USAID | INDONESIA
FROM THE AMERICAN PEOPLE

Decentralized Basic Education 1: Management and Governance

EMIS Assessment

DBE 1 Special Report

June 2007

This report was prepared for review by United States Agency for International Development

This report was prepared by Research Triangle Institute International

More Effective Decentralized Education Management and Governance (DBE1)

EMIS Assessment Report

Contract 497-M-00-05-00029-00

Prepared for
USAID/Indonesia

Prepared by
RTI International
3040 Cornwallis Road
Post Office Box 12194
Research Triangle Park, NC 27709-2194

Table of Contents

Page

List of Figures

List of Tables

Executive Summary

In the post-decentralization era in Indonesia, the use of education data to support education management decisions and planning is more important that ever. Education managers, from the school committee to the national Minister of Education, can use data to obtain baseline measures of education quality, identify realistic policy objectives, measure progress toward those goals, and report on improvements in the education sector, locally and nationally.

While the potential impact of education data has never been so high in Indonesia, the threats to the effective use of education data have never been so many. In the decentralized system of data collection, management, transmission, and use, local deficiencies can have a national impact, as reported data flows up through the education administration to the center (i.e., national) level. Failing to resolve problems at the lower levels—schools and districts—means that all data users "upstream" are affected by poor data quality, including inaccurate and incomplete data. As a result, decisions made based on data aggregated at the district, province, or central levels may be based on faulty assumptions of the state of education.

This assessment identifies a number of threats to data use in Indonesia. Among these threats are technological issues, related to the physical resources required for data entry and management; process issues, related to data entry and management quality control; and human resource issues, related to the ability of districts to benefit from the education management information systems (EMIS) they use.

While these issues certainly need to be addressed, there is a larger obstacle facing EMIS systems in Indonesia. EMIS systems depend on the active participation of education managers at the school and district levels to produce an accurate and complete data set for the nation as a whole; however, the systems have not been designed in such a way as to adequately motivate schools and districts to take a vested interest in the success of the EMIS systems. In light of decentralization, the central level of administration cannot compel schools and districts to comply with data-collection initiatives; rather they must make sure that there is an adequate incentive for these lower levels to participate in the process.

The assessment found that while there is a demand for data to support education management at the school and district levels, there is low demand for the EMIS systems currently used in Indonesia. This low demand can be attributed to a number of factors: difficulty extracting data from the EMIS systems; limited understanding about the purpose of data collection; and redundancy in data collection by different units of Ministry of National Education (MONE) and Ministry of Religious Affairs (MORA). The issues must be addressed and addressed quickly: failing to generate demand for EMIS systems will likely perpetuate the sense of disenfranchisement in the EMIS process that leads to poor-quality and incomplete data being reported.

Creating the demand for EMIS systems requires reorienting the systems to overtly serve schools and districts. While these potential users can benefit from the current

systems, it seems to be only as an afterthought rather than by conscious design. Systems that serve these users will collect information needed by them and present it in a way that meets their decision-making needs, in terms of level of aggregation, means of access, and level of sophistication. Without understanding what these requirements are, it is impossible to reorient existing systems or implement new systems that will be able to serve the wide range of data users that Indonesia now has, and as a result the chain of demand for data will break somewhere along the way. Once this chain of demand is broken, and once there is apathy about the quality of data being reported, all EMIS data becomes suspect.

1. Introduction

1.1 Why Conduct an EMIS Assessment?

Data and information play a key role in decentralized education management. Despite the decentralization of responsibility and decision-making authority in many countries around the world, education information systems have not necessarily changed to keep pace with new users and new uses of data and information. In Indonesia, a need remains for reporting education data and statistics at a central level; however, low demand for data at provincial, district, and school levels, as well as a weak capacity to use the data for education management at these levels, hinders the country's ability to present a comprehensive picture of its education sector. As a result of this history of non-use, the demand for data and information from local stakeholders is weak; heir capacity to collect and report data must be strengthened for the information to be used to support improved decision making. Centralized information systems that fail to meet the needs of new users may actually reinforce low-demand trends, discouraging capacity building by perpetuating the notion that data and information systems "belong" to the central level ministries, and that school and district levels serve only as data providers instead of data consumers.

To understand how these issues may adversely affect decentralized education management in Indonesia, the More Effective Decentralized Education Management and Governance (DBE1) project implementing partner RTI International has undertaken an assessment of EMIS in the country. The objective is to understand how the current EMIS environment enables or hampers data use at the school and district level, and how data use at the school and district levels impacts data use at the central level.

1.2 Conceptual Framework

Despite common misconception, the objective of an EMIS is not to collect data, nor is the goal to manage, input, print, or send data to government or international education agencies such as the UNESCO. Instead, an EMIS should enable information use to support education managers and decision makers.

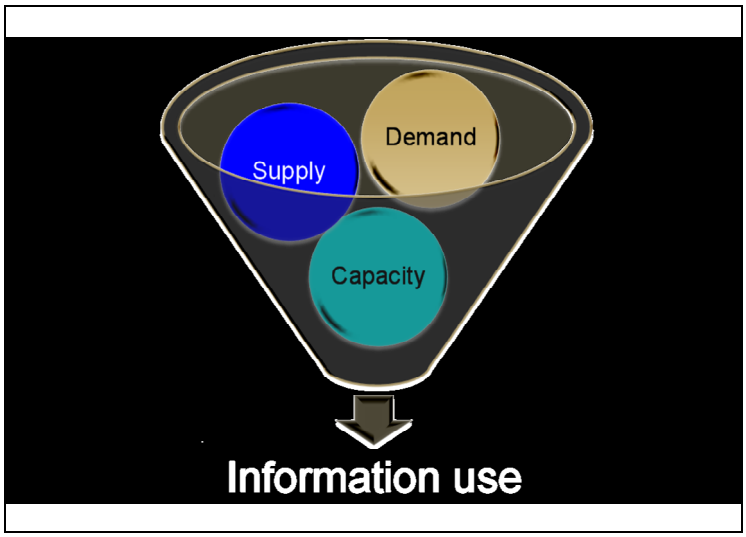
In examining the EMIS environment in Indonesia, there are three interdependent elements related to information use: 1) supply of quality data; 2) demand for data in education management; and 3) capacity to use data (see Figure 1.1).

- Quality data refers to the availability of data that is timely, accurate, reliable, and relevant and accessible to users. Information that is not of satisfactory quality may lead to: poor decisions, such as in cases where the data in inaccurate; baseless decisions, where data are not available or not accessible; and distrust in data, when it is unreliable.
- Demand for data refers to the incentives (or disincentives) for decision makers to use data in planning, monitoring and evaluation (M&E), and administrative and management duties. Regardless of the quality of data available, if there is

no demand for it to be used to support decision making, it will likely languish. Lack of demand may result from various reasons, including, but not limited to, lack of: value placed on data; awareness that data are available; and accountability for using data to inform decisions, as well as failure to consider data to be functional to different decision makers.

- Capacity to use information refers to the ability of users to access, understand, apply, and benefit from data.[1] Even where quality data and a demand for it exists, many would-be users are not able to understand data as it is typically presented, or to use it to guide their decision making. This may be particularly true in systems that have recently decentralized, where new actors who have not previously been responsible for using data for making decisions now find themselves with the responsibility to use data, but without the requisite capacity to do so.

Figure 1.1 Supply, Demand, and Capacity Affect Information Use



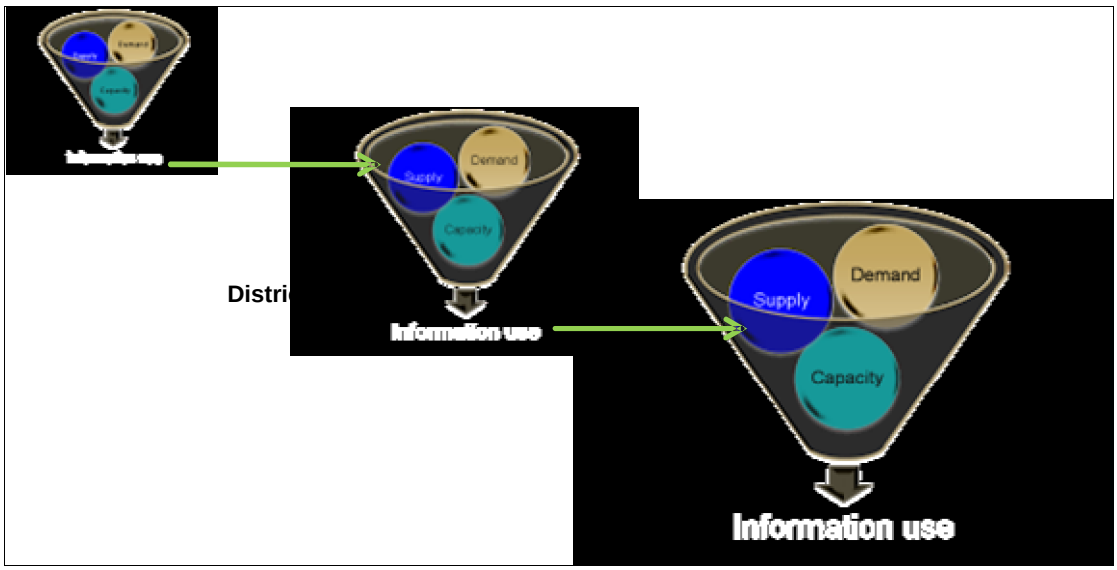
Supply, demand, and capacity ultimately determine whether or not information is used and whether data can actually support education management. These three factors were investigated with particular focus on school and district levels. The rationale for this examination was three-fold. First, school and district levels have most recently assumed the responsibility of decision making as a result of decentralization; therefore, it can be expected that at these levels, the greatest disconnect exists between what is available and what is needed for planning and management purposes. Secondly, DBE1 is principally engaged at the school and district levels, and is thus more likely able to identify areas of opportunity for piloting solutions to problems that may be uncovered. Lastly, and perhaps most importantly, failure to ensure data use at the school and district level has an adverse impact that ripples through all higher levels of education administration and education data aggregation.

Experience shows that when data are not used at the school level, the quality of data passed on to the district level is likely to be poor. Likewise, in instances where data are not used at the district level, the quality of data flowing up to the provincial or central level is often unsatisfactory or lacking. In Indonesia, where the central level need for data depends on the school and district levels as its source, it is of paramount

[1] Use of data in this context does not refer to the use of computerized information systems, but rather the use of the data contained in them.

importance to ensure high-quality data at the lower levels. The best way to secure high-quality data is to make sure it is being utilized by the schools and districts. In effect, all levels of education administration and management must play a part in ensuring that issues of supply, demand, and capacity are addressed on a system-wide basis (Figure 1.2).

Figure 1.2 System-wide Impact of Supply, Demand, and Capacity



1.3 The Current Situation

Both the MONE and the MORA have developed EMIS over the years. In the case of MONE, several information systems have been developed by different units within MONE, with different objectives, intended users, and data-collection instruments and cycles (see Table 1.1). Some of these MONE information systems feature multiple data-collection instruments, depending on the information being managed. For example, Table 1.2 describes the many forms in use by Sidiknas.

Table 1.1 EMIS Systems in Use in Indonesia

EMIS Name	Description
Sidiknas (MONE education management information system)	The most prevalent information system, collecting data on basic school statistics from all MONE and MORA elementary schools
SIM Guru (teacher management information system)	Collects data on MONE teachers, including qualifications, training, workload, and specialization
Biaya Operasional Sekolah (BOS, operational school budge)	Collects data to be used for per-student transfers to schools
Monthly Report	Collects data related to basic statistics—number of students, teachers, classrooms, etc.

EMIS Name	Description
School Mapping	Originally designed to collect data about the location and condition of vocational schools, the system now includes all MONE schools
Sistem Informasi Keuangan (SI Keuangan, financial Information system) in *Dinas Pendidikan* (*Disdik*, District Education Office)	Collects data on school finance to be used by district education planners

Table 1.2 MONE Sidiknas Data-Collection Instruments (Annual Data-collection Date: August 3–September 20)

Form	Type of School	Target	Respondent/Person in Charge (PIC)
Format T	*Sekolah Dasar* (SD, elementary school)-*Madrasah Ibditaiyah* (MI, Islamic primary school)	School (SD-MI)	*Kepala Sekolah* (School Principal)
Format DP-SD/MI	SD-MI	*Kecamantan* (Subdistrict)	*Kepala Dinas Pendidikan Kecamantan* (Subdistrict)
Format RK-SD	SD-MI	*Kabupaten/Kota* (District)	*Kepala Dinas Pendidikan Kabupaten/Kota* (District)
Format LNS	*Sekolah Menegah Tingkat Pertama* (SMP-MTs, junior high school)/ *Madrasah Aliyah* (MA, Islamic secondary school)	School (SMP-MTs/MA)	School Principal
Format RKSM	SMP-MTs/MA		
Format RSLTPT	SMP-MTs/MA	*Kabupaten/Kota* (District)	*Kepala Dinas Pendidikan Kabupaten/Kota* (District)
Format RPdd	SMP-MTs/MA		

MORA and MONE differ in their data-collecting approach. MORA currently uses a centralized system to collect and manage data for religious schools. Data is collected by MORA staff nationwide and processed and managed in Jakarta. In contrast, MONE has historically relied on a decentralized method by which data on secular and religious schools is collected with the cooperation of provincial and district education authorities and entered into a data system in Jakarta.

Districts in Indonesia are diverse and the number of schools in a given district varies widely. *Kabupaten Gresik*, for example, has a total of 1,069 schools, while *Kota Blitar* has only 118. In addition to differing numbers of schools, Indonesia also features a diverse topography and climate, with more than 17,000 islands, dense forests, and urban megacities. The time allocated for data collection in all areas has remained the same, however—from August 3 through September 20 of each year.

In addition to the challenges inherent in collecting data in such a diverse environment, Indonesia has struggled recently with the issue of compliance in districts with data-collection initiatives. MONE cites a dramatic decrease in the response rates of districts to request for data collection after decentralization, falling from near-universal compliance prior to decentralization to less than 50 percent compliance in the middle of the decade.

Furthermore, under the strategy MONE previously employed, all data was entered in to a data system centrally. The time required to enter the volume of data received at the central level became crippling, with significant delays in the availability of data. At one point, even *Dewan Perwakilan Rakyat* (DPR, National Parliament) expressed concerns about delays in reporting education-sector data.

MONE's Strategic Planning 2005–2009 acknowledges the challenge in collecting data in such a diverse environment, as well as the existing problem of education information systems that are not unified or accurate. MONE realized that by dividing the responsibility of data collection and management among district staff, it is possible to expedite the data entry process and make data available in a timely manner. Furthermore, MONE recognized that it can empower district decision makers with the responsibility for ensuring that data were well managed and *used*, which creates incentive to collect and manage data in a manner that preserves its integrity.

MONE has indicated a commitment to improving the utility and availability of its data through the creation of the *Pangkalan Data dan Informasi berbasis WEB* (PADATIWEB), a data entry application developed by *Pusat Statistik Pendidikan* (PSP) to accelerate the data entry process by facilitating data transfer from districts through the internet. PADATIWEB is a means by which the burden of data entry is shared among all districts to create a manageable workload of data entry and to result in data that is more readily available and useful to education managers. Additionally, the rate of data transmission is increased by using the internet for data entry. By streamlining the data entry process, PADATIWEB seeks to improve the relevance, utility, and reliability of education data, as well as the demand for such data from decision makers and managers.

According to MONE, key features of the new system are

- **Timely data:** School year 2006–2007 data should be available by December 2006.[2]
- **Comprehensive:** For the first time, MORA data collection on religious schools will be synchronized with MONE data collection on the public school

[2] As of April 2007, not all data from all districts was available.

system. There should be a comprehensive picture of the entire education sector by December 2006. Over 300,000 *lembaga pendidikan* will be included in the survey (e.g., schools, *madrasah*, kindergarten, out-of-school education [PLS], and universities).

- Information provided at **different levels:** School, *kecamantan*, district, province, and central level.
- **Single data-collection instrument:** *Diknas* directorates no longer send data questionnaires to districts. MONE policy is to work with single-source data instead of not multisource, as in the past; however, risk remains that that some directorates may issue questionnaires for program monitoring purposes.

In this new system, districts are empowered to assume responsibility for preparation and use of data for decision support. Districts should no longer have to wait for a higher level of administration to finalize data entry. Assuming they are adequately motivated by the desire to use data, districts themselves can enter and send it to a higher level of administration, while at the same time using the data. Naturally, a motivating factor is the extent to which districts can benefit from the available data. As mentioned above, if districts do not find the data beneficial or insightful, they are unlikely to take great care in collecting, entering, or using it. It is therefore important to reflect on the perceptions held by district- and school-level with regard to the quality, demand, and capacity to use education data.

1.3.1 EMIS-related Initiatives Supported by Donors

A number of other studies on EMIS and education data have been conducted or are ongoing; two of the major initiatives are mentioned below, studies conducted by the World Bank and MONE.

- The World Bank and DG-PMPTK[3] MONE conducted a study, in July–August 2006, titled *The Impact of Teacher Law: The Information Systems of the Directorate General of Quality Improvement of Teacher and Education Personnel*. The study discovered that there were five[4] out of 11 central information management systems that carried out personnel-related information management. The implications were that district offices had to collect, store, and transmit five different data sets (for five different directorates general) to central MONE.
- The MONE Web-based information system, the PADATIWEB, requires telecommunication infrastructure and access to a computer and the Internet to fully operate. UNESCO and Japanese-Fund in Trust (JFIT) conducted a

[3] DG-PMPTK: Directorate General of *Peningkatakan Mutu Pendidik dan Tenaga Kependidikan* (DG of Quality Improvement of Teacher and Education Personnel).

[4] The five central information management system are: SIM-PEG (personnel management information system [MIS]), SIM-PTK Guru (Teacher MIS of Teacher and Education Personnel), "Master Data" SYSTEM, SIM-PSP (Education Center Statistics MIS, also known as Sidiknas), and PADATIWEB (new Web-based version of SIM PSP).

survey in August 2006, titled *e-Readiness in the Asia Pacific Region.*[5] The survey explored responses related to telecommunication infrastructure, access to computers and the Internet, the availability of training in information and communication technology (ICT) skills and technology training, and the organization and level of electronic resources available in libraries. The survey summarized that there were significant variations between urban and rural situations such as connectivity, skills and expertise, and equipment and infrastructure. The survey concluded that because of an inadequate information infrastructure and a low rate of ICT literacy and awareness, Indonesia needs a national ICT policy to support education planning and management.

1.4 The Assessment–What It Is and What It Is Not

The assessment **is not** intended to give an overall appraisal of the EMIS environment as a whole by rating it as "good," "satisfactory," nor is it intended to be definitive, nationally representative, or statistically significant. The findings are not meant make a causal link between observations related to supply, demand, and capacity and the quality of education or the quality of decisions made.[6]

However, this assessment **is** intended to provide observations that can serve as the pretext to a nationwide dialogue among education stakeholders about the future of education data and information in Indonesia. It provides some evidence to support the framework above and identifies disparity between perception and reality. Recognizing and addressing these disparities and their causes is a critical step in improving information use in Indonesia. This information will be particularly relevant to MONE's PADATIWEB initiative, as it will provide insight into ways in which stakeholder needs can be better met, thereby strengthening the quality of education data and promoting wider education data use. Accordingly, the report identifies some potential investments that can be made to strengthen the use of data from the school level up.

1.5 Methodology

The assessment was initiated with a discussion, organized by DBE1, on policy, constraints, and challenges on EMIS operation and implementation in MONE and MORA. The discussion was held in Salatiga, Central Java on December 28, 2005, and

[5] *E-readiness is not simply a matter of the number of computer servers, Web sites, and mobile phones in the country, but also things such as its citizen's ability to utilize technology skillfully, the transparency of its business and legal systems, and the extent to which governments encourage the use of digital technologies.*—"The 2005 e-readiness rankings: a white paper from the Economist Intelligence Unit," *Economist Intelligence Unit* (2005); available at http://graphics.eiu.com/files/ad_pdfs/ERR2004.pdf.

[6] It should be pointed out that there is a vast amount of information available for further exploration as it relates to the use of education data for decisions support. For example, we have been able to collect data related to the number of computers on average in place at a district, as well as the skills of the information system staff, etc. Stakeholders should identify what the infrastructural standards are for data collection at the district level. In the absence of an agreed upon norm for resources (human and physical), it becomes very difficult to reach consensus on what districts should be able to accomplish.

was attended by Dr. Ade Cahyana, M.A., Director of MONE's Education Statistics Center *Pusat Statistik Pendidikan* (PSP)[7]; Dr. H. Firdaus, M.M., Director of *Madrasah* and Islamic Education (MAPENDA), MORA; Dr. Mashuri, Director of EMIS, MORA; officials from the Central Java Education Office, and DBE2 and DBE3 staff.

MONE officials acknowledged shortcomings of the current EMIS system and outlined their plans for improving it. The MONE and MORA officials also welcomed DBE1 strategy for the EMIS assessment and offered support and cooperation in carrying out the assessment.

Data collection. The assessment team developed five sets of data-collection instruments in February 2006 (Table 1.3). The instruments were designed to collect data from MONE and MORA district and provincial offices and schools. The instruments were pilot tested in three districts (Pangkep, South Sulawesi; Mojokerto, East Java; and Bangkalan, East Java [Madura island]); the instruments were modified as a result of the testing. In April 2006, the assessment team trained DBE1 Data and Information Specialists (DIS) and Data and Information Assistants (DIA) in five DBE provinces (North Sumatra, Banten-East Java, Central Java, East Java, and South Sulawesi) on data collection.

The instruments were administered in two districts in each of the provinces, one urban and one rural, between June and September 2006. In each district, data was collected from two SDs and two elementary-level MIs. A list of the districts and schools can be found in Annex A. Data was entered by DBE1 district staff in the DBE Project Data Management System (PDMS).

The data source was very small—38 schools, 11 districts, and 5 provinces. However, as explained above, the data sample is sufficient to discern certain trends and to propose further research.

Table 1.3 List of EMIS Data-collection Instruments

Level	Data Source	Data Purpose	Procedure
District/ province	Head of *Dinas Pendidikan/Kandepag*	• Document planning, monitoring, and evaluation process at district and province level	DBE 1 DIS and District Coordinators (DC) interview Head of District education office (Kepala Dinas), plus one staff member
	Staff *Dinas Pendidikan/Kandepag*	• Document ICT environment for EMIS	DBE1 DIS and DC interview one staff member
	Various *Dinas pendidkan* staff	• Document various types of information systems available at the office • For each available EMIS type (e.g., School Mapping, Teacher MIS, etc.), gather data and information on	DC interviews/observes *Dinas* units implementing various types of EMIS (e.g., Sidiknas, School Mapping, SIM Guru, BOS, Monthly Report, SI Keuangan).

[7] PSP was formerly named *Pusat Data dan Informasi Pendidkan* (PDIP).

Level	Data Source	Data Purpose	Procedure
		o District uses of the EMIS data o Skills of staff/unit in charge o ICT environment for each specific EMIS type o Data-collection instruments and data entry processes o Requests for EMIS data o Data verification, access to data, and data archive	
	Staff *Dinas* perform role and function (functional tasks)	• Data and information needs for Planning and Development, Personnel/Human Resources, Budget and Finance, Policy Research and Analysis, Curriculum, Pedagogy, or Administration	DBE1 DC interviews/observes *Dinas* units using MIS for functional tasks (e.g., Planning and Development, Personnel/Human Resources, Budget and Finance, Policy Research and Analysis, Curriculum, Pedagogy, or Administration)
School	Principal	• Quality of school data sources • Perception and understanding of school regarding various EMIS instruments • Request for data and information at school level • Supply of information from the higher level back to school • School understanding of available sources of information	DBE1 DIS and DC interview school principal and conduct spot check to verify data
	School Stakeholder (School Committee)	• Opinion of school stakeholders about existing information source	DBE1 DIS and DC interview representative of School Committee

1.6 Timing and Scheduling

The study began with stakeholder consultations in September through December 2005. Data-collection instruments were designed and tested; data-collection staff were trained from February to May 2006; and data was collected between June and September 2006. The first analysis was completed by October 2006. Since the initial analysis, we have continued to monitor EMIS developments in the field and at the central level. In September 2006, DBE1 presented initial results to at a MONE meeting of national and provincial EMIS stakeholders. Assessment results supported new direction for MONE EMIS. Between Fall 2006 and Spring 2007, the EMIS Assessment Team observed the impact of DBE1 planning and capacity-development interventions at the school and district level to gather lessons learned to inform the current study.

2. Findings

Findings are divided into three sections: 1) supply of EMIS data at the school and district; 2) demand for data at the school and district level; and 3) and capacity to use data at the district level.[8] In the sections that follow, an analysis of survey data is accompanied by statements of impact and recommendations for mitigating impact. Issues for further investigation are identified, since this assessment is a preliminary study.

It should be noted that the findings in this report are based on data collected from districts supported by DBE1. As such, they are not necessarily representative of all districts or schools in Indonesia. Gathering additional data from other districts and schools may highlight other issues affecting data quality and use in Indonesia.

2.1 Supply of Quality Data

Deficiencies in the quality of data at the school level have an impact from schools to the central ministries. Poor-quality data used at the school level for planning results in poor plans; poor-quality data at the school level used to complete data-collection instruments for use at the district or central levels results in inaccurate and unreliable data.

Aggregated school data can be the basis for district-level planning, M&E, and management and administrative decisions. It is frequently at the district level where data-collection activities are organized, data are entered into a data management system, and electronic information can be put to use and to generate printed reports. It is, therefore, essential to understand the district environment and the processes that safeguard or threaten the quality of data.

The following sections review findings concerning the supply of data at the school and district levels, as well as the factors that influence the quality of data.

2.1.1 Factors that Affect Supply of Quality Data at the School Level

School respondents' statements about data collection and data availability

School head teachers and other school stakeholders, such as school committees, were asked their opinions about data at the school level, its quality and use, and other issues related to the data-collection process. Just as district actors play a pivotal role in the data-collection and management process so do school actors, for they are the foundation on which all data management and use is built.

Schools are burdened with completing multiple data-collection instruments during the year, many of which collect very similar information. Head teachers and school stakeholders indicated that they complete more than 3 data-collection instruments per year, on average.

[8] Capacity to use data at the school was not included in this assessment; it is the subject of DBE1 ongoing activities and as such, insight into latent capacity to use data and strategies for strengthening this capacity can be gained by other means.

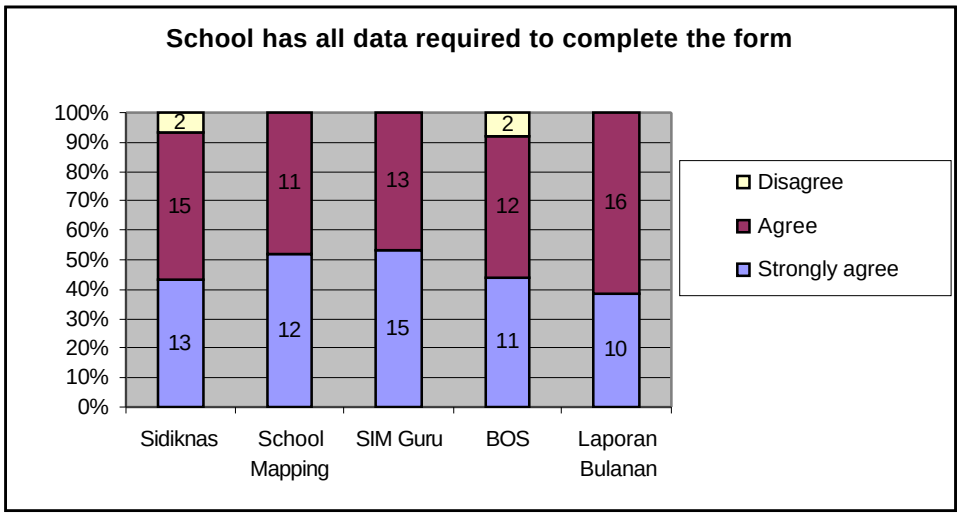
Table 2.1 Types of EMIS Data Collection in Sample Schools

District	School Name	School Type	Name of Information System				
			Sidiknas	School Mapping	SIM Guru	BOS	Monthly Report
Kabupaten (Kab.) Bangkalan	SD N *Kajjan* 1	SD	x	-	x	x	x
	MI *Hidayatus Shibyan*	MI	x	x	x	x	x
	MI *Thoriqul Muhtadin Bangkalan*	SD	x	-	x	x	x
	SD N *Kemayoran* 1	MI	x	-	-	x	x
Kab. Boyolali	SD N *Cepogo* 1	SD	-	-	-	x	x
	MI *Sawahan*	MI	x	-	-	x	x
	SD N *Sawahan* 1	SD	x	-	-	x	x
	MI *Candigatak*	MI	x	-	-	x	x
Kab. Indramayu	SD N *Kepandean* 1	SD	x	x	x	-	x
	SD N *Tambi Lor* 1	SD	x	x	x	-	x
	MI *Gippi Teluk Agung*	MI	-	-	-	-	-
	MI *Yapida Tambi*	MI	x	x	x	x	x
Kab. Jepara	SD N *Dorang* 1	SD	x	-	x	x	x
	MI *Al Hidayah Langon*	SD	x	-	x	x	x
	MI *Nalumsari*	MI	x	-	-	x	x
	SD N *Sukodono* 3	MI	x	-	-	x	x
Kab. Pangkajene Kepulauan	MI DDI *Laikang*	MI	-	-	x	x	x
	SD N 14 *Bonto Bonto*	SD	-	x	-	x	x
	SD N 31 *Tumampua* 5	SD	x	-	-	x	x
	SD N 32 *Tumampua* 6	SD	x	-	x	x	-
Kab. Sidoarjo	SD N *Sedati Gede* 2	SD	-	-	x	x	x
	MI *Khoirul Huda*	MI	x	x	-	x	-
	SD N *Kemantren* 1	SD	x	x	x	x	x
	MI *Asasul Huda*	MI	x	-	x	x	x
Kab. Tapanuli Utara	SDN 173259 *Pearaja*	SD	x	-	x	x	x
	SD *Katolik Santa Maria*	SD	x	-	-	x	x
	MI N *Peanornor*	MI	-	-	-	x	x
Kota Binjai	SDN 020263	SD	-	-	x	x	x
	MI N *Binjai*	MI	-	-	-	-	x
Kota Palopo	SD N 75 *Surutanga*	SD	x	-	x	x	x
	SD *Muhammadiyah* 1	SD	-	-	-	-	-
	SD N 376 *Sumarambu*	SD	-	-	-	x	x
	SD N 80 *Lalabata*	SD	-	-	-	-	-
Kota Tangerang	SD N *Sukasari* 4	SD	x	x	x	x	x
	MI N *Buaran*	MI	x	x	x	x	x
	MI *Nurul Huda*	MI	x	x	x	x	x
	SDN *Karawaci Baru* 5	SD	x	x	x	x	x
Kota Tebing Tinggi	SDN 023894	SD	-	-	-	x	x

Despite the fact that they respond to numerous data-collection instruments, **not all necessary data are available at each school** (Figure 2.1). Respondents' statements about the availability of data indicate that there are some data elements and pieces of information lacking at the school level. Even for data on student admissions, the most

widely reported data available at the school, only 71 percent of respondents reported that it was available at the school. On the other end of the spectrum, only 21 percent of respondents report there is data at the school to support education standards policy, and only 21 percent of respondents report that there is data at the school on school-aged children. In cases where data was not available for use at the school, frequently cited reasons include the reliability, level of aggregation, and access to data.

Figure 2.1 Data Availability at School



Impact: Data quality is threatened by repetitive requests for data. Schools that provide the same information repeatedly may acquire respondent fatigue and may cease to take the time necessary to provide quality data.[9]
Recommendations: Data quality can be improved by reducing data respondent fatigue through rationalization and coordination of data-collection activities.
Questions for further investigation: School actors state that the data they need are not always accessible, and that the reliability of the data they do have access to is inadequate. A more in-depth investigation of these might help identify solutions. Additionally, DBE schools had just completed an intensive planning process. Conducting a sample of non DBE schools might give a very different picture.

School respondents' opinions about various information systems

Enumerators collected school stakeholder opinion data about each of several different information systems.

Sidiknas: Three quarters of school-based respondents who report using Sidiknas believe the schools receive adequate training in how to complete the form. Some respondents, however, did not feel they have the ability to provide feedback about the data-collection process. Conversely, all respondents agreed that the form is easy to fill out and that the data needed to complete the Sidiknas form is available and accurate.

[9] We were informed by a MONE official of cases where schools simply photocopied data from 2–3 years ago.

School Mapping: Respondents were generally happy with the School Mapping data-collection activities; they found the forms easy to fill out and believed that they had all the data needed to complete the forms.

SIM Guru: Response was positive in general, although 15 percent of respondents felt they do not receive sufficient training in how to fill out the form. Twelve percent of respondents feel they do not have an opportunity to share feedback about the form.

Monthly Reports: The level of satisfaction with the Monthly Reporting process was lower than other information systems. Nearly one-third of respondents did not feel they have adequate training to complete the monthly report form, and 35 percent of respondents reported they do not receive support materials and guides to help complete the form.

Figure 2.2 Available and Accurate Data

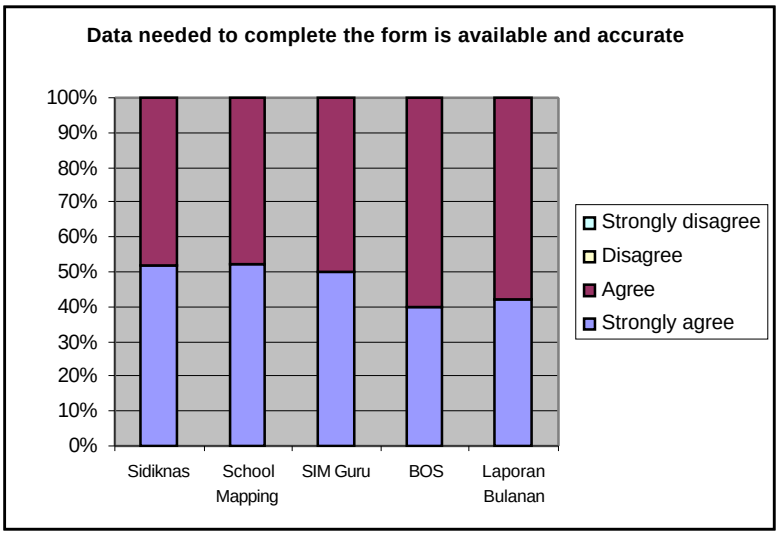


Figure 2.3 Training Provided to Schools

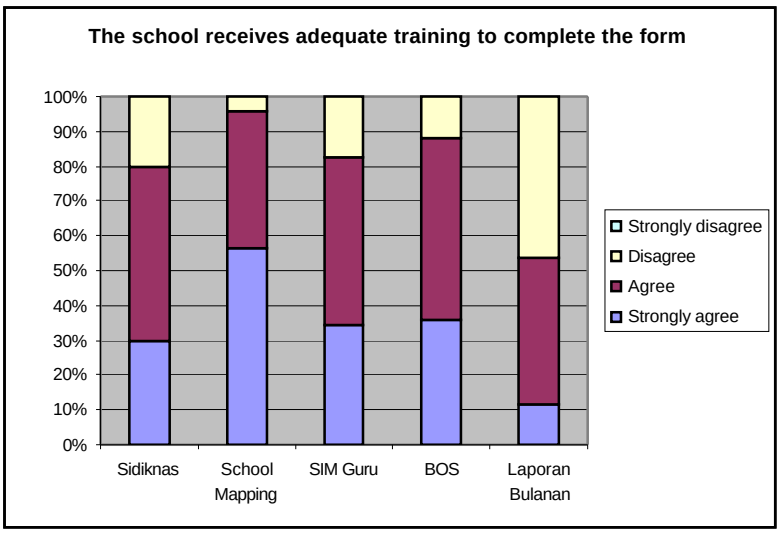
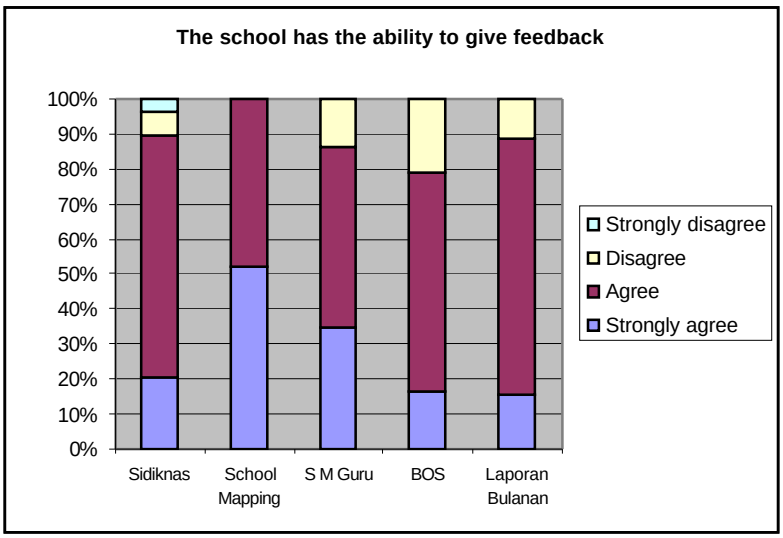


Figure 2.4 Opportunity to Provide Feedback



Impact: Giving school head teachers an opportunity to provide feedback about the data collection instrument and process will go a long way toward creating a sense of ownership and inclusion in the data-collection and use process.

Recommendations: Engage school head teachers in ways to improve data collection. Also, most respondents indicate that they have the data needed to complete the forms, while at the same time, they admit that there are data inadequacies. This warrants further investigation.

Question for further investigation: Are there elements of different information management systems that stand out (e.g., is the training approach for SIM Guru the highest rated, and should therefore be adapted for other systems)?

School motivation for providing quality data

As part of the assessment of the quality of school-level data, respondents were asked to identify reasons for data not being available. The reasons cited included: “Lack of log books in which to record data”; “No sanction if the school does not have data”; and “School does not need data.” However, the latter two reasons were not cited in many cases. Nonetheless, these are disconcerting statements when taking into account that they were cited as reason for why the following information was unavailable: ”Student drop out by class”; “Student drop out by gender”; “Study books by class”; “Study book by subject”; and “Supporting book/reference by class” (see Table 2.2). These pieces of information should be critically important at the school level. Therefore, if even a few respondents indicate that they have no need for such data, this gives an indication of **a potential lack of understanding of the power of the data and of its role in supporting school management and decision making**.

Impact: School head teachers who do not understand the significance of data and the school's role in using it may lead to decisions made in an information vacuum.

Recommendations: Raise awareness about the role of schools in using data for informed school management.

Question for further investigation: Is this lack of motivation driven by lack of awareness or by lack of incentive?

Empirical evidence about school-level data quality

After interviewing school stakeholders to record their perceptions of the data-collection and management processes, the Assessment Team examined the availability and accuracy of data at the school level. School records were examined for evidence of different typical pieces of data, and the availability (i.e., available/not available) and state of available data (i.e., up-to-date, not up-to-date) was noted. Where data was not available, school headmasters were asked for an explanation. Lastly, school records for enrollment and for the number of desks in the fourth grade were compared against classroom "reality" for accuracy (i.e., spot checking).

There are several pieces of data that are not widely available at the school level ("available and up to date" ranges from 56.8 percent to 77.8 percent; see Table 2.2). Notable among these are: data on student dropouts and repeaters; teachers by title, class, and gender; textbooks and reference books; and school inventory by type, location, and condition. The availability of log books is a frequently cited reason for not having data.

Table 2.2 Availability of Data at the School as Observed by Enumerator

Data	Available and updated	Available but not updated	Not Available
Registered students by class	94.6%	5.4%	0.0%
Registered students by gender	94.6%	5.4%	0.0%
Student academic performance by class	83.3%	11.1%	5.6%
Student academic performance by gender	80.0%	11.4%	8.6%
Students availability by class	91.9%	8.1%	0.0%
Students availability by gender	91.7%	5.6%	2.8%
Dropout students by class	56.8%	10.8%	**32.4%**
Dropout students by gender	57.1%	5.7%	**37.1%**
Students repeat the class by class	81.1%	5.4%	13.5%
Students repeat the class by gender	77.8%	2.8%	**19.4%**

Data	Available and updated	Available but not updated	Not Available
Teacher level and title	91.9%	8.1%	0.0%
Teacher numbers by title	77.8%	5.6%	**16.7%**
Teacher class teacher	88.9%	8.3%	2.8%
Teacher subject teacher	83.8%	8.1%	8.1%
Teacher education background	94.6%	5.4%	0.0%
Teacher years' of teaching experience	94.4%	5.6%	0.0%
Teacher's age	94.6%	5.4%	0.0%
Teacher by gender	94.6%	5.4%	0.0%
Teacher availability by class	70.6%	11.8%	**17.6%**
Teacher availability by gender	69.7%	6.1%	**24.2%**
Study book by class	67.6%	5.4%	**27.0%**
Study book by subject	66.7%	8.3%	**25.0%**
Supporting books/reference by class	60.0%	6.7%	**33.3%**
School budget (APBS)	91.7%	5.6%	2.8%
School financial cash book	89.2%	8.1%	2.7%
School financial other	77.8%	11.1%	11.1%
School inventory by type of inventory	72.2%	**19.4%**	8.3%
School inventory by location	62.9%	17.1%	**20.0%**
School inventory by condition	67.6%	**20.6%**	11.8%

Comparing school records with in-classroom "reality" (i.e., spot checking) showed that **school-level data quality may be a serious issue.**

- In schools where the recorded data on enrollment was different from the actual classroom situation, the average margin of error was 36 percent for both boys' and girls' fourth grade enrollment. This means that on average, the school records misreport boys' enrollment by seven students and girls' enrollment by 10.1 students for the fourth grade.
- In schools where the recorded data on desks was different from the actual classroom situation, the margin of error was 41 percent. This means that on average, the number of desks is misreported by 8.6 desks for the fourth grade classroom.

Some of the variance between records on student enrollment and classroom observation may be attributed to student absence, i.e., the number of students present on the day the enumerator visited the school differs from the number of students registered at the school. Likewise, disparities between records on desks and the observed number of actual desks may be due to the fact that some desks are no longer in usable condition. This is likely the case in some schools, but not in all: the variance between school records and observation ranges from

- One male student to 32 male students, i.e., in one school the difference between what was on record and what was observed was one (the minimum), while in another school it was 32 (the maximum), with other schools falling in between. Student absence may explain the difference in schools with small variation between records and observation, but it is unlikely that it is a valid explanation in schools with a high differential.
- One female student to 115 female students.
- One desk to 83 desks.

Greater discrepancies confirm that **there are schools in which records are very poor**.

While initiatives such as PEDATIWEB focus on leveraging technology to result in speedier availability of data, the reality is that the obstacle is not related to technology, rather it is data unreliability in paper form at the school level, which requires a solution not necessarily technological in nature, if data quality is to be remedied. No amount of computer technology will be able to improve the quality of school data.

Impact: The reliability of data at the school is inadequate, which corroborates school respondents' statements about availability. Poor-quality data at the schools equates to poor data at every higher level of aggregation. Improving data quality at the school is critically important for all education data users. This cannot be overstated.

Recommendations: Schools need to have the resources necessary to maintain records of data that are required for decision support at all levels of the education system. Making these resources available is not a technically challenging problem; ensuring they are used is a different matter. Schools need to be supported and motivated to keep better records. This can be achieved by assigning support responsibility to district and subdistrict offices, and by holding them accountable, along with the schools, for quality record keeping at the schools.

Question for further investigation: An investigation of the causes of missing log books is important, as is more in-depth research into the record-keeping habits of school head teachers.

Coverage

For data to be used effectively at the district level in planning, budgeting, and policy research, reported data from schools should be comprehensive and valid. Missing data distorts the district-level education situation and makes assumptions that are based on the weaker data.

Forty-three percent of district-level respondents state that they do not receive data from all schools. SIMPAK and BOS have the highest percentage of respondents (100 percent), indicating all schools return data, while Sidiknas has the lowest (33 percent).

Table 2.3 Share of Schools Returning Form According to District-level Staff

	All Respondents	BOS	EMIS Department Agama (Depag, Ministry of Religious Affairs)	School Mapping	Financial IS	SIM Guru	SIMPAK	Sidiknas
All schools return the form	57.1%	100.0%	75.0%	40.0%	50.0%	50.0%	100.0%	33.3%
Majority of schools return the form (>90%)	28.6%	0.0%	25.0%	40.0%	0.0%	25.0%	0.0%	50.0%
Some schools return the form (50–90%)	14.3%	0.0%	0.0%	20.0%	50.0%	25.0%	0.0%	16.7%

For the forms that are returned to the district, **only 40 percent of district respondents indicate that the forms are completely filled in**. No SIMPAK and Sidiknas respondents indicated that all the forms they received were completely filled in. **The most frequently cited reason for incomplete returned forms is that data are not available at the school, and that schools do not understand how to fill out the form.** Lack of data at the school is a particularly prevalent response among School Mapping and SIMPAK respondents.

Table 2.4 Share of Returned Forms Completely Filled Out

	All Respondents	BOS	EMIS Depag	School Mapping	Financial IS	SIM Guru	SIMPAK	Sidiknas
Of all the returned forms, all questions were answered 100%	40.7%	100.0%	71.4%	20.0%	50.0%	50.0%	0.0%	0.0%
Of majority of schools (>90%) returning the forms, all questions were answered	37.0%	0.0%	28.6%	20.0%	50.0%	25.0%	100.0%	66.7%
Of some schools (50%–90%) returning the forms, all questions were answered	11.1%	0.0%	0.0%	20.0%	0.0%	25.0%	0.0%	16.7%
Of all the returned forms, none of them answer all questions	11.1%	0.0%	0.0%	40.0%	0.0%	0.0%	0.0%	16.7%

Table 2.5 Cause of Incompletely Filled Out Forms According to District Staff

	All Respondents	BOS	EMIS Depag	School Mapping	Financial IS	SIM Guru	SIMPAK	Sidiknas
Time to complete the form is not sufficient	13.0%	0.0%	11.1%	25.0%	20.0%	0.0%	0.0%	20.0%
Data to complete the form is not available	15.2%	0.0%	11.1%	12.5%	40.0%	0.0%	0.0%	30.0%
The schools do not understand how to fill the form	15.2%	0.0%	11.1%	25.0%	20.0%	0.0%	0.0%	30.0%
School is too lazy to fill out the form	8.7%	0.0%	0.0%	12.5%	0.0%	16.7%	0.0%	20.0%
School do not see the benefit of filling out the form	4.3%	0.0%	11.1%	0.0%	0.0%	0.0%	0.0%	10.0%

	All Respondents	BOS	EMIS Depag	School Mapping	Financial IS	SIM Guru	SIMPAK	Sidiknas
Other	13.0%	33.3%	22.2%	12.5%	0.0%	16.7%	0.0%	10.0%
Do not know	6.5%	0.0%	11.1%	0.0%	0.0%	16.7%	25.0%	0.0%

Examining **school stakeholder** responses sheds more light: Although a high percentage of respondents indicate that they think the training they receive is adequate and that the forms are relatively simple to complete, there are still gaps in compliance with completing forms. This might support the idea that low motivation is a contributing factor for failure to complete forms, rather than a lack of understanding of how or why to complete all sections of the forms.

Sidiknas

- Over 75 percent of school respondents who report using Sidiknas believe the school receives adequate training in how to complete the form.
- Some respondents do not feel they have the ability to provide feedback about the data-collection process.
- All respondents agree that the form is easy to fill out.
- All respondents agree that the data needed to complete the Sidiknas form is available and accurate.

School Mapping

- Respondents are generally quite satisfied with the school mapping form.

SIM Guru

- Eighty-five percent of respondents feel they receive sufficient training in how to fill out the form.
- Eighty-eight percent of respondents feel they have an opportunity to share feedback about the form.

BOS

- Eighty-three percent of respondents believe they receive the BOS form with sufficient time to complete it.
- Ninety percent of respondents feel the form is easy to fill out.
- Over 90 percent of respondents feel they have an opportunity to provide feedback about the BOS.

Monthly Report

- Thirty-two percent of respondents do not feel they have adequate training to complete the monthly report form.
- Thirty-five percent of respondents do not receive support materials and guides to help complete the form.

Impact: Incomplete coverage—the lack of complete data from all schools—makes district-level planning, budgeting, etc., difficult and predicated on a partial view of education in the district. The evidence indicates that schools do not complete data collection forms NOT because of inadequate training or because the forms are difficult to complete. The most significant factor appears to one of relevance—the schools do not see the need or benefit for them to provide the data to the district. Schools that have completed DBE1 school development plans are readily providing data because they see the immediate relevance for their needs. This is consistent with the high percentage of school respondents stating that they use data for planning at the school, while not necessarily complying with requests for data form the district. This implies that the school must see itself as the beneficiary of data collection.

Recommendations: The value that schools place on participating in data collection activities needs to be raised. This can be done in part by including them as a beneficiary of the activity, namely by ensuring that useful data flows back to the schools so that they see themselves as benefiting from the initiative, rather than have it benefit only the district.

Question for further investigation: DBE1 can follow up with its beneficiary schools to test the assumption that relevance of data collection to the school translates into increased compliance with district data collection activities.

District-level perception of school data and school stakeholders

The findings above question the reliability of data at the school. An important factor contributing to the ongoing lack of comprehensive and valid data at the district level is the perception of district staff that school-level data is not a problem. District personnel were asked their opinion about school data quality availability, and about the level of understanding at the school of the importance of quality data and of the reasons for data collection. This is important for several reasons: District actors are in a pivotal position in the data-collection and management process, serving as an interface between the source of data (i.e., the schools) and the information systems that rely on the schools' data. They likely have critical insight into what works well in the process and what does not, and should be solicited for advice on how to identify obstacles and improve the process. Moreover, district actors are well placed to provide support to schools to address some of the issues surrounding data collection, and as such their perception is invaluable. On the other hand, if they have confidence in the quality of data at the school, regardless of whether it is actually of poor quality, they may be unlikely to try to improve it.

District respondents think that data are available at the school level, and generally feel confident in the quality of the data. When asked about the availability of data at the school level, district-level respondents indicated that they think schools have all the necessary data to complete data-collection instruments. In fact, the only respondents who had any doubts about this were those who dealt with

the School Mapping data. Over 80 percent of respondents feel that school-level data are accurate and reliable, though this is lower for School Mapping and Sidiknas, where there is a somewhat greater concern about the quality of data.

In general, respondents believe that the school understands the data-collection process and the need for quality data. Nearly 80 percent of respondents believe that the school understands why it completes data-collection instruments. Eighty-five percent of respondents think the school understands the importance of providing accurate data. These two facts combined indicate that district staff feel that there is little need to bolster local understanding of the process. However, our check on data at the school level, as reported in Section 2.1, indicates that this is not the case.

Impact: District staff confidence in school-level data quality and the importance placed on providing accurate data threatens data quality if that confidence is misplaced. Failure to recognize a weakness in the data chain can result in poor quality data being used throughout the education system.

Recommendations: After reviewing empirical evidence about the quality of data and the awareness about the need for quality data at the school level, district staff should be helped to understand how this impacts the school's and their ability to manage education, as well as that of higher levels of administration.

Question for further investigation: Upon what is district confidence in data based? Do district staff have an opportunity to examine school records, and do they have a chance to engage school actors in dialogue about data collection and use?

2.1.2 Factors that Affect Supply of Quality Data at the District Level

Data from the source, that is, at the school, are the foundation on which all higher levels of data aggregation are built; failing to ensure the quality of school data results in poor data at the district, province, and central levels. The district also shoulders a considerable responsibility for ensuring data quality and integrity as they are collected and managed; however, there are many threats to data quality rooted at the district level. Some are technological, others are procedural. A number of these threats were assessed by examining the data collection and management environment at the districts.

Technological issues

Only 13 percent of respondents report never losing data. The most frequently cited reasons for data loss are hardware malfunction and data entry software.

Table 2.6 Reasons for Data Loss

Reason	% of respondents
Hardware malfunction (e.g., hard drive, circuit board, etc.)	26.1%
Errors on data entry and data management software	23.9%
Malicious software (e.g., computer viruses, worms, Trojans, etc.)	17.4%
Electricity failure (e.g., lightning, electric volt, blackout, etc.)	17.4%
No backup or malfunctioning of data backup system	10.9%
Loss of computer	6.5%
Unknown reasons	2.2%
We never experience data loss	13.0%

There are maintenance issues that may be causing some of these data losses, issues that can be quite easily addressed. According to respondents

Internet security

- Very few respondents (21 percent overall, 28 percent for Depag, and 14 percent for Depdiknas) report having any sort of internet security in place.
- Only 58 percent of respondents report using antivirus software.
- Twenty percent of all respondents never update their antivirus software.
- Thirty percent of respondents report they update their antivirus software weekly.
- There is inconsistent practice for most information systems, indicating that there may not be clear guidelines given to district staff.
- School Mapping is the most frequently updated and most consistent in its practice.
- The least frequently updated is among SIMPAK respondents (25 percent).

Data backup

- Thirty-seven percent of respondents say they do not back up their data.
- SIMPAK (75 percent) and Sidiknas (40 percent have the highest rate of respondents who report they do not back up data).
- Sixty-eight percent of respondents say they back up data “as necessary.”

Power

- Less than half of the respondents indicate they have a device (UPS) to prevent data loss in the event of power loss.
- No respondents report using surge suppressors, and only one respondent indicated the availability of a backup generator.

Technical support

- Almost 70 percent of respondents say there is no computer technician on staff.
- Only 39 percent say a technician will come when needed.
- Only 2 percent say they use an outside company to provide support.
- Six and a half percent say they have no support at all.
- None of the SIMPAK, BOS, and SIM Guru respondents say there is technical support staff.
- Forty-four percent of EMIS Depag respondents and 62 percent of School Mapping respondents report there is a technical support staff available. Only 30 percent of Sidiknas respondents report the same.

Impact: Losing data, at best, results in delays in data being available and at worst, results in incomplete data.

Recommendations: Districts need support to identify clear guidelines to follow in terms of maintaining their computers. In addition to this support, they may require training to implement the policies. Equally important, they need to be encouraged to adhere to the policies.

Question for further investigation: What guidelines or policies are in place that govern technology? What other data collection and management initiatives, perhaps outside of the education sector, can be considered as models to adopt?

Data-collection process issues

Above and beyond technology issues that seem to exist at the districts, there are aspects of the data-collection processes that leave room for degradation of data quality.

The process for completing data-collection instruments is inconsistent for most information systems. While SIM Guru and Sidiknas are somewhat consistent compared to the others, data-collection procedures vary from one district to the next. For example, while some district respondents report that they do not provide support to schools in completing the School Mapping instrument, others indicate that the subdistrict staff visit the schools and help head teachers complete the forms; other respondents report that the head teacher comes to the district office to complete the instrument. There is no right or wrong method here; there is only inconsistency. As a result of this inconsistency, one cannot be sure of the level of quality control in place, with regard to how schools complete the forms, which jeopardizes the accuracy of the data, as well as its credibility and reliability.

Similarly, **there is no agreement on the support materials that accompany most of the data-collection instruments**. About half of the respondents report that they do not receive guidelines to accompany the data-collection instrument, though EMIS

Depag respondents consistently report receiving guidelines (see Table 2.7). While nearly all respondents agreed that the forms are easy for schools to fill out, there can be little doubt that accompanying guides would improve the accuracy of data by reducing head teachers' confusion.

Table 2.7 Data-collection Form Support Materials

Are adequate materials received?	All respon-dents	BOS	EMIS Depag	Laporan Bulanan	School Mapping	SI Keuangan	SIM Guru	SIMPAK	Sidiknas Depdiknas
No	47.8%	66.7%	22.2%	100.0%	50.0%	60.0%	33.3%	100.0%	40.0%
Yes	52.2%	33.3%	77.8%	0.0%	50.0%	40.0%	66.7%	0.0%	60.0%

Though most district staff (96 percent) think the district receives adequate training in completing the forms, nearly 30 percent of respondents feel they do not have adequate time to distribute data-collection instruments to schools. This is particularly the case for School Mapping (40 percent) and Sidiknas (43 percent). Nearly a quarter of respondents think they do not have adequate resources to collect and enter data, with the notable exceptions of BOS respondents, all of whom thought they had adequate resources. **District staff feel rushed and under-resourced when it comes to collecting data**; experience has shown that this combination leads to data errors.

Impact: Inconsistent data-collection processes, inconsistent availability of guides to accompany instruments, inadequate time to distribute and collect forms, and lack of resources all jeopardize the likelihood of collecting accurate data from schools in a timely manner. District respondents' statements about the availability of training and support materials (nearly half stating that they do not receive adequate materials) seem to contradict school respondents' statements that they receive adequate training in how to complete the forms (with most school respondents indicating a satisfactory level of training and support).

Recommendations: Districts need to be educated about the data-collection process, and they must be equipped to execute the standard practice. They need to be held accountable for following the practice; this accountability can come from the district heads once they see their own ability to use data being threatened. Obstacles to making support materials available should be identified.

Question for further investigation: What guidelines or policies are in place that govern the process of data collection? What other data-collection and management initiatives, perhaps outside of the education sector, can be considered as models to adopt?

Data entry process issues

Taking into consideration all the information systems for which districts are expected to provide data, there are on average more than nine personal computers (PCs) available for data management at the district level. This is higher for Depdiknas respondents than for Depag respondents. However, **there is great variability in computing resources from one district to the next**. Thirteen percent of district heads report having no PC at all, while more than 80 percent report having 5 or more PCs. On average, respondents report 1 PC available for BOS, 2.8 for EMIS Depag, 3.75 for school mapping, and 2 for Sidiknas. Here, again, there is great variability from one district to the next: Forty-five percent of respondents say there is no computer for their information system. Eighty-seven percent report they have 4 PCs or fewer.

All respondents indicated that the data entry software in use at the district is easy to use. Almost all (96 percent) agree that they have received sufficient software training for data entry and for using the software for district-level data perusal. About half of the respondents state that training is available from MONE or MORA, and another quarter say there is training available from another entity at the central level, while only 6.5 percent of respondents indicate that training is available at the district level. Few respondents report that technical support is available at the center (8.7 percent) or district (6.5 percent) levels.

Respondents indicate a variety of different software packages used to enter data. This may be due to varying applications, or it may be due to a lack of knowledge about the source of the software that is being used. If the reason is the former, this raises questions about the consistency in data format and processing.

Table 2.8 Data Entry Software Used at the District

	All Respondents	BOS	EMIS Depag	School Mapping	SI Keuangan	SIM Guru	SIMPAK	Sidiknas
Application/software provided by central (Depdiknas-Depag)	52.4%	33.3%	62.5%	62.5%	66.7%	66.7%	0.0%	50.0%
Application/software provided by province	19.6%	33.3%	22.2%	25.0%	40.0%	0.0%	25.0%	10.0%
Application/software provided by district	6.5%	0.0%	11.1%	12.5%	20.0%	0.0%	0.0%	0.0%
Others	6.5%	0.0%	0.0%	0.0%	0.0%	16.7%	25.0%	10.0%

In addition to whatever application may be used to enter data, Microsoft Excel is the most frequently cited software used with different information systems.

Though most respondents report entering data at the district level, some respondents identified the following obstacles and reasons for data entry not being completed:

- Eight percent of all respondents cited the lack of adequate software as a reason for data not being entered at the district.
- Ten percent of Sidiknas respondents think data entry is not necessary, while 16.7 percent of SIM Guru respondents concur.
- Ten percent of Sidiknas respondents do not feel it is not the district's responsibility to enter data.

Impact: The lack of standard resources at the district level is likely to result in a lack of standard data quality, as well. Better-equipped and supported districts should be expected to transfer better quality data in a timelier manner. On the issue of lack of data entry, respondents who think that data entry is not necessary, or that it is not the responsibility of the district, are perhaps unlikely to care about the quality of data. At the very least, they are contributing to the inadequacy of coverage.

Recommendations: Minimum data entry standards should be established and districts should be encouraged to implement them. Districts also need to be made aware (or reminded) about their role in data management.

Question for further investigation: In the context of decentralization, what guidelines or policies can be put in place to govern data management? What other data-collection and management initiatives, perhaps outside of the education sector, can be considered as models to adopt? Even though training may be available for software use, are staff taking advantage of it?

Access to data and availability of data

Ensuring the integrity of data is important. However, quality data that cannot be accessed or easily used results in it sitting idle**.**

Nearly 75 percent of district respondents think that it is easy to extract data from the software they use for planning purposes, and most users think that it is easy to print reports for use at the district. However, **the number of printed reports available from the various information systems is surprisingly low.** On average, respondents say that 1.4 reports are available in print format from their information system. This is highest for Sidiknas (2.14) and lowest for SIM Guru (0.5). According to the respondents, few reports are available in electronic format and no reports are available online. Few reports are sent to the public from information systems, according to the respondents, and hardly any reports are received at the district from higher levels of administration. This is another indication of perception differing from reality in the EMIS field.

According to district respondents who rely on data for decision support, **not all data are sufficiently available**. Notable pieces of inadequate information include test development, data for preparation of the district's budget, data to enable M&E and data for staff management and staff promotion.

Table 2.9 District Staff Opinion About Data Availability

Data	% Reporting Sufficiently Available
School building: construction	87.5
School building: rehabilitation	81.3
School building: rationalization	70.0
Personnel: staff training	82.6
Personnel: staff recruitment	81.8
Personnel: performance review	77.8
Personnel: staff salary	76.5
Personnel: staff management (e.g., allocation)	70.0
Personnel: staff promotion	69.6
Study books and curriculum: curriculum development	90.0
Study books and curriculum: book procurement	90.0
Study books and curriculum: book development	88.9
Study books and curriculum: book distribution	85.7
School facilities: furniture repair	81.8
School facilities: teaching and learning resources	77.8
School facilities: furniture allocation and distribution	70.0
Student testing: test administration	75.0
Student testing: test development	66.7
School funding: school fundraising	83.3
School funding: budget preparation	81.3
School funding: budget monitoring	78.6
Research and analysis: research and analysis	80.0
Research and analysis: reporting to district legislative body	80.0
Research and analysis: preparation of district's budget	60.0
Research and analysis: M&E	58.8

Impact: There is a mountain of data stored at the district; it must be made more accessible. Not being able to extract data to use for purposes such as planning, and the paucity of reports that can be generated from the information systems, makes it difficult for districts to use data. Failure to improve access to data will result not only in diminished data use at the district; it may also perpetuate the district perception that they are not end users of data.

Recommendations: A greater number of reports should be made available at the district level, particularly in print format. Printed forms can be easily shared at lower levels of administration, where computers may not be available. Included among these reports should be some targeting the general public.

Question for further investigation: What are the reasons for lack of reporting? Is it cost-related and if so, what is the monetary implication of expanding the report production and distribution?

District opinions about responding to school-level demand

The assessment raises concern about the ability of districts to generate reports for schools to use. Over 30 percent of district respondents think it is difficult to print reports for the schools to see, and this figure is particularly high for staff responsible for SIMPAK (100 percent) and for Sidiknas (57 percent).

One reason that schools may not see the benefit of completing the form, as described in the section on coverage, is that they rarely see any output from it. According to district information system staff, schools receive 0.53 reports on average from each information system, and can receive an additional 0.6, if requested. Both School Mapping and Financial IS respondents report sending one report to schools. Sidiknas reports 0.71 reports are sent to schools and another 1.29 reports are available upon request. In other words, **schools that receive a report from the district are the exception**. This corroborates the fact that fewer than 60 percent of school respondents state they receive information about their schools.

Impact: Difficulty in generating reports for schools to use means that schools are unlikely to have easy access to data, which may diminish their demand for it. The lack of data flowing back to schools makes them primarily data providers, as opposed to data consumers. As such, they may feel that the EMIS "belong" to higher levels of administration, and that they (the schools) are not allowed to use the data that is collected. This lack of ownership may diminish the attention paid to providing quality data (since the schools do not necessarily perceive themselves as using the data, they may not care about its quality). They may knowingly provide data which may be of dubious quality.

Recommendations: Modify information system software to facilitate the creation of information products targeting the school as the end user. Ownership of data can be created at the school level by providing information back to schools in a way that they can use to help them address their management needs, creating a vested interest in ensuring data quality.

Questions for further investigation: Why is there limited output sent to schools? Is the problem one of cost (for paper, etc.), technology, or interest?

Data verification and validation

The quality control processes of **data verification** (i.e., comparing the data that is provided with the reality in the school) and **data validation** (i.e., comparing the data that is provided with the data that is entered into the information system) are essential to maintaining data quality integrity. However, the assessment found that the quality of data supplied by schools is suspect (see Section 2.1). It also was discussed that district respondents do not think this is a problem. Therefore, it is not surprising that verification and validation of school data by the district staff is minimal at best.

Nearly 40 percent of respondents indicate that either there is no data verification process, or that they do not know if there is one or not. Additionally, there is inconsistency in the verification process used for each information system. For example, one-third of Sidiknas respondents report that there is a data-verification process in place that does not include spot checking of data; half of Sidiknas respondents say that there is a verification process in place that features spot checking of data; and the remaining 16 percent report that there is no verification process in place.

There is no consensus on whether schools are sanctioned for providing false data, intentionally or otherwise. Forty-one percent report that there is a sanction, which is also the same percentage reports there is not a sanction. The remaining 18 percent do not know.

Most respondents report that there is no sanction for data entry operators who make errors and only 9 percent of respondents report that there is an incentive for data entry operators who make few errors.

Impact: There is an often-quoted saying related to information systems: "Garbage in, garbage out." The output of the system is only as good as the quality of data that goes into it. Failing to verify and validate data increases the amount of "garbage."

Recommendations: Standard data-verification and validation protocols need to be created, implemented, and enforced. Some type of accountability mechanism, especially for schools, needs to be included in these standards.

Question for further investigation: Taking into consideration the relationship between schools and districts, and districts and the central government, what would be appropriate sanctions for failing to comply with data collection activities? Are there similar sanctions in place in other sectors that can be adapted? What is the financial implication of establishing a data-verification and validation protocol?

Relevance of collected data to district needs

As discussed above, schools that see personal value in managing and using data are likely to be more willing to participate in district-led data-collection activities. The same logic holds true for districts: if they see personal value in collecting and managing data, they are likely to be more willing to comply with larger-scale data-collection and management initiatives. A key to both schools' and districts' willingness is the relevance of data.

Data must be relevant to its intended users; if data does not support the decision-making needs of education managers, it is not very valuable. Respondents are relatively satisfied that the content of the instruments currently in use meets their needs for district-level planning, funding, and M&E. They also generally agree that the instruments collect data that can also be used at the central level.

Table 2.10 Relevance of Data Collected "Form/Instrument is Aimed to Collect Data that will be Used by District and Central Government (Depdiknas/Depag)"

	All Respondents	BOS	EMIS Depag	School Mapping	SI Keuangan	SIM Guru	SIMPAK	Sidiknas
Strongly agree	64.3%	100.0%	57.1%	60.0%	50.0%	75.0%	0.0%	71.4%
Agree	35.7%	0.0%	42.9%	40.0%	50.0%	25.0%	100.0%	28.6%

Table 2.11 District Input into the Data-collection Instrument "Data-collection Form/Instrument is Designed by Taking into Consideration the Input from District"

	All Respondents	BOS	EMIS Depag	School Mapping	SI Keuangan	SIM Guru	SIMPAK	Sidiknas
Strongly agree	37.0%	0.0%	28.6%	40.0%	50.0%	25.0%	0.0%	66.7%
Agree	37.0%	50.0%	42.9%	40.0%	50.0%	50.0%	0.0%	16.7%
Disagree	18.5%	50.0%	14.3%	0.0%	0.0%	25.0%	100.0%	16.7%
Strongly disagree	7.4%	0.0%	14.3%	20.0%	0.0%	0.0%	0.0%	0.0%

2.2 Demand for Data

Even where the quality of data available is adequate, low demand for data hampers its use to support decision making. This lack of demand means that data are not used, which can result in degradation in data quality from the school up to the central ministry. Lack of demand stems from several causes: lack of motivation, incentive, or pressure to use data for decision support; lack of sense of ownership of data among stakeholders; and/or lack of awareness that data are available at all. The assessment gathered information about school-and district-level demand to identify areas for intervention and improvement.

2.2.1 Demand for Data at the School

Low demand due to lack of ownership: school perceptions of reasons districts collect data

As an open-ended question, school level stakeholders were asked their opinions about the reasons that districts collect data. The results indicate **varying understanding about why districts engage in data collection and management.** The most frequently cited reason for why districts collect data is for teacher allocation and planning needs, while only a third of respondents think the district collects data to facilitate school-level planning.

Table 2.12 Why Does the District Collect Data?

Reason	% Citing Reason
To know how many teachers are needed	86.5%
To develop report about education condition in the district	73.0%
To monitor school progress	73.0%
To know how much money they can provide to the school (BOS)	67.6%
To know how many books are needed	67.6%

Reason	% Citing Reason
To know the focus of resources that needs to be improved	64.9%
To know about school rehabilitation	56.8%
To know how well students are performing	56.8%
To be provided to Depdiknas-Depag	45.9%
To assist the school to plan	**35.1%**
Other	13.5%

A question followed, asking respondents to identify the most important reason for collecting data. "Satisfying teacher allocation and planning needs" is cited most frequently as the most important reason for the district to collect data, and cited three times as often as reasons related to student performance and resource allocation.

Impact: In general, school respondents do not think that the data that they report for EMIS systems are used to facilitate their planning activities ("To assist the school to plan"); indeed perhaps they are not. However, the sooner school head teachers begin to think about themselves as being end users of data and of data impacting their schools, the more likely they are to use it.

Moreover, district respondents are confident that schools understand why data are collected. Without knowing what district staff understand the purpose of data collection to be, it is difficult to judge whether school respondents' answers confirm or refute this. It is entirely possible, though, that district staff do not think that data are collected to support the school planning process either.

Recommendations: Further investigate district level understanding of the purpose of data collection to see if it includes school-level data use. Raise awareness about the role of schools in using data for informed school management both at the school level as well as at the district level.

Question for further investigation: What role do district staffs think the school plays in data collection, management, and use?

Unmet demand: data required for school management

After asking school head teachers why data was collected, they were asked about the management activities for which the school is responsible. A quarter of respondents thought the school was responsible for monitoring school performance against Minimum Service Standards. Only 40 percent of respondents thought discussing school performance with particular officers (e.g., DPRD) was a management responsibility of the school; the same share of respondents thought monitoring school

resources compared to other schools was a management responsibility of the school. Nearly two-thirds of respondents thought monitoring utilization of school resources and budget preparation were the schools' management responsibilities, while over 80 percent of respondents stated that the school was responsible for discussing school performance with parents of students. Of the various management functions at the school, most, if not all, depend on data.

Respondents were also asked about how the school used data. Ninety-one percent of respondents said they used data for school development planning; eighty-two percent reported using data for "management." Two out of three stated that they use data for budget preparation.[10] Although they supply data to many information systems, fewer than 60 percent of respondents say they receive information about their school from government.

These responses about school management depending on data and about data being used at the school seem to contradict school opinion data about why data is collected by the district: "To assist the school to plan" was cited by only 35 percent of respondents. This represents an **unmet demand for data**: the school does not think the district collects what is needed to support school management and planning.

DBE has had success in meeting the demand for data at the school level by providing schools with planning tools, techniques, and data tailored to the school level, and therefore more relevant than the data collected by the district on behalf of MONE. This supports the case that if data is made relevant to the schools, they would recognize the importance of collecting it.

Impact: Schools do not perceive that the data they are currently required to report for EMIS is relevant to the school needs; thus, it is unlikely to be in demand. The demand that does exist is currently unmet by the EMIS system in the opinion of school stakeholders. Unless MONE and MORA can collect data for their use while at the same time demonstrating to schools that EMIS data can also be used to support decision making and planning at the schools, low demand for data at the school level will continue.

Recommendations: Data-collection and management tools such as PADATIWEB need to ensure that they meet the school-level demand for data. MONE and MORA should ensure that schools think of themselves as primary beneficiaries of EMIS data collection and management, rather than school-level data use being an afterthought.

Question for further investigation: What are the specific data that are needed by the schools for school-level planning, management, and governance?

[10] These figures may not be representative, as the sample schools are supported by DBE and have had support in data use for planning and budgeting.

2.2.2 Demand for Data at the District

As a result of decentralization, districts, along with schools, find themselves with new authority and responsibility for managing basic education. Districts serve as the liaison between the higher levels of education management and the schools, and act as the interface between the two for data collection and management. District use of data collected for the central level should not be only an afterthought; it should be one of the driving reasons for collecting and managing data. Given that districts have acted as an agent of the center for collecting school level data for some time, they are undoubtedly familiar with some of the information systems in use. The assessment sought to understand what the level of demand for data was in district offices.

Unmet demand at the district

District education managers have responsibility for administration, budget and finance, curriculum, pedagogy, research and development, personnel, and financial research and analysis. These responsibilities require the support and use of data if they are to be executed effectively.

The assessment examined demands placed on information systems at the district level by interviewing staff responsible for the data systems themselves. District staff who manage different information systems were asked about the number of requests they receive for different kinds of data in a year. According to these managers, more requests are fielded for student admission data than any others. Staff salary requests are the second most demanded. At the other end of the spectrum, there seem to be few requests for school funding data or for data on books. SIMPAK respondents reported fielding no data requests, and very few requests were reported by BOS staff. These figures are all relative; in absolute terms, **there are few requests for data from information systems made at the district level**.

Table 2.13 Data Requests Made at the District by Percent

Information Item Requested	Mean Total Requests for Different Information by Information System						
	All respondents	BOS	EMIS Depag	School Mapping	SI Keuangan	SIM Guru	Sidiknas
Condition of school building	1.17	.50	.89	.75	.33	.67	2.71
Data of school location	1.13	.00	.78	.75	.33	.50	3.00
Staff qualification	1.07	.00	.78	1.00	.33	.67	2.43
Staff training	.59	.00	.56	1.00	.67	.33	.71
Staff retirement	.40	.00	.11	1.00	.67	.50	.43
Staff recruitment	.41	.00	.22	.50	.33	.00	1.00
Staff management (allocation, etc)	.52	.00	.11	.25	.33	2.00	.86
Staff promotion	1.03	.00	.22	.50	7.33	.33	.43

Information Item Requested	Mean Total Requests for Different Information by Information System						
	All respondents	BOS	EMIS Depag	School Mapping	SI Keuangan	SIM Guru	Sidiknas
Staff salary	1.28	.00	.67	.75	.33	.00	3.86
Study books (number)	.24	.00	.11	.50	.33	.00	.43
Other materials	.93	.00	.89	.50	1.00	.33	1.86
Furniture (number)	.52	.00	.56	.50	.33	.33	.86
Condition of furniture	.34	.00	.22	1.00	.67	.33	.14
Other teaching and learning resources	.48	.00	.33	.25	.67	.33	1.00
Student test data	.31	.00	.33	.25	.67	.33	.29
Student presence data	.38	.00	.22	.75	.67	.33	.43
Student admission data	1.55	.00	.33	.75	5.00	.00	3.43
School funding data	.23	.50	.00	.25	.00	.25	.57

Again there seems to be a disconnect between perception and reality. Whereas district education mangers say that the current EMIS systems meet their needs, in reality, the demand for data by managers is quite low. This may be indicative of weak analytical capacity to use data as discussed below.

It is possible that the situation at the district resembles the situation at the school. If districts do use information systems, that "use" may be limited to utilizing the data provided by schools without actually entering it into the computer system and making use of analysis that system might provide.

Impact: Though there may be ample data available at the district level, and though the district has management responsibilities that depend on data, we found that there is a relatively low demand by the district for the information systems used to collect data on behalf of the central level. While the system may not be in demand, there may still be demand for the data that is collected.

District managers indicate having responsibility for making decisions that should be informed by data, and they cite a number of indicators that should be used to support them. Managers are relatively satisfied with the data-collection instruments to meet their needs. However, there are relatively few requests made by district staff for data from the information systems. This could be a reflection of the perception that they are not allowed to use the information systems, they know the data will not meet their needs, they are unaware that the information systems can meet their needs, or that the information systems lack the user interfaces required to enable data to be extracted for use by districts and schools.

Recommendations: There clearly seems to be a demand for data at the district level, but it is not manifesting itself in requests for data from information systems. This could be the perpetuation of the mindset of the past, namely that data are not intended to be used at the district. This mindset must be changed: once information systems are reoriented to meet district users' needs, awareness about the availability of data and about the ease with which it can be accessed must be raised. DBE1, for example, has found that the data collected for PADATIWEB is very useful for districts and their demand for it is high, although PADATIWEB lacks an interface to let districts use the data.

Question for further investigation: DBE1 has invested in the development of an information system that allows the manipulation and extraction of PADATIWEB data for use by the district. How can this investment be leveraged to benefit all districts?

Why are there few requests for data made by district staff? What data, if any, do they use to support their decision-making if they are not requesting data from the information systems? What are the obstacles to incorporating reporting and analytical modules into existing information systems to enable wider data use?

2.2.3 Capacity at the District to Use Data

Demand for data is in part a function of the capacity to use it. There are a number of factors at the district level that affect the capacity of the staff to use data, as mentioned above. These factors include resources to enable the use of data (e.g., number of PCs, software, infrastructure) and support and capacity-building outlets (e.g., technical support, information system software training), among others. These issues have been discussed and shortcomings and opportunities for improvement identified above (see technological issues in Section 2.1). However, addressing these

issues will do little to advance the use of data,[11] if the capacity of district staff to use it is inadequate. To better understand the capacity of the human resources at the district, an inventory of the district information system staff looked at their specific skills related to the data management and use process.

In absolute terms, **there are few information system staff at the district level with skills that would enable more and better use of data by a wider audience, and there is a critically high share of districts lacking staff altogether in these vital areas.**

Table 2.14 District Information System Staff

Number of Staff	Percent of Information System Respondents Indicating Different Numbers of Staff with Specific Skills						
	Data Entry	Software Development	Network Management	Design of Data-collection Instrument	Statistical Analysis	Planning	Policy Research/ M & E
0	**41.3%**	**82.6%**	**67.4%**	**78.3%**	**84.8%**	**78.3%**	**87.0%**
1	21.7%	13.0%	23.9%	10.9%	13.0%	13.0%	6.5%
2	13.0%	2.2%	2.2%	6.5%	0.0%	4.3%	4.3%
3	8.7%	0.0%	2.2%	0.0%	0.0%	2.2%	0.0%
4	8.7%	2.2%	2.2%	2.2%	0.0%	2.2%	0.0%
5	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6	4.3%	0.0%	2.2%	2.2%	2.2%	0.0%	2.2%

The percent of district information system managers that say they have no staff with expertise in software development is alarmingly high, 82.6 percent. This scarcity of staff with higher-level skills, particularly in the area of analysis, planning, and policy research and evaluation, only compounds the district's inability to use information systems to support management decisions and planning.

[11] Use of data in this context does not refer to the use of computerized information systems, but rather the use of the data contained in them.

Impact: The small number of staff with skills in key areas such as statistical analysis, planning, policy research, and M&E may well hamper the use of data, no matter how much they may want to use it or how high the level of quality is.

Recommendations: Minimum district staffing standards need to be established. This can be facilitated by the harmonization of information systems, which might make some of the positions currently occupied at the district level redundant and may free up resources that can be spent on staff with different skills.

Question for further investigation: Are there other staff at the district level, outside of the information system staff, with the skills referenced above?

3. Conclusions, Recommendations, and Next Steps

There are several dominant issues that color the EMIS landscape in Indonesia, related to supply, demand, and capacity to use data. Over the course of this report we have touched on a number of specific findings related to the interplay between the supply of data, the demand for data, and the capacity to use data for education management. What follows below is a summary of some of the more important findings and recommendations for improvements in EMIS and steps that may be taken to implement the recommendations.

3.1 Major Conclusions—School Level

1. The quality of school-level records is poor (see empirical evidence about school level data quality in Section 2.1). This data is the basis for all data-based decision support and planning in Indonesia; failing to improve data quality at schools will draw into question the validity of all data-based decisions.
2. In contrast, the use of data at the school is reported to be very high (see unmet demand: data required for school management in Section 2.2), suggesting that decisions may be based on inaccurate data, or that data are collected by the school separately from the records maintained at the school level.
3. Schools report having adequate training to complete EMIS data-collection tools (see school respondents' opinions about various information systems in Section 2.1), but not all schools fill out the forms or complete them in their entirety (see coverage in Section 2.1). This suggests a lack of motivation rather than a lack of capacity to provide data.
4. The low motivation to complete EMIS forms and to maintain accurate records at the school level can be attributed to, among other factors, a lack of relevance of the collection tools (and EMIS in general) to the needs of the school. This is supported by the low number of respondents who believe that EMIS activities are designed to enable school level data use (low demand due to lack of ownership: school perceptions of reasons districts collect data in Section 2.2).
5. Lack of relevance and "ownership" at the school level is reinforced by the low number of reports that make their way back to the school (see district opinions about responding to school-level demand in Section 2.1): data flow is one-way, and failing to provide data to the district has little impact for the school.
6. Data is being used at the school level, even though this data use seems to be independent of the larger EMIS initiative. This represents a demand for data that is currently not being met by what the EMIS systems in Indonesia currently offer to schools.

3.2 Major Conclusions—District Level

1. Districts do not recognize the poor quality of data at the school level, nor do they recognize that schools' non-compliance with data-collection tool completion is driven by low motivation, rather than by low capacity (see district-level perception of school data and school stakeholders in Section 2.1).

2. There are resource constraints at the district level, both physical and technological (see technological issues in Section 2.1) and human (see Section 2.2.3). These limitations hamper data use not only at the district level, but at all levels of the education system.

3. There are data management process issues at the district level, notably inconsistent or absent quality control mechanisms that jeopardize the accuracy and reliability of data (see data verification and validation in Section 2.1).

4. EMIS systems do not adequately facilitate extraction of data at the district level for use at the school level (see district opinions about responding to school-level demand in Section 2.1). Districts recognize that this limits their ability to satisfy school-level demand.

5. There is general satisfaction at the district with data-collection instruments (see relevance of collected data to district needs in Section 2.1), though there is only a small number of requests for data from the systems (see unmet demand at the district in Section 2.2.2). This suggests that while the data that are being collected are useful and relevant for the district, the EMIS systems do not facilitate data use at the district level. Districts have the ability to make use of the data collected by the tools, even if they are not using the EMIS systems to do so.

6. Just as the lack of relevance of EMIS for schools results in poor record-keeping and low levels of compliance with data-collection initiatives, the same can be seen at the district level. The lack of relevance or user-friendliness for district-level use of EMIS means that failing to provide data into EMIS has limited impact on district-level data use. The risks for districts who fail to collect and enter data from schools are low, with the result that they are not motivated to ensure school compliance.

7. Districts lack capacity to analyze data, as well as lacking capacity to manipulate existing information systems to render them more relevant and useful for district managers (Section 2.2.3). This weak capacity further diminishes the low level of demand for data at the district.

3.3 Recommendations

1. EMIS systems contain the data that schools and districts need; however, they must be reoriented to make them relevant and useful to schools and districts. This reorientation involves modifying systems to make access to data and the way that data are presented more suitable for school and district users. It also requires a marketing and training strategy to build demand for EMIS and

ensure that potential users are aware of how EMIS systems can benefit them. This increase in demand for EMIS systems and the data they contain will lead to an improvement in data accuracy at the school, and will lead to an improvement in data accuracy and coverage at the district and, by extension, at the central level.

A prerequisite for reorienting EMIS systems is to understand what is needed by districts and schools, both in terms of the details of the data and the way in which they are presented. Only by understanding what is in demand can systems enable data use. Systems such as PADATIWEB may not take into consideration the need to enable data use at the district or school. This would reinforce the message that systems are not designed to serve districts and schools.

DBE1 is promoting the development of information-based Education Strategic Development Planning process (*Renstra SKPD/Pendidikan*), working with district planners to use available data from EMIS data-collection activities to conduct additional data analyses. This is done using third-party software such as Microsoft Access and SPSS. By using analytical tools, such as frequency tables and cross tabs to identify and better understand education issues, the value of data becomes greater for these district planners, and it is expected that they will take the necessary actions to ensure reliable data collection. These analytical tools can serve as examples of the types of modifications that can be made to existing EMIS to meet the demand of district data users.

2. An action plan for resolving the technology issues that exist at the district level needs to be created, as well as a plan for maintenance of technology.

3. The apparent absence of quality control mechanisms for school-level record keeping, EMIS data-collection instrument completion, and data entry into EMIS software seriously jeopardizes the quality of education data. Building demand for data will go a long way toward improving the quality of data but a Quality Control Framework will still be needed. Districts will need to determine what their role is in supporting schools; a strategy of building demand for quality data may be more likely to result in improvement that would a strategy of inspections and punishments for failing to comply.

4. The capacity to analyze data at the district level needs to be strengthened. As mentioned above, DBE1 is currently supporting districts in the development of District Improvement Plans and has developed training modules for data analysis and education planning that can be shared with all districts or adapted to serve a broader training program.

3.4 Next Steps

Unfortunately, there is no single solution to the issues identified in this report. However, there are several opportunities currently underway that can use and build on the findings in this report to improve data quality and promote data use.

- In PEDATIWEB, education stakeholders at all levels in Indonesia have the potential opportunity to have ready access to relevant, reliable, and accurate information in a timely manner. This potential is more likely to become a reality if the issues identified in this assessment are taken into consideration in the design and development of the Web-based system, as well as in the creation of policies, procedures, and resources that are intended to support it. For example, taking into consideration the specific needs of school-level stakeholders in developing Web-based reports and school report cards that can be easily and reliably put into the hands of school heads will go a long way in promoting use of data at the school and deepening the understating of the importance of quality data. This in turn will help to ensure that schools maintain accurate records and that they provide data in a timely manner.
- DBE1 would welcome the opportunity to collaborate with MONE in helping to identify specific ways in which PEDATIWEB content and processes may be enhanced to achieve greater use of data.
- As mentioned above, DBE1 is currently working with district planners to capitalize on the data that they have at their disposal, to support district-level education planning activities. As planners experience first-hand the limitations and risks of conducting analysis with poor data, they place a greater value on data management issues such as the data-collection process, data entry, and data quality control because they understand the return on the investment. DBE1's experience in this area should be shared widely and should be looked upon as a pilot of potential interventions.
- A national-level workshop, including participants from districts and schools, should be convened to present these findings and discuss possible solutions. Stakeholder feedback should be included in a revised version of this report.
- Questions identified as requiring further investigation should be answered. These include:
  - *Understanding why there is a disconnect between district perception and district and school reality.* An examination of the ways in which district stakeholders form opinions about what takes place at the school level may identify steps that can be taken to ensure that district staff have a realistic understanding of the school.
  - *Gaining a more realistic nation-wide impression of the situation by looking at similar issues in non-DBE areas.* Data in this assessment comes from a relatively small number of schools and districts, all of which are in districts supported by DBE. DBE1, working with MONE and MORA, could increase the scale of the assessment by gathering data nation-wide, or with a larger sample population.
  - *Examining the accuracy of data being used to support decisions compared to the reality at the school and district level (i.e., an audit).* A more scientific study of the accuracy of data used for decision making may demonstrate and quantify the impact that reliance on poor data has.

- An in-depth investigation, via focus groups, interviews, etc., into the informational needs of data users should be conducted. Understanding not only what information is needed at the school and at the district level, but also how it needs to be conveyed (e.g., format, access, distribution) will address many of the issues cited in this report, in terms of building demand and creating local ownership.
- EMIS stakeholders should convene on a regular basis in order to coordinate initiatives, share resources, and collectively monitor progress toward the goal of data use at all levels of the education system.

Annex A. List of Districts and Schools Sampled

Province	District	School Type	School Name
North Sumatra	*Kab. Tapanuli Utara*	MI	MI N *Peanornor*
		SD	SD *Katolik Santa Maria*
		SD	SDN 173259 *Pearaja*
	Kota Binjai	MI	MI N *Binjai*
		SD	SDN 020263
	Kota Tebing Tinggi	SD	SDN 023894
Banten-West Java	*Kab. Indramayu*	MI	MI *Gippi Teluk Agung*
		MI	MI *Yapida Tambi*
		SD	SD N *Kepandean* 1
		SD	SD N *Tambi Lor* 1
	Kota Tangerang	MI	MI N *Buaran*
		MI	MI *Nurul Huda*
		SD	SD N *Sukasari* 4
		SD	SDN *Karawaci baru* 5
Central Java	*Kab. Boyolali*	MI	MI *Candigatak*
		MI	MI *Sawahan*
		SD	SD N *Cepogo* 1
		SD	SD N *Sawahan* 1
	Kab. Jepara	MI	MI *Al Hidayah Langon*
		MI	MI *Nalumsari*
		SD	SD N *Dorang* 1
		SD	SD N *Sukodono* 3
East Java	*Kab. Bangkalan*	MI	MI *Hidayatus Shibyan*
		MI	MI *Thoriqul Muhtadin Bangkalan*
		SD	SD N *Kajjan* 1
		SD	SD N *Kemayoran* 1
	Kab. Sidoarjo	MI	MI *Asasul Huda*
		MI	MI *Khoirul Huda*
		SD	SD N *Kemantren* 1
		SD	SD N *Sedati Gede* 2
South Sulawesi	*Kab. Pangkajene Kepulauan*	MI	MI DDI *Laikang*
		SD	SD N 14 *Bonto Bonto*
		SD	SD N 31 *Tumampua* 5
		SD	SD N 32 *Tumampua* 6
	Kota Palopo	SD	SD *Muhammadiyah* 1
		SD	SD N 376 *Sumarambu*
		SD	SD N 75 *Surutanga*
		SD	SD N 80 *Lalabata*

Annex B. List of EMIS at District

Province	District	Source of Information	Existing EMIS Type
North Sumatra	*Kab. Tapanuli Utara*	*Kandepag*	EMIS Depag
		Disdik	School Mapping
			SIM Guru
			SIMPAK
			Sidiknas Depdiknas
	Kota Binjai	*Kandepag*	EMIS Depag
		Disdik	School Mapping
			SIM Guru
			SIMPAK
			Sidiknas Depdiknas
Banten-West Java	*Kota Tangerang*	*Kandepag*	EMIS Depag
			SI Keuangan
		Disdik	Sidiknas Depdiknas
	Kab. Indramayu	*Kandepag*	BOS
			EMIS Depag
		Disdik	School Mapping
			Sidiknas Depdiknas
Central Java	*Kab. Boyolali*	*Kandepag*	EMIS Depag
			SI Keuangan
		Disdik	Sidiknas Depdiknas
	Kab. Jepara	*Kandepag*	EMIS Depag
		Disdik	BOS
			Laporan Bulanan
			School Mapping
			SI Keuangan
			SIM Guru
			SIMPAK
			Sidiknas Depdiknas
East Java	*Kab. Bangkalan*	*Disdik*	BOS
			School Mapping
			SI Keuangan
			SIM Guru
			SIMPAK
			Sidiknas Depdiknas
	Kab. Sidoarjo	*Kandepag*	EMIS Depag
			SI Keuangan
		Disdik	School Mapping
			SIM Guru
			Sidiknas Depdiknas
South Sulawesi	*Kab. Pangkajene Kepulauan*	*Kandepag*	EMIS Depag
		Disdik	School Mapping
	Kota Palopo	*Kandepag*	EMIS Depag
		Disdik	School Mapping
			SIM Guru
			Sidiknas Depdiknas

Abbreviations

BOS	*Biaya Operasional Sekolah* (Operational School Budget)
Depag	*Departemen Agama* (Ministry of Religious Affairs)
DBE1	More Effective Decentralized Education Management and Governance project
DC	District Coordinator
DIA	DBE1-Data Information Assistant
Dinas Pendidikan	District Education Office
DIS	DBE1-Data Information Specialist
Disdik	*Dinas Pendidikan* (District Education Office)
DPR	*Dewan Perwakilan Rakyat* (National Parliament)
ICT	Information and Communication Technology
JFIT	Japanese-Fund In Trust
MA	*Madrasah Aliyah* (Islamic secondary school)
MAPENDA	Madrasah Islamic Education
MI	*Madrasah Ibditaiyah* (Islamic primary school)
MONE	Ministry of National Education
MORA	Ministry of Religious Affairs
PDMS	DBE Project Management System
PADATIWEB	*Pangkalan Data dan Informasi berbasis WEB*
PLS	Out-of-school education
PSP (PDIP)	*Pusat Statistik Pendidikan* (Education Statistics Center) previously *Pusat Data dan Informasi Pendidikan* (Education Data and Information Center)
SD	*Sekolah Dasar* (elementary school)
SI Keuangan	*Sistem Informasi Keuangan* (financial information system) in *Disdik*
Sidiknas	MONE Education Management Information System
SIM Guru	Teacher Management Information System
SMP-MT	*Sekolah Menegah Tingkat Pertama* (junior high school)