-teaching staff	Teaching materials	Other recurrent																		
Level	Producing Unit																						
Level 1																							
	Producing unit 1a																						
	Producing unit 1b																						
	Producing unit 1c																						
	Producing unit 1d																						
Level 2																							
	Producing unit 2a																						
	Producing unit 2b																						
	Producing unit 2c																						
	Producing unit 2d																						
	Producing unit 2e																						
Level 3																							
	Producing unit 3a																						
	Producing unit 3b																						
	Producing unit 3c																						
	Producing unit 3d																						
	Producing unit 3e																						
Level 4																							
	Producing unit 4a																						
	Producing unit 4b																						
	Producing unit 4c																						
	Producing unit 4d																						
	Producing unit 4e																						
Level 5																							
	Producing unit 5a																						
	Producing unit 5b																						
	Producing unit 5c																						
TOTAL																							

Central government

To derive the most accurate indicators on education financing, it is important to determine as precisely as possible what has effectively been spent (actual or executed expenditure). Finance laws or provisional budgets indicate a spending intent rather than effective spending. Data on government expenditure should therefore be for **actual expenditure** on education, which accounts for what was effectively spent and incorporates potential further expenditure associated with budget revision.

Actual expenditure is recorded by public accountants according to the classification of budget lines within the government budget. This information is available from the ministry of finance or the administrative and financial departments of each of the ministries in charge of education services.

In some cases, actual expenditure may not be available or easily accessible. In such situations, the NEA team may have to use the records of commitments or payment orders instead.

Expenditure of government will normally follow the ministry of finance's budget classification system. Translating these data into the NEA classifications may require further disaggregation. For example, it is common for pre-primary and primary education expenditure to be joined together in government accounts, or for salaries to cover all categories of staff in a given ministry. Classifying data into the NEA categories will often require estimations using additional information, such as payroll figures or data organized in terms of teacher level or category of school, often available from human resources departments.[11]

Government expenditure data must be collected from all ministries and agencies funding the education domain as previously defined. For example, data on staff compensation should include all remuneration paid directly to employees, but also all other social charges paid by employers to pension and social security schemes. Sometimes, these do not appear within the ministry of education's accounts, and will have to be collected from the ministry in charge of the pension scheme to complement the employment costs of teaching and non-teaching staff.

Similarly, in some countries vocational training or preschool programmes are provided by ministries other than those in charge of education services (for instance, nursing training provided through the ministry of health, or preschool programmes under the ministry of social affairs). It is important to include, to the greatest extent possible, expenditure by central or local government on such training, regardless of a country's institutional arrangements.

[11] For more practical details on how to do such estimations and how to process government expenditure data in general, please refer to Annex 1.

Lower levels of government

In decentralized contexts, lower levels of government may bear an important share of public funding of education. Expenditure by lower levels of governments may come from two major sources: transfers from central government and locally generated funds. External funding or other private entities may also channel their funding via lower levels of government.

Sources that can be used to obtain data on education funding by lower levels of government include:

- a centralized body in charge of the supervision of lower levels of government;
- executed/committed expenditure for lower levels of government from the budget division within the ministry of finance that consolidates the executed/committed expenditure of all ministries with responsibility for education.

Difficulties may occur when financial mechanisms vary among the various decentralized entities or when accounting classifications do not allow an easy translation into the various dimensions of the NEA.

Households

Household spending on education includes tuition fees paid directly to educational providers as well as other school-related payments made both inside and outside of schools, such as catering costs, transportation costs, uniforms, textbooks, etc.

The main source of data on household spending on education is usually (where they exist) household expenditure surveys. Those surveys are usually carried out by the national institute for statistics, though rarely every year. They often record categories of educational institutions or items of expenditures in a different way to the NEA requirements. The broad process involved in the processing of household expenditure surveys is as follows:[12]

1. Identify the type of information available in the survey. Do the data relate to each individual in the household (allowing for easier estimations by level of education and type of school) or to the household as a whole? Are the data disaggregated by type of expenditure, or is only the total available?
2. Identify and understand the variables necessary for the analysis: type/category of expenditure (such as fees, textbooks, and uniforms), level of education, type of institution. Map these variables to the NEA categories.
3. Identify the sub-sample (e.g. only individuals currently attending school) and the recall/reference period (e.g. the last 12 months—how does it relate to the school year?).
4. Extract per-student averages (weighted to represent the total population) along three dimensions: type of expenditure, level of education, and type of school.
5. Multiply the per-student average for each sub-category by the number of students enrolled in that category.
6. Where some years are missing, estimate using the Consumer Price Index (or where possible, a price index specific to educational items) and/or compound annual growth rate.

Contributions to schools by families can also be estimated from school accounts, when available, or using estimations based on a sample survey on fee structures. These are among the data sources on producing units and will be discussed in more detail below.

Several types of surveys allow the estimation of household expenditures on education but very few are specifically designed for that purpose. Consequently, depending on the available type of survey, specific processing methods will be applied in order to derive average expenditure by level of education, category of school, and type of expenditure, based on data provided by the survey.

Another issue is to determine which items of expenditure in the survey should be integrated into the NEA, as their definition and coverage may not fit the definition of the education expenditure domain of the NEA..

Non-profit institutions

NPIs (such as NGOs) rarely intervene in a single sector (i.e. education only) and do not necessarily keep a distinct accounting book for each sector in which they intervention. This complicates data collection on NGOs' funding of education activities. Consequently, in many cases, a specific sample survey will need to be carried out to collect expenditure by NGOs on education activities.

Sources of data may include:

- NGO internal reports on revenues and expenditures;
- an NGO coordination body in cases where there is one that collects members' annual financial reports;
- national institutions such as the institute of statistics, which may conduct specific surveys on NGO activities.

Depending on the specific country context, faith-based organizations (FBOs) may be important actors in either managing or financing (or both) educational activities. In the latter case, FBOs may be fully or partially financing educational activities. As such, it is important to understand their functioning and funding mechanisms to be able to track and collect their contribution to education funding.

Community-based organizations (CBOs) are non-profit entities that work at a local level to improve the lives of their residents in social fields such as education and health. CBOs may play an important role in providing and/or funding educational services at local level. Data collection on CBO funding will be based on the exercise of mapping sources of funding.

CBOs may be fully or partly funded by the government, FBOs, local NGOs, or other organizations. Thus, attention should paid to avoiding counting such transfers twice.

Rest of the world

There exist a number of mechanisms through which external funding may be channelled to recipient countries. Data collection on external funding will benefit from the financing flows mapping exercise, which, along with other tools, will help identify all external financing mechanisms in a country.

[12] For more details on how to process education expenditure data from household expenditure surveys, please see Annex 2.

Sources of data for funding from the rest of the world may include:

- planning or finance ministries' units that monitor and compile external funding (e.g. donor coordination units);
- budget units within the ministry of finance;
- development partners' financial/performance reports with a possibility of implementing a specific survey;
- an education development partners' coordination body (if available) which may be used to help collect data on external funding by its members;
- aid management platforms;
- the OECD-DAC database which can be used when national sources are non-existent or cannot be easily accessed.

5.4 Processing information on producing units

Depending on the specific country context, collecting data on resources and expenditure of producing units may turn out to be more or less challenging.

In all cases, a thorough survey of all education services providers – an exercise that can be conducted at the same time as the mapping of financing flows – should identify all categories of education services providers, and the availability of school financial reports (on resources and expenditures) potentially existing at school, local, or central levels.

Potential sources of data on producing units' resources and expenditure may include:

- centralized services either at local or central government levels to which education services providers are required to submit their annual financial reports (audited accounts);
- school censuses/EMIS (education management information system) in cases where they collect data on schools' income and expenditure;
- specific surveys on a sample of service providers.

As for sources for financing units, processing data from producing units will require translating existing categories on resources and expenditure into the terms of the NEA classification.

Resources should be classified by level of education, the originating financing unit, the activity, and the economic transaction from the financing unit's perspective.

Expenditure should be classified by level of education, the activity, and the economic transaction from the producing unit's perspective. Processing these sources will result in the production of standardized tables on income and expenditures.

When a producing unit has activities covering more than one level of education, it will be necessary to separate resources and expenses by level of education and produce tables for each level of education and producing unit.

Figure 21. Example of standardized income and expenditure table of producing units

INCOME AND EXPENDITURE OF EDUCATIONAL INSTITUTIONS														
Year														
Production Unit:														
Activities	Characteristic Activities (Funding of producing units)													
	Teaching activities					Ancillary service			Ancillary service	General administration			All	
Economic Transaction	Compensation of staff		Other recurrent expenditure		Capital	Compensation of staff	Other recurrent	Capital		Compensation of staff	Other recurrent	Capital	Total provider	
	Teaching staff	Non-teaching staff	Teaching materials	Other recurrent										
INCOME														
Government														
	Financing unit 1													
	Financing unit 2													
	Financing unit 3													
Private														
	Financing unit 4													
	Financing unit 5													
	Financing unit 6													
External Funding														
	Financing unit 7													
	Financing unit 8													
Internally generated funds														
TOTAL INCOME														
EXPENDITURE														
EXPENDITURES														

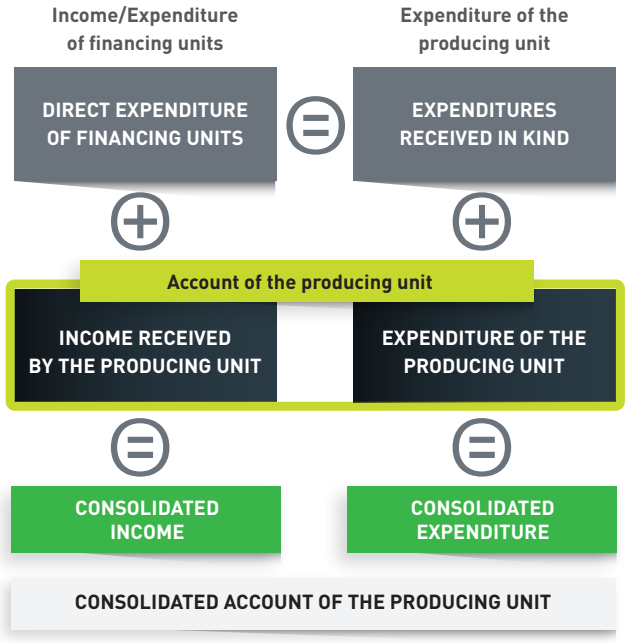
5.5 Consolidation and reconciliation

Once all sources of information are processed and have been translated into either financing tables or producing units' tables, the data must be gathered and compared in order to be consolidated and reconciled.

This essential step ensures the quality, uniformity, and completeness of the information. Data from both the financing units' expenditure tables and the producing units' income and expenditure tables are gathered, consolidated, and compared in order to produce final and consistent tables (see *Figure 22*).

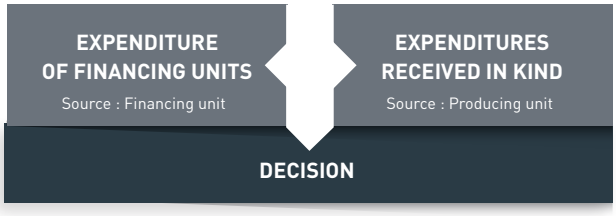
Consolidation: Information on resources received in kind (paid directly by the financing units) is added to the income received in the producing unit's account, in order to create a comprehensive picture of resources mobilized for the institution's activities. On the expenditure side, amounts are amended by incorporating the equivalent of resources received in kind.

Figure 22. Consolidation of producing units' accounts



Reconciliation: This ultimate stage ensures coherence and consistency, reconciling data obtained from the various sources by selecting the more reliable figure for each financial flow.

Figure 23. Reconciliation of data



Consolidation and reconciliation will result in final adjustments carried out after data has been initially processed and compiled for each financing and producing unit.

Consolidation and reconciliation are carried out using producers' income and expenditure tables, extended to include expenditure for connected products.

Decisions are taken on the basis of some basic principles:

- Income of the producing units is expenditure of the financing units, categorized from the point of view of the financing unit.
- The resources provided in kind (paid directly by the financing units) are added as an additional resource for the producing unit and equivalent amounts are added as income and expenditure.
- When two sets of data are available for the same financial flow, the more reliable figure must be selected.
- The adjustments made on the income side of the producing unit have to be balanced in the expenditure side.

At the end of the consolidation stage, financial estimates are made coherent, with the income of producing units equal to the expenditure of the financing units.

The consolidated accounts of the producing units must include all resources mobilized for their activities.

The direct expenditure of households outside educational institutions (connected products) can also be reported, using additional columns of the table. As there is usually only one source of information, only the expenditure of the financing unit (households) will be recorded.

6 Chapter

ANALYSES OF A NATIONAL EDUCATION ACCOUNT

6.1 Analyses from education accounts

The full sequence of an account presents a set of tables that may be grouped into series for a detailed analysis of the NEA in line with planning and policy needs. It consolidates the economy of the education sector into five dimensions, providing most of the information needed on education cost analysis by differentiating the activities of financing units and producing units (schools), and economic transactions.

This makes it possible to assess:

- the overall level of domestic education expenditure, which may be presented in relation to the main socio-economic indicators, such as the GDP, government budget, and population numbers;
- the structure of financing indicating the expenditure of financing units on education (i.e. who finances education?);
- the cost of the various levels of education and the structure of their financing (i.e. how much does primary education, for example, cost, and who finances it?);
- expenditure by activity, teaching activities, ancillary services, administration, and connected products;
- the cost of the various categories of school (public or private) and the structure of their financing (how much does public higher education, for example, cost, and who finances it?);
- the production costs for the various categories of school, by making a distinction between compensation of employees, goods and services, and capital expenditure (what are funds being spent on in private primary schools, for example?).
- average financing and cost per student (how much was spent per student in public secondary schools, in terms of teaching personnel, for example?).

Boxes 5 and *6* show two examples of possible tables covering the various angles for analysis.

BOX 5. TABLES PRODUCED BY THE NEA IN KENYA

1. Financing of education levels	2. Expenditures of financing units
This series cross-references the financing units with education levels. It describes the expenditure of financing units and provides an overview of the financing of the system. The total represents the domestic expenditure for education. It could describe the transfers between financing units and show both initial financing and final financing of the education domain. It could be divided in three tables: › total expenditures (recurrent & capital) of financing units by level, › recurrent expenditures of financing units by level, › capital expenditures of financing units by level.	This series are about specific financing units, and cross-references producing units with activities and object of education. It describes the expenditure of one specific financing unit or a group of financing units. It could be divided in six tables according to country level of decentralization: › expenditure of government, › expenditure of regional governments, › expenditure of local governments, › total expenditure of public administrations, › expenditure of households and private entities, › expenditure from external funding.
3. Financing of education providers	**4. Expenditure of education providers**
This table cross-references the producing units by education level with the financing units. It describes the expenditure of funding units that forms the resources of producing units. It covers three tables: total expenses, recurrent expenses, capital expenses. › total expenditures (recurrent & capital) of financing units, › recurrent expenditures of financing units, › capital expenditures of financing units.	This table shows for each activity and each category of school the total expenses according to the economic nature, i.e. the ultimate use of resources received.

5. Average financing per student	6. Average production cost per student
This series shows the average financing per student for each category of providers, and by source of funding. It covers four tables, two of which cover all financing units, in a similar way to series n°3. › average financing per student (recurrent & capital), › average recurrent financing per student. Two are for specific financing units: › average expenditure of government per student, › average expenditure of households per student, › total expenditures (recurrent & capital) of producing units.	This table is structured like table 4. It shows average expenditure for each category of provider, per student, according to the object of the expenditure: › average expenditure of producing units per student, › 15 synthesis tables are produced to provide the picture of the domain and form the Education Account for one year.

BOX 6. TABLES PRODUCED BY THE NEA IN NEPAL

Two tables provide a global picture of initial financing and transfers between financing units:	
Table 1:	expenditure for education by level and source of financing total expenditures (recurrent & capital) of initial financing units
Table 2:	transfers between financing units total expenditures of initial and final financing units
Six tables describe the financing by level, producing unit and activities. Government of Nepal includes MOE, other ministries, DDCs VDCs, External loans and grants on-budget; external sources include external loans, grants on-budget, technical assistance off-budget and INGOs:	
Table 3:	financing of activities expenditure of **all financing units**
Table 4:	financing of activities expenditure of **public financing units**
Table 5:	financing of activities expenditure of **private financing units**
Table 6:	financing of activities expenditure of **government of Nepal**
Table 7:	financing of activities educational expenditure of **households**
Table 8:	financing of activities expenditure from **external sources**

Two tables describe the income (by source) and expenditure (by object) of producing units:	
Table 9:	Funding of educational providers Resources by sources of funding, expenditures of final financing units
Table 10:	Expenditures of educational providers
Three tables describe the average financing per student. They are calculated from the previous tables 3, 6 and 7:	
Table 11:	Average financing per student expenditure of **all financing units**
Table 12:	Average financing per student expenditure of **Government of Nepal**
Table 13:	Average financing per student expenditure of **households**
Two tables describe the average income (by source) and expenditure (by object) per student of producing units. They are calculated from tables 9 and 10:	
Table 14:	Average funding of educational providers per student Resources by sources of funding, expenditures of final financing units
Table 15:	Average expenditures of educational providers per student
Tables 11 to 15 present average costs per student only for a selection of producing units.	

This set of tables is complemented by detailed financing tables for each financing unit, and income and expenditure tables for each producing unit. Those detailed tables do not need to be published and constitute the most disaggregated level of information. In those detailed tables, all financial flows are classified in terms of the five dimensions.

Some further analyses, such as analyses of issues related to equity in public resource allocation or of efficiency of expenditure, may be carried out using the vast array of data provided by an education account exercise, in association with other complementary data.[14] The two issues of equity and efficiency are major policy issues in education.

6.2 Potential additional analyses[13]

The previous analyses are directly linked to the synthesis tables of the NEA and the financing and producing units in the education domain.

[13] See also the *Education Sector Analysis Methodological Guidelines.*

[14] Analysing whether public resources are equitably distributed or efficiently spent will require additional types of information such as data on enrolment, teachers, textbooks, etc. allocated at school level.

Equity in public resources allocation

Equity in public resource allocation may be viewed as falling within the scope of equal opportunities.[15] In this regard, it may be interesting to investigate whether resources (human, material, and financial) are equitably allocated to education or skewed toward certain segments, such as a specific school population or particular schools, regions, or districts.[16]

There are several approaches to analysing equity issues in education. The two commonly used are: (i) distributive equity of resources, and (ii) benefit incidence analysis.

Distributive equity of resources allocation

Teacher salaries and learning materials represent by far the largest share of (recurrent) public spending on education. Therefore, from an equity perspective, education providers enrolling the same number of children should have the same number of teachers and learning materials. Deployment of teachers and learning materials appears, therefore, to be an important dimension of distributional equity of public resources. The aim here is to examine the extent to which public resources allocated to the education sector are allocated fairly.

Using administrative data on enrolment, teachers, and textbooks, the equity analysis could then document the following aspects:

- equity in teacher allocation, by comparing the number of teachers with the number of students in the various institutions;
- equity in the allocation of textbooks, by comparing (i) the number of textbooks with the number of students in public institutions and (ii) the number teacher guides with the number of teachers.

Benefit incidence analysis

Benefit incidence analysis (BIA) is an analytical approach that estimates the distribution or appropriation of public resources across different beneficiary groups, such as boys versus girls, rural versus urban, rich versus poor, and basic education pupils versus higher education students.

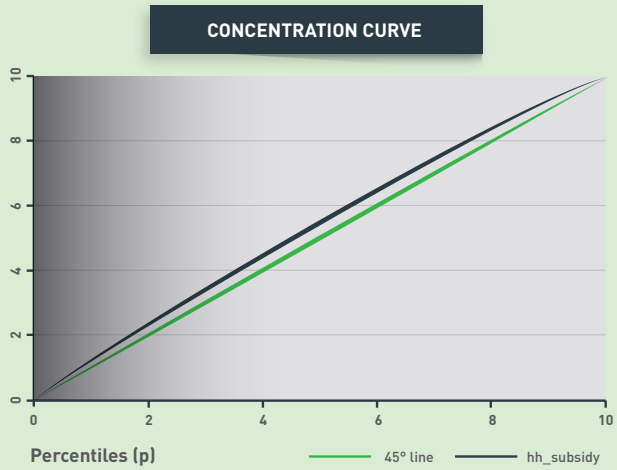
BIA's implementation procedure consists of establishing per-unit public expenditure according to the beneficiary groups' differentiated use of educational services. The rationale is that some beneficiary groups may benefit disproportionately from public resources compared with others, thus creating inequity in access to public resources. For instance, students in public higher education institutions consume much higher public expenditure than those in public primary and secondary schools, which may raise some equity issues related to the public financing of education.

Indicators generally used for BIA for equity issues in public resources include the Gini index of public expenditure distribution and the share accumulated by the 10 per cent most-educated students. Using data from household surveys on individual characteristics and their schooling patterns, BIA can also be used in assessing public expenditure appropriation according to gender, locality, wealth, and so on.

BOX 7. THAILAND: BIA DISTRIBUTION OF PUBLIC SPENDING ON EDUCATION

In most countries, including Thailand, the education budget represents the biggest share of the overall government budget. Access to education thus determines who will benefit from public education subsidies. However, the benefits may not be equally distributed among income groups as opportunities in education differ. An NEA can provide key information in assessing the distributional impacts of education spending via BIA.

Using household and geographical variation data on public subsidies compiled by the NEA study for Thailand in 2013, Punyasavatsut et al. (2016) found that total education subsidy was more equally distributed than income. The concentration curve of basic education incidences lies above the 45° line, implying that the poorest households gain more than the better off. Public education subsidy for tertiary education was, however, regressively distributed. For most regions, subsidies were well distributed, with the exception of Bangkok Metropolitan.



Efficiency of expenditure on education

Efficiency analysis focuses conceptually on the process of transforming resources into results. In this regard, efficient educational institutions are those that produce maximum results for a given level of resources, or produce a given level of results using a minimum of resources. In this context, efficiency inevitably entails a comparative dimension in the sense that levels of performance are understood in comparison to other educational systems with comparable resources.

In this framework, the results produced by an education system, given the resources mobilized, can be approached from two complementary angles:

- The first is a *global comparative analysis* that compares national performance with those of other countries. Thus, a system is more efficient than another if it performs better for a comparable level of expenditure or if it gets at least the same results for a lower level of spending.
- The second is a *within-country approch* that compares the performance of different schools with regard to resources allocated to them. It examines (i) whether schools that have more resources per student generate, all things being equal, better results, and (ii) whether schools benefiting from comparable resources also produce comparable results.

[15] The notion of equity is to be distinguished from that of equality with which it is sometimes confused, however close they may be. Equality is based on a mathematical premise, i.e. the relative evenness in the distribution of resources, and is, in that case, close to the notion of equal treatment. Equity on the other hand refers to a concept of social justice and thus is more assimilated to the notion of equal opportunities.

[16] Analyses of equity in resource allocation are limited here to allocation of public resources.

BOX 8. INTEGRATED VERSUS SEPARATE ANALYSES

In some country experiences, NEAs are regarded as a comprehensive exercise of collecting and processing financial information and, at the same time, gathering much more information and further indicators to support analyses of equity, efficiency, or performance. This is the case in countries where NEAs have been developed with references to health accounts.

In other countries, NEAs are viewed as an exercise for collecting, processing, and organizing financial data, to complement existing information systems on education. Countries are developing various analyses of their education system, including education sector analyses and sector review exercises. NEAs contribute to the sector analyses, without replacing them.

Both options have their justifications. An in-depth analysis of the financing or production costs has to put together and compare financial figures to organizational patterns and non-financial indicators. Setting up an NEA does not exhaust all the potential analyses of the economy of the domain.

The choice could be linked to the ways in which NEAs are considered, as an exercise to be conducted from time to time or as a regular exercise in order to produce comprehensive annual statistics on the funding and costs of the education system.

7 Chapter

SETTING UP A NATIONAL EDUCATION ACCOUNT

This chapter reviews the steps involved in setting up a national education account. It addresses some of the organizational and practical issues that often arise during the development of an NEA.

Mobilizing, gathering, and processing a comprehensive set of financial information requires good organization and coordination, and a technical team in charge of data collection and processing.

At the beginning of the process, precise knowledge of the system and of the ways in which the various types of educational institution are funded is necessary. This mapping of the financing patterns of the system helps identify which institutions own which parts of the information, and supports the collection and organization of the data collection process.

Before processing data, the analysis framework must be defined. This means fixing the classifications for the various dimensions of the NEA. This stage will determine the format for the intermediate financing tables (to record expenditure of financing units), and income and expenditure tables (to record income and expenditure of producing units).

The objective of the processing stage is to translate the various sources of information into the common classifications of the NEA. At the end, data from all sources are presented through two set of standardized tables: the financing tables and the income and expenditure tables.

Consolidation and reconciliation is the stage at which the processed data are put together, compared, and reconciled. It results in consolidated accounts for all producing units and ensures coherence between the income of producing units and the expenditure of financing units. Final tables are produced from the reconciled data.

This chapter also addresses the issue of regular updating and institutional anchorage.

7.1 Constitution of the NEA team

Implementing an NEA requires the following skills and knowledge, which should be combined when setting up the technical team:

- a good knowledge of the education system, its organization, the funding mechanisms of the various categories of schools and educational institutions, and financial management at school level;
- the ability to process accounting documents, which implies a good knowledge and understanding of the government budget, the various existing financial statements and reporting documents, and external funding;
- a good knowledge of educational statistics, their availability within the ministry's EMIS, and the ability to extract or process this information;
- a good knowledge of the household survey database, and the ability to extract and process the data, normally using the preferred statistical software of the national statistical office;
- the ability to process financial and educational data, to design methods to classify them in terms of the NEA classification and to control and assess their reliability.

An NEA must cover the whole education sector, and all those skills and knowledge must be combined in the technical team, which should include personnel from the ministries in charge of education, the national statistical office, and the ministry of finance. Typically, the team should at least include a budget officer, a planner with knowledge of external funding, a statistician working on school census data, a specialist in household surveys, and an education officer knowledgeable on financial management at school level.

7.2 Mapping financial flows and identifying sources of information

The process of setting up an NEA for the first time involves the development of precise and comprehensive knowledge of the financial flows in the domain.

This may come from the expertise of the technical team and of other officers working at ministry level, but they will benefit from visits to local offices, schools, and educational institutions. It is advisable to visit one institution per category of regional and local offices, schools, and institutions at the various levels, public, community, and private.

The purpose of the visits is to map the origin of the resources used by the schools and to determine whether those resources are provided in cash recorded in the school account, or paid directly by the financing unit and provided in kind to the school.

In addition to the identification of the financial flows, the aim of the visits is also to determine how and where the information on financial flows is located, and who owns it. School accounts can provide information as to resources managed financially at school level, and it may be the case that schools report to local offices, or even to the central ministry. In some countries, school censuses include information on the financial management of the school.

In this process of identifying potential sources of information, it is important to seek full coverage of all financing units and all types of institutions (producing units).

Typically, financing units include the ministries in charge of the education sector, other ministries supervising

specialized educational institutions, development partners, local governments, parents, international and local NGOs, religious bodies, and corporations. Sources of information can be accounting sources as for the government budget, or statistical sources such as the household expenditure survey.

Information on schools or educational institutions can be from audited accounts or financial reports, or statistical surveys.

At this stage, the technical team should have a clear vision of the sources of information that could be used, and of potential data gaps. From previous experience, information on local government or NGOs is more difficult to access, and additional surveys or more demanding data collections may be required.

7.3 Setting the NEA framework

Before processing the information, it is important to fix the analysis framework for the NEA, the dimensions, and the classifications that will be used.

Classifications should reflect the organization of the system and be relevant for the eventual users of the NEA, that is, national planners and policy-makers. For example, categories of producing units have to be homogeneous regarding the financing patterns so that total and unit costs are meaningful. The basic categories and logic presented in this methodology should nonetheless serve as the basis for national classification, to facilitate international reporting and comparison of the data.

It is, however, advisable not to have a long list of levels, producing units, or activities. Sources of information may not detail the categories in the same way. When processing data, this could require too many detailed estimates, based on enrolment figures, for example. The precision of the detail could be a statistical illusion. Another aspect is to keep the tables in a format that is easily readable by the user.

Once the classification is set, tables can be designed to accommodate the data processed from the sources on financing units (financing tables) or producing units (income and expenditure tables).

The classifications can be modified during the data processing stage, as some categories might have to be merged or (more rarely) further disaggregated. It is, however, advisable to do the adjustments as soon as possible during the process as this has consequences for the tables used during the processing.

7.4 Collection and processing of information

This is the most time-consuming part of the work. When implementing an NEA for the first time, it is necessary to cover the full scope of information, which means that data collection and processing can last for up to a year.

Some data sources are common and not too difficult to obtain. Actual government expenditure is recorded by accounting departments and usually publicly communicated or available at the ministry of finance or at the finance department of line ministries. Surveys of the conditions of living or the income and consumption of households are also common, though they do not always provide the level of detail required for an NEA.

Additional surveys may have to be carried out, such as for NGOs or private providers. It may also be necessary when the financial accounts of schools are not centralized or reported within the EMIS. Since putting in place specific surveys takes time, it is advisable to initiate them as soon as possible so as not to delay the whole process.

When sources are administrative documents that do not undergo any statistical processing, an alternative is to collect those documents and process part of the information included. This may happen with audited accounts of educational institutions or with reports from decentralized bodies. This solution works better when the number of documents is limited and where they are already centralized. Processing hundreds of audited accounts could be feasible when they are already gathered in one place, but if it requires requesting thousands of schools to communicate their accounts or financial statements, it may be advisable to design a specific survey or to work on a sample of schools.

Working on samples can be a practical solution. The processing leads to figures on average financing and spending per student. Global estimates are made afterwards, using enrolment figures or any other suitable variables.

Some sources provide information only for one year, as is often the case for household surveys, audited accounts, and one-off surveys. Estimates will then have to be updated for additional years, using the Consumer Price Index, average spending per student, and/or other background data.

Information on the funding from development partners could be difficult to mobilize for support and projects not included within the government budget. When disbursements are not consolidated, it may require collecting various agreement documents and processing whatever data they contain.

Each individual source of information has its own specificities and format. The aim of processing is to classify all collected data in accordance with the common dimensions and classifications of the NEA. The techniques chosen should be based on a good knowledge of the contents and must be adjusted to the specificities of each individual source.

BOX 9. SOURCES OF INFORMATION MOBILIZED FOR THE NEA IN MOROCCO

The NEA in Morocco covers education institutions under the authority of the Ministry of National Education. At higher education level, only programmes taking place in secondary schools are included. The NEA mainly deals with the financing of the system.

Four major sources of information were mobilized:

Private schools

A sample of private schools was designed, covering all levels of pre-school, primary, lower secondary, and secondary.

A visit to each school in the sample was undertaken to fill in the questionnaire.

The survey resulted in data on average costs per student.

Development partners

Information on external funding can be found in the government budget for grants and loans.

For the funding not recorded in the budget, the variety of financial management systems prevented the implementation of a survey using a standardized format. Instead, the technical team met each development partner individually to get the information required for the NEA.

Government expenditures
Due to the autonomy of the education academies in charge of the management of the system in their region, two types of data collection were employed.

For expenditure made at central level, the finance department of the ministry recorded all expenditures.

At regional level, the academies have legal responsibility for the consolidation of expenditure from their budget, whether spent directly or through provincial delegations. The consolidated financial statements of every academy were collected and processed.

Household expenditures
Household expenditure was assessed using the statistical survey on household consumption and expenditure implemented by the High Commissary for Planning, which is in charge of national economic and social statistics.

The processing resulted in data on average expenditure per student, by region, and by urban/rural areas.

7.5 Updating for additional years and institutional anchorage

Updating for an additional year is a much less strenuous exercise than starting everything from scratch. The methodology is defined, the whole process is known (and hopefully documented), and sources of information have been identified. The first NEA series can cover a period of several years, while regular updating requires working only on one year.

The process of updating is about obtaining similar sources of information for an additional year. Because not all sources are available every year, the data collection could be less extensive, covering only one part of the required data, and complementing them with estimations to update areas where data are not available or are difficult to get on an annual basis.

New data will often be collected and processed for government expenditure, external funding, and schools (when information is included in the regular EMIS or when audited accounts are easily accessible), and simple updated estimates can be made for households, NGOs, or private providers.

The processing should follow the same steps of producing financing tables for each financing unit and income and expenditure tables for producing units. Consolidation and reconciliation are undertaken following the same patterns.

It is very important to follow the same procedures and use the same techniques so that final results are comparable and provide reliable information on variations and trends.

A regular (annual) production of NEA data would complement the statistical information system on education, enrich the quantitative indicators for analysing and monitoring the education system, and provide additional information useful for decision-makers.

To reach this level, an NEA needs to become a core activity of the information system, as school censuses are, and for that institutional anchorage will be needed. Whatever the option taken by a country, an NEA should be a cooperative undertaking of the ministries of education, the national institute for statistics, and the ministry of finance.

BOX 10. UPDATING NEA AND INSTITUTIONAL ANCHORAGE IN THAILAND

Following the initial 2013 and 2015 rounds of Thailand's NEA, covering the 2008–2013 budget years, the Quality Learning Foundation, which developed the NEA, began efforts to ensure the NEA was well utilized and institutionalized, in partnership with the Ministry of Education and the UNESCO Institute for Statistics in Bangkok. The work has the following key aims:

1) Identify the right team within the Ministry of Education to handle the NEA and to sustain it in the education system. The responsible team should be technically competent and understand the concept of NEA and its importance, as well as the need for a robust working relationship with related partners, especially external data owners. The team should also have sustained and sufficient support in terms of resources and personnel. More importantly, to create a healthy environment for a sustainable NEA, open access should be available for journalists and researchers to utilize NEA in academic and public policy dialogue, as well as in cooperation with the international community.
2) Establish a culture of evidence-based education policy-making using NEA. The NEA should be institutionalized in places where it can inform education policy and improve efficiency and equity in education resource allocation as well as its impact on quality teaching and learning. This should happen, for example, in the analysis of resource allocation by education levels, gender, geographical area, income, public/private, and benefit incidence analysis. NEA data can also be used to promote efficiency in education resource allocation by uncovering possible delay and withholding of funding by financing agents or producing units.
3) Improve the efficiency of NEA-making processes. This is essential to the continued improvement of NEA administration, in terms of both technical and partnership aspects. The development of automated data-processing methods or tools will reduce the time and effort required for the NEA team to compile and process the data from different sources and formats. More importantly, domestic and international partnership is vital in energizing the NEA team to update and sustain the NEA with rapid improvements. For instance, Thailand's NEA and NHA (National Health Accounts) plan a health education expenditure survey with the National Statistical Office, which will substantially help improve the understanding of household data for both teams. Furthermore, joining the international conference on the NEA at regional and international levels will help create an international network for NEA and promote domestic advocacy for NEA anchorage.

ANNEXES

Annex 1: Processing of data on government expenditure on education

1. Introduction

This annex outlines a practical approach to processing data on government expenditure within the context of an NEA. It is assumed here that the prerequisite data files (as described in *Chapter 5* of the main NEA guide) have been collected and are available in a format ready for processing, for example in the form of detailed MS Excel files on **executed or actual government expenditure on education** for one or several financial years.

The annex is structured around three key steps, namely: **(1) assuring data quality**; **(2) processing of information, including the estimation techniques using allocation keys**; and **(3) producing synthesis/final financing tables**. A country case study of Uganda is used to illustrate the processing exercise.

2. Checking data quality and exhaustiveness

Ensuring the quality of the mobilized data is an important preliminary step to undertake prior to any processing exercise. Particularly critical quality issues related to government expenditure data may, for example, be linked to: (i) using budgeted or provisional expenditure figures instead of actual or executed ones; (ii) partial coverage of government spending on education; and (iii) referring to government expenditure data that includes other expenses outside the 'education domain' as defined by the NEA framework. Below are a few approaches that could help ensure the quality of the yet-to-be processed file.

i. Using figures on actual government expenditure is crucial. To derive the most accurate account of what the government has effectively spent on education services in a given period, it is necessary to process executed/actual/outturn expenditure rather than budgeted or provisional figures. Depending on each country's public finance reporting system, executed/actual/outturn government expenditure on education will be more or less accessible, but, in any case, efforts should be made to mobilize actual data even if that implies working on an older reference period. See *Section 5.3* for more details on this.

ii. Partial coverage of government expenditure on education may be an issue where important government expenditure on education has been left out during the data-gathering exercise, resulting in a potentially serious underestimation of what has effectively been spent by a government, and affecting, in turn, all subsequent statistics on public funding of education. Below are some potential sources of such omissions, together with guidance on how to spot them and, ultimately, address them.

- The most common cause of omission is likely to be that not all ministries or government entities in charge of education and training activities and/or all levels of government were included in the data mobilization exercise. Data collection tends to focus on well-known sources of education finance data, such as the main ministries or government entities in charge of education/training activities. However, quite often, important education/training activities are funded by other ministries. Early childhood development and pre-primary education, for example, may be the responsibility of the ministry of family affairs, technical and vocational education and training (TVET) may come under the ministry of labour force development, and medical training may come under the ministry of health. Lower levels of government, such as municipalities or districts, may also spend on education, but, given the difficulties related to mobilizing data on these expenditure flows, may be left out.
- Similarly, some expenditure on education may be managed/recorded in budget books other than those of the main ministry or ministries in charge of education and training. This may, for example, be the case for education staff pension and social benefit schemes, which are often the responsibility of the ministry (or ministries) in charge of the civil service, and must be added to the education sector's personnel compensation. In other cases, some 'special' expenses may be recorded in the budgets of other government entities. In Guinea, for instance, scholarships for university students studying abroad, which account for a large portion of education expenditure, are paid and managed under the presidential cabinet's budget. In Benin, the salaries of primary and secondary part-time teachers were, for a time, paid directly from the Ministry of Finance's budget.

iii. Ministries in charge of education/training activities may also be responsible for programmes or activities not related to the education domain, according to the NEA definition. For example, the ministry in charge of primary and secondary education may also be responsible for youth and sports, which do not fall under the definition of education used for the purposes of the NEA or for international comparison. The ministry of higher education may also be responsible for research and development (R&D) activities outside education institutions, which should also be excluded from the NEA.

A few practical tips may help uncover potential omissions of significant government spending:

- As a general rule, a thorough mapping exercise should be conducted to allow for the most comprehensive possible coverage of all government funding of education and training, whatever the funding mechanisms or the managing/executing entity.
- Special attention should be paid during processing to clearing data files of all expenditure items not related to the education domain.
- Cross-checking data from various data sources is another advisable approach to gauging the quality of the expenditure figures at hand. This can be done through comparisons of different national reporting sources, such as national bank reports and ministry of finance reports on budget outturns. Cross-checking data using international reporting sources, such as the

UIS database, the World Bank's World Development Indicators (WDI) database, or the International Monetary Fund's World Economic Outlook (WEO) database, is also an option.

In the end, this quality assurance step should lead to a clean and unified database ready for processing. This database should contain as much detail as possible in order to facilitate the processing exercise. If the processing exercise covers more than one financial year, it is advisable that all years be combined to form one overall appended database that can be processed at once, expediting the exercise. The database can be presented in Excel, and the format should be one line per expenditure item (no totals), described by as many dimensions as are available in the original sources (see the example in *Table 1*). This is the most practical and efficient way to arrange a large amount of data, and allows for easy use of the pivot table function in Excel.

Example: Extract from a database of government expenditure on education in Uganda after quality assurance and validation

Table 1 presents an extract from the Ugandan database on government expenditure following the completion of the quality assurance exercise. This database was compiled using data from several sources for a period of six years. Data on central government expenditure was extracted from the integrated financial management and information system of the Ministry of Finance, Planning, and Economic Development (MOFPED). Data on local governments was collected from the database on revenue and expenditure managed by MOFPED and fed by regular administrative records (audited annual reports) prepared by government units (districts and municipalities). Uganda has a decentralized system in which central and local governments have shared responsibilities for specific education services. For instance, local governments are fully in charge of pre-primary, primary, and secondary education services while central government has responsibility for policy definition and overall management of the system. Higher education institutions are autonomous. Furthermore, several other ministries in addition to the Ministry of Education and Sports (MoES) incur important expenditure on education activities. These are the Ministry of Gender and Social Development, the Ministry of Finance and Planning, the Ministry of Environment, and the Ministry of Justice.

Table 1. Extract from the dataset on the Government of Uganda's education outturn, 2008–2014 (figures are in millions of Ugandan shillings)

A	B	C	D	E	F	G	H	I
Line Number	Year	REC/ DEV	Vote description	Program description	Output description	Function description	Item description	Expenditure
1	2013-14	Rec	MoES	MOE Headquarter	Ministry Support Services	Education n.e.c (CS)	Salaries	29 491 972
2	2013-14	Rec	MoES	MOE Headquarter	Ministry Support Services	Education n.e.c (CS)	Salaries	18 075 846
3	2013-14	Rec	MoES	MOE Headquarter	Ministerial and Top Management Services	Education n.e.c (CS)	Allowances	57 972 923
...	2013-14	Rec	MoES	MOE Headquarter	Ministerial and Top Management Services	Education n.e.c (CS)	Medical Expenses To Employees	5 607 754
2546	2013-14	Rec	MoES	MOE Headquarter	Ministerial and Top Management Services	Education n.e.c (CS)	Staff Training	14 340 543
2547	2013-14	Rec	MoES	Pre Primary & Primary Education	Instructional Materials for Primary Schools	Education n.e.c (CS)	Small Office Equipment	14 340 543
2548	2013-14	Rec	Mbarara University	Headquarters	Teaching and Training	First stage of tertiary education (IS)	Medical Expenses To Employees	3 750 000
2549	2013-14	Rec	Mbarara University	Headquarters	Teaching and Training	First stage of tertiary education (IS)	Incapacity Death Benefits And Funeral Services	2 186 000
2550	2013-14	Rec	Mbarara University	Headquarters	Teaching and Training	First stage of tertiary education (IS)	Retrenchment Costs	-
2551	2013-14	Rec	Mbarara University	Headquarters	Teaching and Training	First stage of tertiary education (IS)	Advertising And Public Relations	830 000
2552	2012-13	Rec	MoES	Higher education	Policies, guidelines to universities and other tertiary institutions	Other Higher Education	Travel Abroad	2 577 240
2553	2012-13	Rec	MoES	Higher education	Policies, guidelines to universities and other tertiary institutions	Other Higher Education	Fuel, Lubricants And Oils	1 145 440
2554	2012-13	Rec	MoES	Higher education	Policies, guidelines to universities and other tertiary institutions	Other Higher Education	Maintenance - Vehicles	924 000
2555	2012-13	Rec	MoES	Higher education	Support establishment of constituent colleges	Other Higher Education	Contributions to Autonomous Institutions	477 266 715
2557	2012-13	Dev	MoES	Pre Primary & Primary Education	DEVT TVET P7 GRAD. ENROLLING INSTIT	Business, Technical And Vocation Education	Non Residential Buildings	102 105 244
2558	2012-13	Dev	MoES	Pre Primary & Primary Education	DEVT TVET P7 GRAD. ENROLLING INSTIT	Business,Technical And Vocation Education	Residential Buildings	102 105 244
2559	2011-12	Dev	MoES	Pre Primary & Primary Education	DEVT TVET P7 GRAD. ENROLLING INSTIT	Business,Technical And Vocation Education	Allowances	5 088 000
2560	2011-12	Dev	MoES	Pre Primary & Primary Education	RELOCATION OF SHIMONI PTC & PRI.SCH	Teacher Education	Allowances	5 088 000
2561	2011-12	Dev	MoES	Pre Primary & Primary Education	RELOCATION OF SHIMONI PTC & PRI.SCH	Teacher Education	Non Residential Buildings	96 688 751
2562	2010-11	Dev	Districts	Pre Primary & Primary Education	RELOCATION OF SHIMONI PTC & PRI.SCH	Teacher Education	Printing, Stationery, Photocopying And Binding	-
2563	2010-11	Dev	Districts	Pre Primary & Primary Education	RELOCATION OF SHIMONI PTC & PRI.SCH	Teacher Education	Allowances	-
2564	2010-11	Dev	Districts	Pre Primary & Primary Education	RELOCATION OF SHIMONI PTC & PRI.SCH	Teacher Education	Non Residential Buildings	7 260 002
2565	2010-11	Dev	Municipalities	Pre Primary & Primary Education	GULU UNIVERSITY	University Education	Consultancy Services-Short Term	-
...	2009-10	Dev	Municipalities	Pre Primary & Primary Education	GULU UNIVERSITY	University Education	Scholarships And Related Costs	-
11188	2009-10	Dev	Municipalities	Pre Primary & Primary Education	GULU UNIVERSITY	University Education	Non Residential Buildings	-
11189	2009-10	Dev	Municipalities	Pre Primary & Primary Education	GULU UNIVERSITY	University Education	Transport equipment	2 186 000
11190	2009-10	Dev	Municipalities	Pre Primary & Primary Education	GULU UNIVERSITY	University Education	Machinery and Equipment	924 000
11191	2008-09	Dev	Municipalities	Pre Primary & Primary Education	GULU UNIVERSITY	University Education	Furniture and Fittings	25 666 987

This database provides detailed information on both recurrent and development expenditure for the financial years 2007/08–2013/14 and consists of more than 11,000 expenditure lines. It presents the raw data, showing:

- **Line number** of the expenditure line (Column A), numbered from 1 to 11,191.
- **Year** of the expenditure line refers to the period during which the budget execution takes place. In this case, it runs from July to June for the years under consideration (Column B).
- Whether the expenditure line is **recurrent** (REC) or **capital**, which is termed development expenditure (DEV) in Uganda (Column C).
- **A vote** represents groups of related services delivered by a vote, e.g. education services (Column D).

- **A programme**, which represents the results or sets of activities implemented by the vote or which contribute to the achievement of the vote function objectives (Column E).
- **An output**, which represents results or sets of activities implemented by the vote which contribute to the achievement of the vote function objectives (Column F).
- **A function**, which refers to a set of programmes and projects defining the roles and responsibilities of a vote/institution, and contributing to the attainment of vote and overall sector objectives (Column G).
- **An item**, which describes the economic transaction. It offers a distinction between recurrent expenses, such as compensation of employees (staff salaries and allowances and social contributions), general expenses (for example, staff training, books, newspapers, printing, stationery, photocopying, and binding), expenditure on scholarships, and direct support and expenditure on investment (Column H).
- **Expenditure,** which shows the actual amount spent on the particular expenditure line (Column I).

Expenditure on sports, research, and development outside education activities, interest paid on domestic and external debts, depreciation, bad debts, and tax refunds were excluded from the NEA processing.

NB: Although the processing procedure presented below is derived from the case of Uganda, which has two levels of government with specific funding mechanisms and several ministries in charge of education, it could also be applied to any country, whether it has one or several education ministries, and one or several levels of government. Furthermore, the processing procedure applied to government data applies also to data on all other financing units (external funding, NGOs, etc.), with the exception of data on household spending, which requires the specific approach described in *Annex 2*.

3. Processing of information

***Processing* simply means converting the raw data gathered into synthesis or final tables, such as that shown in *Table 2*, ready to be consolidated and analysed along with the expenditure of other financing units (external, household, etc.).**

This processing exercise is conducted by classifying each expenditure line according to four (of the five) NEA dimensions, namely: **(i) education levels**, **(ii) producing units**, **(iii) educational activities**, and **(iv) economic transactions**. *Chapter 3* of the NEA guidelines presents a detailed description of NEA dimensions and their interlinkages.

STEP 1: Defining the list/groupings of education levels, producing units, activities, and economic transactions to be used for data processing

The first step of the processing exercise is to decide on the NEA classification, that is, a list of categories for each dimension (levels of education, producing units, activities, and economic transactions) that will be used in processing and, ultimately, in the NEA financing tables. **This is an essential step that should be discussed and agreed with all parties of the NEA exercise.** Below are the four dimensions as agreed for the Ugandan final financing table.

Example: List of levels of education, producing units, activities, and economic transaction used in the Ugandan NEA

The education system of Uganda is organized into a number of levels of education: pre-school, primary, secondary, technical and vocational, and tertiary education. To those main levels, three other groups of educational programme can be added, namely teacher training, non-formal education, and adult education. Education services are delivered not only by government or public schools but also by private schools, faith-based schools, and secular schools. Within levels such as primary and secondary, some beneficiaries are categorized as belonging to the areas of special needs education or sports. All public primary schools are required, under the universal primary education (UPE) programme, to offer six years of fee-free education. At secondary level, public schools can either be part of the universal secondary education (USE) programme, a continuation of the UPE scheme, or opt out and charge fees. Higher education institutions are autonomous universities or colleges.

Table 2. Levels of education, producing units, activities, and economic transactions, Ugandan NEA 2008–2014

LEVELS OF EDUCATION AND PRODUCTION UNITS	ACTIVITIES AND ECONOMIC TRANSACTIONS
Pre-school education	**Personnel remuneration**
ECD centres	**Teaching staff salaries**
Primary education	Basic salaries, allowances, pensions and other benefits
UPE schools	**Non-teaching staff salaries**
Public special needs schools	Basic salaries, allowances, pensions and other benefits
Private schools	**Other recurrent expenditure**
Secondary education	**Scholastic materials**
Lower secondary	Textbooks
Public USE schools	Other scholastic/learning materials
Public non-USE schools	**Other recurrent expenditure**
Public special needs schools	Grants and subventions
Private USE schools	Other recurrent goods and services (water, supplies etc.)
Private non-USE schools	**Capital investment**
Upper secondary	New constructions and buildings maintenance
Public USE schools	Equipment
Public non-USE schools	**Ancillary services**
Public special needs schools	Board, food, medical
Private USE schools	**Transfers between financing units**
Private non-USE schools	**Transfers paid**
Non-formal education	Scholarships and direct support to families
Non-formal centres	Other transfers paid
Teacher education	**Transfers received**
Public primary teachers' colleges	
Private primary teachers' colleges	
Secondary teachers and instructors	
Post-primary education	
Public BTVET	
Private BTVET	
Tertiary education	
Public universities	
Public colleges	
Private universities	
Private colleges	
Adult education centres	

The **activities of educational providers** in the Ugandan NEA have been grouped into two categories: (1) **teaching activities** and **management**, and (2) **ancillary services** (meals, board, medical care, and transport organized by the school). The activities of administrative offices fall under the management component.

Economic transactions comprise: i) gross personnel remuneration (including all deductions and benefits) for teaching and non-teaching staff; ii) other recurrent expenditure, on, for example, scholastic materials, grants, and subventions, and other recurrent goods and services, such as water, electricity, and office supplies; iii) capital investment or gross capital formation; and iv) transfers including scholarships and support to families, and transfers received.

Once the relevant categories of education levels, producing units, activities, and economic transactions have been defined and agreed upon, they can be synthetized into draft financing tables that show the final outcome table expected to be filled out at the end of the data-processing exercise. *Table 4* shows the draft financing table produced for the Ugandan NEA.

Table 3. Example of a financing table, Ugandan NEA 2008–2014

Levels of Education Economic Transaction	Production units (Education Providers)	Teaching, General administration and support activities					Ancillary services	Total Teaching, General administration and support activities	Transfers between financing units			GRAND TOTAL
		Personnel Compensation		Other recurrent		Capital	School Meals, Boarding and Transport		Transfers paid		Transfers received	
		Teaching staff	Non-teaching staff	Scholastic materials	Other recurrent				Scholarships and supports to families	Other transfers received		
Pre-school Education	ECD Centres											
	Administrative offices											
Primary Education	UPE schools											
	Private schools											
	Administrative offices											
Secondary Education	Public USE schools											
	Public not USE schools											
	Private USE schools											
	Private not USE schools											
	Administrative offices											
Teacher Education	Public Primary Teachers Colleges											
	Private Primary Teachers colleges											
	Secondary Teachers and Instructors											
	Administrative offices											
BTVET	Public BTVET institutions											
	Private BTVET institutions											
	Administrative offices											
Tertiary Education	Public Universities											
	Public Colleges											
	Private Universities											
	Private Colleges											
	Administrative offices											
Adult Education	Producing unit 4e											
	Administrative offices											
Non Formal Education	Producing unit 5a											
	Administrative offices											
GRAND TOTAL												

NB: this is a slightly revised version of the draft financing table presented in *Chapter* 5. First, since this annex concerns government expenditure alone, only activities related to that financing unit are retained for ease of presentation. Second, activities related to general administration and support are merged with those of teaching, but this should not affect the reading of the table since administration-related expenses have a specific line for each production level, labelled 'Administrative offices'.

STEP 2: Converting the raw data into synthesis tables

In practice, there is more than one way of approaching the processing. Some, however, tend to be more efficient than others in terms of time and work organization.

- One simple and efficient way of conducting the processing is to add, after the last column of the database, **a column for each category of level of education, producing unit, activity, and economic transaction listed during the previous step**.
- **The next stage consists of categorizing each expenditure line according to the listed categories and sub-categories.** As much as possible, each expenditure line should be categorized according to **ONE level of education, ONE producing unit, ONE Activity, and ONE economic transaction.** But that won't possible all the time. In fact, if categorizing some expenditure lines is straightforward, other budgetary expenses are by nature **TRANSVERSAL**, **meaning that they span more than one level of education, one activity, or one economic transaction**.

Example: Original Ugandan database on government expenditure with appended columns for each dimension and processing

If we apply the described procedure to the Ugandan database presented in *Table 1*, we have a datasheet that looks like

Table 4. Appended columns J, K, L, and M are highlighted and correspond to the four dimensions listed above.

Whenever possible, expenditure lines are categorized into only *one* dimension. However, some administrative expenditure at central services is transversal to all levels of education and labelled 'Transversal all', while some teaching-related expenditure covers both pre-primary and primary education levels and is labelled 'Transversal primary and pre-primary'. Similarly, some expenditure lines may cover either administrative and pedagogical expenses, or teaching and non-teaching staff expenses.

Table 4. Original database with appended columns for each dimension

A	B	C	D	E	F	G	H	I	J	K	L	M
Line Number	Year	REC/ DEV	Vote description	Program description	Output description	Function description	Item description	Expenditure	STEP 2.1: Levels of education	STEP 2.2: Producing units	STEP 2.3: Activities	STEP 2.4: Economic transactions or Object of expenditure
1	2013-14	Rec	MoES	MOE Headquarter	Ministry Support Services	Education n.e.c (CS)	Salaries	29 491 972	Tranversal_all levels	Public	General administration	Salaries and benefits for teaching staff
2	2013-14	Rec	MoES	MOE Headquarter	Ministry Support Services	Education n.e.c (CS)	Salaries	18 075 846	Tranversal_all levels	Public	General administration	Salaries and benefits for teaching staff
3	2013-14	Rec	MoES	MOE Headquarter	Ministerial and Top Management Services	Education n.e.c (CS)	Allowances	57 972 923	Tranversal_all levels	Public	General administration	Salaries and benefits for teaching staff
...	2013-14	Rec	MoES	MOE Headquarter	Ministerial and Top Management Services	Education n.e.c (CS)	Medical Expenses To Employees	5 607 754	Tranversal_all levels	Public	General administration	Salaries and benefits for teaching staff
2546	2013-14	Rec	MoES	MOE Headquarter	Ministerial and Top Management Services	Education n.e.c (CS)	Staff Training	14 340 543	Tranversal_all levels	Public	General administration	Other recurrent
2547	2013-14	Rec	MoES	Pre Primary & Primary Education	Instructional Materials for Primary Schools	Education n.e.c (CS)	Small Office Equipment	14 340 543	Transversal_primary and preprimary	Public	Teaching	Other recurrent
2548	2013-14	Rec	Mbarara University	Headquarters	Teaching and Training	First stage of tertiary education (IS)	Medical Expenses To Employees	3 750 000	Transversal_primary and preprimary	Public	Teaching	Salaries and benefits for teaching staff
2549	2013-14	Rec	Mbarara University	Headquarters	Teaching and Training	First stage of tertiary education (IS)	Incapacity Death Benefits And Funeral Services	2 186 000	Transversal_primary and preprimary	Public	Teaching	Other recurrent
2550	2013-14	Rec	Mbarara University	Headquarters	Teaching and Training	First stage of tertiary education (IS)	Retrenchment Costs	-	Transversal_primary and preprimary	Public	Teaching	Other recurrent
2551	2013-14	Rec	Mbarara University	Headquarters	Teaching and Training	First stage of tertiary education (IS)	Advertising And Public Relations	830 000	Transversal_primary and preprimary	Public	Teaching	Other recurrent
2552	2012-13	Rec	MoES	Higher education	Policies, guidelines to universities and other tertiary institutions	Other Higher Education	Travel Abroad	2 577 240	Higher education	Public	Teaching	Other recurrent
2553	2012-13	Rec	MoES	Higher education	Policies, guidelines to universities and other tertiary institutions	Other Higher Education	Fuel, Lubricants And Oils	1 145 440	Higher education	Public	Teaching	Other recurrent
2554	2012-13	Rec	MoES	Higher education	Policies, guidelines to universities and other tertiary institutions	Other Higher Education	Maintenance - Vehicles	924 000	Higher education	Public	Teaching	Other recurrent
2555	2012-13	Rec	MoES	Higher education	Support establishment of constituent colleges	Other Higher Education	Contributions to Autonomous Institutions	477 266 715	Higher education	Public	Teaching	Grants and subvention
2557	2012-13	Dev	MoES	Pre Primary & Primary Education	DEVT TVET P7 GRAD. ENROLLING INSTIT	Business, Technical And Vocation Education	Non Residential Buildings	102 105 244	BTVET	Public	Teaching	Other recurrent
2558	2012-13	Dev	MoES	Pre Primary & Primary Education	DEVT TVET P7 GRAD. ENROLLING INSTIT	Business,Technical And Vocation Education	Residential Buildings	102 105 244	BTVET	Public	Teaching	Other recurrent
2559	2011-12	Dev	MoES	Pre Primary & Primary Education	DEVT TVET P7 GRAD. ENROLLING INSTIT	Business,Technical And Vocation Education	Allowances	5 088 000	BTVET	Public	Teaching	Other recurrent
2560	2011-12	Dev	MoES	Pre Primary & Primary Education	RELOCATION OF SHIMONI PTC & PRI.SCH	Teacher Education	Allowances	5 088 000	Teacher training	Public	Teaching	Other recurrent
2561	2011-12	Dev	MoES	Pre Primary & Primary Education	RELOCATION OF SHIMONI PTC & PRI.SCH	Teacher Education	Non Residential Buildings	96 688 751	Teacher training	Public	Teaching	Other recurrent
2562	2010-11	Dev	Districts	Pre Primary & Primary Education	RELOCATION OF SHIMONI PTC & PRI.SCH	Teacher Education	Printing, Stationery, Photocopying And Binding	-	Teacher training	Public	Teaching	Other recurrent
2563	2010-11	Dev	Districts	Pre Primary & Primary Education	RELOCATION OF SHIMONI PTC & PRI.SCH	Teacher Education	Allowances	-	Teacher training	Public	Teaching	Other recurrent
2564	2010-11	Dev	Districts	Pre Primary & Primary Education	RELOCATION OF SHIMONI PTC & PRI.SCH	Teacher Education	Non Residential Buildings	7 260 002	Teacher training	Public	Teaching	Capital investment
2565	2010-11	Dev	Municipalities	Pre Primary & Primary Education	GULU UNIVERSITY	University Education	Consultancy Services-Short Term	-	Higher education	Public	Teaching	Other recurrent
...	2009-10	Dev	Municipalities	Pre Primary & Primary Education	GULU UNIVERSITY	University Education	Scholarships And Related Costs	-	Higher education	Public	Support to students	Scholarships
11188	2009-10	Dev	Municipalities	Pre Primary & Primary Education	GULU UNIVERSITY	University Education	Non Residential Buildings	-	Higher education	Public	Teaching	Capital investment
11189	2009-10	Dev	Municipalities	Pre Primary & Primary Education	GULU UNIVERSITY	University Education	Transport equipment	2 186 000	Higher education	Public	Teaching	Equipment
11190	2009-10	Dev	Municipalities	Pre Primary & Primary Education	GULU UNIVERSITY	University Education	Machinery and Equipment	924 000	Higher education	Public	Teaching	Equipment
11191	2008-09	Dev	Municipalities	Pre Primary & Primary Education	GULU UNIVERSITY	University Education	Furniture and Fittings	25 666 987	Higher education	Public	Teaching	Other recurrent

Once the codification is completed, a pivot table can be created in Excel to obtain a first intermediate synthesis table similar to Table 5 for financial year 2013/14.

Table 5. Preliminary financing table, Ugandan NEA, central and local government, 2013/2014 (in millions of Ugandan shillings)

	Teaching, General administration and support					Ancillary services	Total School, General administration and support activities	Transfers between financing units			GRAND TOTAL
	Employee cost		Other recurrent		Capital			Transfers paid		Transfers received	
	Teaching staff	Non-teaching staff	Teaching and Learning Materials	Other recurrent		Boarding, fedding, health and transport		Scholarships and supports to families	Other transfers paid		
Preprimary Education	-	15	-	61	-	-	**76**	-	-	-	**76**
ECD Centres							-				-
Administrative offices		15		61			76				76
Primary Education	**562 371**		**14 546**	**20 342**	**29 693**	**12 548**	**639 500**	**15 458**	-	-	**654 958**
UPE schools	562 371		14 546	7 828	29 693	12 548	626 986	15 458			642 444
Private schools											-
Administrative offices		65 125		12 514			77 639				77 639
Lower Secondary Education	**151 753**	**22 326**	**1 045**	**6 198**	**25 555**	**25 000**	**231 877**	**12 126**	-	-	**244 003**
Public USE schools	124 041	11 021	844	4 510	25 555	25 000	190 971	12 126			203 097
Public not USE schools	27 712	1 051	201	434	-	-	29 398				29 398
Private schools											-
Administrative offices		10 254		1 254			11 508				11 508
Upper Secondary Education	**19 562**	**10 510**	**142**	**1 058**	**12 548**	**21 000**	**64 820**	**15 855**	-	-	**80 675**
Private USE schools	10 418	1 541	76	200	12 548	21 000	45 783	15 855			61 638
Public not USE schools	9 144	948	66	143	-	-	10 302				10 302
Private schools											-
Administrative offices		8 021		715			8 736				8 736
General admin (transeversal)		**29 125**		**15 650**							-
GRAND TOTAL	**860 772**		**15 734**	**43 309**	**67 796**	**58 548**	**1 046 159**	**43 439**	-	-	**1 089 598**

NB: For illustration purposes, this table is limited to education levels up to upper secondary. It summarizes the total expenditure of both central and local government. It would be possible to separate out and present expenditure at each level of government. This can be done by producing a separate pivot table for each.

Table 5 shows transitory figures since transversal expenditures **are not yet distributed.** For instance, expenses related to teaching and non-teaching staff remuneration at primary level are still merged (cells shaded in red). Furthermore, although some expenses related to general administration and support have been allocated to specific levels of education, others still need to be split between pre-primary, primary, and lower and upper secondary levels (shaded in yellow).

STEP 3: Processing transversal expenditure

As noted above, some expenditure lines will cover several teaching levels, activities, or economic transactions. Ultimately however, each and every expenditure line should be allocated to a single education level, producing unit, activity, and economic transaction. This can be done using what is known as **'allocation keys'**, i.e. percentage shares to split transversal expenses.

There are several ways of estimating and using allocation keys, and choosing the most appropriate can be a challenge. Generally, allocation keys can be derived using i) teaching and non-teaching staff numbers and corresponding payroll figures, ii) student enrolment numbers, or iii) any other figures judged relevant. Below are some application cases that illustrate the use of allocation keys in the case of the Ugandan NEA.

i. Separating staff compensation between teaching and non-teaching staff

This is a common scenario according to which, for each education level and producing unit, overall employee costs must be separated in terms of teaching and non-teaching staff expenditure. Government expenditure data rarely make that distinction. However, for NEA and subsequent analytical purposes, it is necessary to separate as accurately as possible teaching and non-teaching staff costs.

Using staff payroll data to split teaching and non-teaching staff compensation

The best option is to obtain a detailed dataset on payroll showing, for each staff member, their type of contract, status, gross salary, function, classes taught (for those teaching), etc. It is straightforward to derive from such a dataset compensation for each staff category for a given education level and producing unit.

This type of dataset can be generated from the human resource (HR) departments of the different ministries in charge of education and/or other government services in charge of civil servant payroll. When discrepancies exist between different files, reconciliation will be necessary to obtain the most accurate figure possible.

Table 6 presents a screenshot of a staff remuneration dataset that compiles all primary and secondary education staff (teaching and non-teaching) under government payroll in Uganda for the financial year 2013/14. It shows for each staff member, their name, title (headmaster, teacher, clerk, etc.), staff type (teaching, administration, etc.), location (UPE, USE, non-USE, etc.), type of contract (permanent staff, temporary, etc.), salary scale, and gross salary.

The 'Title' category refers to the employee's socio-professional category whereas staff type is their effective role or function. This distinction is necessary as some trained teachers may work in an administrative capacity, in which case they should be accounted for as non-teaching staff.

Table 6. Extract from staff remuneration dataset, MoES, Uganda, 2013/14

Institution Name	Staff Names*	Title	Staff Type	Location	Classification	File Number*	Computer No*	Salary Scale	Actual Gross Salary
Ministry of Education and Sports	Edward Namera	Teacher	Teaching	UPE	Permanent Staff	xxx	0000000000xxxxx	U5U	445 285
Ministry of Education and Sports	Oliver Kanteu	Teacher	Teaching	UPE	Permanent Staff	xxx	0000000000xxxxx	U6U	537 258
Ministry of Education and Sports	Emily Tumusiime	Teacher	Teaching	UPE	Permanent Staff	xxx	0000000000xxxxx	U7U	268 129
Ministry of Education and Sports	Kaitesi Alison	Teacher	Teaching	UPE	Permanent Staff	xxx	0000000000xxxxx	U7U	227 240
Ministry of Education and Sports	James Ali	Head master	Administration	UPE	Permanent Staff	xxx	0000000000xxxxx	U7U	272 481
Ministry of Education and Sports	Douglas Kalimunda	Head master	Administration	USE	Permanent Staff	xxx	0000000000xxxxx	U7U	268 129
Ministry of Education and Sports	Kaihura Claver	Office Attendant	Support Staff	USE	Permanent Staff	xxx	0000000000xxxxx	U8U	176 169
Ministry of Education and Sports	June Kabale	Office Attendant	Support Staff	Not USE	Permanent Staff	xxx	0000000000xxxxx	U8U	176 169
Ministry of Education and Sports	Oswald Name	Office Attendant	Support Staff	Not USE	Permanent Staff	xxx	0000000000xxxxx	U8U	176 169
Ministry of Education and Sports	Kale James	Office Attendant	Support Staff	Not USE	Permanent Staff	xxx	0000000000xxxxx	U8	176 169

* Staff names, file numbers, and computer numbers have been changed or veiled for reasons of privacy.

From *Table 6* it is straightforward to derive staff compensation by category and education levels using a pivot table according to the 'Staff Type', 'Location' and 'Actual Gross Salary' columns. The results of such a pivot table on the entire dataset are shown below.

The staff remuneration dataset gives a total of 568,125 million Ugandan shillings (UGX) for personnel remuneration in public primary schools in 2013/14, of which UGX 532,333 (93.7 per cent) is for teaching staff and UGX 35,792 (6.3 per cent) is for non-teaching staff. There is a small difference between the total amount given in the staff remuneration file and that given in the budget execution file, of UGX 562,371. After cross-checking, the figure for executed expenditure was considered to be the most accurate and percentage shares obtained from the staff remuneration file were used to split teaching and non-teaching staff compensation. According to this split, UGX 526,942 (93.7 per cent) of the total staff remuneration in public primary schools was spent on teaching staff remuneration and UGX 35,429 (6.3 per cent) on non-teaching remuneration.

Table 7. Summary table of staff remuneration by personnel category and education level, MoES, Uganda, 2013/14 (millions of UGX)

	Personnel remuneration by category according to staff remuneration file			Total amount to be distributed according to the government outrun file
	Teaching staff (only staff with teaching responsibilities)	Non-teaching staff (administration and support staff)	Total	
Transversal primary teaching and non-teaching	**532,333**	**35,792**	**568,125**	562,371
As a % of total	93.70%	6.30%	100.00%	

NB: In almost all cases, figures from the payroll dataset will differ from figures provided by the budget execution file, although they should not be very far apart. There are a number of reasons that may explain the discrepancies, but what is important is to assess which of the two figures is the most accurate. For instance, it is important to know where there are staff paid as part of the education payroll but not working in education, or staff paid by the ministry of education but not yet officially on the payroll, which may be the case for newly recruited staff. Also worth investigating is whether figures in both files consider gross staff salaries since, in some cases, deductions such as those for pension schemes may be missing.

Using number of staff to split teaching and non-teaching staff compensation

Where it is not possible to access a complete, detailed payroll database, an alternative may be to use only the number of teachers per level and/or type of school, if that data is available. This is less accurate than using payroll data since the corresponding salary figures will be missing and the shares will be less accurate, especially if there are important differences between how much different types of staff are paid. However, in some cases, this option may be the only one available. If average salary by type of staff (e.g. primary versus secondary school teacher) is known, simple estimations can be made to obtain more precise percentage shares by level of education, type of school, and/or staff category. Where shares are estimated in this way, the official staff compensation figure(s) from the budget should always be used as the total figure, to be disaggregated using the estimated shares.

ii. Distributing transversal central administration expenditure between levels of education using already allocated expenditure by specific education levels

During the categorization procedure, some expenditure lines related to general administration and support will be immediately attributed to a specific level of education. This is the case, for instance, for expenses related to a direction or department in charge of primary education at the ministry of education, which can undoubtedly be allocated to primary education level. However, an important number of administration services span several levels of education. These may, for example, be HR services, or audit and finance services, the work of which covers all levels of education under the umbrella of the ministry of education. In such a case, effort should be made to distribute transversal expenditure among single education levels.

Using allocation keys based on already allocated expenses to specific levels.

The hypothesis here is that expenses that cannot be allocated by level are proportional to those than can be. *Table 5* shows that there is a transversal amount of UGX 29,125 million related to general administration and support services (both local and central) that needs to be distributed among pre-primary, primary, lower secondary, and upper secondary. *Table 8* proposes to distribute transversal expenses using already allocated expenses for each specific level.

Column 1 gives the initial figures with, on the one hand, expenditures already allocated for each specific level and, on the other, expenditure transversal to all levels (in yellow). Column 2 gives percentage shares corresponding to each level. Column 3 shows percentage shares but based only on expenditure already allocated. These shares are then used to split the transversal amount of UGX 29,125 million in Column 4. Column 5 gives the final amount for each level of education by combining initial spending in Column 1 and the reallocated transversal expenses in Column 4 for each level of education. **The same procedure is repeated for all transversal general administration expenditure.**

Table 8: Distribution of transversal general administration expenditure by level of education

	Initial spending In millions of UGX (1)	As a % of grand total, % (2)	As a % of total spending per specific level, % (3)	Transversal expenses distribution in millions UGX (4) = (1)*(3)	Final total spending per level, millions UGX = (1) + (4)
Pre-primary	15	0.01%	0.02%	5	20
Primary	65,125	57.87%	78.07%	22,739	87,864
Lower secondary	10,254	9.11%	12.29%	3,580	13,834
Upper secondary	8,021	7.13%	9.62%	2,801	10,822
Transversal to all levels (TS)	**29,125**	25.88%	-	-	-
GRAND TOTAL (GT)	**112,540**	100.00%	100.00%	**29,125**	**112,540**

Allocation keys presented in this example are the best given the information available. Ideally, this option should be used only when a reasonable portion of the total is already allocated by level. In the example here, 25 per cent of expenditure was still transversal/unallocated. In cases there are no initial allocations for each specific level, alternative options for distributing transversal expenditure would be needed, such as using allocation keys based on student enrolment figures, as presented in *Table 9*.

Table 9. Alternative allocation keys based on enrolments in public schools, Uganda, 2013/14

Education levels	Enrolment numbers (public only)	As % of total
Pre-primary	433,258	5%
Primary	7,061,349	86%
Lower secondary	592,461	7%
Upper secondary	80,666	1%
TOTAL	**8,167,734**	**100%**

In data processing and in splitting transversal expenditure, in particular, the following rules should be observed in prioritizing data sources and allocation keys:

- In processing data on teaching and non-teaching staff compensation, the use of the actual payroll dataset showing staff categories, function, and so on, is highly recommended. Alternative approaches, such as those based on enrolment figures, may yield unrealistic results. Preferably, salary data for different staff categories should be obtained from the government's payroll service.
- When the total payroll amount obtained on the basis of payroll data is slightly lower or higher than that indicated in the budget department files (executed expenditure), an adjustment may be used to fine-tune the obtained disaggregated payroll figures to ensure that their total matches the budget figures which should normally be the point of reference. When the difference is significant, a detailed comparative revision of both sources should ensure the identification of gaps.
- Special attention needs to be paid to issues related to temporary government staff, newly recruited staff, pension schemes, and so on, when processing information on staff compensation. Depending on data sources, such items may or may not be accounted for.
- In case of transfers between financing units, they have to be properly processed, as explained in *Section 4.2*.

4. Preparing the final financing table

Once all pending transversal expenditures have been processed and allocated, final financing tables will present the definitive and most accurate account of government funding of education for a given period. Prior to any use or consolidation with other data, it is useful to double check the produced table to ensure it is correct. It is equally important to document every notable processing procedure used in order to keep track of the work done and to facilitate replication in the future. *Table 10* presents the final financing table based on the example of Uganda for the financial year 2013/14.

Table 10. Final government financing table, 2013/14 (in millions of UGX)

	Teaching, General administration and support					Ancillary services	Total School, General administration and support activities	Transfers between financing units			GRAND TOTAL
	Employee cost		Other recurrent		Capital			Transfers paid		Transfers received	
	Teaching staff	Non-teaching staff	Teaching and Learning Materials	Other recurrent		Boarding, fedding, health and transport		Scholarships and supports to families	Other transfers paid		
Preprimary Education	-	20	-	127	-	-	**147**	-	-	-	**147**
ECD Centres							-				-
Administrative offices		20		127			147				147
Primary Education	**526 942**	**123 293**	**14 546**	**33 808**	**29 693**	**12 548**	**740 830**	**15 458**	-	-	**756 288**
UPE schools	526 942	35 429	14 546	7 828	29 693	12 548	**626 986**	15 458			642 444
Private schools											-
Administrative offices		87 864		25 980			113 844				113 844
Lower Secondary Education	**151 753**	**25 906**	**1 045**	**7 547**	**25 555**	**25 000**	**236 806**	**12 126**	-	-	**248 932**
Public USE schools	124 041	11 021	844	4 510	25 555	25 000	190 971	12 126			203 097
Public not USE schools	27 712	1 051	201	434	-	-	**29 398**				29 398
Private schools											-
Administrative offices		13 834		2 603			16 437				16 437
Upper Secondary Education	**19 562**	**13 296**	**142**	**1 827**	**12 548**	**21 000**	**68 375**	**15 855**	-	-	**84 230**
Private USE schools	10 418	1 541	76	200	12 548	21 000	45 783	15 855			61 638
Public not USE schools	9 144	933	66	143	-	-	10 287				10 287
Private schools											-
Administrative offices		10 822		1 484			12 306				12 306
GRAND TOTAL	**698 257**	**162 515**	**15 734**	**43 309**	**67 796**	**58 548**	**1 046 159**	**43 439**	-	-	**1 089 598**

Annex 2: Processing education expenditure data from household surveys

1. Introduction

The object of this annex is to outline the context, challenges, and key steps in using household surveys to estimate household expenditure on education. It is geared towards the use of survey data in the context of a comprehensive education financing data processing exercise, such as an NEA. It is also intended to facilitate the reporting of the data at international level and its eventual insertion in the UIS database for comparison between countries. As such, the suggested classification is in line with both NEA methodology and international standards as to what should constitute household expenditure on education based on UIS and UOE (UNESCO-OECD-Eurostat) international data collection.

A household is generally defined as a person or group of persons who live in the same home. Any expenditure by students, or by their parents on their behalf, that is linked to school attendance should be considered household expenditure on education. Expenditure by households includes payments for all types of fees *paid to schools*, such as for tuition, registration, examinations, and ancillary services, as well as items purchased *outside of school*, such as uniforms, learning materials, and private classes linked to the official curriculum. Data on all payments to school derive from two main types of source. One is the schools' own accounting books, which can either be collected or compiled, or reported through the school census or other surveys. In many countries, however, this data is either not compiled at all or is of very low quality. These school-based sources do not, of course, include expenditure which happens outside of schools. **Household surveys**, which are the subject of this methodological note, are a source of data both on expenses paid *to* schools and on expenses purchased *outside of* schools.

1.1 Potential data sources

Several types of household survey may include questions or sections on education expenditure. However, the data collected may not always be usable for the purposes of in-depth education expenditure analysis. This will depend on the level of detail and how questions on education expenditure are put (see Step 1). Below are examples of household surveys which may include education expenditure:

- **Budget consumption or household expenditure surveys**, which estimate expenses incurred over a given period for various items, including those for the education of household members. Their main objective is usually to measure household consumption in general, and the level of detail of the education question or section will vary from survey to survey.
- **Multi-purpose household surveys** collect data on several aspects, including education (as well as healthcare, housing, etc.). They are increasingly accessible in several countries and are usually conducted to monitor progress towards the Millennium Development Goals as well as the success of national poverty reduction programmes. Typical examples include:
  - **The Core Welfare Indicators Questionnaire survey (CIWQ)** and the Integrated Household Living Conditions Assessment. They may or may not include specific questions on education expenditure.
  - **The Living Standards Measurement Study survey (LSMS)**[17] is a research project that was initiated in 1980 by the World Bank, with surveys normally covering detailed expenditure questions on several sectors, including education, with questions on literacy, numeracy, schooling, textbooks, and expenses. More than 35 countries have participated, with some continuing with their own version of a living standards survey (sometimes with a different name), with or without support from the World Bank.
  - **The Demographic and Health Survey (DHS)** is an international survey programme designed to provide current and reliable information on key indicators of social development. The DHS collects data on the highest level of education of all respondents and all household members.[18] Even though DHS surveys are mainly focused on the areas of population, health, and nutrition, on occasion (but quite rarely) they may include a section on education expenditure.
  - **Multiple Indicator Cluster Surveys (MICS)** play a key role in tracking progress towards the elimination of disparities and inequities. Similar to the DHS surveys, MICS can also, on occasion, cover education expenditure, although this is not a core part of the survey, as it is mainly focused on social and health data collection.

In almost all developing countries, these surveys will be implemented by national statistical offices with the technical and/or financial assistance of international organizations (often UNICEF or the World Bank). Surveyed households are typically asked to estimate expenses incurred over a given period of time for various items, including those for the education of household members. Most of these surveys also include information on the enrolment status (level of education, current class, type of school, etc.) and on the socio-economic and demographic characteristics of household members (location, wealth, etc.). It is thus possible to intersect the various types of information to estimate expenditure per enrolled child by level of education as well as other relevant dimensions. Doing so, however, is not always a straightforward exercise, as the section below explains.

1.2 Limitations concerning the use of household surveys for education spending estimation

Household surveys are currently the only comprehensive source of data from which to estimate household expenditure on education. However, existing surveys come with several challenges and limitations which should be kept in mind and properly dealt with during data processing and analysis in order to derive valid estimations of expenditure on education. While some of these limitations and challenges are related to household surveys in general, others are specific to expenditure on education.

Generally, household surveys are associated with two types of error: sampling errors and non-sampling errors.

A) **Sampling errors** arise from factors related to the sampling design, i.e. the way the survey was designed, samples selected, and, in particular,

[17] http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTLSMS/0,,menuPK:3359053~pagePK:64168427~piPK:64168435~theSitePK:3358997,00.html

[18] http://dhsprogram.com/Topics/Education.cfm#sthash.FrpGNPLQ.dpuf

the extent to which the selected samples are representative of the entire population.

Most sampling errors need to be dealt with during the survey design stage by increasing the sample size or using proper stratification techniques. Technical and methodological survey manuals usually provide users with sufficient documentation on the extent and parameters of known sampling errors and how they were handled (United Nations, 2008).

B) **Non-sampling errors** are usually the most important when estimating household spending on education. In fact, in most surveys, sampling errors are negligible compared with non-sampling errors. Non-sampling errors may arise from the failure to obtain data from a sample unit or a variable – in which case they are called non-observational errors – or measurement errors, or a failure to cover adequately all components of the population being studied, in which case they are called coverage errors.

- *Non-response errors* are the most common non-observational errors. They concern a situation where no data are collected from part of the sample. This may be because a household or person refuses to cooperate, because there is a language barrier, or because no one is at home during the survey period.
- *Measurement errors* affect the actual values of variables and may come from several sources, such as respondents, interviewers, data-entry clerks, and even data-processing systems. Respondent-related measurement errors occur when a respondent forgets information needed and gives an incorrect response, or distorts information in response to a sensitive question.
- *Coverage errors* are errors in an estimate that result from a failure to include specified units in the conduct of a survey (under-coverage) or the erroneous inclusion of some units, either because of a defective frame or because of inclusion of unspecified units or of specified units more than once in the actual survey (over-coverage) (US OMB, 1988: 44). For instance, coverage errors occur when a survey does not properly cover all areas of a country or excludes certain segments of the population, such as high-income households, for instance.

Regarding expenditure on education specifically, the error sources discussed above may have significant impacts. As described in the introduction, existing household surveys are not designed to collect data on expenditure on education, which represents a relatively small section among many others. Consequently, data on expenditure may be subject to important errors that need to be taken into account during processing. These are the most common:

- **Missing or under-represented levels of education or education programmes**: some levels of education or education programmes may not be represented well enough to allow for valid estimations, or be completely missing from the survey. These are often levels of education or programmes with traditionally relatively low enrolment numbers, which affects the likelihood of their being sampled. Pre-primary, early childhood development, and vocational and technical programmes are the most common cases. This situation can only be addressed during the sample design stage.
- Education expenditure items may be surveyed using **a classification of education expenditure which does not match the NEA definition**. As outlined in Step 2, the education expenditure sections of household surveys are not standardized, and the basket of goods considered may vary from country to country, or between surveys. This is a challenge in the context of a comprehensive exercise such as an NEA where the delineation of the education expenditure domain is essential, or when attempting to compare household expenditure between countries.
- **Measurement errors** can have the most critical impact on estimates. They occur when a respondent fails to report the true value of an education expense because of recall errors, or when the respondent reports an event as being within the reference period when it actually occurred outside that period. Non-sampling measurement errors also occur when the interviewer relies on information provided by a proxy respondent who provides the information on behalf of other members of a household, which is often the case in surveys where the household head is asked to report on the education expenditure of all members of the household. Measurement errors may also arise because respondents are embarrassed or wish to avoid any risk of social stigma.
- **Non-response and missing data** are also common and may have important effects on subsequent estimations. In the case of education expenditure, non-responses are primarily due to omissions when surveyed households forget to report incurred education expenditure because they do not keep records of their expenses. This results in a dataset with missing data which, if not adequately addressed, can have an impact on the validity of estimations derived.
- **Seasonal bias** arises when there is significant seasonal variation in education expenditure (such as at the beginning of the academic year compared with the rest of the year) and the survey is not designed to collect data for all periods in the year. This problem must be dealt with at the design stage, either by arranging to collect data on the expenditure of households over a full year, or by spreading the interviews over a year.
- Household surveys sometimes **lack regularity**. Where they are carried out every five years or less, estimations based on price indices can be used to fill in missing data. However, in some cases, the latest survey may be 10 years old or more, in which case estimations would not be a good representation of the reality of the moment.

There are several statistical techniques to deal with each of the above mentioned potential non-sampling errors. A useful approach would aim to:

a) Conduct a series of tests and quality assurance checks in order to identify potential errors or abnormalities within the data. Some of the errors are fairly easy to identify, such as missing data, duplicates, or outliers, while others may require advanced techniques. Before using raw data, it is necessary to verify that it is 'clean'. A simple sorting, cross-tabulation, or chart may help identify errors, for example, calculating total expenditure per child.

b) Once an error is identified, assess the size and potential impact of the error on the work being done. The importance of the impact on the estimates of interest will determine what kind of response is needed.

c) Choose appropriate procedures to reduce the size of the error or its impact on the estimates of interest. For instance, in the case of non-response, the issue could be addressed by *reweighting*, if it is related to sampling unit non-response, or by *imputation*, in the case of item non-response/missing data. Sometimes, if identified errors are judged to have limited impact, it may be decided to do nothing and use available data unaltered. Measurement errors are difficult to quantify, usually requiring special, expensive studies, such as re-interview programmes, record check studies, behaviour coding, cognitive testing, and randomized experiments. In some extreme cases, where errors have important impacts on estimates of interest and are impossible to address, it may be more appropriate to not use the data at all.[19]

2. Steps to extract data and make estimations

STEP 1: Identifying the type of information available in the survey

Once the survey questionnaire has been obtained, the type of education expenditure data potentially available from the data should be clarified. There are three broad possibilities:

1. There is an education expenditure section asking respondents to estimate how much was spent on the education of *each member of the household* over a given period of time, and a disaggregation between different types of expenditure (tuition fees, uniforms, textbooks, etc.). This means that by crossing variables on school enrolment (type of school, level of education attended) of each individual in the household with his or her education expenditure, an average by sub-category can be straightforwardly calculated. This is the best case scenario, and the one which is assumed in the subsequent steps of this note.
2. There is an education expenditure section asking respondents to estimate how much was spent on education *by the entire household* over a given period of time, and a disaggregation between different categories of expenditure (tuition fees, uniforms, textbooks, etc.). In this situation, data may still be usable, but because it will not be possible to associate spending with a specific individual in the household, econometric estimation techniques will be necessary, where total expenditure on education for the household is regressed against the number of enrolled children in that household by education level and by institution type. Average expenditure on education per enrolled child by level of education and by type of institution will then be the regression coefficients. For more information about these techniques, please refer to IIEP Pôle de Dakar's methodological guidelines on household education spending (IIEP-UNESCO, 2013).
3. There are a small number of questions asking respondents to estimate how much was spent on education *in total by the entire household* over a given period of time. In addition to the challenges outlined in the second option, it will not be possible to disaggregate by type of expenditure (tuition fees, uniforms, textbooks, etc.). It may not be possible to use the data for a full NEA or for any detailed analysis, but they could still be used to produce some broad aggregates.

STEP 2: Identifying and understanding the variables necessary for the analysis

The second step is to identify and understand all the variables which will be necessary for the estimation of averages per student. When doing so, it will be important to classify those variables (and in some cases merge them) so that they fit, as closely as possible, the NEA classification, since, ultimately, the data will need to be integrated with data on other sources of education funding (government and rest of the world). This can be a challenge, since, often, the variables in the survey will not have been defined for this purpose, and the categories may be hard to match. When choosing how to treat the variables, a trade-off should be considered between the level of detail desired and the need for an acceptable sample size for each sub-group considered.

For example, there may be three types of private school in a country, which may be interesting to consider separately. However, if a sub-category is created for each, the number of observations may become too small to be valid. In such cases, it is advised to merge the three and create a new 'private schools' variable in the database before extracting the averages.

Having a printed questionnaire of the survey at hand can also be helpful. In fact, survey datasets do not have all the details necessary for data processing, while survey questionnaires usually include the coding definition of each variable and the corresponding question.

2.1 Type of expenditure

Each household survey will include a distinct list of questions on the type of education expenditure incurred by respondents, although they normally have some common features. To match the NEA classification and to prepare the data for eventual international comparison, the survey variables (questions asked) should, at a minimum, be grouped into the following two sub-groups:

1. Household payments *to* educational institutions, which should include the following (which may or may not constitute additional categories, depending on survey questions, national interest, and consequent sample size in the sub-group):
   i. tuition fees;
   ii. other fees charged for educational services (such as registration fees, laboratory fees, or examination fees);
   iii. fees paid for ancillary services provided to students by educational institutions, such as for board/student housing, meals, health services;
   iv. contributions to PTAs, school-management committees (SMCs), or any sort of 'school fund' or 'parent contribution fund' paid to the school.
2. Household payments for education goods and services purchased *outside* educational institutions,

[19] For more information on survey data processing techniques in response to errors, see: *United Nations, 2008; United Nations, 2005; Brilhant and Cavon, 2004; Minot, 2009.*

which are the 'connected products' as described in *Chapter 2* of the NEA methodological guidelines. These include two main sub-groups:

a. Payments required for school attendance, for example:
   i. school uniforms and other required clothing;
   ii. school books and teaching materials;
   iii. other required purchases, such as athletic equipment, materials for arts lessons, and so forth.

b. Payments *not* required for school attendance, but *nonetheless linked to participation in the education programme*, for example:
   i. extra classes or private tuition linked to the official curriculum;
   ii. transport to and from school or canteen fees where these services are not provided through educational institutions;
   iii. additional books or computer or learning software to be used at home in support of schooling.

The criteria used to decide whether or not the expenditure should be included under 'education expenditure' should be whether the expenditure would have been incurred if the individual did not attend school. If the answer is 'yes', it should probably be excluded (if possible). For example, extra music, arts, language or other leisure classes *not* linked to the official curriculum should be *excluded*.

Table 1 illustrates how the 'type of expenditure' variable in three different surveys can be fitted into these common categories. In practice, it may be very difficult to match the categories exactly into the above definitions, as this is not how household questions are designed. Best efforts should, however, be made, using the available information. There are three things to note about the examples in *Table 1*:

1) The basket of goods included is not the same in all three countries, illustrating problems of comparability. For example, there is no clear reference to food, meals, or canteen fees in the Viet Nam survey, as opposed to Nepal and Côte d'Ivoire.
2) Some items appear on their own in some surveys, and as part of a broader 'other' group in others (e.g. transport).
3) There are 'other expenses' categories, not very well defined and including different groups of items.

Table 1. Example of differences in existing household survey education expenditure questions, and how they can be grouped under common categories

Minimum/ common set of questions	Household expenditure in educational institutions				Household expenditure outside educational institutions								'Other' categories to reassign or leave out	
					Goods and services required for school attendance			Goods and services not required for school attendance						
	Tuition and other fees			Ancillary fees paid to institutions (canteen, board, transport)	Uniforms and other school clothing	Textbooks and school supplies		Private tutoring	Canteen and transport to school purchased outside of institutions		Other not required (but linked to school attendance)			
Nepal	Tuition fees	Other fees (exams admission, events, etc.)			Uniforms	Textbooks and supplies		Private tuition	Transport				Others (snacks, tea, etc.)	
Viet Nam	Tuition fees	Contribution to school construction fund	Parents' fund, class fund		Uniforms	Textbooks and reference books	Other educational materials	Extra classes linked to curriculum					Other education costs (transport, lodging, etc.)	
Côte d'Ivoire	Tuition fees	Inscription and other fees	SMC or PTA		Uniforms, sports and other clothing	Books and other teaching materials		Private tuition, repetition, extra courses	Transport	Food, canteen, lodging	Contribu-tions to extra-curricular activities		Identity documents required for school attendance	Other school expenses

2.2 Level of education

The survey variables related to the grade or level of education in which the individual is currently enrolled (often in another section of the questionnaire) should be identified and assigned or merged to match the NEA classification. This should reflect the way the national education system is organized in the country in which the household survey is conducted, as well as being easily relatable to an ISCED level (see the 'Level of education' section of *Chapter 3* in the main NEA guide). When the survey classification is by grade rather than level, relevant grades should be merged together to form a new category/variable in the database. For example, grades 1 to 6 may correspond to primary education in a given country.

2.3 Producing unit (type of educational institution)

With regard to level of education, the type of institution currently attended by the individual should be identified and assigned or merged to match the NEA classification of producing units. This may mean merging some survey variables, especially if it increases the sub-group sample size (or the number of observations by sub-category). At a minimum, institutions should be separated between public and private.

2.4 Background characteristics

Background characteristics such as gender, location, and economic status are provided by most surveys and may be worth having alongside education expenditure variables for further analysis, even if they are not necessarily required for estimations or for the NEA.

STEP 3: Identifying the sample in the sub-group and the recall period

Depending on when the survey was conducted, expenditure on education is reported for the current year, the previous one, or the last 12 months. It is important to identify the period over which declared expenditure on education was incurred, along with the corresponding school year, in order to identify the level of education of enrolled children for whom expenditure was reported.

If the survey includes household spending, it necessarily specifies the year in which it was incurred. Furthermore, the education section often covers school status for at least two years, the current and the previous. If expenditure is declared for the previous 12 months and that covers two schooling years, depending on the date when the survey was conducted, reported expenditure should be attached to the school year spanning the majority of the 12 months.

STEP 4: Estimating per student averages

Once the key variables have been identified, merged, and/or classified, the next step is to produce weighted averages per student for each of the sub-categories. **Our estimation of interest is the average household expenditure per student per level of education and producing unit, and by type of expenditure.** Since these estimates must be produced by level of education and producing unit, sub-groups will be considered, each covering one level of education and one producing unit. Estimates will be calculated for each sample in these sub-groups.

Table 2. Example of a dataset with required variables for estimating expenditure on education

Household ID	Individual ID	Level of education	Producing units	TOTAL expenditure	Tuition and other related fees	Ancillary fees paid to institutions	Uniforms and other school clothing	Textbooks and school supplies	Other purchases outside of institutions	Weight (Wi)

The estimation must be weighted to reflect the population of the country as a whole. The weight of a sampled unit *i* can be interpreted as the number of population units represented by that unit. Weights are provided in the database for each survey, and these should be used in the calculations.

The average expenditure per student per level of education equals the weighted sum of all expenditure of/for students enrolled at that level of education, divided by the weighted sum of students enrolled at that level of education.

Formally, this can be written as follows:

$$\widehat{\bar{y}_g} = \frac{\sum_{i \in s} w_i * y_{gi}}{\sum_{i \in s} w_i * I_{gi}}$$

Where:

- $\widehat{\bar{y}_g}$ is the weighted average of expenditure on education for education level *g*
- ***i*** identifies the individual *i* enrolled at a given level *g*
- ***g*** stands for the level of education, *g* being pre-primary, primary, secondary, etc.
- y_{gi} , is the total expenditure on education made on the i*th* student in the sample *s* enrolled at level of education *g*
- $I_{gi} = \begin{cases} 1, i \in U_g \\ 0, otherwise \end{cases}$ U_g is the considered sub-group of students enrolled at level of education *g*
- $w_i =$ is the weight of the i*th* student in the sample
- **S** is the sample of the household members that participated in the survey.

This formula can then be generalized into sub-groups, with greater disaggregation. For example, if we consider the sub-group that consists of primary students in public institutions, then the goal is to estimate the average household expenditure in education per primary student in public institutions.

The average expenditure per student of public primary institutions equals the weighted sum of all expenditure of/for students enrolled in public primary institutions divided by the weighted sum of students enrolled at public primary institutions.

Formally, this can be written as follows:

$$\widehat{\overline{y_{gk}}} = \frac{\sum_{i \in s} w_i * y_{igk}}{\sum_{i \in s} w_i * I_{igk}}$$

With:

- $\widehat{\overline{y_{gk}}}$ the weighted average of expenditure on education for education level *g* and producing unit *k*
- ***i*** identifying individual *i* enrolled at a given level *g*, producing unit *k*
- ***g*** standing for the level of education, *g* being pre-primary, primary, secondary, etc.
- ***k*** standing for producing unit, *k* being either public, private, etc.
- y_{igk} as the total expenditure on education made on the i*th* student at level of education *g*, producing unit *k* in the sample *s*
- $I_{gki} = \begin{cases} 1, i \in U_{gk} \\ 0, otherwise \end{cases}$ U_{gk} as the subgroup of students enrolled at level of education *g*, producing unit *k*
- w_i as the weight of the i*th* student in the sample
- ***S*** as sample of the household members that participated in the survey.

Note that the sample size in the specified subgroup might be quite small, which can produce estimations of limited validity. It is important to extract, in addition to averages, the number of sampled units in each sub-group, and decide on a minimum number of observations (for example, 25) to judge the estimations as valid. Similarly, the standard deviation (or other types of tests) should be extracted for each average, to help judge its validity. It could be that in some sub-groups (e.g. students in private technical education), the number of sampled units will be too small and/or the standard deviation too large and it will not be possible to produce valid estimations.

STEP 5: Multiply by the number of students to estimate totals per sub-category

Once an average for each sub-category has been produced, the next step is to estimate the total for the whole country for each, so that it can be integrated with the other financing unit data in the NEA.

The data source for the number of students in each sub-group should be the administrative records (e.g. from the EMIS) of the ministry (or ministries) of education. This method should be used, rather than calculating a total directly from the household survey database, for two main reasons. First, because household surveys are not designed for education specifically, the weight given to some specific education-related population groups will not be representative of the situation at national level. Second, it is important to ensure consistency with estimations and calculations on other sources of funding (for example, government), especially in the context of an NEA.

When the household expenditure totals per category are integrated into the NEA tables (or database), all household payments *to* educational institutions (the first point under Step 1) should be classified as 'teaching activities' of educational institutions, under 'other goods and services'. This is because it is not possible to know exactly how these funds are used at school level, until the perspective of the producing unit (the school) is reconciled with that of the financing unit. All household payments for education goods and services purchased *outside* educational institutions should be classified under 'connected products'.

3. How to design new (or improve on old) survey sections on education expenditure

Most currently available household surveys contain either limited or not quite fit-for-purpose data on education expenditure. Where possible, or when a new survey is put in place, it may be worth discussing with the national statistics office the need to make small modifications to the education expenditure section so that data is more usable in future.

First, issues of sampling and recall period should be considered. While the sampling design of a multi-purpose survey will never be entirely adapted to the needs of the education sector, there may be options for improving the coverage of certain under-represented categories. Similarly, the recall period for all education-related questions in the survey may be reconsidered so that it matches the school year more closely. For example, households could be asked how much they have spent over the most recent completed school year, rather than over the last 12 months (which may overlap two school years and complicate estimations).

The way in which the questions are put to respondents in the education expenditure section should follow a few key principles:

1) The domain of what constitutes household expenditure on education should be specified in the questionnaire. It should match the domain of the NEA (as described in *Chapter 2* of the main NEA guide), and where there are additional items which may not fit within the NEA domain but may, nevertheless, be of interest to national policy-makers, they should be included in a distinct category or question.

2) At a minimum, categories of type of expenditure should distinguish between payments *to* and *outside* educational institutions, as described in Step 1.

3) 'Other' categories should be avoided. Respondents should be encouraged to report expenditure according to the type of classification shown below, even if they are rough estimations. If absolutely necessary, there could be a 'not allocated' category, but with a specification that it should only include expenditure which fits under the education domain described, and which could fit under one or more of the categories but may be hard to disaggregate.

Below is an example of the way in which household expenditure for education should be classified in order to produce data usable in a NEA, and comparable between countries. The exact questions and names should reflect national realities, and may contain more categories than the common ones shown. There can also be additional *and separate* categories outside the NEA domain if desired.

In addition to questions about expenditure, household surveys often ask whether students have received any financial support for their education. This information can be of interest, especially in the context of an NEA where it is important to consider transfers between financing units and avoid double-counting. However, this is only possible when the questions are asked in a way which specifies where

the funding came from, as opposed to a general 'financial support' category which often mixes up support from the government, NGOs, or other sources. To avoid this problem, it would be advisable to separate the questions about the amount received through scholarships, student loans, and other financial support received for education in the past 12 months into: (1) received from government; (2) received from NGOs or faith-based organizations; and (3) received from individuals outside the household (including support received from remittances from abroad).

Table 3. Suggested common categories for future household surveys, with flexibility for national categories

Minimum/common set of questions	Household expenditure in educational institutions				Household expenditure outside educational institutions						Not included in NEA or for international comparison
					Goods and services required for school attendance		Goods and services not required for school attendance				
	Tuition and other fees			Ancillary fees (canteen, board, transport)	Uniforms and other school clothing	Textbooks and school supplies	Private tutoring	Canteen and transport to school purchased outside of institutions		Other not required (but linked to school attendance)	
Individual country household questionnaire example	Tuition fees	Exams and registration	Contribution to PTA	Boarding fees	Uniforms	Textbooks and supplies	Private classes	Transport	School meals	Computer and extra books	Music and arts lessons

4. Steps applied to an example from an actual household survey

Below is an illustration of the methodology, using data on household expenditure on education from a household expenditure survey conducted in Côte d'Ivoire in 2008 (Côte d'Ivoire INS, 2008). All the computation steps that follow were undertaken using Stata software, but the same logic can be followed using other statistical software (SAS, SPSS, etc.).

STEP 1: Identifying the type of information available in the survey

The ENV 2008 is a 'best option' type of survey, in that detailed questions by type of expenditure are asked for each member of the household, making it relatively straightforward to estimate expenditure by level of education, producing unit, and type of expenditure.

STEP 2: Identifying and understanding the variables necessary for the analysis

4.1 Identifying and retaining from the original household survey dataset

1) The variables related to household expenditure on education. In the case of the Côte d'Ivoire ENV, these variables are in section Ha of the questionnaire, and the corresponding dataset is ha.dta.

2) The auxiliary variables that are not related to household expenditure on education, but that will be used as indicators to group household members by level of education and type of institution (public/private). These are included in section D of the questionnaire, and the corresponding dataset is d.dta.

3) If desired, further analysis based on gender or on urban/rural classification can be included, using information from section A of the questionnaire and the dataset a.dta.

4.2 Creating ID variables for the household and its members

First we create ID variables for the households as well as their members. Below is an example of a Stata code to do that:

```
keep grappe menage region depart mil idcode d10 d11a d11b d12 d13a d13b d14 d15 d16
gen long IDHH = grappe*10^2+menage
gen long IDHM=IDHH*10^2+idcode
order IDHH IDHM  d10 d11a d11b d12 d13a d13b d14 d15 d16
```

4.3 Creating education expenditure variables

From the section Ha of the questionnaire, we identify the variables that relate to household expenditure on education. In the Côte d'Ivoire ENV, there are 11 variables (or questions in the survey) related to education expenditure. Some of the variables may be summed up, while others may be kept as they are, depending on analytical needs and the consequences of the size of the sub-group.

For example, a new variable can be created for 'fees', merging ha1 (registration fees) + ha2 (tuition fees) + ha9 (contributions to PTA):

```
gen fees= ha1 + ha2 + ha9
```

For school supplies, the variable can be equivalent to ha3, 'textbooks and other school supplies':

```
gen school_supply = ha3
```

The same can be done for all other desired variables. It is also important to create one for total expenditure (all types combined), as follows:

```
gen total_exp= ha1 + ha2 + ha3+ ha4 +ha5 + ha6 + ha7 + ha8+ ha9
+ ha10 + ha11
```

4.4 Creating variables for the level of education attended by household members

The variable d13b ('What is your enrolment level in the current year?') is used to group household members by grade. To group household members enrolled in primary education, an indicator variable 'Primary' is created which takes value 1 whenever d13b falls between grades 2 and 7, as primary education is defined in Côte d'Ivoire. The same approach is applied to the remaining education levels as they are defined

in the country (pre-primary g1, general secondary first level g 8–11, general secondary second level g 12–14l, etc.)

The following Stata code generates the indicator variables for primary education level, and can be adapted to each other level:

```
gen Primary = (d13b==2 | d13b==3 | d13b==4 | d13b==5 | d13b==6
| d13b==7)
replace Primary =1 if d13a==2
replace Primary =. if d13b==.
label var Primary 'enrolled in Primary in the current year'
```

4.5 Creating variables for the type of institution attended by household members

The variable d15 ('What is the type of institution?') is used to group the household members by type of institution (producing units in the NEA classification).

The codification of the variable is as follows:

```
1 = Public, 2 = Private international, 3 = Confessional, 4 = Private
secular, 8 = Other
rename d15 type_inst
la var type_etabs inst 'type of institution'
```

In this case, there are three separate categories of private institution plus an 'other' category. They can be kept separate if that is useful to the analysis. However, this may mean very small sub-groups when per student averages are estimated. If that is the case, it may be advisable to merge variables by creating a new 'private' one, joining 2, 3, 4, and 8 together.

4.6 Creating variables for background characteristics of household members

Additional characteristics of household members can be obtained from Section A of the questionnaire (dataset a.dta), for example, gender, age and urban/rural classification. These can be used subsequently for further analysis.

```
rename a3 sex /* 1= male, 2= female */
rename mil classification /* 1=urban, 3= rural */
label var classification 'classification urban/rural'
rename a6a age
```

4.7 Merging the datasets

Finally, all these datasets must be merged: a.dta for the characteristics of the households, d.dta that contains the auxiliary variables indicating the type of institution as well as the education level, and ha.dta for the variables that pertain to the household private expenditure on education, in order to get a larger dataset that contains all of these variables.

```
use 'C:\ d.dta'
merge IDHH IDHM using 'C:\ a.dta'
drop _merge
merge IDHH IDHM using 'C:\ ha.dta'
drop _merge
```

Data Editor (Edit) - [caracteristiques3.dta]

File Edit View Data Tools

IDMEN[1] 119

	IDMEN	IDIND	strate	grappe	idcode	ha1	ha2	ha3	ha4	ha5	ha6	ha7
1	119	11901	11	1	1	.	.	.	.	.	.	.
2	105	10507	11	1	7	.	.	.	.	.	.	.
3	117	11702	11	1	2	.	.	.	.	.	.	.
4	108	10805	11	1	5	.	.	.	.	.	.	.
5	116	11602	11	1	2	.	.	.	.	.	.	.
6	114	11402	11	1	2	.	.	.	.	.	.	.
7	111	11101	11	1	1	.	.	.	.	.	.	.
8	108	10802	11	1	2	.	.	.	.	.	.	.
9	110	11004	11	1	4	.	.	.	.	.	.	.
10	110	11003	11	1	3	.	.	.	.	.	.	.
11	108	10804	11	1	4	.	.	.	.	.	.	.
12	104	10406	11	1	6	10000	0	20000	15000	0	36000	16200
13	105	10505	11	1	5	.	.	.	.	.	.	.
14	118	11806	11	1	6	3000	0	0	6000	0	0	0
15	112	11201	11	1	1	.	.	.	.	.	.	.
16	119	11902	11	1	2	.	.	.	.	.	.	.
17	107	10701	11	1	1	.	.	.	.	.	.	.
18	118	11801	11	1	1	.	.	.	.	.	.	.
19	105	10503	11	1	3	.	.	.	.	.	.	.
20	104	10402	11	1	2	.	.	.	.	.	.	.
21	111	11102	11	1	2	.	.	.	.	.	.	.
22	120	12003	11	1	3	.	.	.	.	.	.	.
23	115	11505	11	1	5	15000	45000	17000	10000	90000	63000	0

STEP 3: Identifying the sample in the subgroup and the recall period

In the Côte d'Ivoire ENV 2008, variable d12 indicates whether the household member is attending school in the current year. Only those attending should be included in the sub-group. As is often the case, the survey asks respondents to report expenditure on education incurred within the last 12 months. Since the last 12 months may overlap two school years, adjustments may be required by including variable d11, or which grade was attended by the household member the *previous* year.

STEP 4: Estimating average household expenditure on education

The next step is to estimate average household expenditure on education, by type of expenditure, by level of education, and by producing unit. We can also compute estimates by gender and by rural/urban classification if we wish to.

Using the Stata svyset procedure, we declare our sampling variables, namely the weights of the household members, the primary sampling units, as well as the strata:

```
svyset [pweigh=pond], psu(grappe) strata(strate).
```

Example 1: Total household expenditure on education, by level of education

While we ultimately want expenditure disaggregated by all three dimensions (level, producing unit, and type of expenditure), we must also estimate totals and sub-totals directly from the database (as opposed to summing up the sub-categories at a later stage). The following Stata code will give us estimates of the average household total expenditure on education by level of education, as well as for all levels of education combined:

svy: mean total_exp (e.g. for all levels combined)
svy: mean total_exp if Pre_primary ==1 (e.g. for pre-primary)

Below is the result for pre-primary, including an estimate of the standard error and the confidence interval. The same can be repeated for all other levels (e.g. for first general secondary: svy: mean total_exp if SECGEN1==1):

```
. svy: mean total_exp if  Pre_primary==1
(running mean on estimation sample)

Survey: Mean estimation

Number of strata =      11        Number of obs    =        245
Number of PSUs   =     152        Population size = 250.503006
                                  Design df        =        141
```

	Linearized			
	Mean	Std. Err.	[95% Conf.	Interval]
total_exp	69881.77	6921.488	56198.47	83565.08

Example 2: Total household expenditure on education, by level of education and type of institution

We can repeat the same procedure, this time adding a breakdown by producing unit: public or private educational institution. For example, for pre-primary students in public institutions, the code would be:

svy: mean total_exp if Pre_primary==1 & type_inst ==1

Below is the result, which can be repeated for other levels (e.g. for tertiary public education: svy: mean total_exp if TER==1 & type_inst==1):

```
. svy: mean total_exp if  Pre_primary==1 & type_inst ==1
(running mean on estimation sample)

Survey: Mean estimation

Number of strata =      11        Number of obs    =        118
Number of PSUs   =      95        Population size = 112.980323
                                  Design df        =         84
```

	Linearized			
	Mean	Std. Err.	[95% Conf.	Interval]
total_exp	48035.64	7030.243	34055.23	62016.05

To do the same for private institutions, all private institution variables should be included (2, 3, 4, and 8, in this case) instead of the public institution variable (1). For example, for primary private institutions the code would be:

svy: mean total_exp if Primary==1 & [type_inst==2 | type_inst==3 | type_inst==4 | type_inst==8]

Example 3: Household expenditure on education, by level of education, producing unit, and type of expenditure

Finally, we want to estimate expenditure by type of expenditure. For example, to estimate the expenditure on uniforms per primary student enrolled in private institutions, we can run the following Stata code:

svy: mean uniform if Primary==1 & [type_inst==2 | type_inst==3 | type_inst==4 | type_inst==8]

```
.    svy: mean uniform if [type_etabs==2|type_etabs==3|type_
     etabs==4|type_etabs==8] & PRIMAIRE ==1
(running mean on estimation sample)
Survey: Mean estimation

Number of strata =      11        Number of obs    =      1,000
Number of PSUs   =     292        Population size = 1,050.1113
                                  Design df        =        281
```

	Linearized			
	Mean	Std. Err.	[95% Conf.	Interval]
uniform	4029.202	270.9209	4200.162	5370.242

In the context of an NEA, the objective is to produce a financing table for total household expenditure. The estimated averages per student can, therefore, be put into an intermediate NEA financing table format, as shown in *Table 4* (the example here is a reduced version for ease of reading). As explained in the first section of this annex, all fees and payments made directly to schools should be recorded as 'goods and services', under 'direct expenditure of producing units', while all expenses incurred outside producing units (e.g. textbooks, uniforms, private tuition) should be recorded as 'connected products'.

Table 4. Intermediate NEA table with average expenditure per student:

		Direct financing of producing units		Connected products (outside producing units)					Total
		Teaching activities	Total producing units	Goods and services required for schooling			Not required for schooling		
		Goods and services		Uniforms	Textbooks and school supplies	Transport	Private tuition	Other	
Pre-primary		...	...	...	...	...	...	...	69,882
	Public	19,351	19,351	...	...	...	...	...	48,036
	Private	...	...	...	...	...	...	...	...
Primary		...	...	...	...	...	...	...	...
	Public	...	...	...	...	...	...	...	...
	Private	...	...	4,829	...	...	...	...	...
First general secondary		...	...	...	...	...	...	...	...
	Public	...	...	...	22,088	...	...	...	...
	Private	...	...	...	...	...	...	...	...

Step 5: Multiplying by the number of students to estimate totals per sub-category

The final step consists of multiplying the averages per student by the number of enrolled students for each level of education and producing unit, to obtain the final NEA financing table for households, showing total expenditure for the whole country (*Table 6*). The enrolment figures are obtained from external sources, usually the ministry of education's information management system. Enrolment figures should cover a year which correspond to the survey's reference year (in this case 2008). For example, average expenditure on tuition fees for students in pre-primary public institutions is FCFA 19,352 (*Table 4*), which means that for the 33,112 students enrolled in pre-primary public institutions (*Table 5*), an estimated total of FCFA 640,750,312 is paid to pre-primary public schools in fees (*Table* 6).

Table 5. Number of students per level and type of institution

		No. of students
		2008
Pre-primary	Public	33,112
	Private	19,513
Primary	Public	2,184,789
	Private	171,451
First general secondary	Public	423,880
	Private	211,721

Table 6. Final NEA financing table for households' total expenditure on education

		Direct financing of producing units		Connected products (outside producing units)					Total
		Teaching activities	Total producing units	Goods and services required for schooling			Not required for schooling		
		Goods and services		Uniforms	Textbooks and school supplies	Transport	Private tuition	Other	
Pre-primary		...	...	...	...	...	...	...	3,677,528,146
	Public	640,750,312	**640,750,312**	...	...	...	...	...	1,590,552,800
	Private	...	...	...	...	...	...	...	...
Primary		...	...	...	...	...	...	...	...
	Public	...	...	...	...	...	...	...	...
	Private	...	...	827,936,879	...	...	...	...	...
First general secondary		...	...	...	...	...	...	...	...
	Public	...	...	...	22,088	...	...	...	...
	Private	...	...	...	...	...	...	...	...
Etc ...		...	...	...	...	...	...	...	...
	Etc ...	...	...	...	...	...	...	...	...
TOTAL		...	...	...	...	...	...	...	...

One final element to consider is the question of transfers, which, in the case of households, comprise financial support for education received from governments and/or other financing units. These should be recorded separately so they can be netted out of the total when all financing units are consolidated. Although household surveys often include a question related to financial aid, it is not always appropriate in the context of an NEA and education expenditure analysis. For example, in the Côte d'Ivoire ENV, questions are asked about whether the household member has received a school kit (ha13) and about general financial support received from governments and other institutions, including scholarships but also other types of support not linked to education (f7 in another section). Because the definition of this variable is not accurate for the purpose, it is better to record scholarships, grants, and loans from government data sources (e.g. budget files where this information is often available), but in some cases it could be that recording the amount available from the household survey is the best (or only) available option.

Annex 3: Country experiences

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'The French education accounts, principles and methods'. In: Les dossiers n°199, Direction de l'évaluation, de la prospective et de la performance, May 2011.

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ISCED International Standard Classification of Education

The document on the International Standard Classification of Education 2011 is available in Arabic, Chinese, English, French, Indonesian, Macedonian, Russian, and Spanish on the website of the UNESCO Institute for Statistics:

http://www.uis.unesco.org/Education/Documents/isced-2011-en.pdf

Education Sector Analysis Methodological Guidelines

The guidelines are presented in two volumes, also available in French.

The first volume features methodologies for assessing six sector-wide thematic areas: context; access; costs and financing; quality, system capacity, and management; external efficiency; equity.

https://www.iipe-poledakar.org/sites/default/files/fields/publication_files/edu_sector_analysis_guide_v1_en_low_def_final.pdf

The second volume covers four sub-sectors: early childhood development, higher education, literacy and non-formal education, and technical and vocational education and training.

https://www.iipe-poledakar.org/sites/default/files/fields/publication_files/edu_sector_analysis_guide_v2_en_low_def_final.pdf

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