Ministry of Education Youth and Sport

KINGDOM OF CAMBODIA

NATION RELIGION KING

EMIS MASTER PLAN

2014-2018

March 2014

EMIS Master Plan

2014-2018

March 2014

Preface

Cambodia has considered human capital investment in the form of education as a major tool for sustainable development. Education plays a key role in achieving moral, aesthetic, intellectual, ideological, cultural, social, scientific and technological development of people in society as well as the national goals of unity, democracy, economic progress and security for all Cambodia's citizens.

Accurate and timely education data is essential for effective education planning, monitoring, evaluating and budgeting and for other activities that are essential to the operation and progress of the education system at each level of government. Information regarding education indicators is required for measuring progress towards important goals for our education system such as the 2015 Millennium Development Goals (MDG) and Education for All (EFA) targets.

In the progress towards this goal of achieving accurate and timely information, we are pleased to present the EMIS Mater Plan 2014-2018. The plan is designed to ensure that Cambodian Education Planning is informed by the most timely, detailed and accurate data possible. The plan provides a comprehensive roadmap to improving all aspects of education data, monitoring and planning throughout ECD, primary, secondary and higher education in Cambodia.

The plan is in line with our national vision of participatory democracy in which citizens and civil society organizations, armed with information such as that derived from EMIS, can play a more active role in the social and economic development of our education system within an agreed consensus.

EMIS Mater Plan will support the objectives of the *Education Strategic Plan 2014-2018*, and the *Policy on Information and Communication Technology in Education 2009-2013*. The EMIS Mater Plan will:

*   Strengthened capacity and systems for analysis, planning, monitoring, review and evaluation at all levels
*   Strengthened capacity and systems to manage, develop and incentivize human resources effectively, efficiently and equitably;
*   Effective administration, ICT and information management; and Strengthened capacity and systems for financial management and audit.

We hope that through the implementation of this plan education planning at all levels will be significantly strengthened over the coming years. This will ultimately benefit children by addressing issues of inequality and through improved access to quality education.

The ministry hops that all stakeholders participate and provide support the implementation of the EMIS Master Plan 2014-2018 successfully.

Phnom Penh, March 07 , 2014

Minister,   Dr. HANG CHUON NARON

Ministry of Education, Youth and Sport

Summary

In application of Cambodia's Education Law, it's Education for All National Plan, and the Education Strategic Plan 2009-2013, and also in line with the Ministry's vision to "establish and develop human resources of the very highest quality and ethics in order to develop a knowledge-based society within Cambodia".

EMIS should supply managers and stakeholders at all levels of Cambodia's education sector with comprehensive, shared, accurate and up to date information and data for planning, resource allocation, monitoring and evaluation in order to support a strong culture of data driven decision making.

Accurate and meaningful quantitative and qualitative reports will show Cambodia's progress in educational development and highlight priority areas for future improvement. These reports are used in developments funded by the Government of Cambodia and by ODA partners. Within a decentralized model of management, there will be appropriate levels of flexibility for meeting local needs and supporting local innovations.

This, the EMIS Operational and Strategic Plan2014-2018, has the general objectives of:

a) Increasing access to and the quality of service delivery in early childhood, basic, secondary and tertiary education through the provision of improved access to and use of timely, quality education data on which to base planning.
b) Ensure that education administrators have improved tools at their disposal to access and utalise education data to plan, monitor and evaluate the education system so as to ensure better utilization of available resources.
c) To develop improved ICT, planning and professional skills needed by education administrators can increase the effectiveness and efficiency of Ministry and school management.

Owing to the rapid pace of change in the technology sector, the duration of the EMIS strategic plan is 5 years. The EMIS strategic plan supports the vision, values and goals of the MoEYS EMIS Office at both the national and sub-national levels.

The EMIS operational plan and strategic development plan details:

- The requirements of the new EMIS system which is becoming operational with the aid of the EEQP2 project.
- Annual operational costs and needs of operating the EMIS system at the national and sub-national levels.
- A medium to long term EMIS strategic development plan, also called an EMIS roadmap, defining the issues and gaps in the current system and strategies or directions in which to develop in order to address the gaps. The steps and resources required to achieve the goals are clearly stated.
- By combining the operational and strategic development plans into a single document, this document presents the ongoing operational costs of EMIS in Cambodia, the costs of further

developments to the systems (including capacity building of staff) and the overall increments to ongoing operational costs.

In order to generate the plan a realistic assessment of the status of EMIS in Cambodia was undertaken which included including access to electricity, the necessary infrastructure, the required skills and the required systems.

The Operational Plan is broken into three components which are subject to change and should be reviewed on an annual basis. Each component details the activities and costs associated with each thematic area to ensure proper operation and maintenance of the existing EMIS system. These are:

1. Component 1 details the annual data collection and publishing activities and associated costs.
2. Component 2 details the Recurrent Training activities and associated costs
3. Component 3 details the annual Support and Maintenance activities and associated costs

The Development Plan is divided into four thematic areas each one targeted at improving a different aspect of information access and use.

1. Strengthen Processes (Data Accessibility)
2. Increase Access to and Use of Information (Data Use)
3. Improve Data quality and completeness (Data Collection)
4. Further develop Human and Technical Resources (Data Demand)

Each thematic area contains multiple activities leading to outputs to strengthen EMIS in each of the thematic areas. Each activity can be funded through a separate funding stream. The plan defines the budget needed to accomplish the totality of the goals. Some funding is secured for all short-term and some longer-term items, it is hoped that this Master Plan will help the Ministry's development partners understand its commitment to use EMIS data to improve its management and the quality of education it provides and therefore support the rest of this Plan. The Plan is therefore open to all possible partners, in terms of both participation and resources (financial, technical and human).
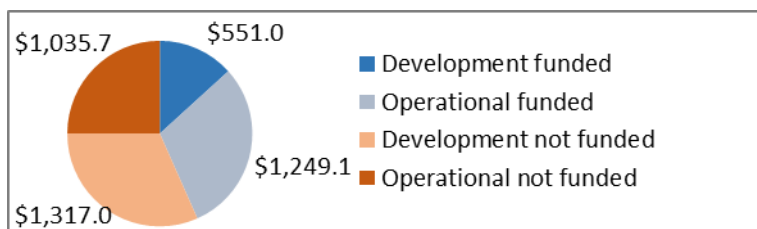
One of the main objectives of the Operational and Development plan is to advocate for funding of EMIS in Cambodia which is currently starved of funds.   Funding will help ensure quality data is available in a timely manner.   The figure to the left shows the operational and development funding and funding gap in 1000's of USD. Presently partners have committed 551,000 USD to the development budget however a further 1.317 million USD is required if the development objectives outlined in this document are achieved. Development partners are currently funding 1.249 Million USD of the operational budget, assuming present funding levels are maintained and increased with inflation annually for the duration of the plan (4 years). The present operational funding gap for four years is 1.317 million USD to be reviewed annually.

List of Abbreviations

Acronym	Meaning
DEMIS	District Education Management Information System
DoP	Department of Planning
DHS	Demographic and Health Survey
DMF	Data Management Framework
DQAF	Data Quality Assessment Framework
ECCD	Early Childhood Care and Development
EFA	Education for All
EMIS	Educational Management Information System
ESP	Education Strategic Plan
FMIS	Financial Management Information System
HE	Higher Education
HR	Human Resources
HRMIS	Human Resource Management Information System
IIEP	International Institute for Educational Planning (a UNESCO institute)
ICT	Information and Communications Technology
IT	Information Technology
ITA	International Technical Assistant (Assistance)
LTA	Local Technical Assistance
M&E	Monitoring and Evaluation
MoEYS	Ministry of Education, Youth and Sport
MoF	Ministry of Finance
NGO	Non Government Organization
NFE	Non Formal Education
NSO	National Statistical Office
ODA	Overseas Development Assistance
PDP	Professional Development Planning
PMIS	Personnel Management Information System
SIS	School Information System
SMIS	School Management Information System

Acronym	Meaning
SPSS	Statistical Package for the Social Sciences
STS	Student Tracking System
TA	Technical Assistance
TORs	Terms of Reference
TVET	Technical Vocational Education and Training
UNICEF	United Nations Children's Fund
UNESCO	United Nations Educational, Scientific and Cultural Organization
WEI	World Education Indicators

Contents

1.1   Tables

1.2   Figures

1. Introduction

1.1. Cambodia EMIS, Global and Regional Status

Global investment in the development of Education Management Information Systems (EMIS) has been relatively high in recent years[1]. In the pursuit of quality education for all, the significance of timely, cost effective and accurate data in evaluating education policy, determining education planning, and monitoring of the progress towards attainment of development goals is increasingly important. However in many cases, countries are hampered in conducting evidence-based policymaking in education because they lack reliable, relevant, and easily accessible information about schools, teachers, enrollments, and education outcomes.

The Asian region contains some of the world's most advanced information-driven societies and those that are at the very early stages of development. Among the most developed countries with information policies are the People's Republic of China, Japan, Singapore and Republic of Korea. While Japan is moving towards anything-anytime-anywhere access with complete assurance driven by the u-Japan Policy Package, Singapore's Singapore ONE and Korea's Informatization policies have a holistic coverage. In 2006, the Chinese government mapped The State Informatization Development Strategy 2006-2020 with meticulous care to set forth China's goals, tasks, plans and policies in information development for the next 15 years[2]. Cambodia, despite being less developed in many regards, has a relatively advanced EMIS which is soon to be deployed over the internet and has provided data annually for planning purposes for over fifteen years.

This represents a significant achievement however in order to keep pace with rapidly developing economies within the region it is now necessary to plan for the next 5 years of development of the information systems. Regionally countries some countries are starting to support School Information Systems which provide real time and accurate data to centralized systems via the internet. However other countries are much less advanced than Cambodia in terms of development of national information systems.

As countries progress towards universal basic education, there is a need to ensure that marginal and disadvantaged groups are properly targeted and have their needs addressed. There is also a strong need to focus on aspects of the quality of education and to monitor education outcomes. Both these objectives require robust and detailed information on the education system. In order to use EMIS data, education managers need to have confidence that the data is robust, accurate and relevant. Therefore there is also an urgent need to strengthen the quality of EMIS data available throughout Cambodia.

---

[1] Over forty World Bank education projects over the last four years have had components related to the development of education management information systems (EMIS), but little is known about best practices and lessons learned from such investments (http://www.camemis.com.kh/university-references/36-education-management-information-systems-emis).

[2] http://www.unescobkk.org/resources/aims/efanews0/news-details/article/information-policies-in-asia-development-of-indicators/

It is therefore necessary for Cambodia to also consider further enhancement of its EMIS to progress towards the goal of real time, reliable education data at all levels of the system to ensure information driven decisions are made for education policy and planning. This document is intended to provide a roadmap and a costed development plan to achieve these goals and which takes into account current operational requirements.

1.2.   EMIS National and Sub-National Context

The education and training sector plays a vital role in Cambodia's development. The effective management of the sector requires stakeholders and actors at all levels to have access to information and data that supports:

1. Resource allocation
2. Education Policy and Planning
3. Local, national and international reporting
4. Strengthened accountability
5. Education administration innovation
6. Efficient administrative practices.

At the national level there is a need for increasingly robust education data to support national education policy and planning, such as the recently Education Strategic Plan 2014-2018 and the annual Education Congress Report.

As Cambodia moves towards decentralized planning there is a strong need to ensure robust and timely data is available at the sub-national level for preparation of Provincial Education Strategic Plans, to inform Provincial education policies and for micro level planning of resource allocation to schools. As planning becomes increasingly decentralized there is a need for detailed education data at the district and school levels to inform district and school development planning. As systems mature further they should move away from the present annual census based system towards transactional systems such as Human Resource Management Information Systems (HRMIS), Student Tracking Systems and School Information Systems (SIS). This will ensure increasingly accurate and timely data is available at all levels of the education system.

Therefore, the EMIS should ultimately support the management, planning, monitoring and management requirements of the following actors and stakeholders:

1. School managers and administrators
2. Parents and local communities
3. Ministry of Education, Youth and Sport - Central, Provincial, District and other management
4. Ministry of Economic and Finance (MoEF)
5. National Institute for Statistics (NIS)
6. ODA partners

1.3   Macro Economic Environment

Currently the Government of Cambodia has embarked on major reforms aiming at modernizing public sector management, in particular decentralization of state management and public finance management, including a new system of allocation of the public budget within a performance based medium term expenditure framework. Those reform areas are directly relevant to the education sector and are impacting all levels (central, provincial, district and school). Moreover, the Prime Minister has approved the National EFA Action Plan 2003-2015 and has requested the Ministry of Education, Youth and Sport to ensure its implementation.

To support the above-mentioned renovation and reform efforts, a fully functional and modern education management information system (EMIS) is essential. EMIS is a key instrument in providing relevant and timely information for policy making, strategic planning and performance monitoring of the education sector. As such, a thorough review of the current system has been called for to make the system more responsive to changing needs of the current education sector. Therefore, the MoEYS, with support from UNICEF, has reviewed the present situation of EMIS - data collection, storage, analysis, dissemination and use, and thereafter, to help strengthening the function and tasks of the EMIS.

1.4   Education System

The Cambodian formal education structure consists of three years of pre-school education, six years of primary school (grades 1-6), three years of lower-secondary school (grades 7-9), and three years of upper secondary school (grades 10-12).

The Education Law adopted in 2007 highlights that the education system also includes two other approaches to learning: non-formal and informal. Lifelong education is encouraged in Cambodia so that its citizens can upgrade the knowledge and skills they need to enhance creativity, productivity, and professional development.

After completing nine years of basic education, students can either continue to upper secondary education or enter secondary-level vocational training programs however it is not mandatory to complete upper secondary school to enroll in vocational training centres. After completing upper secondary education, students may either enroll in university, enter vocational training or undertake non-formal education. Teachers for Cambodian schools are trained either at the National Institute of Education (for upper secondary school teachers), six regional Teacher Training Centers (for lower secondary school teachers), 18 provincial Teacher Training Centers (for primary school teachers), and one pre-school Teacher Training Center and National institute of physical education and sport. Around 7,000 new teachers were trained in 2014, adding to the present pool of approximately 110,000 teachers in the 2012-13 academic year.

1.5   EMIS Vision and objectives

EMIS should supply managers and stakeholders at all levels of Cambodia's education sector with comprehensive, shared, accurate and up to date information and data for planning, resource allocation, monitoring and evaluation in order to support a strong culture of data driven decision making.

Accurate and meaningful quantitative and qualitative reports will show Cambodia's progress in educational development and highlight priority areas for future improvement. These reports are used in developments funded by the Government of Cambodia and by ODA partners. Within a decentralized model of management, there will be appropriate levels of flexibility for meeting local needs and supporting local innovations.

1.6   Overall Purpose of the EMIS Mater Plan

The high level goal of the EMIS master plan are to ensure the provision of quality education information in a timely, cost-effective, and sustainable manner, at all administrative levels, and to support selected operational functions. What ultimately drives EMIS success is being able to answer the questions that education stakeholders raise, and providing consistently understandable answers. Therefore, while new technologies are making certain factual information more readily available, there remains a key requirement to develop the capacity for interpretation and analysis of these resulting "facts." Making information accessible to give support to the MOESAC Strategic Plan in Improving Information and Strengthening Policy Implementation. The EMIS master plan is designed to improve the supply of complete, timely, accurate education data upon which education actors can base decisions to better manage resources throughout the education sector.

1.7   Responsibilities of EMIS

The EMIS has responsibility for the following functions and tasks:

- Study and prepare annual school census form at all education levels.
- Data collection from provinces and all units.
- Summarizing and analyzing education statistics at all levels.
- Produce, publish and disseminate all types of education information.
- Cooperation for making projection of students, teachers and education equipment's facilities needed.
- Strengthening of education management information system at all levels.
- Cooperation with concerned units abroad, national and international organizations.

1.8   Purpose of the Master Plan

Cambodia EMIS is currently undergoing migration from a client server system which has been used for over 10 years to a web-enabled and integrated (with Financial and Human Resources) system developed under the EEQP2 project.   The 5 year development plan will focus on further enhancement and decentralization of the EMIS and the possible piloting of new systems including Student Tracking Systems and School Information Systems (SIS).

The master plan merges two approaches. The plan analyses:

- The present system and its recurrent operational requirements

- The desired or 'target' system is defined and a gap analysis results in development actions and activities which will help progress Cambodia from the present system towards the target state over the next five years.
- This is presented in two plans 1) Operational Plan 2) Development plan. The two plans are merged in the final section to determine annual costs for operation and development of EMIS

1.9 Support the Objectives of the Education Strategic Plan 2014-2018

In order to achieve the following general activities are specified which are supported in the EMIS master plan:

- All provinces have provincial ESPs 2014-2018 and to be supported by EMIS diagnosing sector performance in education congress reports. As of 2013 only 10 provinces had met this target and there are questions as to the quality of the plans and the data used to generate the plans.
- Tools are developed or strengthened and piloted to assess the impact of capacity development activities
- Training and continuing professional development for Department of Planning
- Ensuring adequate staffing at the District and Provincial levels.

1.10 Management, sustainability and development requirements

The EMIS should be managed and sustained in accordance with the following requirements:

1. There should be ongoing support of all components of the EMIS so that any technical or other problems are promptly corrected.
2. The EMIS should be managed and supported in ways that ensure maximum reliability.
3. Staffs who use the EMIS should receive sufficient training.
4. Additional staff to ensure the quality and timeliness of the data
5. The EMIS should be managed and supported using cost effective means.
6. Recurrent funding should be available for ongoing support and maintenance.
7. Support and maintenance should be well coordinated.

The EMIS should be developed in accordance with the following requirements:

1. The EMIS should be regularly developed to meet changing needs.
2. Changes to the various elements including the software systems and databases should be coordinated to ensure compatibility is retained.
3. Clear data specifications should be maintained and updated as requirements change.
4. All changes to software systems should ensure ongoing compliance with the data specifications.
5. Appropriate funding should be available for ongoing development

The data within the EMIS should be managed to meet the following requirements:

1. The data should be used by managers and administrators to drive effective strategic and operational decision making.
2. The data should be accurate and reliable.
3. The data should be up to date.

4. Individual sets of data should be widely used for many purposes by many actors and stakeholders.
5. The data should be integrated and consistent.
6. The data should be secure.

1.11 Review Process

Both the education system and technology paradigms are rapidly changing and therefore, the EMIS master plan should be considered a live document and should be reviewed by a panel of experts annual. In particular budget should be reviewed annually to ensure sufficient funds are allocated to activities, maintenance and training.

1.12 EMIS Master Plan Assumptions

The EMIS master plan assumes that affordable electricity is available throughout the country as the costs for installing and operating solar panels and generators are not included in the plan.

The EMIS master plan does not assume that there will be sufficient budget allocated to all initiatives. Significant progress can be made on EMIS through the funding of some aspects of the plan. This is discussed further in the section concerning implementation.

1.13 Significant Achievement to Date

A significant achievement of EMIS development has been successfully fulfilling objective 5.3 of the ICT Master Plan (MoEYS, 2009) which specifies that All Education Management Information Systems and other databases in MoEYS are homogenized and integrated.

- **Result 5.3.1:** A new information management system is established to integrate existing databases and accommodate all information needs of the Ministry. All databases in the Ministry of Education will be centralized to one integrated information management system to minimize maintenance costs and ensure interconnectivity. All existing database and information systems (EMIS, HRMIS, FMIS) will be harmonized into this Open-Source integrated information management system with centralized management and security control and with end users sharing similar interfaces. Unicode will be used as the encoding system for Khmer in all databases. The new integrated information management system will serve the management of Higher Education Information and Non-formal Education Information. A new database that will include data on all students will also be defined and developed.

- **Result 5.3.2:** Departmental, provincial and district offices will adopt the new information management system. Departmental, provincial and district staff will be trained to use the new databases. Training will be given first to provincial and then to district offices on how to enter data on the databases and how to obtain information from them. Data entry and the use of this data will be decentralized whenever possible. Data will be migrated from the old systems to Unicode encoding and to the format of the new databases.

2 Current Situation

2.1 Overview of the Present System

2.1.1 System from 1995 - 2013

The EMIS Office is managed under Planning Department of the MoEYS and has been active since 1995. The EMIS Office is currently supported by UNICEF/Sida, the Asian Development Bank (ADB), the Global Partnership for Education and more recently by Capacity Development Partnership Fund (CDPF).

The main form of data collection is the annual school census undertaken on October 30 and published in February as preparation for the annual education congress. A separate 3-4 page form exists for each level of the education system, pre-primary, primary, secondary as well as district and municipal education services on the following attributes: Teachers and students; Income; some facilities; staff of province, cities and districts. The form is distributed to schools for filling and collected by districts and verified at the districts and provincial levels.

The Department of Planning (DoP) EMIS Office operate a robust EMIS using a relational database, Dbase 5.5, with input and (limited) reporting functions decentralized to provincial level for the purpose of data entry. Reports are generated through SPSS (scripts) and exported to MS Excel.

The system has received significant support to its annual operational budget from UNICEF. The system is a mature system and has not undergone significant modification in almost a decade. Minor modifications are made annually to the system following a review process.

2.1.2 System 2013 onwards

The system is currently being upgraded under the ADB funded EEQP2 project. A private company, Khmer Dev developed an integrated Human Resources Management Information System (HRMIS), Financial Management Information System (FMIS) and Education Information System (EMIS) software into a single integrated software system using MySQL backend and Microsoft *. Net web based front end. The total cost of production including one year of maintenance was $197,624 USD. The source code is owned by MoEYS. Both HRMIS and FMIS are also census based systems with the data being collected twice annually for each. The system was piloted in two provinces during the 2012 census in parallel with the existing EMIS system. The system replicates the reports and data of the old systems and no new data or reports are being added. The reports will be generated directly from the system using a web browser. There is presently no backup server and so if the servers crash there is no easy way to retrieve the systems and data.

The new system contains technical training materials and there is presently a range of training materials for training of educational staff at all levels in the use of data for planning, budgeting and other activities. Under the new system data entry at the provincial level was planned for 2013 and for the district level in 2014 however owing to delays in software development it is likely that provinces will enter data in 2015 and districts in 2016, depending on capacity such as the ability for the districts to

access the internet. In the mean time district level access will be improved and training of staff will take place. ADB is presently funding provincial internet connectivity. The new system is presented in the figure below.

Figure 1:   Present EMIS after upgrade to EEQP 2013
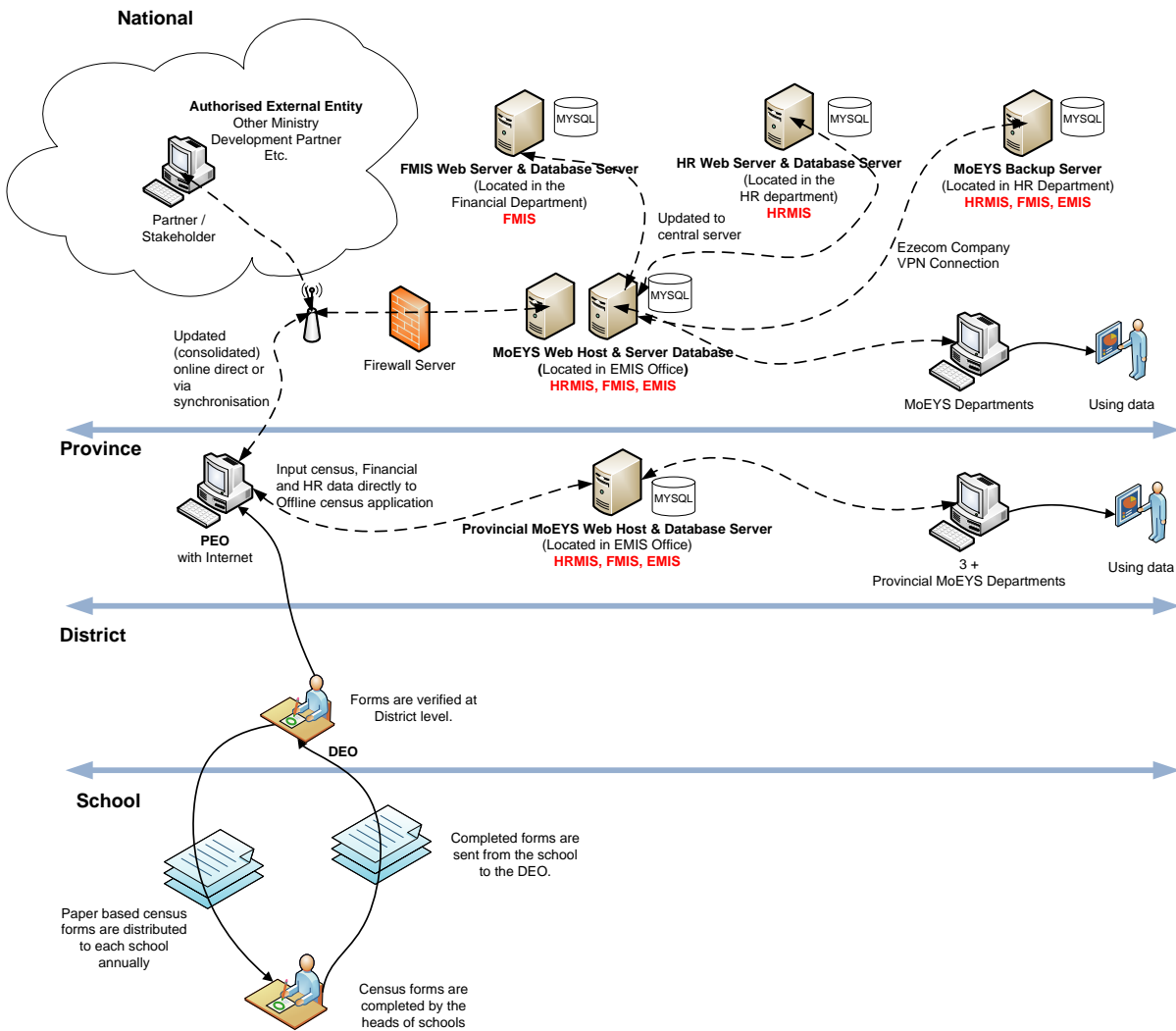
2.2   Student Tracking System

2.2.1   Present Status

The Global Partnership for Education (GPE) will support for implementation of a new, computer-based Student Tracking System to replace current practice of paper-based student record keeping practices under component 4. A preliminary feasibility study (pilot) has been conducted by the MoEYS and found that the existing methods of student record and data keeping can be characterized as time- and space-consuming, manually controlled, error-prone, costly, and high risks of information security and loss. The project will finance activities including a detailed system design specification including a blueprint,

prototype development, application testing, and instalment of software for the users. Under the GPE application component 4, a student tracking system is to be piloted for 500,000 USD (see below). The pilot will cover all primary schools in one urban area, or some selected secondary schools

2.2.2 Recommendation

- Monitor and carefully review lesson learned from the pilot.
- Ensure integration of the piloted **Student Tracking System** with EMIS and inclusion of rollout and recurrent budget estimates in future iterations of the **EMIS master plan**.

2.3 School Information Systems

2.3.1 Present Status

The Department of Planning reports that many of the larger secondary schools are using basic electronic School Information Systems (SIS) using spreadsheets and databases such as MS Access. There may some schools operating more sophisticated SIS which allow for teacher scheduling, management of school finances, resource management etc.

The Department of Planning will utilise GPE application component 4 to undertake a pilot of school information system which would include a student tracking system.

2.3.2 Recommendations

- Standards should be developed for SIS as part of the **Data Management Framework**. This will help ensure that information from SIS is compatible with national systems and meets national standards.
- DoP to consider merging its present information systems under the EMIS Office and strengthen the EMIS Office capacity to manage an integrated online server system.

2.4 QEMIS

2.4.1 Present Status

The EMIS Office, in cooperation the Swedish Statistics Bureau (SCB), has developed a proposal for development of QEMIS (reference) which is to be piloted and eventually integrated with EMIS. QEMIS will build a system for supporting quality assurance through collecting of student's learning achievement. The system should also contribute to the implementation of Education Law, curriculum and other policy documents and report back results, trends and development needs to the Government.

2.4.2 Recommendations

Ensure integration of QEMIS with EMIS.

2.5 Data Completeness

2.5.1 Present Situation

A summary of data responsibilities, collection and storage is shown in the table below. In summary the following main issues exist.

- Within the basic education sector data all government schools are captured however some data could be improved in terms of detail such as financial data which only shows income not expenditure and ICT which is not represented on the forms.
- Participation rates only take into account public enrolment figures; not those in private, from other ministries, and other non-governmental schools.
- The EMIS Office presently lacks data on the vocational and skills subsector, higher education, assessment and financial data which are stored in other departments. The vocational and skills data is presently in the Ministry of Labor and Vocational Training, MoEYS Department of Planning, however there have been difficulties in obtaining sufficient data from others.

2.5.2 Recommendations

- Strengthen policies to ensure private schools must register and submit annual census forms to district education offices.
- Develop data standards to ensure compatibility between data from different sources where required (see points below).
- Standardize data capture for the school census with the census conducted by the Ministry of Cultures and Religion to ensure incorporation of data from religious schools into the EMIS database.
- Develop a data warehouse at EMIS to store information gained from other ministries and departments concerning: Pupil assessment data; Higher education; Vocational education and learning centers. Ensure data is annually integrated into the data warehouse in accordance with data standards (see point above).
- Review the school census form to ensure capture of all required data. In particular data, data on ICT and financial income and expenditure.
- Develop standards for school information systems to ensure data is compatible with national level and help support adoption of school management systems.
- Pilot and rollout decentralization of data entry and management to the district and school level for districts and schools able to access the internet.
- Expand QEMIS to use it for internal communication for policies/lists etc. Presently policies and permissions are scanned and send as a .pdf through different channels. Ideally documents should be sent through QEMIS using digital signatures and permission using different levels of access to reduce the amount of paperwork and increase the speed of communication and implementation of new policies and to help ensure that older/obsolete documents are no longer used/ can be removed from the system.

Table 1. Main Sources of Education Data

Sr.	Data	Name of Database	Description	Department responsible for use of data	Department or unit responsible for data capture	Data captured at	Frequency of data collection	Notes
1.	ECD	EMIS	Institutional census data on government ECD	Early Childhood Education (ECE)	EMIS	School	Tri-annual	Captured via the school census
2.	Primary	EMIS	Institutional census data on government Primary	Primary	EMIS	School	Tri-Annual	Captured via the school census
3.	Secondary	EMIS	Institutional census data on government Secondary	Secondary	EMIS	School	Tri-Annual	Captured via the school census
4.	Higher Education	HEMIS (1)	Institutional census, teacher and pupil data on all Higher Education	Higher Education (HE)	EMIS	Institution	Annual	Not available at the EMIS Office
5.	Private Schools	EMIS	Institutional census data on all private ECD and basic education schools	ECE, Primary, Secondary	EMIS	School		Data not presently captured
6.	Religious Institutes	NA	Institutional census data on all religious ECD and basic education schools	Planning Department / Ministry of Cults and Religion	Planning Department / Ministry of Cults and Religion	District		Presently only summary data on number of institutes, pupils and teachers
7.	Non Formal Education	NFEMIS	Institutional census data on all non-formal learnig centres including within basic education	Non-Formal Education (NFE) / Ministry of Labor	Non-Formal Education (NFE) / Ministry of Labor	District	Annual	Not available at the EMIS Office. Information collected from villages through community learning centers (CLC).
8.	School Inspections	None	Ready access to school supervision and inspection reports	Education Inspection	Education Inspection	School	Annual	Not available at the EMIS Office.
9.	Teacher In-service Training	None	Individual staff bio data and Training data	Teacher Training (TT)	Teacher Training (TT)	TT Centre (4) Individual	Annual	Not available at the EMIS Office.

Sr.	Data	Name of Database	Description	Department responsible for use of data	Department or unit responsible for data capture	Data captured at	Frequency of data collection	Notes
10.	Student Assessment		Pupil assessment data for nationally standardised examinations to a school level	ECE, Primary, Secondary	Quality Assurance	School		Not available at the EMIS Office.
11.	Teaching and non-teaching staff	HRMIS	Individual staff bio data and in-service record	Personnel	Personnel	Staff	Quarterly	Not available at the EMIS Office.
12.	School financial information	FMIS	Income, expenditure and resource allocation to schools	Finance	Finance	School/BMC	Bi-Annual	Not available at the EMIS Office.
13.	National population data	EMIS	Population data to school catchments (communes)	National Population Commission	National Population Commission	Commune	Projection updated annually	EMIS now uses national figures however figures are still compared with those collected from districts.
14	Student Tracking	None	Individual bio and enrolment data on children	EMIS	EMIS	School	TBA	Pilot is planned possibly through a school information system (SIS)
15	QEMIS	None	Quality on inspection, teachers	EMIS	EMIS	School	TBA	Pilot is planned

2.6   Data Quality

2.6.1   Present Status

- The process of EMIS data capture is detailed in annex 2. Data capture commences on October 30 with the production and distribution of the forms and is completed by February the following year with the publishing of figures at the national level. The timeframe is short and does not allow for extensive data verification and validation to be implemented.
- Data verification and validation processes are weak and rely heavily on the District Education Office

2.6.2   Recommendations

- Improve data verification and validation processes to involve both the national and provincial levels in the verification of school level data.
- Link school resource allocation (and funding) to the provision of accurate data.
- Distribute school report cards back to schools
- Develop a series of reports that can be produced as data is being entered and that indicate historical deviations in data and also data which falls outside acceptable norms. Analysis such as the Simplified Cohort analysis undertaken at the sub-national level will help identify anomalies in the data which can be addressed with the relevant authority.
- Consider rescheduling the school census to commence at an earlier date to ensure data is available and analysed by February in time for the education congress. Most data could be completed during the rainy season/holidays with the exception of enrolment data. Redesign of the census form could also accelerate form completion and data entry. Also consider more regular collection of student enrolment and attendance data and teacher attendance data. Consider also less frequent data collection of static data such as classrooms.

2.7   Data Dissemination

2.7.1   Present Status

Reports are standard and are produced annually and widely disseminated to all stakeholders. Reports and statistical publications include the following:

- Education Statistics and Indicators (Yearbook) at national and provincial levels
- Education Statistics and Indicators by School Cluster by province
- A Pamphlet on 'Education Indicators' for last five years
- Wall sheet 'Education in Cambodia' for last five years
- Cluster, district, provincial and national school maps
- An interactive (interface) CD containing most EMIS outputs listed above and as well as subsets of the EMIS database for provinces (PES), different MoEYS projects and for selected users (on request)

- Softcopies of the school report card are sent to provinces who are responsible for printing the cards. Printing occurs in a small number of provinces. There is insufficient budget to print the school report cards.

The system is capable of producing school, district, provincial and national level report cards containing general indicators however school report cards were discontinued in 2006.

Reports generally lack graphical capacity which must be done manually in software such as MS Excel.

2.7.2 Recommendations

- Review reports to ensure inclusion of graphical presentation
- Enhance reporting to include other forms of data analysis such as sub-national cohort analysis
- Enhance needs analysis reporting to show development needs of schools by highest to lowest and ensure reports are linked to annual planning needs.
- There should be budget made available at the provincial level for printing of school report cards and other reports required from EMIS.

2.8 Data Use

2.8.1 Present Status

A full analysis of the use of EMIS data in education planning and policy making was beyond the scope of this report however the following observations are made:

- At the national level EMIS data informs policy through use in the education congress report.
- At the national and sub-national level EMIS data is used for predictive financial modeling and budgeting using CAnPro (Cambodian AnPro).
- There are presently no studies available on the use of EMIS data for budgeting and prioritization to schools.

2.8.2 Recommendations

- Consider redesigning school report cards to make them applicable to school development planning, to include sub-national and regional comparisons of key indicators against targets.
- standardize and code reports and develop training materials which link reports to use in planning in accordance with the sub-national the planning cycle.
- Support development of national EMIS capacity to undertake longitudinal studies to help analyse EMIS data.
- Support development of national EMIS capacity to triangulate EMIS data against other data sources to help report on the accuracy of EMIS data.
- Support to provinces to analyse EMIS data for sector performance in education congress reports

2.9   Hardware and Networking

1.1   ICT infrastructure

2.9.1   Present Status

Like many countries, Cambodia does not yet have a full sustainable model for providing technical support for its ICT infrastructure. The problem will likely be most acute in the smallest schools where there is very limited availability of resources to support complex technology. In these schools, there will likely be no effective capacity to support complex server.

Recurrent repair and improvement budgets are not allocated except through project initiatives such as UNICEF/Sida, EEQP2. Schools, districts and provinces must find their own funds for these purposes. Many offices have difficulty in funding the replacement of older computers. As computers age, it becomes more difficult to operate modern up to date software.

Most computers in head office are networked. The status of networking in PEO, DEO and schools is currently unknown.

EEQP2 purchased 1,628,169 USD of equipment and installed to provide for a central and mirrored mainframe computer in the provincial of education service planning office and personnel office and mini computers for each of the functions of HRMIS, EMIS and FMIS in their respective departments and computers for these functions in each provincial office as tabled below.

Table 2.   Computer equipment purchased under EEQP2

Location	Computers	Numbers	Replacement Costs (USD)
Planning Department	Mainframe computer	1	$8,000
Personnel Department	Mirrored Mainframe computer	1	$8,000
Planning office	Mini computer	1	$3,000
Finance Department	Mini computer	1	$3,000
Personnel Department	Mini computer	1	$3,000
Provincial Planning office	Desktop computer	24	$24,000
Provincial Finance office[3]	Desktop computer	24	$24,000
Provincial Personnel office[1]	Desktop computer	24	$24,000
TOTAL			$97,000

Tendering for the full VPN service between all central and provincial offices was reported at a cost of USD 46,400 per annum and is supported through to beginning 2014.

- The national EMIS office has sufficient client computers however servers are kept in inadequate conditions subject to dust and heat. Wireless internet is required.
- Provinces reportedly have sufficient infrastructure and equipment but generally require utilities such as paper, toner and ink cartridges and back-up devices.

---

[3] Not included in the EMIS recurrent hardware budget

- Districts reportedly have unreliable power, lack internet and in some cases do not have sufficient computers and printers for EMIS.
- Most schools do not have computers and printers, even electricity in some cases especially in far rural areas

A general summary of ICT infrastructure and internet connectivity is presented below and should be refined after proper survey.

	Urban school	Rural school	District	Province	National
Internet access	Poor	Poor	Poor	Poor	Poor
Hardware	Unknown	Unknown	Poor	Medium	Medium
Support and infrastructure	Poor	Poor	Poor	Poor	Medium

2.9.2 Recommendations

- Conduct an audit to assess the hardware and internet capacity of districts and schools
- Assess the budget requirements of supporting districts to input EMIS data via the internet
- Refurbish the national EMIS server room to ensure it is dust free and remains cool.
- Review the possibility of utilizing portable devices such as tablets for future deployment and capture of EMIS data.
- Review the possibility of assistance from large private sector companies practicing corporate social responsibility to aid in the development of infrastructure to support EMIS.

2.10 Human Resources

2.10.1 Present Status[4]

The national EMIS reportedly has sufficient resources to conduct the census with 1 chief and 2 deputy chiefs and 10 technical staff. However if data validation and verification is to be improved, staffing or temporary staffing during verification, should be reviewed.   Capacity of staffs to undertake sector analysis and longitudinal studies is limited.

2.10.1.1 Central Level

At the central level, the deputy director of the planning department is responsible for providing overall guidance and management, and the chief of EMIS office is in-charge of daily activities. Out of 13 technical staff (including EMIS Chief), only two staff have skills sufficient to perform highly technical tasks such as managing EMIS databases, revising data entry programs, creating or updating school maps, and providing quality technical assistance to other offices and to the PEOs. Four more staffs are versatile enough to perform many technical tasks. All remaining staff is experts in performing regular EMIS tasks such as, collecting, batching, checking, coding, data entry, data verification, and liaising and providing training to PEOs staff.

---

[4]Update from EMIS review (UNICEF 2006)

2.10.1.2   Provincial and District Levels

The provincial education office (PEO) staff levels vary from approximately 30 staff to over 140 staff. The number of staff in the planning section (or joint section) varied from approximately 4 to 14 staff. In a survey conducted in 2006 (reference) between 3 and 6 staff on average are working in the EMIS Office of the PEOs. Many provinces assign additional staff to the EMIS Office during the school census. Provinces stated that they required further training on EMIS including database management, data analysis, and programming. Districts had a shortage of human resources for EMIS with approximately one person on average working on EMIS activities.

Under the present system, the main function of school staff is to accurately complete the school census and other forms relevant to EMIS such as enrolment registers.

2.10.2 Recommendations

As the systems are migrated to the new web based systems and additional systems such as child tracking are introduced staffs at the national and provincial levels required training. At the national level staffs would benefit from training in improved techniques of analyzing data.

- Conduct a full staffing and skills audit on provinces and districts in relation to the new systems to determine staffing numbers and recurrent training requirements for the provincial and district offices. Training should ensure a support person for each technical role.
- Train national staff in the conduct of longitudinal studies using EMIS data. IIEP provide distance and face to face learning through the Advanced Training Programme, Specialised Courses and in-country workshops.
- A study tour for senior staff in the department of planning to review EMIS operation in 1-2 countries following good EMIS practice.
- Pilot training on head teachers of advanced secondary schools for completion of census forms online.
- Review record keeping at schools and school level completion of census forms. Schools require technical assistance including a handbook with the clear definitions of education statistics and indicators, and a manual on how to manage the school statistics. Determine a programe of recurrent training for head teachers in school record keeping and census form completion.

2.11   EMIS Legislative and Policy Environment

2.11.1 Present Status

The policy and legislative environment to support EMIS has not been studied in detail however there is a lack of support for the mandatory registration and submission of data from private schools.

2.11.2 Recommendation
Review the policy and legislative environment to support reliable and timely education data and make recommendations for changes where required.

3 Applicable policies

3.1 General Policies Guiding Development of EMIS

In January, 2005, the Ministry of Education, Youth and Sport approved the document "Policy and Strategies on Information and Communication Technology in Education in Cambodia" as the lead policy on the use of ICT in education, thereby guiding major lines of work required for Cambodia to effectively integrate technologies for teaching, learning and education management across all education sub-sectors. This policy integrated the major policies of the Ministry at the time, in particular the Education for All (EFA) Plan and the Education Strategic Plan (ESP). The updated Education Strategic Plan and the Education Law (December 2007), developed later, are still in line with the 2005 policy.

The Education for All National Plan 2003-2015 states that: "ICT policies will include: (a) expansion of ICT as a teaching and learning tool, (b) **as a means of improving education service productivity and management through improved information sharing, communication and knowledge management**, and (c) expansion of distance learning opportunities especially for disadvantaged groups in remote areas. The overarching goal will be to ensure Cambodia's international competitiveness in an increasingly global and interconnected knowledge-based economy."

These ICT policies were reinforced in the Ministries *Master Plan for Information and Communication Technology in Education (2009-2013)* (MoEYS, 2009) which is presently being redrafted for the years 2014-2018 to be in line with the Education Sector Plan 2014-2018. The ICT plan emphasizes as its fourth strategic goal "**To increase the effectiveness and efficiency of Ministry and school management.**"

The Education Strategic Plan 2014-2018 also specifies the need for improved information use by management and improved quality of education data; the expansion of technology and ICT facilities; and the computerization of school management, monitoring, and finance systems, using ICT to enhance school efficiency. A substantial budget is allocated in both documents to ICT development. The objectives of this Master Plan are integrated in the Education Strategic Plan 2009-2013, becoming an integral part of the development plans for the Ministry of Education, Youth and Sport and ensuring that relevant technologies will be applied wherever they can support the strategies of the Ministry. They will be operationalized through the MoEYS's Annual Operation Plans (AOP) with the understanding that the relevant departments will integrate ICT in their planning processes.

Finally, the Education Law promulgated in December 2007 in Article 28 emphasizes that: "The State shall promote and support research, development, invention, and production, which are scientific and technological, for education to meet the needs of the labour markets and globalization, to promote human resource capacity, and to enhance the development of the country."

EMIS Office, of the Department of Planning, is charged with the coordination and compilation of education statistics for Cambodia. The EMIS master plan 2014-2018 is therefore aimed at furthering this goal and is based upon Education Law and furthering the objectives of the ESP 2014-2018.

4 Desired State of EMIS 2018 and Beyond

4.1 Architecture

The ideal (target) architecture of the EMIS would be based on the present series of databases which feed into a main data store. This would be complemented by a data warehouse that regularly receives information from system(s) such as a pupil assessment data, inspectorate, higher education and non-formal education. The warehouse would also be replicated at the provincial level.

The major sources of information for the database (data warehouse) would be:

a) A school census system.

b) Operational (transactional) and management systems in schools, universities and other education institutions

c) Data from other ministries and ministry entities including the Population census and household and health surveys and student assessment systems.

d) Operational (transactional) systems managed at the provinces, districts and MOESAC levels. These would include financial management and human resources training systems.

Some external data, such as population data would also be received from systems external to the education sector.

Data would be transferred into data warehouses through specified and regularly scheduled data collections. Where feasible, data transfer would use modern integration technology for moving data into the data warehouses. Data would be based on established **Data Standards** defined in a **Data Framework**.

The diagram on the following page summarizes the architecture. The model conforms to the Government's National ICT policy which aims to enable e-Governance, with all entities, including schools and districts, connected to the internet. The model also makes facility.

The model also makes allocation for use of **commercial and government school based MIS**. Commercial school MIS would conform to data export and import guidelines established through MoEYS DoP so as to conform to the data warehouse. The use of commercial school IS for school management should be encouraged in schools where the cost benefits are realized through more efficient school management and increased teacher and parent participation.

The above data model will result in significant response, qualitative and quantitative improvements to data.

Table 3.   Entities of the target state

Data Elements	Description	Source
Schools without MIS (School data)	Schools without MIS will submit data to higher levels on compliance forms and census forms. The school census should be the main for used to collect school data from schools without MIS	School records transposed to annual school census form.
Schools with MIS (School data)	Schools operating commercial or in-house MIS should be able to submit data electronically either as a file attached to email or on portable disk (flash, CD Rom etc). School MIS should adhere to data standards (and for export of data) established by MoEYS DoP.	Commercial MIS Potential for the government to develop a school based MIS either web enabled or client server
Schools with internet (School Data)	Schools with internet should be able to input data directly into the census database.	School records transposed to annual school census form.
DEO with internet	DEO with internet should be able to input data directly into the census database.	Schools
DEO EMIS	DEO without internet should be able to access a client server version of the census database	Schools
Partner / Stakeholder	External partners and stakeholders can access data over the internet or upon request to MoEYS DoP.	MOESAC

4.2   Data management framework

MoEYS DoP would take an active leadership role in managing data for all stakeholders and actors. There would be an overall Data Management Framework.

The data needs of the different stakeholders and actors would be regularly reviewed. As needs changed, gaps in the current data collections would be identified. As part of the **data management framework**, (DMF) detailed data specifications would be maintained and updated. The census database and the data warehouse would be regularly updated to conform to the updated data specifications and the changing needs. Indicators required for monitoring and evaluation would also fall under the data management framework.

The data framework would provide detailed descriptions of:

1. The indicators used for reporting
2. Data recorded in the online census systems
3. Data collected from the operational systems
4. Clear definitions and glossaries of terms
5. Coding and classification schemes
6. Identifier schemes for major entities.
7. Definitions of all compliance reports for all departments.
8. Definitions of all indictors and other forms of measurement.

Figure 2:   Target System Diagram
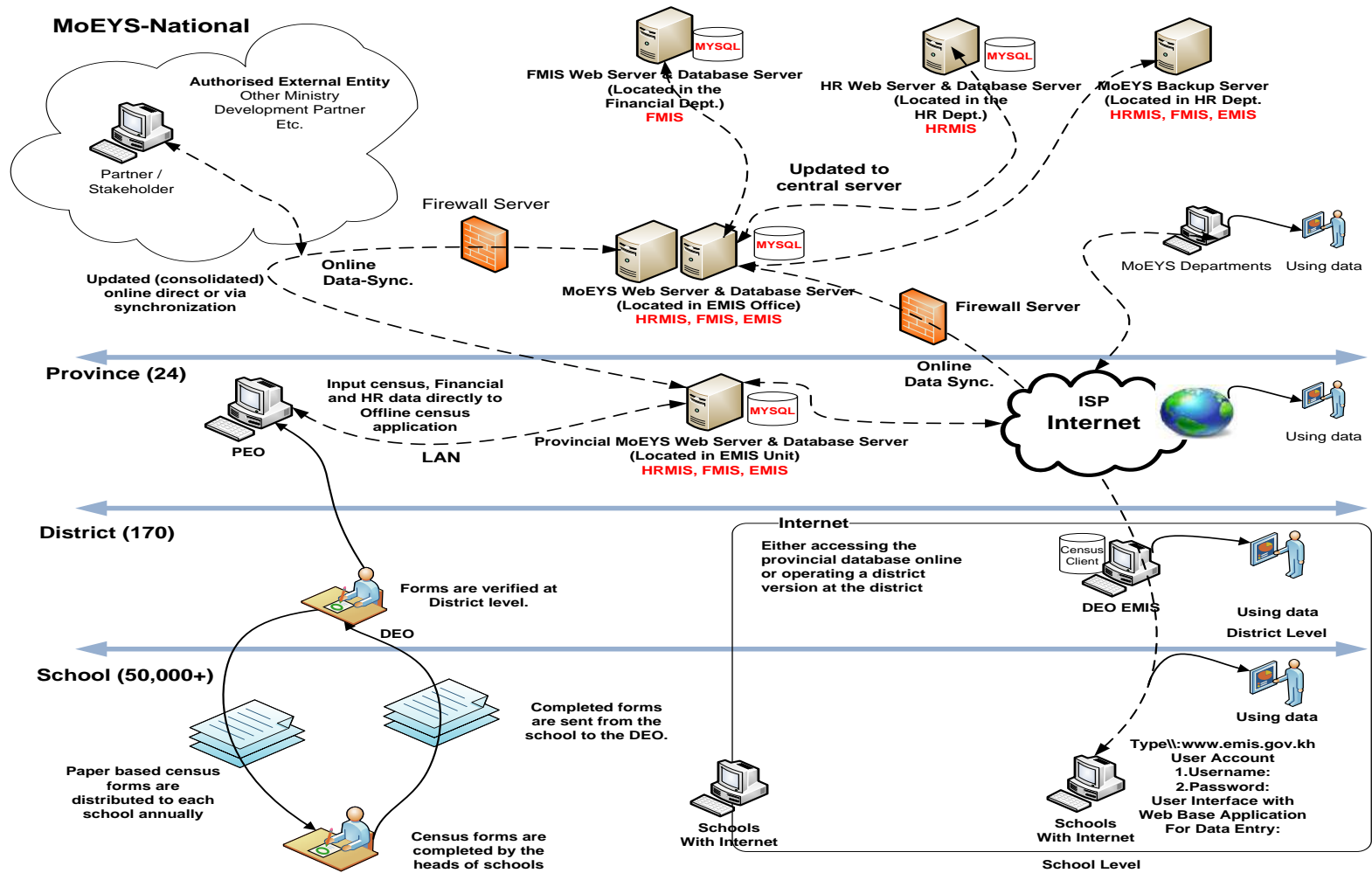
4.3   Data Standards for Operational systems (School IS)

Although there are a range of operational systems required by institutes, a key system is the school based information system. The benefits of such a system are widely acknowledged. There should be a gradual move towards use of school IS throughout Cambodia.

An increasing number of schools would use various ICT based software systems for supporting school administration and for regular reporting of data. These systems would be well supported and regularly updated. Most would comply with the data specifications.

It may be preferable to establish a standard system which can be employed throughout Cambodia and gradually rolled out to all schools. This would enable data for the census system to be principally derived from school based operational systems, possibly through an online system feeding directly into the census system.

Operational standards should be established for operational systems such as commercial and government school IS. High quality and detailed data should be able to be exported to the census system from schools operating school IS.

4.4   Management of EMIS

The roles, responsibilities and processes for managing the EMIS would be clearly defined and clearly understood. The MoEYS EMIS Office would co-ordinate:

1. The Data Management Framework including the data specifications and standards and indicator frameworks
2. Changes to the data warehouses to meet changing needs
3. Training and support for the information systems.
4. System technical standards.
5. Data verification and validation

Recurrent funding should be available for these purposes.

Changes to the data warehouse and operational systems should be made in accordance with sound project management and system development methodologies. The organizations or departments with co-ordination responsibilities for systems should collaborate with other departments and organizations.

4.5   Decentralized Institutional Arrangements

Over the longer term, the EMIS strategy would involve many staff using new operational systems, particularly in schools and other institutions. Staffs in provinces and MoEYS are using new operational systems and the data warehouse. As EMIS decentralizes it can also move towards more regular data collection

- o   HR system becoming an operational system (data processed real time)
- o   EMIS including monthly enrolment updates

The different systems would be progressively changed as overall needs changed. This creates significant ongoing training needs which will need to be met by a combination of:

1. Training documentation and materials
2. Courses
3. Coaching
4. On-line delivery.

4.6   Support requirements

Support services are required which provide assistance to staff who encounters difficulties with software systems. The services need to provide staff with advice and to diagnose any apparent technical faults. In some case, difficulties will be due to software faults that need to be rectified.

4.6.1   Software maintenance

Software faults will arise from time to time in the online census system and the various operational systems. For each system, there needs to be a group responsible for analysing apparent faults and where necessary, correcting those faults in the software. There are ongoing costs for this.

As an estimate, systems typically require 15% of the cost of development to annual support. This is included in the cost estimates provided in chapter 4.

4.6.2   Determining the training and support model

MoEYS needs to develop a comprehensive training and support model and provide ongoing resources to support it. Modes of deployment of training should include on-line training modules and other means of distance learning. Infrastructure for distance learning is available through the Provincial hall which is presently hosting weekly video conferences with the national level.

4.6.3   ICT infrastructure

ICT infrastructure will be required to host the census system and the various operational systems. Technical support will be required and key components such as computers will need to be regularly replaced. Currently, most computers have an effective lifetime of no more than 5 years.

Given likely trends in the ICT industry, future technical developments to the online census system and operational systems should be based on:

1. Locating servers mainly at the national level.
2. Use of very low cost computers in schools and provinces, with access largely provided through Web browsers operating on the low cost computers.

Cost estimates for hardware maintenance for central hosting services are provided in the operational cost analysis presented in the section below.

5 Specific Objectives of the EMIS Master Plan

5.1 Support to the ICT Master Plan (2009-2013)

The EMIS master plan builds upon and maps to the goals of the ICT Master Plan 2009-2013 (MoEYS 2009) and also introduces new goals and objectives based on recent progress in developing EMIS and shifts in global and regional trends in EMIS development.

The ICT Master plan 2009-2013 (MoEYS 2009) gives guidance to the EMIS master plan. The ICT Master Plan specifies:

- The need to quickly access, exchange, analyze, and apply education information to facilitate the planning and management of educational activities in Cambodia.
- An Interconnected information management system will enable MoEYS leaders easily and directly access the information needed to make evidence-based decisions concerning educational policy and practice.
- The need to harmonize, standardize, and interconnect information databases; this will include decentralizing data collection and input to the place of origin of the information (schools, district and provincial education offices, etc.), ensuring data security, and delivering information to those who most need to use it.

An overarching objective of the EMIS master plan is to seek support for the EMIS plan from a variety of sources. This is specified in the ICT Master Plan (MoEYS 2009) as **Objective 5.8:** Investment costs and recurrent expense in implementing ICT in Education are shared with stakeholders. This plan supports Result 5.8.1 in which a Partnership Program is established, including donors, the private sector, local communities, professional associations and individuals who can help to share the cost of ICT in education expenses.

5.2 Objective 1.0: Strengthen Processes and Data Accessibility of EMIS

5.2.1 General Overview

The EMIS master plan will strengthen the processes and data accessibility of EMIS. This will be achieved through improvements to the infrastructure required to manage EMIS at the provincial, district and school levels, improvements in the management of EMIS data to the school level and revision of the policy and legislative environment to support EMIS.

5.2.2 Result Area 1.1: Improve the infrastructure to manage EMIS

The infrastructure of the national and provincial planning offices will be further improved and the specific infrastructure (hardware, software, networking and human resource) needs of district and schools will be identified and a plan for addressing requirements developed.

Maps to ICT Goals:

- **Objective 5.4:** All administrative offices of MoEYS are able to exchange data internally through an intranet. This plan supports **Result 5.4.1** which is to define and implement a basic computer network that will serve the administrative needs of the MoEYS.
- **Objective 5.6:** District Offices of Education (DOEs) use ICT to facilitate their administration. This is achieved through Result 5.6.2 specifying the provision of ICT equipment and training of staff of 194 DOEs. 194 DOEs will be equipped with computers, printers and other equipment and ICT training will be provided to their staff.

Activities and Indicators:

Activity 1.1.1: Conduct an audit to assess the hardware, internet and human resource capacity of provinces, districts and secondary schools including reassessment of the budget requirements of supporting districts to input EMIS data via the internet.

Activity 1.1.2: Refurbish the national EMIS server room to ensure it is dust free and remains cool (2014) and 12 provinces for 2015 and 12 provinces for 2016.

Indicators:

1) The specific hardware, internet and human resource development needs of district offices and schools are identified and a plan developed, endorsed and funded for addressing the development requirements.
2) The National and Provincial EMIS offices have their infrastructure refurbished and further improved to ensure effective 24 hour operation of EMIS.

5.2.3 Result Area 1.2: Improve EMIS data management leading to improvements in data quality

EMIS data quality should be improved through development of a data management framework specifying data standards. This should be facilitated by a review of school record keeping and census form completion.

Maps to ICT Goals:

- **Objective 5.1:** MoEYS applies a clear Information Management Strategy that harmonizes, standardizes, and interconnects information and databases in all of its departments. Specifically this plan supports **Result 5.1.1** which specifies an information management strategy for MoEYS be defined which will include standardization of how data is **e**xchanged and kept at MoEYS, security measures, tools to be used and standard training to be offered to Ministry staff.
- **Objective 5.2:** The standardization and interoperability of data and electronic communications inside MoEYS are accomplished. Specifically this plan supports **Result 5.2.1** which specifies that basic standard formats for the exchange of data and electronic communications inside the Ministry are specified and implemented.

Activities and Indicators:

Activity 1.2.1: Review record keeping at schools and school level completion of census forms. Schools require technical assistance including a handbook with the clear definitions of education statistics and indicators, and a manual on how to manage the school statistics and school data. Cascade 1 day training to all head teachers via school supervisors at the district level. Pilot in 1 province in 2014 and rollout to 6 provinces 2015, 6 provinces 2016, 6 provinces 2017, 5 provinces 2018

Activity 1.2.2: Undertake a data needs assessment**. Develop a Data Management Framework for Education Data.** Develop data standards to ensure compatibility between data from different sources where required. Standards should be developed for SIS as part of the **Data Management Framework**. This will help ensure that information from SIS is compatible with national systems and meets national standards.

Indicators:

1) Head teachers trained in school record keeping leads to improved school record keeping and census form completion in 1 province in 2014, 6 provinces 2015, 6 provinces 2016, 6 provinces 2017, 5 provinces 2018
2) Data management framework leads to improved data standards applied throughout EMIS and associated systems.

5.2.4 Result Area 1.3: Improve the Legislative and Policy environment for EMIS to ensure proper support for EMIS data collection, completeness and quality

The legislation and policy required to support EMIS should be reviewed and where possible strengthened to ensure data quality and completeness.

Activities and Indicators:

Activity 1.3.1: Review the policy and legislative environment to support reliable and timely education data and make recommendations for changes where required. In particular review and strengthen legislation to ensure private schools must register and submit annual census forms to district education offices.

Indicator:

1) The policy and legislative environment to support EMIS is reviewed and strengthened

5.3 Objective 2.0: Increase Access to and Use of EMIS Information

5.3.1 General Overview

The EMIS master plan will improve access to and use of information at all levels of government and at the school. This supports Objective 5.5 of the ICT Master Plan 2009-2013 where ICT is used to facilitate administration of schools. This plan supports Result 5.5.1 to ensure secondary schools use information management software to facilitate their administration. 120 upper secondary schools will use computer

software to register and manage their students, activities, and budget, sending data regularly in a format that can be integrated in EMIS.

This will be achieved through: The piloting of a student tracking system or SIS in selected secondary schools; integration of EMIS with QEMIS; a reporting needs assessment and improvements to report formats and displays; generation and distribution of school report cards to be in line with school development planning; development of a dedicated EMIS website to disseminate data and support EMIS throughout Cambodia.

5.3.2 Result Area 2.1: Strengthening of school planning and management through School Information System (SIS)

School development planning and management and data on individual students will be available through a school information system piloted in either one district or 120 selected upper secondary schools. School report cards will be designed and distributed and will facilitate initiatives to support school development planning

Activity 2.1.1: Student Tracking and / or SIS: The Department of Planning should participate in and monitor the pilot of the student tracking system. Ensure integration of the piloted **Student Tracking System** with EMIS and inclusion of rollout and recurrent budget estimates in future iterations of the **EMIS master plan**. An SIS can be developed to support the student tracking system for operation in schools able to access the internet. Pilot in one district for 3 years or in selected schools throughout Cambodia or in 120 upper secondary schools.

Activity 2.1.2: Redesign and pilot school report cards to ensure they are compatible with the needs of school development planning. Ensure school report cards are distributed back to schools. Also post online on the EMIS website (see below).

Indicators:

1) School and student level data will be improved through enabling schools in one district or 120 selected upper secondary schools with a student tracking system and a school information system (possibly the same).
2) School development planning will be improved in all schools through the design and distribution of school report cards.

5.3.3 Result Area 2.2: Enhance reports on EMIS data and improve means for distributing reports to ensure access of EMIS data in appropriate formats by all stakeholders

The report formats generated from EMIS will be enhanced and made compliant with the reporting needs of stakeholders. This will involve a comprehensive review of the reporting needs of stakeholders at each level of the education system. The scope of EMIS reports will be enhanced with data from QEMIS. The internet will be employed as a vehicle for dissemination of EMIS data.

Activity 2.2.1: Develop QEMIS and ensure integration of QEMIS with EMIS.

Activity 2.2.2: Based on the data needs assessment. Review EMIS reports to ensure inclusion of graphical presentation. Enhance reporting to include other forms of data analysis such as sub-national cohort analysis. Enhance needs analysis reporting to show development needs of schools by highest to lowest and ensure reports are linked to annual planning needs.   Standardize and code reports and develop training materials which link reports to use in planning in accordance with the sub-national the planning cycle. With reference to the data needs assessment, review the school census form to ensure capture of all required data. In particular data, data on ICT and financial income and expenditure. Modifications to the D**ata Management Framework** will also be required.

Activity 2.2.3: Develop a **dedicated website** for uploading (EMIS office) and searching (others) EMIS data and reports in generated format (such as school report cards). The website should facilitate online support and help from the National EMIS office to sub-national units including the capacity to download training materials

Indicators:

1) QEMIS data is merged and reported with EMIS data and used to inform planning at provincial and national level.
2) Increased use of EMIS data to inform provincial and national sector plans and micro level planning.
3) Dedicated EMIS website established and accessed for EMIS data.

5.4   Objective 3.0: Improve EMIS Data quality and completeness

5.4.1   General Overview

EMIS data quality will be improved and the existing gaps in EMIS data will be addressed through: the development of a data warehouse integrating pupil assessment data, data on higher education and vocational education; capturing data on religious and private schools; decentralizing data management to districts and schools; improving error reporting during the school census; improving the capacity of national level EMIS staff to triangulate EMIS data with data from other sources to help identify errors.

5.4.2   Result Area 3.1: Improved completeness of EMIS data through integration of data from other line ministries and departments

A data warehouse will be developed which will integrate and report on data from other line ministries and departments such as pupil assessment data, data on higher education institutions and vocational education and learning centers. Religious schools teaching basic education will be incorporated into the school census.

Maps to ICT Goals:

- **Objective 5.3:** All Education Management Information Systems and other databases in MoEYS are homogenized and integrated. Specifically **Result 5.3.1:** which supports the objective to analyse education management information needs (of line departments as well as of by provincial offices) that are not yet covered by the information presently collected and provided

28

by the current EMIS. Reports to be produced automatically by the databases will include the information presently being received and requested by line departments and regional offices. The EMIS and concerned MoEYS departments collecting information on the education system will add to their questionnaires all the new information that needs to be included in the integrated Information Management System.

Activity 3.1.1: Develop a data warehouse based on the Data Management Framework at EMIS to store information gained from other line ministries and departments concerning: Pupil assessment data; Higher education; Vocational education and learning centers. Ensure data is annually integrated into the data warehouse in accordance with data standards (see point above).

Activity 3.1.2: Standardize data capture for the school census with the census conducted by the Ministry of Cultures and Religion to ensure incorporation of data from religious schools into the EMIS database.

Indicators:

1) A data warehouse generating reports which integrate EMIS data with assessment data, higher education data and data on vocational education and learning centres.
2) Inclusion of all religious schools in the EMIS data

5.4.3   Result Area 3.2: Improve the quality of EMIS data through improved processes and techniques of analyzing EMIS data to identify errors and problems

EMIS data quality will be improved through: improved data verification and validation processes; improved error and problem reporting from EMIS software; possible rescheduling of the school census; improved analysis and triangulation of EMIS data with other data sources.

Activity 3.2.1: Improve data verification and validation processes to involve both the national and provincial levels in the verification of school level data.   Involve NGO's and development partners in the validation of school data.

Activity 3.2.2: Improve reports so that as data anomalies are identified and data which falls outside acceptable norms can be easily identified. Analysis such as the Simplified Cohort analysis undertaken at the sub-national level will help identify anomalies in the data which can be addressed with the relevant authority. This requires generation of time series reports. POEs/DoP, partners and external parties can review historical data to help identify anomalies and identify areas where support is required to improve data or the data collection process.

Activity 3.2.3: Review scheduling of the school census to commence at an earlier date to ensure data is available and analyzed by February the following year in time for the congressional meeting. Consider more regular collection of student enrolment and attendance data and teacher attendance data. Consider also less frequent data collection of static data such as classrooms.

Activity 3.2.4: Support development of national EMIS capacity to triangulate EMIS data against other data sources to help report on the accuracy of EMIS data.

Indicators:

1) The quality of EMIS data is improved through improved analytical techniques as measured through cohort analysis, time series consistency and other methods.

5.4.4   Result Area 3.3:   Improve data quality and timeliness through decentralization of EMIS data entry and management to the district and school level

Data quality and timeliness will be improved through the piloting of EMIS data entry and management at the district and school levels.

Activity 3.3.1: Pilot and rollout decentralization of data entry and EMIS management to the district and school level for districts and schools able to access the internet.

Indicators:

1) Data entry of census form online from up to 200 schools (2015) and 400 schools (2016) and 400 schools (2017) and 400 schools (2018). 5 pilot districts undertake online data entry, analysis and use EMIS reports for planning.

5.5   Objective 4.0: Further develop Human and Technical Resources

5.5.1   General Overview

National staff will be trained in techniques of improved analysis of EMIS data, in particular the capacity to undertake longitudinal studies using EMIS data. National EMIS staff and leaders in policy and planning will gain exposure to international best practice for EMIS development which will help inform future iterations of the EMIS master plan.

5.5.2   Result Area 4.1:   Improved planning through the publishing of longitudinal studies using EMIS data.

Activity 4.1.1: Train national staff in the conduct of longitudinal studies using EMIS data. IIEP provide distance and face to face learning through the Advanced Training Programme, Specialised Courses and in-country workshops.

Indicators:

1) Longitudinal studies are published using EMIS data and used to inform sector planning

5.5.3   Result Area 4.2: Planning for EMIS is improved through exposure to international best practice for EMIS development

Activity 4.2.1: A study tour for senior staff in the department of planning to review EMIS operation in 1-2 countries following good EMIS practice.

Indicators:

1) The EMIS Operational and Development plan is updated annually incorporating international best practice in EMIS development.

5.6   Other Objectives for Possible Implementation

The following are not included in this plan but may be considered in future revisions:

a) The conduct of a school mapping exercise throughout Cambodia. A digital mapping excersise could be conducted together with district council/ commune council members using hand held devices to feed data into DOE, POE and the national level.
b) Revision of the census form to a twice yearly mini census for pupils
c) Integration of EMIS into the processes of school supervisors and inspectors
d) Rollout of School Information Systems and direct data entry to other schools not included in this plan.
e) Hardware, software and internet provision to districts and schools. Presently the initial assessment is included as part of objective 1.0.

6 Annual Operational Elements of the Plan

This section summarizes the annual operational costs of the system based on the present deployment of the web based census system and estimates of recurrent training and support to the systems. The operational plan is intended to show main activities requiring budget. Budget should be reviewed annually to ensure sufficient funds are allocated to activities, maintenance and training.

The operational component of the plan gives support to the ICT Master Plan 2009-2013 **Objective 5.3:** All Education Management Information Systems and other databases in MoEYS are homogenized and integrated. Specifically to **Result 5.3.2:** Departmental, provincial and district offices will adopt the new information management system. Departmental, provincial and district staff will be trained to use the new databases. Training will be given first to provincial and then to district offices on how to enter data on the databases and how to obtain information from them. Data entry and the use of this data will be decentralized whenever possible. Data will be migrated from the old systems to Unicode encoding and to the format of the new databases.

6.1   EMIS Annual data collection and publishing

EMIS data collection and publishing contains all activities required to undertake the annual school census including adjustment and printing of the census forms, adjustments to software and collection, verification and validation and analysis and publication of data.

The main addition over previous years is verification and validation to be undertaken on a sub-set of schools. This should serve to encourage schools, districts and provinces to produce accurate EMIS data, particularly if legislation concerning falsification of data is enforced.

6.2   EMIS Recurrent Training

Annually recurrent training is vital to ensure sustainability of the systems and improve technical capacity of EMIS staff. Standard recurrent training activities are included in this section. As online training and distance learning systems are developed the costs of recurrent training should decrease[5].

6.3   EMIS Support and Maintenance

This section includes recurrent expenses relating to general EMIS support activities, maintenance of a minimal level of hardware for EMIS and ensuring internet access to provinces. A standard annual 15% allocation of estimated total replacement costs for hardware is allocated to hardware maintenance.

6.4   Summary of Operational Budget

A summary of the EMIS annual operational budget is included below.

---

[5] Operational activities and budget should be reviewed annually along with the development plan and budget

Table 4.   Summary of Operational Budget

Item	Budget	Present funding	Funding Gap
EMIS Annual data collection and publishing	$198,438	$76,500	$121,938
EMIS Recurrent Training	$102,074	$45,000	$57,074
EMIS Support and Maintenance	$112,975	$104,550	$8,425
TOTAL	$413,487	$226,050	$187,437

Figure 3:   A) % breakdown of operational budget   b) % Funding Gap
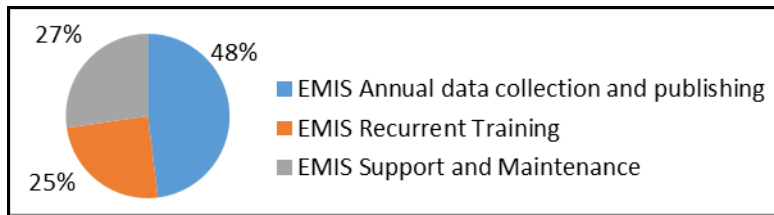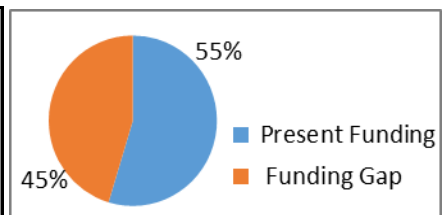
Table 5.   Gantt chart and resource costing for the EMIS annual Operational Plan

SN	Activity	Output	Schedule												Total (USD)	Present Funding	Funding Gap	Present Funding Source
			J	F	M	A	M	J	J	A	S	O	N	D				
1.00	**EMIS Annual data collection and publishing**																		
1.01	Update school census questionnaires (public & private form), Printing form and transportation fee to sub national level including incentives	Questionnaires printed and distributed								🟩	🟩				$28,500	$7,000	$21,500	UNICEF
1.02	Data collection and data entry of school census	First draft EMIS data										🟩	🟩		$86,400	$56,000	$30,400	UNICEF
1.03	Data verification, validation, monitoring and spot check of 5% schools. This could also be undertaken with	Verification of EMIS data	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩				$40,000	$4,500	$35,500	CDPF (EU, Sweden, UNICEF)

SN	Activity	Output	Schedule												Total (USD)	Present Funding	Funding Gap	Present Funding Source
			J	F	M	A	M	J	J	A	S	O	N	D				
	cooperation and assistance of ESWG or CCC by using data collected by NGO's and other stakeholders.		■	■	■	■	■	■	■	■	■							
1.04	Consolidate data	Consolidated data											■	■	$5,000	$0	$5,000	
1.05	Collect data from other line ministries and departments (TVET, Financial, Assessment, religious schools)	Additional data to compare to EMIS											■	■	$5,000	$0	$5,000	
1.06	Analytical working group to analyse data for the congressional report including the sub-national level	Statistical tables	■												$10,000	$0	$10,000	

SN	Activity	Output	Schedule												Total (USD)	Present Funding	Funding Gap	Present Funding Source
			J	F	M	A	M	J	J	A	S	O	N	D				
1.07	Produce and dissemination of education statistics and Indicators	Statistical publications													$13,538	$9,000	$4,538	CDPF (EU, Sweden, UNICEF)
1.08	Longitudinal studies on EMIS data including publications	EMIS data analysed and triangulated													$10,000	$0	$10,000	CDPF (EU, Sweden, UNICEF)
1.00	SUB TOTAL														$198,438	$76,500	$121,938	
2.00	EMIS Recurrent Training																	
2.01	Training on generation of EMIS data through web based portal and manipulation of data in MS Excel and SPSS	National and provincial EMIS staff trained in data manipulation annually.													$8,534	$0	$8,534	
2.02	Recurrent training to National and sub-national level on server	National and provincial EMIS staff trained in technical													$10,040	$0	$10,040	

SN	Activity	Output	Schedule												Total (USD)	Present Funding	Funding Gap	Present Funding Source
			J	F	M	A	M	J	J	A	S	O	N	D				
	application set up, network maintenance and maintaining the EMIS application	maintenance of EMIS hardware and software						▓										
2.03	Capacity development for POEs on web-based application with new data base management system	provincial EMIS staff trained in data entry Pre, Pri Sec.						▓							$7,000	$7,000	$0	CDPF (EU, Sweden, UNICEF)
2.04	Conduct training to national and sub-national level on server administration	Provincial EMIS staff trained in server maintenance.								▓					$8,000	$8,000	$0	CDPF (EU, Sweden, UNICEF)
2.05	Conduct training on statistics and indicators to national level (and on producing statistics)	Improved use of EMIS data for planning, monitoring the national and provincial level								▓					$20,000	$0	$20,000	

SN	Activity	Output	Schedule												Total (USD)	Present Funding	Funding Gap	Present Funding Source
			J	F	M	A	M	J	J	A	S	O	N	D				
2.06	Train new School Principals in Annual School Census Forms and school record keeping	New school principals trained in annual school census and school record keeping													$15,000	$15,000	$0	CDPF (EU, Sweden, UNICEF)
2.07	Training program on for data analysis and use, EMIS and statistics	Provincial EMIS staff trained in analytical report preparation													$15,000	$15,000	$0	CDPF (EU, Sweden, UNICEF)
2.08	Conduct training on QEMIS Primary Questionnaire to provincial level	Provincial EMIS staff in 12 provinces trained in QEMIS questionaire													$8,500	$0	$8,500	
2.09	Coduct Pilot Training on QEMIS Secodary Questionnaire														$10,000	$0	$10,000	
2.00	SUB TOTAL														$102,074	$45,000	$57,074	

SN	Activity	Output	Schedule												Total (USD)	Present Funding	Funding Gap	Present Funding Source
			J	F	M	A	M	J	J	A	S	O	N	D				
3.00	**EMIS Support and Maintenance**																	
3.01	Monitoring and spot check (EMIS)	Regular work in provinces to support EMIS operation										■	■		$4,500	$4,500	$0	CDPF (EU, Sweden, UNICEF)
3.02	Conduct workshop to review EMIS 2013-2014 at national and provincial level	Provinces and national annual review of EMIS							■						$7,500	$7,500	$0	CDPF (EU, Sweden, UNICEF)
3.03	Conduct workshop on EMIS Master Plan national and sub-national level	provincial level learn from the EMIS Master Plan							■						$15,000	$15,000	$0	CDPF (EU, Sweden, UNICEF)
3.04	National EMIS Office supplies and Equipment in national level	Regular provision of required materials								■					$6,225	$5,000	$1,225	UNICEF
3.05	Sub-National EMIS Office supplies and Equipment in 24 provinces	Regular provision of required materials									■				$7,200	$0	$7,200	UNICEF

SN	Activity	Output	Schedule												Total (USD)	Present Funding	Funding Gap	Present Funding Source
			J	F	M	A	M	J	J	A	S	O	N	D				
3.06	Hardware Maintenance at the national and sub-national level	Hardware maintained													$14,550	$14,550	$0	EEQP2
3.07	Internet for national and sub-national to provincial level (presently Esycom under EEQP2)	Internet operational for EMIS													$58,000	$58,000	$0	ADB (52,200) RGB (5,800)
3.00	SUB TOTAL														$112,975	$104,550	$8,425	
	TOTAL														**$413,487**	**$226,050**	**$187,437**	

7 Development Elements of the Plan

7.1   Overview of the Plan

The strategic development plan is aimed at moving towards the target state described in section 2 and to address the recommendations made in section 3. For the purpose of simplifying the plan, development initiatives have been allocated to one of four development objectives. These are:

- Strengthen Processes (Data Accessibility)
- Increase Access to and Use of Information (Data Use)
- Improve Data quality and completeness (Data Collection)
- Further develop Human and Technical Resources (Data Demand)

Each initiative (activity) may contribute to more than one objective however for simplicity an activity has only been assigned a single objective.

7.2   Development Budget 2014-2018

The annual funding required to develop all aspects of EMIS in Cambodia are detailed below.   Cost for each activity, outputs and resources are detailed in the tables in section 5.3 of this document. Activities can be funded separately and not all activities are required to be undertaken in order to show significant progress in EMIS development. Different funding partners can opt to fund different aspects of the plan.

Table 6.   EMIS Development annual budget and total funding gap (1000's of USD)

Development Area	2014	2015	2016	2017	2018	Total	Present Funding	Funding Gap	% Funding
Strengthen Processes (Data Accessibility)	$65.00	$178.00	$173.00	$128.50	$100.00	$644.50	$0.00	$644.50	0.0%
Increase Access to and Use of Information (Data Use)	$345.00	$215.00	$181.00	$35.00	$20.00	$796.00	$551.00	$245.00	69.2%
Improve Data quality and completeness (Data Collection)	$88.50	$83.50	$63.50	$33.50	$23.50	$292.50	$0.00	$292.50	0.0%
Further develop Human and Technical Resources (Data Demand)	$55.00	$20.00	$20.00	$20.00	$20.00	$135.00	$0.00	$135.00	0.0%
Total Budget	$553.50	$496.50	$437.50	$217.00	$163.50	$1,868.00	$551.00	$1,317.00	29.5%

Figure 4:   Development Budget by EMIS development area
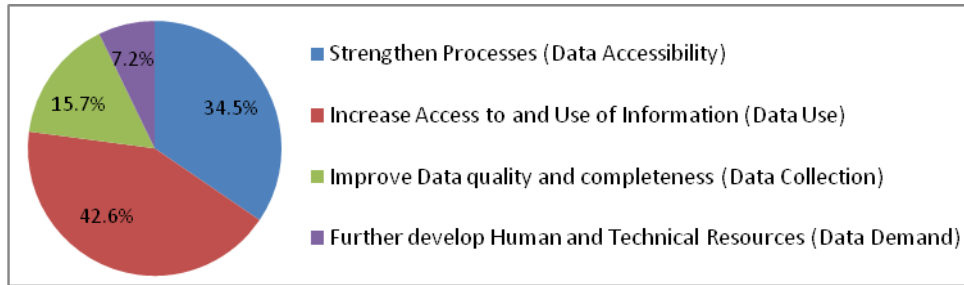
The figure below shows the annual costs if all aspects of the development plan were undertaken. The development plan should be annually reviewed and so the costs may vary in the future.   Development objectives and activities for future years (2017 and 2018) will become clearer as activities are completed in earlier years of the plan.

Figure 5:   Development Budget by Year 2014 – 2018 (1000s of USD)
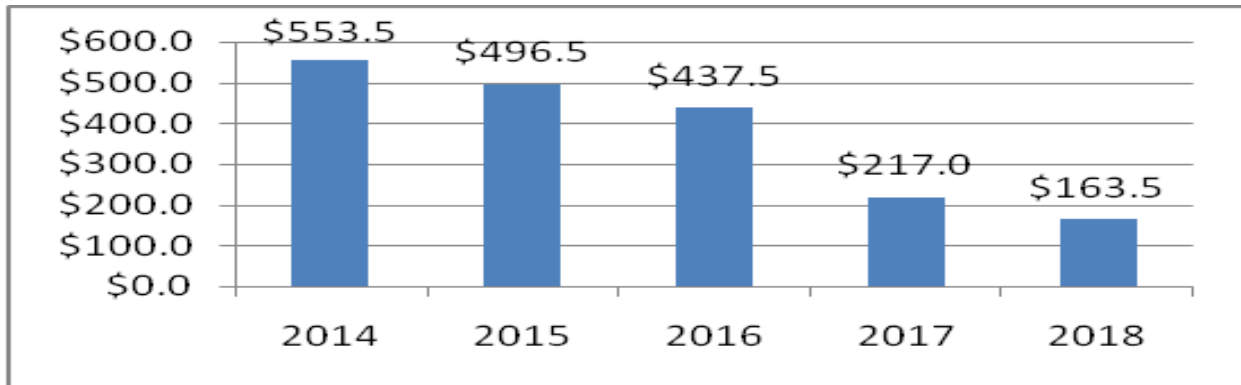
7.3   EMIS Development Plan, Activities, Budget, Outputs and Resources

The following table indicates the estimated cost per activity per year. The costs are indicative and can be used for approximate budget allocation for each activity. Prior to funding being released for each activity, comprehensive plans should be developed. Some plans, such as implementation of a student tracking system and potentially and SIS will require significant planning.

A Gantt chart is also included below indicating outputs for each activity and indicating the indicative resources required for each activity.

Table 7.   Development Budget by Year and Intervention

SN	Activity	2014 (USD)	2015 (USD)	2016 (USD)	2017 (USD)	2018 (USD)	Total (USD)	Present Funding	Funding Gap	Present Funding Source
1.00	**Strengthen Processes (Data Accessibility)**									
1.1.1	Conduct an audit to assess the hardware, internet and human resource capacity of provinces, districts and secondary schools including reassessment of the budget requirements of supporting districts to input EMIS data via the internet.	$15,000	$0	$0	$0	$0	$15,000	$0	$15,000	
1.1.2	Refurbish the national EMIS server room to ensure it is dust free and remains cool (2014) and 12 provinces for 2015 and 12 provinces for 2016	$6,500	$48,000	$48,000	$0	$0	$102,500	$0	$102,500	
1.2.1	Review record keeping at schools and school level completion of census forms. Schools require technical assistance including a handbook with the clear definitions of education statistics and indicators, and a manual on how to manage the school statistics and school data. Cascade 1 day training to all head teachers via school supervisors at the district level. Pilot in 1 province in 2014 and rollout to 6 provinces 2015, 6 provinces 2016, 6 provinces 2017, 5 provincs 2018	$30,000	$125,000	$125,000	$125,000	$100,000	$505,000	$0	$505,000	

SN	Activity	2014 (USD)	2015 (USD)	2016 (USD)	2017 (USD)	2018 (USD)	Total (USD)	Present Funding	Funding Gap	Present Funding Source
1.2.2	**Develop a Data Management Framework for Education Data.** Develop data standards to ensure compatibility between data from different sources where required. Standards should be developed for SIS as part of the **Data Management Framework**. This will help ensure that information from SIS is compatible with national systems and meets national standards.	$10,000	$5,000	$0	$0	$0	$15,000	$0	$15,000	
1.3.1	Review the policy and legislative environment to support reliable and timely education data and make recommendations for changes where required. In particular review and strengthen legislation to ensure private schools must register and submit annual census forms to district education offices.	$3,500	$0	$0	$3,500	$0	$7,000	$0	$7,000	
1.00	**TOTAL**	**$65,000**	**$178,000**	**$173,000**	**$128,500**	**$100,000**	**$644,500**	**$0**	**$644,500**	
2.00	**Increase Access to and Use of Information (Data Use)**									
2.1.1	Student Tracking and / or SIS: The Department of Planning should participate in and monitor the pilot of the student tracking system. Ensure integration of the piloted **Student Tracking System** with EMIS and inclusion of rollout and recurrent budget estimates in future iterations of the **EMIS Operational and Strategic Development Plan**. Pilot in one district	$200,000	$150,000	$150,000	$0	$0	$500,000	$500,000	$0	GPE

SN	Activity	2014 (USD)	2015 (USD)	2016 (USD)	2017 (USD)	2018 (USD)	Total (USD)	Present Funding	Funding Gap	Present Funding Source
	for 3 years or in selected schools throughout Cambodia. An SIS can be developed to support the student tracking system for operation in schools able to access the internet									
2.1.2	Redesign and pilot school report cards to ensure they are compatible with the needs of school development planning. Ensure school report cards are distributed back to schools. Also post online on the EMIS website (see 1.06 above)	$40,000	$20,000	$20,000	$20,000	$20,000	$120,000	$0	$120,000	
2.2.1	Develop QEMIS and ensure integration of QEMIS with EMIS.	$25,000	$15,000	$11,000	$0	$0	$51,000	$51,000	$0	World Bank
2.2.2	Undertake a data needs assessment. Review EMIS reports to ensure inclusion of graphical presentation. Enhance reporting to include other forms of data analysis such as sub-national cohort analysis. Enhance needs analysis reporting to show development needs of schools by highest to lowest and ensure reports are linked to annual planning needs. Standardize and code reports and develop training materials which link reports to use in planning in accordance with the sub-national the	$40,000	$30,000	$0	$0	$0	$70,000	$0	$70,000	

SN	Activity	2014 (USD)	2015 (USD)	2016 (USD)	2017 (USD)	2018 (USD)	Total (USD)	Present Funding	Funding Gap	Present Funding Source
	planning cycle. With reference to the data needs assessment, review the school census form to ensure capture of all required data. In particular data, data on ICT and financial income and expenditure. Modifications to the D**ata Management Framework** will also be required.									
2.2.3	Develop a **dedicated website** for uploading (EMIS office) and searching (others) EMIS data and reports in generated format (such as school report cards). The website should facilitate online support and help from the National EMIS office to subnational units including the capacity to download training materials	$40,000	$0	$0	$15,000	$0	$55,000	$0	$55,000	
2.00	**TOTAL**	**$345,000**	**$215,000**	**$181,000**	**$35,000**	**$20,000**	**$796,000**	**$551,000**	**$245,000**	
3.00	**Improve Data quality and completeness (Data Collection)**									
3.1.1	**Develop a data warehouse** based on the **Data Management Framework** at EMIS to store information gained from other line ministries and departments concerning: Pupil assessment data; Higher education; Vocational education and learning centers. Ensure data is annually integrated into the data warehouse in accordance with data standards (see point above).	$40,000	$40,000	$15,000	$0	$0	$95,000	$0	$95,000	

SN	Activity	2014 (USD)	2015 (USD)	2016 (USD)	2017 (USD)	2018 (USD)	Total (USD)	Present Funding	Funding Gap	Present Funding Source
3.1.2	Standardize data capture for the school census with the census conducted by the Ministry of Cults and Religion to ensure incorporation of data from religious schools into the EMIS database.	$5,000	$5,000	$5,000	$0	$0	$15,000	$0	$15,000	
3.2.1	Improve data verification and validation processes to involve both the national and provincial levels in the verification of school level data. Involve NGO's and development partners in the validation of school data.	$10,000	$20,000	$20,000	$10,000	$10,000	$70,000	$0	$70,000	
3.2.2	Improve reports so that as data is produced anomalies and data which falls outside acceptable norms can be easily identified. Analysis such as the Simplified Cohort analysis undertaken at the sub-national level will help identify anomalies in the data which can be addressed with the relevant authority. This requires generation of time series reports	$20,000	$0	$0	$10,000	$0	$30,000	$0	$30,000	
3.2.3	Review scheduling of the school census to commence at an earlier date to ensure data is available and analysed by February the following year in time for the congressional meeting. Consider more regular collection of student enrolment and attendance data and teacher attendance data. Consider also less frequent data collection of static data such as classrooms.	$10,000	$10,000	$10,000	$0	$0	$30,000	$0	$30,000	

SN	Activity	2014 (USD)	2015 (USD)	2016 (USD)	2017 (USD)	2018 (USD)	Total (USD)	Present Funding	Funding Gap	Present Funding Source
3.2.4	Support development of national EMIS capacity to triangulate EMIS data against other data sources to help report on the accuracy of EMIS data.	$3,500	$3,500	$3,500	$3,500	$3,500	$17,500	$0	$17,500	
3.3.1	Pilot and rollout decentralization of data entry and EMIS management to the district and school level for districts and schools able to access the internet.	$0	$5,000	$10,000	$10,000	$10,000	$35,000	$0	$35,000	
3.00	**TOTAL**	**$88,500**	**$83,500**	**$63,500**	**$33,500**	**$23,500**	**$292,500**	**$0**	**$292,500**	
4.00	**Further develop Human and Technical Resources (Data Demand)**									
4.1.1	Train national staff in the conduct of longitudinal studies using EMIS data. IIEP provide distance and face to face learning through the Advanced Training Programme, Specialised Courses and in-country workshops.	$20,000	$20,000	$20,000	$20,000	$20,000	$100,000	$0	$100,000	
4.2.1	A study tour for senior staff in the department of planning to review EMIS operation in 1-2 countries following good EMIS practice.	$35,000	$0	$0	$0	$0	$35,000	$0	$35,000	
4.00	**TOTAL**	**$55,000**	**$20,000**	**$20,000**	**$20,000**	**$20,000**	**$135,000**	**$0**	**$135,000**	
	OVERALL TOTAL DEVELOPMENT EMIS	**$553,500**	**$496,500**	**$437,500**	**$217,000**	**$163,500**	**$1,868,000**	**$551,000**	**$1,317,000**	

7.4   Development Gantt Chart, Outputs and Resources

Table 8.   Intervention Framework

SN	Activity	Output	Resources	Schedule 2014 1	2014 2	2015 1	2015 2	2016 1	2016 2	2017 1	2017 2	2018 1	2018 2
1.00	**Strengthen Processes (Data Accessibility)**												
1.1.1	Conduct an audit to assess the hardware, internet and human resource capacity of provinces, districts and secondary schools including reassessment of the budget requirements of supporting districts to input EMIS data via the internet.	Recommendations to provinces for minimum standards required to enable districts for EMIS. Revisions to sub-national recurrent training scheme.	EMIS Staff, survey of districts	■									
1.1.2	Refurbish the national EMIS server room to ensure it is dust free and remains cool (2014) and 12 provinces for 2015 and 12 provinces for 2016	Stable environment for national EMIS	NA	■		■		■					
1.2.1	Review record keeping at schools and school level completion of census forms. Schools require technical assistance including a handbook with the clear definitions of education statistics and indicators, and a manual on how to manage the school statistics and school data. Cascade 1 day training to all head teachers via school supervisors at the district level. Pilot in 1 province in 2014 and rollout to 6 provinces 2015, 6 provinces 2016, 6 provinces 2017, 5 provincs 2018	Handbook of education statistics and managing school data distributed to all schools	EMIS Staff, TA (1 month), survey districts, printing of manual			■	■	■					

SN	Activity	Output	Resources	Schedule									
				2014		2015		2016		2017		2018	
				1	2	1	2	1	2	1	2	1	2
1.2.2	**Develop a Data Management Framework for Education Data.** Develop data standards to ensure compatibility between data from different sources where required. Standards should be developed for SIS as part of the **Data Management Framework**. This will help ensure that information from SIS is compatible with national systems and meets national standards.	Data management Framework for Education Data (including SIS)	EMIS Staff, TA (8 weeks), Survey Other Ministries, Provinces, Districts and Schools (revision to framework 2015)		▓	▓							
1.3.1	Review the policy and legislative environment to support reliable and timely education data and make recommendations for changes where required. In particular review and strengthen legislation to ensure private schools must register and submit annual census forms to district education offices.	Recommendations to legislation and policy changes concerning EMIS and EMIS data	EMIS Staff, TA (2 weeks)		▓					▓			
1.00	**TOTAL**												
2.00	**Increase Access to and Use of Information (Data Use)**												
2.1.1	Student Tracking and / or SIS: The Department of Planning should participate in and monitor the pilot of the student tracking system. Ensure integration of the piloted **Student Tracking System** with EMIS and inclusion of rollout and recurrent budget estimates in future iterations of the **EMIS Operational and Strategic Development Plan**. Pilot in one district for 3 years or in selected schools throughout Cambodia. An SIS can be developed to support the student tracking system for operation in schools able to access the	Piloted student tracking system ready for rollout nationally and basic SIS linked to EMIS and available online for schools able to fund training, internet access and equipment. Pilot in 2014/2015. 5% schools in 2016, 10% schools in 2017, 15% schools in 2018	EMIS Staff, GPE	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓

SN	Activity	Output	Resources	Schedule									
				2014		2015		2016		2017		2018	
				1	2	1	2	1	2	1	2	1	2
	internet			■	■	■	■	■	■	■	■	■	■
2.1.2	Redesign and pilot school report cards to ensure they are compatible with the needs of school development planning. Ensure school report cards are distributed back to schools. Also post online on the EMIS website (see 1.06 above)	Revised school report cards distributed to all schools for 2015, 2016, 2017, 2018.	EMIS Staff, TA (1 month), pilot program (30 schools), Software Development Company, Print budget			■	■	■	■	■	■	■	■
2.2.1	Develop QEMIS and ensure integration of QEMIS with EMIS.	QEMIS operational	EMIS Staff,	■	■	■	■	■	■				
2.2.2	Undertake a data needs assessment. Review EMIS reports to ensure inclusion of graphical presentation. Enhance reporting to include other forms of data analysis such as sub-national cohort analysis. Enhance needs analysis reporting to show development needs of schools by highest to lowest and ensure reports are linked to annual planning needs. Standardize and code reports and develop training materials which link reports to use in planning in accordance with the sub-national the planning cycle. With reference to the data needs assessment, review the school census	New EMIS graphical and analytical reports and redesigned census form	EMIS Staff, TA (3 months), Software Development Company, Survey of schools, districts, provinces and other departments, ministries		■	■							

SN	Activity	Output	Resources	2014		2015		2016		2017		2018	
				1	**2**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
	form to ensure capture of all required data. In particular data, data on ICT and financial income and expenditure. Modifications to the D**ata Management Framework** will also be required.				🟩	🟩							
2.2.3	Develop a **dedicated website** for uploading (EMIS office) and searching (others) EMIS data and reports in generated format (such as school report cards). The website should facilitate online support and help from the National EMIS office to sub-national units including the capacity to download training materials	Dedicated EMIS website and online technical support and knowledge base for training materials	EMIS Staff, Web development company	🟩						🟩			
2.00	**TOTAL**												
3.00	**Improve Data quality and completeness (Data Collection)**												
3.1.1	**Develop a data warehouse** based on the **Data Management Framework** at EMIS to store information gained from other line ministries and departments concerning: Pupil assessment data; Higher education; Vocational education and learning centers. Ensure data is annually integrated into the data warehouse in accordance with data standards (see point above).	Data warehouse designed, developed and populated with data	EMIS Staffs, TA (3 months), Survey provinces, Departments and other ministries, Software Development Company	🟩	🟩	🟩	🟩	🟩					
3.1.2	Standardize data capture for the school census with the census conducted by the Ministry of Cults and Religion to ensure incorporation of data from religious schools into the EMIS database.	Census form and tools incorporated into Ministry of Religion and Cults for capture of religious schools	EMIS Staffs, TA (2 weeks), 1 workshop in each of 2014 and 2015 and national TA for 3 years to assist		🟩	🟩	🟩	🟩					

SN	Activity	Output	Resources	Schedule 2014		2015		2016		2017		2018	
				1	2	1	2	1	2	1	2	1	2
3.2.1	Improve data verification and validation processes to involve both the national and provincial levels in the verification of school level data. Involve NGO's and development partners in the validation of school data.	Develop and implement verification of data at the school level (estimate 2-3% of schools)	EMIS Staffs, TA (1 month)		X		X		X		X		X
3.2.2	Improve reports so that as data is produced anomalies and data which falls outside acceptable norms can be easily identified. Analysis such as the Simplified Cohort analysis undertaken at the sub-national level will help identify anomalies in the data which can be addressed with the relevant authority. This requires generation of time series reports	Develop data validation reports and implement validation checks and processes	EMIS Staffs, TA (1 month), Software Development Company	X	X	X				X			
3.2.3	Review scheduling of the the school census to commence at an earlier date to ensure data is available and analysed by February the following year in time for the congressional meeting. Consider more regular collection of student enrolment and attendance data and teacher attendance data. Consider also less frequent data collection of static data such as classrooms.	Proposal for changes to data collection which may lead to further action	EMIS Staffs, TA (5 week), Workshops		X	X	X	X					
3.2.4	Support development of national EMIS capacity to triangulate EMIS data against other data sources to help report on the accuracy of EMIS data.	Annually updated reports triangulating EMIS data to other data sources	EMIS Staff, TA (1 month per year), workshop to showcase results	X		X		X		X			
3.3.1	Pilot and rollout decentralization of data entry and EMIS management to the district and school level for districts and schools able to access the internet.	Data entry of census form online from up to 200 schools (2015) and 400 schools (2016) and 400 schools (2017) and 400 schools (2018)	EMIS Staffs, Training at school level		X	X	X	X	X	X	X	X	X

SN	Activity	Output	Resources	Schedule									
				2014		2015		2016		2017		2018	
				1	2	1	2	1	2	1	2	1	2
3.00	**TOTAL**												
4.00	**Further develop Human and Technical Resources (Data Demand)**												
4.1.1	Train national staff in the conduct of longitudinal studies using EMIS data. IIEP provide distance and face to face learning through the Advanced Training Programme, Specialised Courses and in-country workshops.	6 national DoP and EMIS staffs trained in longitudinal studies using EMIS data	DoP and EMIS Staffs		■		■		■		■		■
4.2.1	A study tour for senior staff in the department of planning to review EMIS operation in 1-2 countries following good EMIS practice.	4 senior DoP and EMIS staff to review the operational and development plan based on the findings of a study tour	DoP and EMIS Staffs		■								
4.00	**TOTAL**												
	OVERALL TOTAL DEVELOPMENT EMIS												

7.5 Total Annual Budget for EMIS Operational and Development 2014–18

The total annual budget 2014-2018 is shown in the table below. The budget for EMIS operational plan assumes a 5% annual increase in costs, in line with growth in the economy and inflation. The budget for the EMIS development plan assumes all activities are funded and undertaken.

Table 9.   Total annual budget by year 2014-2018 (1000s of USD)

	2014	2015	2016	2017	2018	Total (2014-2018)
EMIS development plan	$553.5	$496.5	$437.5	$217.0	$163.5	$1,868.0
EMIS operational plan	$413.5	$434.2	$455.9	$478.7	$502.6	$2,284.8
Total budget	$967.0	$930.7	$893.4	$695.7	$666.1	$4,152.8

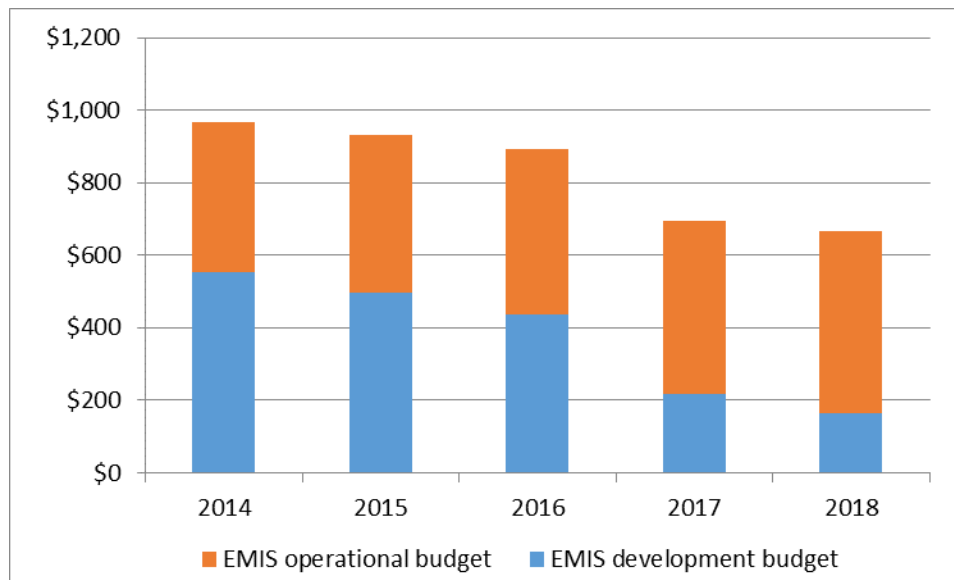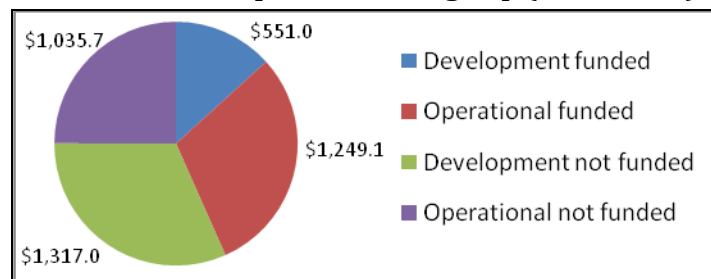**Figure 6:   Annual Operational and Development Budget by Year 2014-2018**

Figure 7:   Operational and Development Funding Gap (2014-2018)[6]

---

[6] *Assumption that present funding arrangements for operational budget are maintained and incremented in accordance with expected inflation annually

Annex 1:   Bibliography

CDPF (2012) *Proposal for CDPF Direct Support to Sub-National Level*, July 2012, MoEYS

Khmerdev (2011) *Management Information System Project for MOEYS Inception Report*, ADB EEQP Project, Sept 2011

MoEYS (2011) *Education Congress Report on the Education, Youth and Sport Performance in the Academic Year 2009 – 2010 and the Academic Year 2010-2011 Goals*, 22 – 24 March 2011

MoEYS (2010) *Education Strategic Plan, 2009-2013*, September 2010

MoEYS (2009) *Master Plan for Information and Communication Technology in Education (2009-2013)*

NIS (2007), Statistical Master Plan for Cambodia, National Institute of Statistics (NIS), Ministry of Planning, Sept 2007

Nyan M (2006) *Assessment of Education Management Information System in Cambodia*, Phnom Penh (August 2006)

Sampoan L., Cheam S., Ang T. (2010) *Enhancing Education Quality Project (EEQP), Technical Documentation, TU1 – Output 1.5*, Department information, Department of Planning, Personnel, Finance, NIE, Coffey, CSCS, July 2010

UNICEF (2012), *Education Capacity Development Partnership Fund (CDPF)*, 2012 CDPF Work Plan, January – December 2013, MARCH 2013

World Bank (2014) *Project Appraisal Document on a Global Partership for Education Grant in the Amount US$38.5 Million to the Royal Government of Cambodia for a Second Education Sector Support Project*, International Development Association, World Bank, MARCH 4, 2014

Annex 2: EMIS Workflow

Figure 8: EMIS Annual Workflow

EMIS Office		
• Revise ASCF • Send to UNICEF for printing • Disseminate 4 copies each to all schools national wide	• Check ASCF data for Error • Enter data for 15 provinces • Clean and verify all data • Generate reports and outputs • Send to UNICEF for Printing • Dissemination to all levels	Dissemination of: • Education Statistics & Indicators • Statistics by Cluster • Textbook Distribution • Basic Information of School • Graphics, Leaflet, Wall-sheets

Provincial EMIS		
• forward ASCF Form (4 copies)	• Check ASCF data for Error • Fill province form • Fill Statistics Summary Tables for province use • Sign and Stamp (keep 1 copy, send 1 copy) • PES: 9 provinces enter data and then send data to EMIS	Receive: • Education Statistics & Indicators • Statistics by Cluster • Textbook Distribution • Basic Information of School • Graphics, Leaflet, Wall-sheets

District EMIS		
• forward ASCF Form (4 copies)	• Check ASCF data for Error • Fill school ID code • Fill district form • Fill Statistics Summary Tables for district use • Sign and Stamp (keep 1 copy, send 2 copies)	Receive: • Education Statistics & Indicators • Statistics by Cluster • Textbook Distribution • Basic Information of School • Graphics, Leaflet, Wall-sheets

School		
• Fill ASCF Form • Sign and Stamp (keep 1 copy, send 3 copies)		Receive: • Graphics for Primary School • Wall-sheet