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مركز مشاريع ودراسات القطاع العام

Report of Mission
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Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)

RECOMMENDATIONS FOR STRENGTHENING THE EMIS PROJECT:

AN OUTLINE FOR AN EMIS MASTER PLAN

A PLAN FOR PROFESSIONAL DEVELOPMENT AND TRAINING ACTIVITIES

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Preface

Considerable thinking and effort has gone into the development of the EMIS in Lebanon over the past 12-15 months. Substantial work is being done in a number of important areas. This work is being done simultaneously with other important work on administrative reform, teacher training, curriculum development, improvements in buildings and facilities, and many other areas. The environment is dynamic and evolving. It would be presumptuous of anyone to think that they could learn enough in such an environment, in only 8 days, to make very detailed and definitive recommendations about what needs to be done to strengthen something as complex as the development and implementation of a comprehensive, integrated education management information system.

The broad objective for my mission was to provide support for current efforts by offering suggestions based on my experience with EMIS development in a number of other countries. While many aspects of EMIS are similar across countries, there are no patented formulas for EMIS development. Context is critically important. There are aspects of the broader social-political-economic context, as well as aspects of the educational system that are unique to Lebanon. Efforts to develop EMIS will be successful in large part to the extent that they are responsive to these contextual realities. However, there is a growing body of knowledge about ways to increase the chances for development and implementation of useful and sustainable EMIS. It is against this knowledge that I endeavored to evaluate the current state of EMIS efforts in Lebanon. The accuracy of my observations is subject for discussion. My intent is to be supportive, not critical. I hope that what I have to say will increase chances for successful implementation by at least enhancing the dialogue about EMIS development.

In fact, this mission is the first of two that will be devoted to the same task. The explicit expectation is that observations and recommendations made here will be the basis for discussion and refinement of an EMIS Master Plan and an associated Professional Development and Training Plan. I am heartened to know that in the follow-up mission efforts will be made to refine the definition and sequencing of tasks and training activities as well as to accurately project the resource and cost requirements of the proposed recommendations. It was impossible for me to gather information required to provide such detail in only 8 days.

Whatever I may be able to offer in the form of ideas that may help to move EMIS development forward is due to the kindness and professional courtesies extended to me by all whom I met. The willingness of people in the Ministry, CERD, the regional office in Zahle, UNESCO, and the WB project office to candidly discuss their involvement and thoughts about efforts to develop an EMIS in Lebanon was helpful and greatly appreciated.

Objectives of the Mission

- Development of an overall framework and Master Plan for EMIS implementation, taking into account work that has been done.
- Identification of the critical information needs of MOE officials and professional staff in the Central Ministry and Regional Educational Offices.
- Identification of the training needs in the Ministry, the regional offices, and the NCERD relative to the implementation of the EMIS, the development of educational indicators, and use of EMIS data in support of decision making, management, administration, planning, policy analysis, and research activities.
- Development of a proposed outline for a three-to-five year training program.

- Identification of the hardware and software requirements to support EMIS development in the Ministry, NCERD, and the regional offices.
- Estimates of the costs associated with the implementation of the training program and installation of necessary equipment.

Frameworks Informing the Current EMIS Review and the Proposed Master Plan and Professional Development and Training Plan.

The purpose for this section is to make explicit the consultant's perspectives on EMIS design and development. That is, to clearly define the lenses used to review current EMIS activities and inform the proposal of future activities.

A useful way of assessing current activities and plans for the implementation of EMIS is by considering current activities and plans against what have been identified by others as elements of more successful EMIS interventions. Context is extremely important, but it is reasonable to expect that one increases the chances for successful implementation by considering the experience of others. The elements of more successful EMIS are presented in Table 1 below. A corollary to this table, "Strategies to Support EMIS Development", was presented to senior staff of NCERD ands can be found in Annex xx.

Table 1
Elements of Successful EMIS

Demand for better data and information.
Clearly perceived utility.
Clearly defined realistic expectations.
Sustained high-level support.
Broad-based involvement in system design and development.
Balanced emphasis on organizational-institutional and technical issues.
Adequate capacity (Tech-Pers-Org-Instit)
Open, flexible system design.
Outputs in easily understood formats.
System provides more relevant, reliable, and timely data and information than before.

EMIS design and development is a not a linear process. It never follows the same path. However, experience across a number of countries and the observations of an increasing number of professional educators suggest a clear set of activities and issues that may be used to guide the work of those responsible for the design and development of EMIS. Annex 1 contains this consultants preferred framework. It suggests that EMIS is a much more complicated process than is generally understood. It argues that EMIS development involves much more than the introduction of computers and the computerization of existing activities. In fact, it confirms the finding of researchers working in many countries in both public and private organizations that an overemphasis on technical matters almost assures failure. It offers that successful implementation requires careful attention to the organization-institutional, political, social, and economic contexts in which the EMIS is to be set. Implicit in the framework is the importance of identifying and meeting expressed demands for data and the importance of broad-based involvement in system design.

A third useful way of assessing EMIS implementation comes from recent and emerging thinking about the characteristics of more successful organizations and what is required to implement new, moderately complex ideas in complex organizations. Here we may be guided by the work of PeterSenge and others, who looking at organizations across a number of sectors and countries, suggest a set of principles and "core practices" that characterize more successful organizations. To summarize, organizations that are more successful: articulate there vision, goals, and objectives explicitly and clearly; promote dialogue and broad-based involvement in the development of new ideas and systems; and manage strategically, as opposed to technically. In such organizations, individuals are encouraged: to develop and share "models" of how they are thinking; to actively seek new learning; and to work in teams. These findings are consistent with the frameworks presented above. The three frameworks taken together are consistent with this consultant's EMIS experience in some seven countries over the past 12 years.

Observations/*General Recommendations*

The overall impression that one gets is that some good work is underway and there is a general sense of the direction that things are going, but that current initiatives are being largely conducted out of faith, not a strong shared understanding or vision of what EMIS is or could be. There exist a number of outlines, timetables, and work-breakdown charts but these seem to be more personalized expressions and tools than they are shared documents that everyone is working from. There have been efforts to expand participation, but perhaps limited appreciation for how much effort generating and sustaining participation really takes. A consistent theme throughout my discussions was the need for greater emphasis on communications – keeping people informed of the vision, goals, objectives and understanding how the activities and tasks relate to the vision and to one another. This is completely consistent with the experience in a number of other countries that have embarked on EMIS at the urging of one or two leaders acting as change agents. The challenge at this point is to broaden substantive participation in EMIS design and development efforts and facilitate negotiation of a shared vision and plan for EMIS. Experience elsewhere is quite clear that participation and decision-making about EMIS must be shared broadly to increase chances for success. Plans developed by one or even several people are rarely successful. This is a challenge in part for two very good reasons: few of us have ever been trained to be facilitators or have any experience developing a comprehensive, integrated EMIS. *This points to the need for development of a professional development program for senior management as much as it does a training program for support and technical staff. It is also a warning, that the plan proposed below be used as a discussion document, as the basis for the real plan, the plan with broad-based endorsement and support.*

What those responsible for EMIS are discovering, I hope, is that EMIS development is more than a technical intervention. It is fundamentally an organizational and institutional development activity. It is about changing how divisions, units, and people work together. Knowledge of how education systems work and managing an organizational change process is as important as getting the technical aspects correct. They are also learning that implementing EMIS is enormously more complicated than is generally appreciated. Most are trying to manage EMIS in addition to other responsibilities. *This suggests the need for a full-time manager of EMIS and that there is a role to be played by an outside technical assistant, for up to two years, preferably someone with broad knowledge of EMIS and sustained, preferably resident, long-term experience with EMIS in other countries.*

In addition to these broad observation, a number of other observations warrant mentioning to the extent that they inform the types of activities, professional development, and training activities that need to take place. In no particular order of importance and guided by the frameworks offered above, the following are some of the more salient I would offer.

أ. Significant efforts are currently underway, but the enthusiasm for the concept of EMIS, where it may have existed, has given way to the realities of implementation. To paraphrase what I heard from several colleagues, "We know the big idea, what we need now is help knowing how to do it. *This speaks to the need for professional development and training, as well as creating opportunities for those responsible for EMIS in Lebanon to engage in dialogue with colleagues from other countries who have been through similar processes.*

ب. While there is a general sense that EMIS will be useful, the potential utility of an EMIS system is not fully understood by many of the important players in the system. *There is a need for greater outreach and "marketing" of the concept. This speaks to the need for a communications strategy, informational seminars, expanding the circle of those involved in system design and development.*

ت. The overall plans for EMIS development are not widely known. Even in one of the two designated pilot regional offices, staff expressed frustration with not being kept informed of what was happening, particularly when plans changed. This may be in part because a single comprehensive shared plan does not exist. There exist a number of various outlines, timetables, and work-breakdown charts but these seem to be more personalized expressions and tools than they are shared documents that everyone is working from. There is a need for negotiation of a shared workplan. As above, *this speaks to the need for a communications strategy, informational seminars, expanding the circle of those involved in system design and development. It also points to the need for broad dissemination and discussion of the Master Plan document.*

ث. There are some real, understandable tensions between the director general's office and CERD. My impression was that they are not insurmountable differences, but that they must be addressed sooner rather than later to increase chances for success. My sense was that a large part of the problem could be explained by lack of substantive involvement of the Director General's staff in EMIS design and development; to a general lack of knowledge in the DG's office of the vision, goals, and objectives of EMIS and the motives of CERD. My sense was that CERD efforts were all in good faith and that this is largely a communication problem that could be solved with some substantive participation of designated staff from the DG's office in the design, planning, and development of EMIS. I would also encourage the EMIS team to *begin development of an application and report formats to serve the needs of the DG as soon as the data from the pilot regions is available. This also suggests the importance of a professional development seminar for the very senior management* in the Ministry and CERD and the utility of a study tour for senior management.

ج. The private school situation in Lebanon is quite unique and the tension between private and public schools quite real. The unwillingness of private schools to cooperate in the school census pilot test was reported by several people. Given the dominate enrollment situation in private schools, *an effort to co-opt private school participation must begin immediately.* This calls for the need for outreach and dialogue with private schools to understand their hesitation and to negotiate their participation, if this is the only way to get basic data required for planning and policy analysis.

ح. Current efforts are heavily "supply driven". Efforts to date have been largely focused on data collection and on the development of data entry modules. While there has been

discussion of data and information needs, I saw and heard little about needs assessments and, at least for the school census, no efforts to develop automated report formats for regional offices or others. Design and development of the data questionnaires appeared to have been conducted by a small group within NCERD. A new, user-friendly application has yet to be developed for use in the regional offices. What is being used is the same text ordata entry only application that has been used at CERD in the past. This is a mistake. The regional offices are central to the new school census strategy. *Broad-based involvement design and development of data questionnaires should be increased. Work should begin immediately on a new application and particularly the development of selected automated report formats for regional offices lest they feel, as one regional officer expressed, that they merely being used to help the statistics people in CERD do there work. Services and communications must be developed. A number of workshops should be conducted for regional officers. Support in the form of training and substantive involvement in data and information need assessments must be provided for relevant planning, monitoring and evaluation units in the MOE and CERD.*

ح. Regional staff reported that in addition to computer-related resources and training that they require additional resources to cover the costs of officers traveling to schools. CERD staff mentioned the same issue. An investigation should be conducted to address this issue, lest low staff morale sabotage the effort.

د. Current efforts are largely focused on gathering data on inputs – on teacher characteristics, textbook distribution, quality of facilities, etc. This understandable and essential, but *emphasis must be placed on the definition and collection of output, and even process data very soon.*

ذ. The technical capacity and infrastructure in NCERD is quite good and getting better. *Some very targeted assistance with applications development, particularly on the design and development of output reports and workshops to increase technicians understanding of the use of data and information in educational policy analysis and planning could be very useful.*

ر The current workload of the technical staff is quite diffuse. Staff seemed to working on a number of applications simultaneously. There was a sense that everything is a priority, which, of course, can result in nothing being a priority. The fact that a user-friendly application for district offices was not underdevelopment was puzzling given the importance of the school census to the data collection effort. *There is a need to prioritize the work of the technical staff, and by inference to set priorities and develop the principles that to guide the EMIS effort as a whole.*

ز. The current technical platform in use in much of CERD and in the pilot regions, INGRESS on a UNIX platform, is likely to be to technically demanding for most users. *There is a need to rethink the database and the operating system platform.*

س. Technical issues are the dominating current development activities and technicians are dominating the leadership of EMIS. Applications development and computers. This is understandable, but *greater emphasis should be put on keeping users involved. Leadership of the effort should include more substantive involvement of line educational officers and staff.*

ش. There are currently a number of sources of computers for division, units, regional offices, and schools. There do not seem to have been any standards governing these. It was unclear, i.e., the regional staff did not know, if the system they got from EMIS was compatible with several other PCs they received from other sources. *An effort should be made to develop standards for MOE, CERD, regional offices and others.*

ص. For all the effort put into the school mapping effort, there seems to be little recognition of the fact that the conditions required for effective school mapping and data to support the effort does not exist, nor is it likely that it will be available. To salvage this effort, *the focus of school mapping could very usefully shift to the production of region and school-based thematic maps that would add significant value to EMIS efforts to support data and information use.*

ض. The EMIS team has already identified some aspects of the integration of data from multiple sources. Efforts are underway to negotiate data standards across divisions. Experience from other countries suggests that this is a much more complicated job than it often appears to be. Units do not give up their existing systems easily. *A substantive effort should begin soon and plans made to sustain this effort for some months to come.*

Data and Information Needs

The data and information needs articulated by those MOE, CERD, and regional office staff were remarkably similar, and limited. Most prevalent were expressions of needs for data and information to support administrative and very general monitoring activities. The dominant concern seemed to be the need to report numbers to others. Most people were only interested in input data, i.e., counts of students, teachers, schools; information on school programs; characteristics of teachers; the availability of textbooks and other materials; the general condition of facilities; the distribution of special needs students; and the availability of other educational services. There was almost no mention of the need for data to support planning or policy analysis, nor to use data to identify effective schools or assess the relative impact of any of the many proposed interventions on student performance. For example, while the government plans to develop standards for textbooks, textbooks will be published by more than one company and schools will be free to purchase the textbooks they use. At this time, there is no evidence of a plan to evaluate the relative effectiveness of various textbooks. There was also no mention of the utility of time series data for any types of analyses.

While, in context, these observations are somewhat understandable, the need to collect and maintain data and information to support the routine monitoring of school performance, quality, efficiency, and equity must be built into the EMIS. As the education system evolves, and it is reasonable to expect this is but a few years off for Lebanon, the need for higher order types of analyses and planning will emerge. It is unreasonable to expect the technicians currently in charge of EMIS developments to anticipate the future system. What they are responding to, at best, is the expressed felts needs of practitioners. Thus, *the need for professional development and training in the areas of policy analysis and planning, evaluation, and the definition and development of indicators. The lack of current concern for evaluation, analysis, and planning also suggests the usefulness of a resident technical assistant to work with various units in these areas.*

The national plan, A Plan for Educational Reform in Lebanon, although also emphasizing primarily inputs, provides a starting point for definition of data and information needs that goes beyond the "felt needs" of line educational officers, even if it is vague on details. Explicit in the national reform plan is concern for rethinking the role of educational planning, a call for the need to evaluate the effectiveness of new interventions, an expression of concern for the equitable distribution of opportunity and outcomes for education, and significant implicit concern for improving the quality of education. The plan talks about the need for students to have the basic knowledge, experience and skills to be productive members of society and meet national development needs, but provides little detail. *This suggests the need and importance of an early*

professional development seminar and other training in the definition and development of indicators for monitoring equity, efficiency, effectiveness, quality, and relevance.

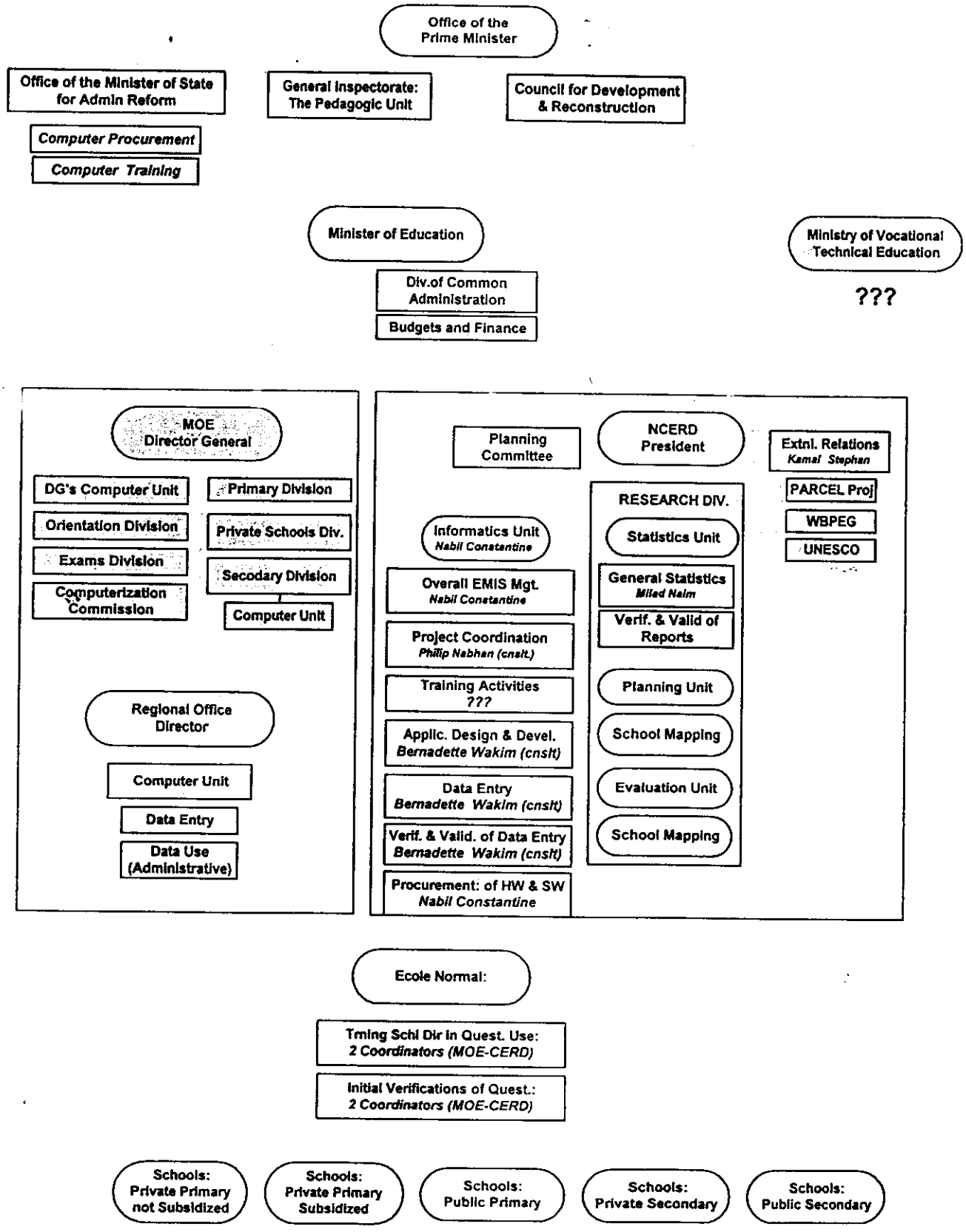
I was not provided nor did I see any document detailing the data and information requirements for the EMIS. It was implicit that the system was intended to collect and gather data on all levels, all types of educational institutions and activities. Current emphasis is on pre-university, academic institutions. No mention of vocational, informal, university or other institutions although these do appear on a diagram of the EMIS provided by the Information Unit in CERD. There was also no mention of a multi-million dollar EMIS effort to be in the Ministry of Technical Vocational Education. *This points to the need for the development of some informational material on EMIS- principles guiding its development and the scope of its activities. The focus of this workshop or workshops could be the production of a priority list of indicators for monitoring educational reform in Lebanon.*

Numerous frameworks exist outlining the types of data and information required to effectively monitoring and plan educational system development. It seems fruitless to reproduce any one or more of them here. Perhaps the most useful framework for Lebanon at this point is that produced several years ago for the neighboring country of Jordan. Annex 7 contains a copy of a set of indicators for monitoring reform of Jordan's Primary and Secondary Education System

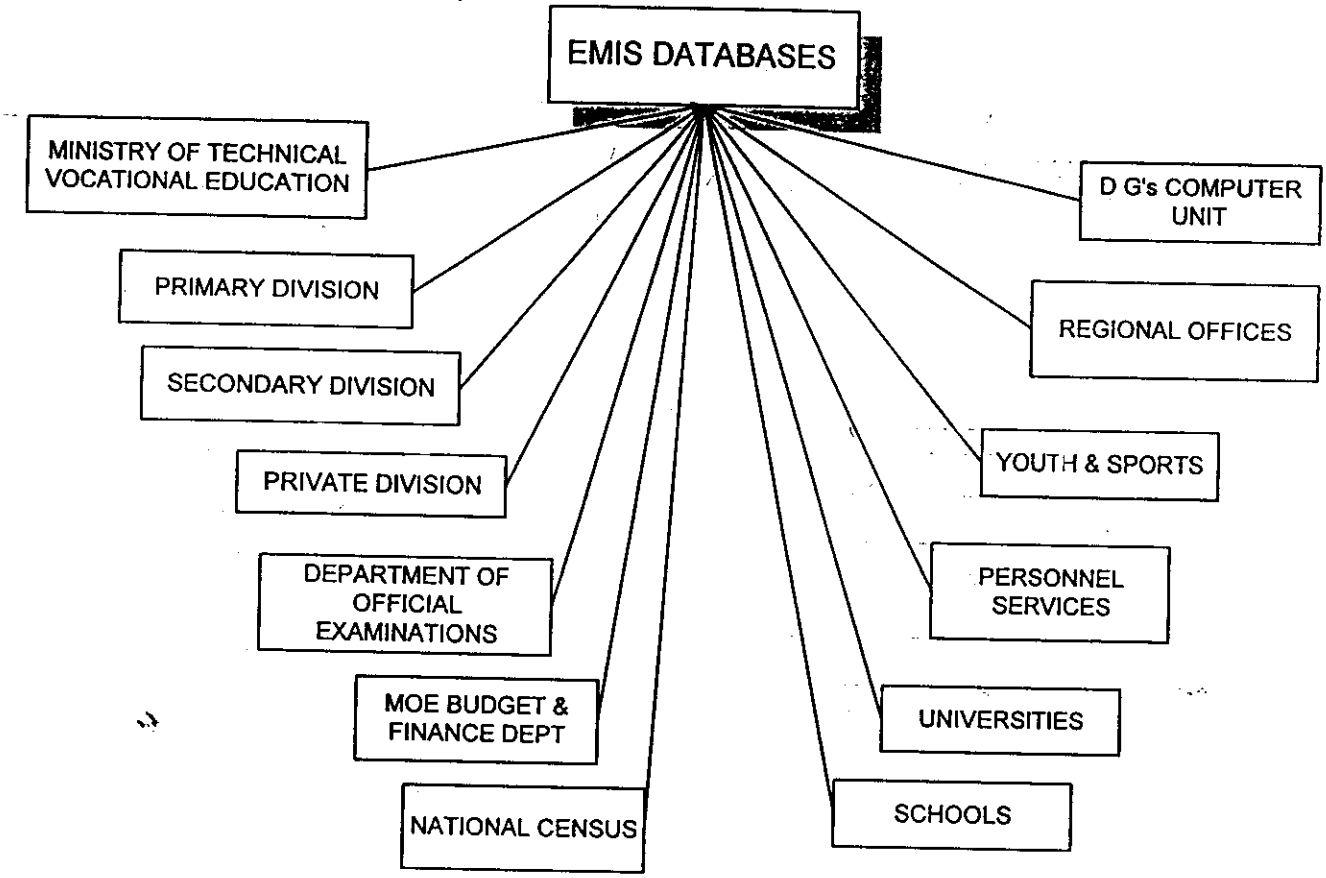
Salient Features of the Organizational - Institutional Context.

While the objectives of EMIS are similar across countries, fitting EMIS into the local organizational-institutional culture is critical for success. This includes identification of potential stakeholders and understanding existing formal organizational structures and processes as well as informal operational norms. Success will also depend upon the extent to which the EMIS is able to identify relevant stakeholders and to respond to and support anticipated changes in the organizational environment – for example changes in the distribution of tasks and responsibilities in the ministry, regional offices, and schools as indicated in the Reform document. The diagram below endeavors to identify some of the more critical organizational stakeholders in the current EMIS initiative and to capture some elements of the context. A review of the diagram suggests the complexity of the task. The two additional diagrams that follow identify the principal sources of EMIS data and the potential users of EMIS data as understood from the various conversations in the MOE, CERD, and the regional offices.

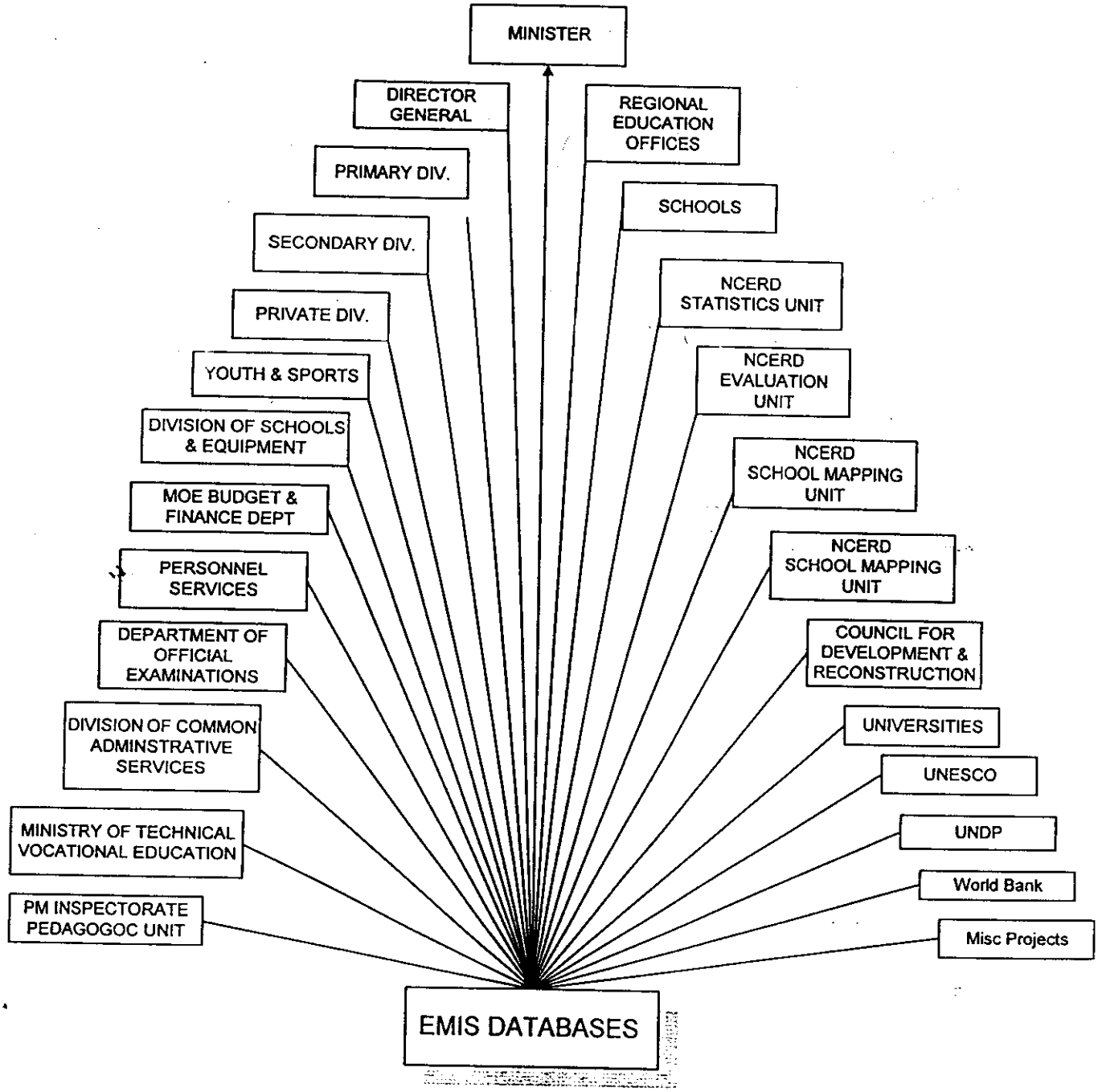
SALIENT ELEMENTS OF
THE CURRENT EMIS OPERATIONAL ENVIRONMENT



PRIMARY SOURCES OF EMIS DATA



POTENTIAL
EMIS DATA USERS



A Comprehensive Plan for EMIS Implementation

An initial effort to develop a comprehensive outline and master plan for EMIS development can be found in Annex 2. In it I endeavor to layout the range of activities that must be attended to implement the EMIS. Those responsible for EMIS development will note that I have tried to include all earlier and current activities. Those familiar with current efforts will note that significant progress has been and is being made. As in any such plan, one could, and someone will have to go into even greater detail then I have done. Consistent with the emphasis I place on the importance of process in EMIS design and development, I propose that this plan be used to facilitate a broader discussion of EMIS and negotiation of an actual working plan document. The plan is divided into six sections with each section outlining several levels of activity details. The six sections are:

1. **Start Up – direction setting and initial planning**
2. **Foundation Building – organizational and institutional preparation for change**
3. **Strengthening Existing Annual School Census (Pilot Project)**
4. **Implementation of Revised School Census in All Regions**
5. **Integration of Data from Other Source**
6. **Data Utilization – strengthening use and serving and sustaining demand**

While I have endeavored to sequence the activities in a logical manner, more work is required in this area. I do not have sufficiently detailed information about the working environment to be confident in contextual accuracy of the sequencing that I might propose. It is understoof that the sequencing of activities will be done during the follow-up consultancy.

Annex 3 contains a framework for thinking about the management of the EMIS effort in terms of the range of functional tasks that must be addressed. What Annex 3 endeavors to do is to organize our thinking about the range and relationship of the tasks presented in the outline of a Master Plan. Annex 3 is a not a proposed organizational structure, although it could be.

Professional Development and Training Programs

As indicated above, EMIS efforts can be significantly enhanced by the development of a series of professional development and training activities. Annex 4 contains an outline for a professional development and training program. The number of days proposed is consistent with training provided in similar contexts in other countries. The number of participants suggested for each activity are but rough estimates of the number of people that seemed to be involved from the discussions that I had. The actual number of participants will need determined in the follow-up consultancy. There may be economies of scale to be gained by combining some of the workshops. Annex 6 contains a comprehensive guide for the development of specific professional development and training activities to serve the needs of various groups at each level of the education system including NCERD; the Ministry of National Education, Youth and Sports; the Regional Offices; and the schools. Annex 6 provides, in considerable detail, the types of knowledge and skills required to effectively implement EMIS. An analysis of the gaps in current knowledge would be useful to the development of specific programs.

I would propose to start the professional development and training series with a workshop / planning session for the core EMIS and EMIS Project team to collectively assess the current state of the process, to reaffirm and, if necessary redefine, commitment to a shared vision, goals and objectives, and develop a consensus around the process and plan to be followed. I would use a team of two/three outside facilitators to do this – all of whom must be familiar with EMIS development - one of whom must be an educator with broad knowledge and experience with education system reform who could insure that the context of education is emphasized and that the teams knowledge of internationally accepted standards, methods, and procedures for assessing effectiveness, efficiency, quality, and equity in educational systems is broadened. A second educator with significant experience working in educational bureaucracies and detailed, experience-based knowledge of EMIS design and implementation. The third a technician with detailed experience and knowledge of the development of school census and other education system applications.

Introductory, intermediate, and advanced professional development and training is required to meet the needs of the following:

Leadership and management
- MOE & CERD Senior Management
- EMIS Core Team Management
- Heads of relevant MOE & CERD divisions
- Regional Directors
- School Directors

Professional Support Staff
- EMIS Team computer technicians/programmers/trainers
- EMIS application development team(s)
- Computer technicians and programmers from relevant MOE & CERD divisions
- Evaluation and Monitoring Specialists: MOE & CERD
- Policy analysts: MOE & CERD
- Planners: MOE & CERD

Support Staff
- Data entry: MOE & CERD
- Office clerical: MOE, CERD, & Regional Offices
- Field support: MOE, CERD, & Regional Offices

The topics required range from organizational and institutional development, management, broad knowledge of data and information use in education, EMIS design and development, planning, monitoring, evaluation and policy analysis, use of data entry and reporting applications, data validations procedures, introduction to computers, and the use of a range of computer programs. It is assumed that, as suggested by EMIS Core Staff, a decision will be taken to standardize on the use of the Windows and Windows NT environments and the MSOffice 97 suite of software, i.e., Access, Excel, Word, and Powerpoint. It is also assumed that SPSS will be the statistical analysis package of choice.

The objectives of all professional development and training activities must include that all programs address very targeted needs, are coordinated with the substantive EMIS project work, emphasize the best practices of adult education, and be product/outcome oriented.

All computer training must be developed around practical examples of the use of the selected software in support of decision making, educational administration, management, planning, policy analysis, etc. Experience in many other countries suggests that generic computer training is of limited value. The constraining issue may initially be the lack of adequate computer skills, but it quickly becomes lack of knowledge about the appropriate use of computers to address the specific daily activities of professional staff.

Training must be timed carefully so those trainees returning to their offices have opportunities to apply the training they have received. Experience in a number of other countries suggests that even relatively short delays between training and application of the training in peoples jobs can significantly compromise the effectiveness of the training and require that training be repeated. This, reportedly, has already been the experienced in at least of the two pilot regional offices.

It is important to understand that EMIS-related training is never a one-off exercise. For EMIS to be sustainable over the longer term, professional development and training activities must be institutionalized. Staff and systems change and the need for training become almost constant.

Provision of effective professional development seminars will require the contracting of senior education professionals with extensive experience in all of the proposed substantive areas. There are a relatively small number of organizations and universities in the world that specialize in educational organizational development and national level educational planning and policy analysis. Fewer still with significant EMIS experience. While it is likely that there exist professionals within Lebanon that could provide some of the professional development seminars, it is assumed, and advised, that professional development seminars will be provided in large part by expatriate consultants and/or foreign university professionals. Every effort should be made to enlist the aid of individuals and institutions with significant experience providing similar professional development and training in other countries

Training of trainers must be a guiding principle for much of the more technical training to be provided. Local and expatriate technical assistance will likely be required in the early phases, but the objective should be to develop and in-house capacity for training of profession support and clerical assistance staff. This should involve providing mentoring for identified future EMIS trainers in Lebanon with local and expatriate educators and training professionals.

Annex 1 – A Framework for Organizing Information System Interventions

EMIS

Education Management Information System

(Presentation made at CERD)

EMIS Objectives

To contribute to the development of more effective and efficient education systems by:

- Strengthening capacity to manage the continuing development of information resources;

- Strengthening capacity to process and analyze data and information effectively and efficiently; and

- Providing relevant, reliable, and timely data and information to support policy-making, management and administration.

Relevant

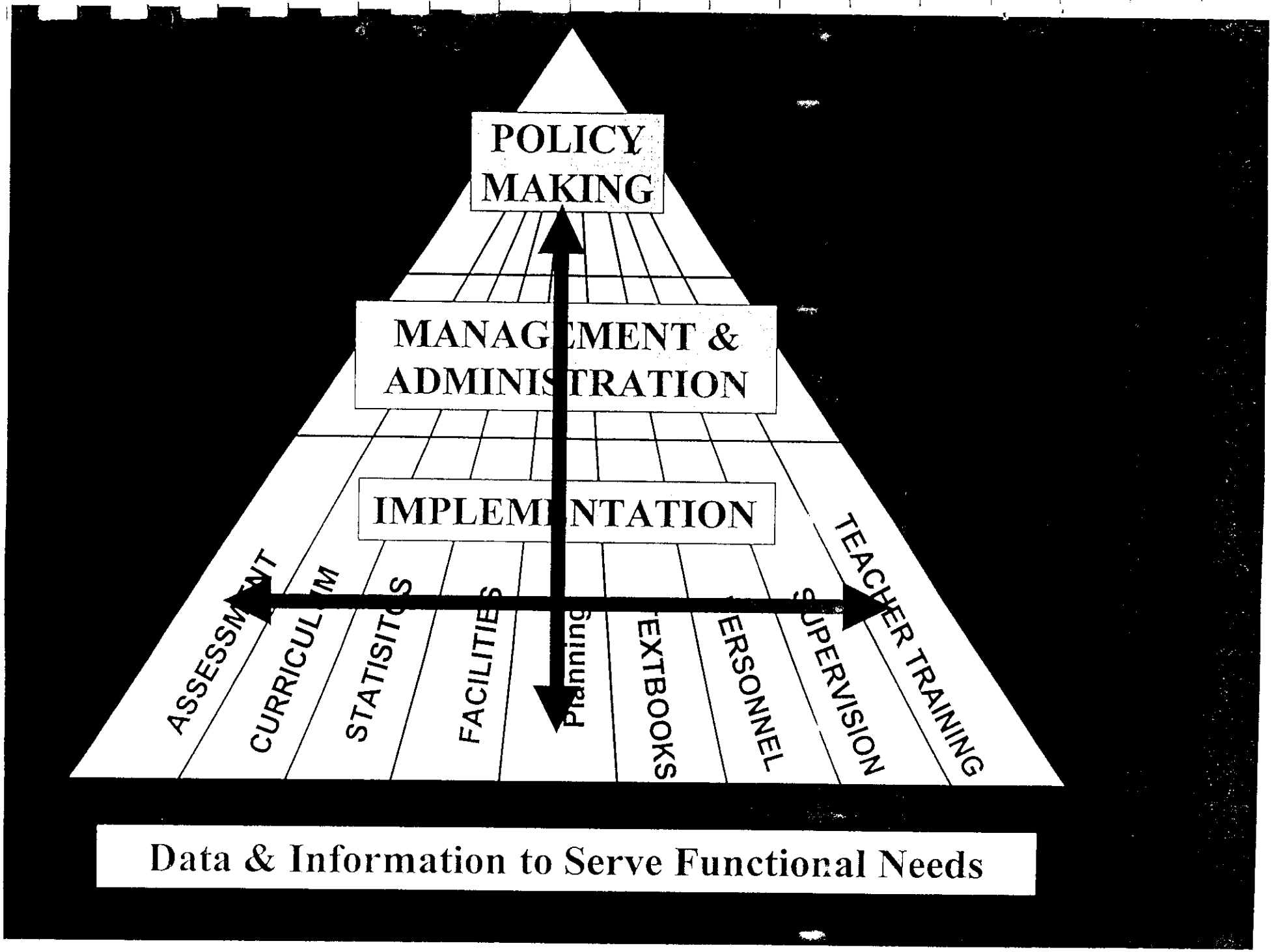
- Providing the data that people need.
- Linking data to the information needs of decision-makers, analysts, planners, managers, and administrators at each level.

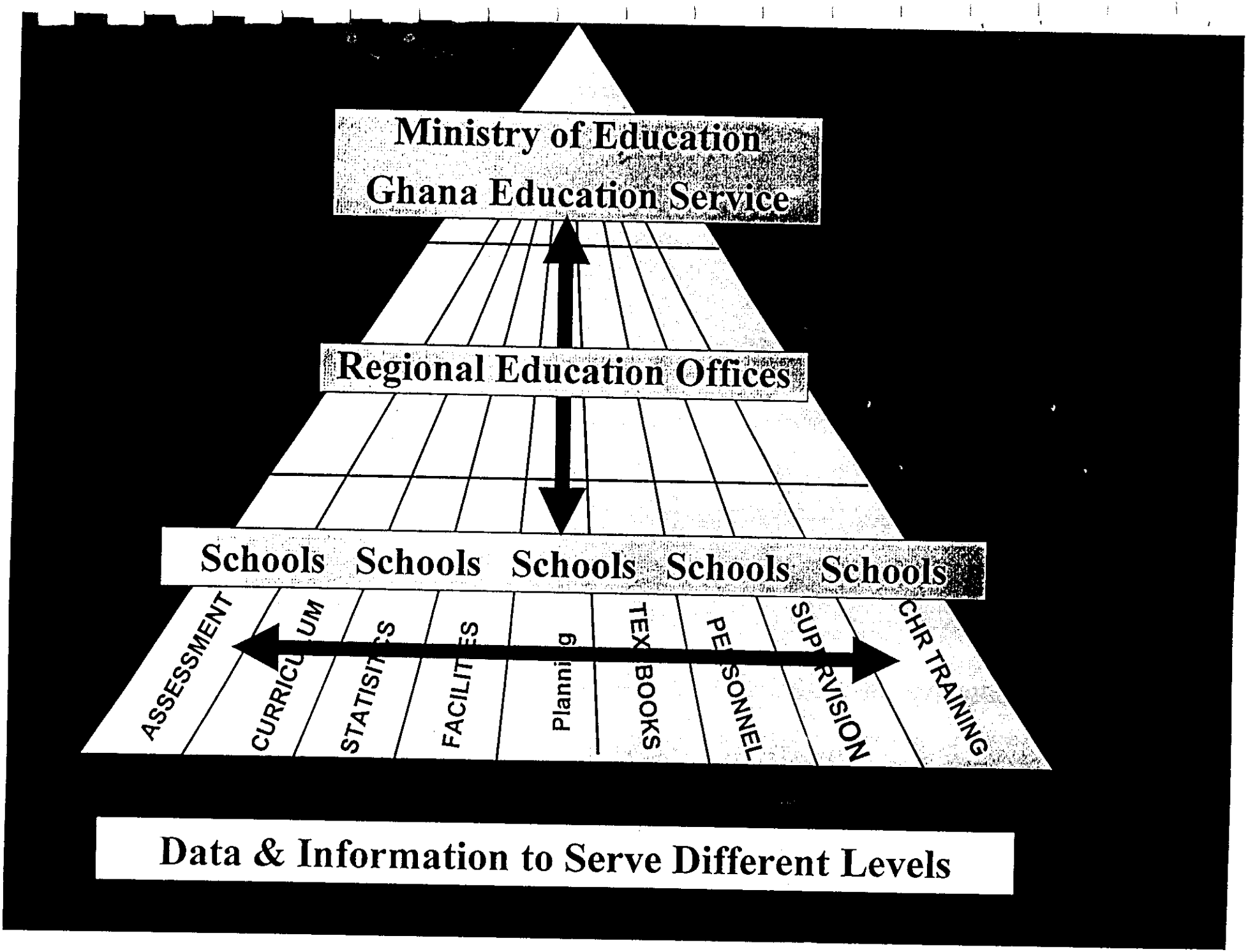
Reliability

- Providing data and information that people can trust.
- Minimizing threats to the quality and usefulness of data and information.

Timeliness

- Providing data and information when and before it is needed.
- Coordinating data collection, processing, and dissemination systems with annual administrative, management, and decision making cycles.


POLICY MAKING
MANAGEMENT & ADMINISTRATION
IMPLEMENTATION
ASSESSMENT
CURRICULUM
STATISTICS
FACILITIES
Planning
TEXTBOOKS
PERSONNEL
SUPERVISION
TEACHER TRAINING
Data & Information to Serve Functional Needs


Ministry of Education
Ghana Education Service
Regional Education Offices
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ASSESSMENT
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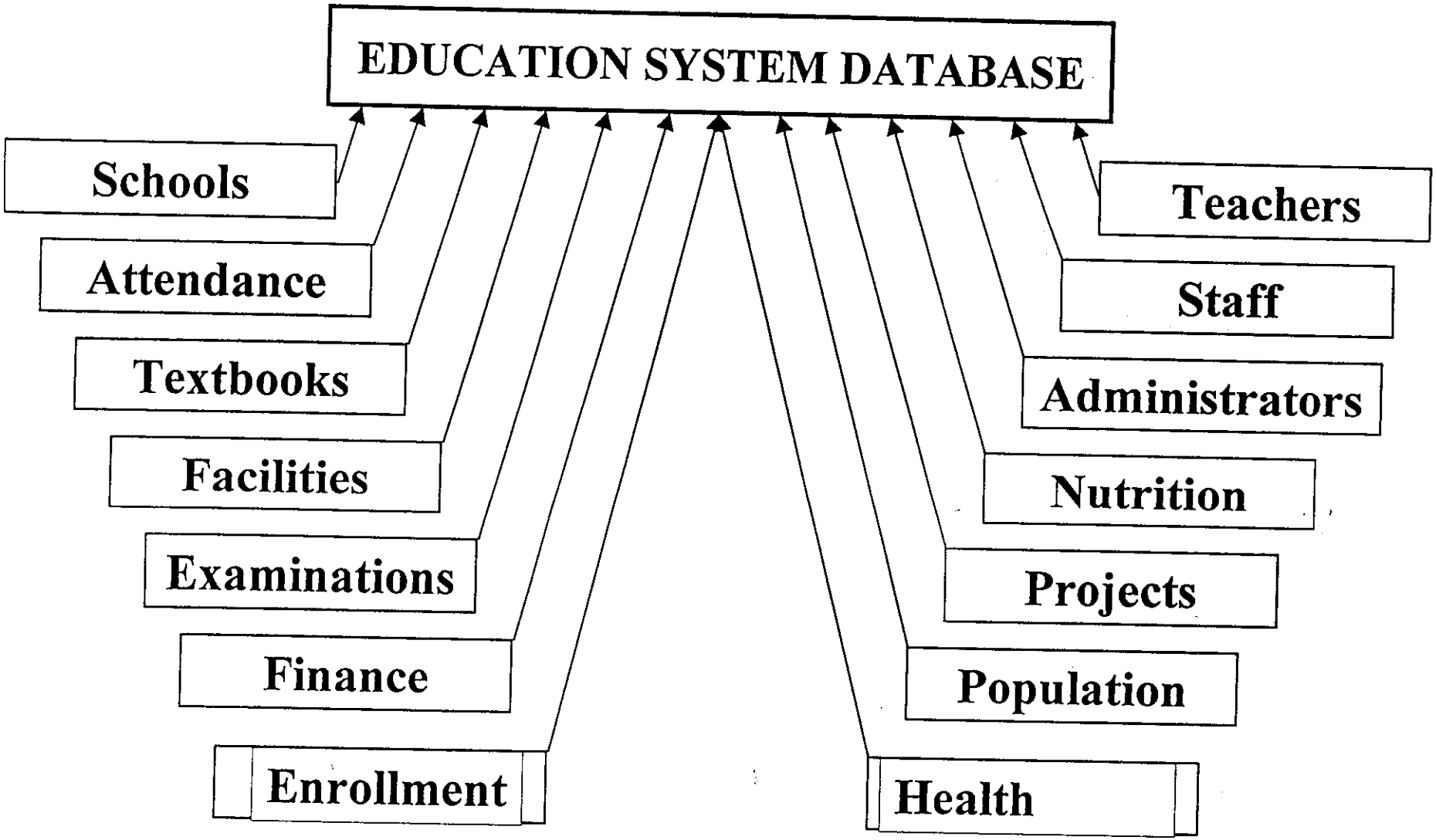
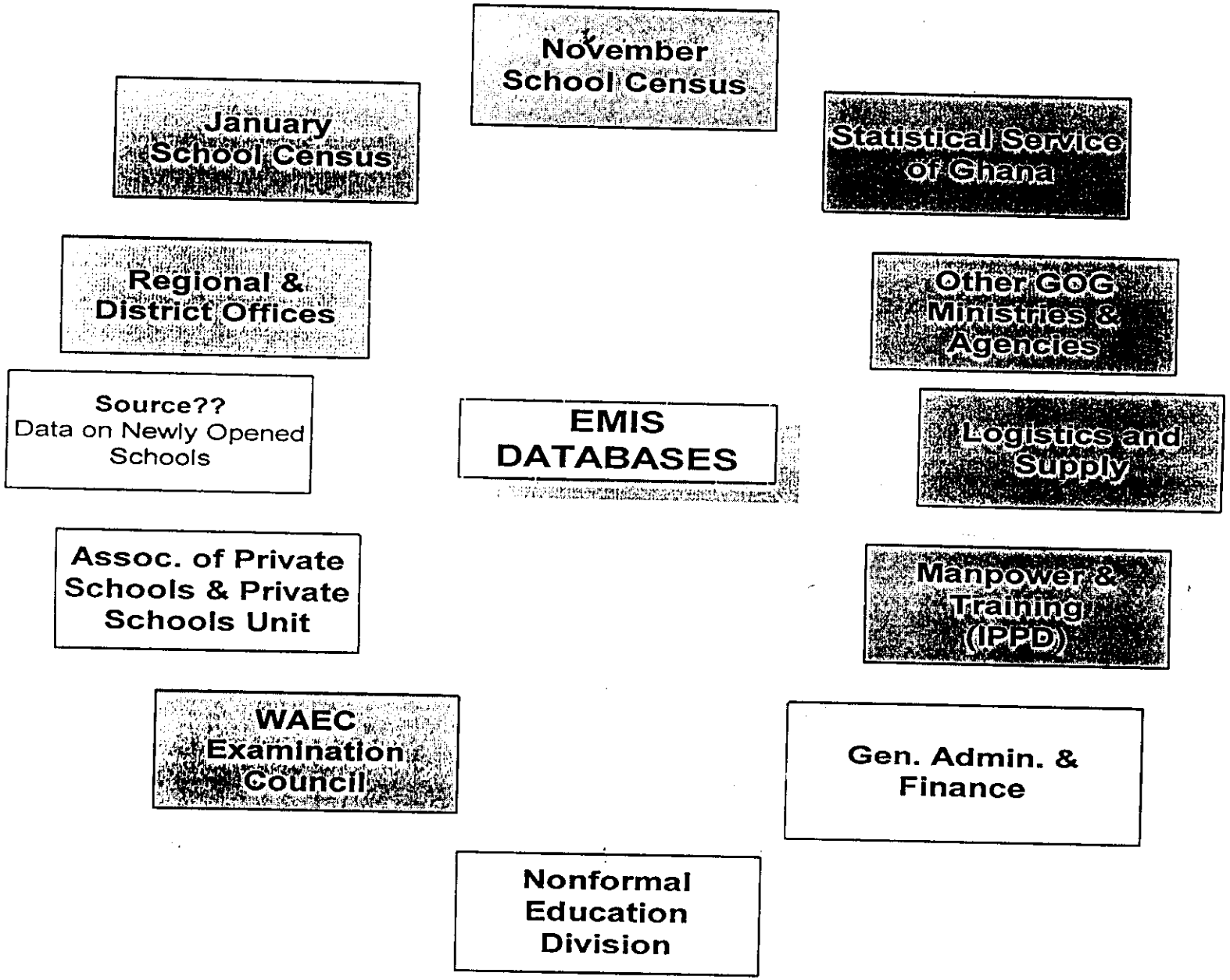
Data & Information to Serve Different Levels

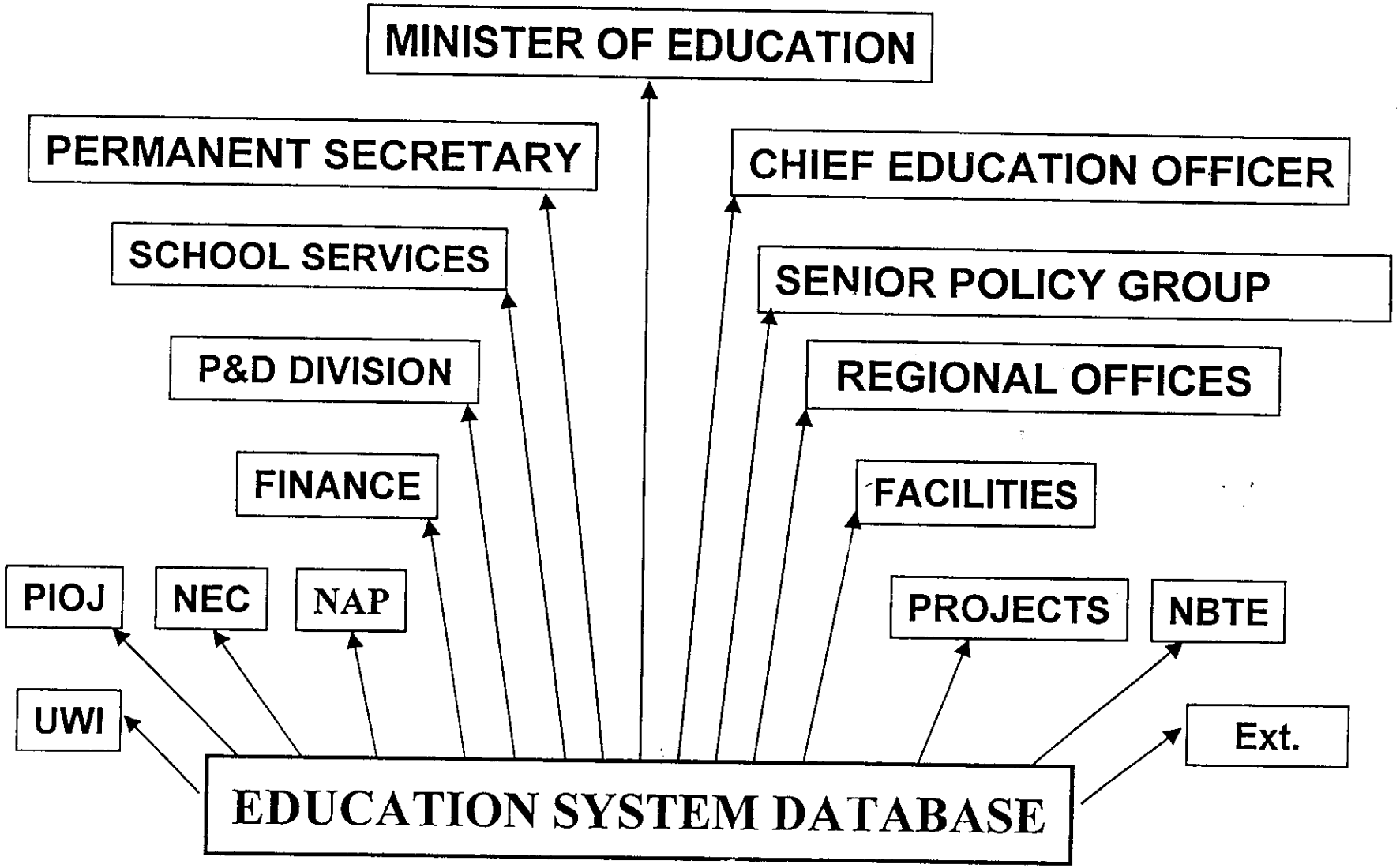
Data Collection (Illustrative)

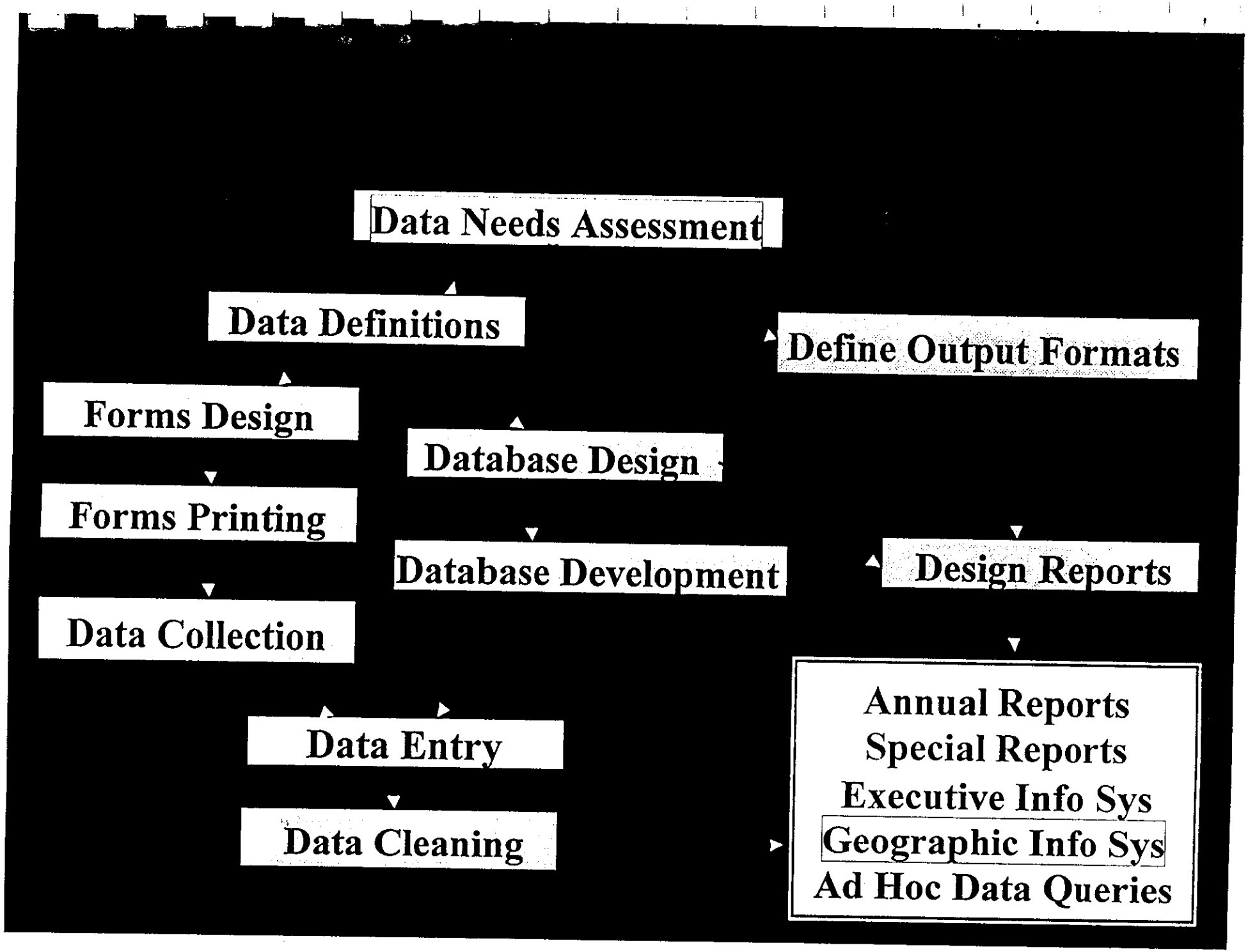


Integrate Existing Data Systems (Illustrative)



Access & Dissemination (Illustrative)

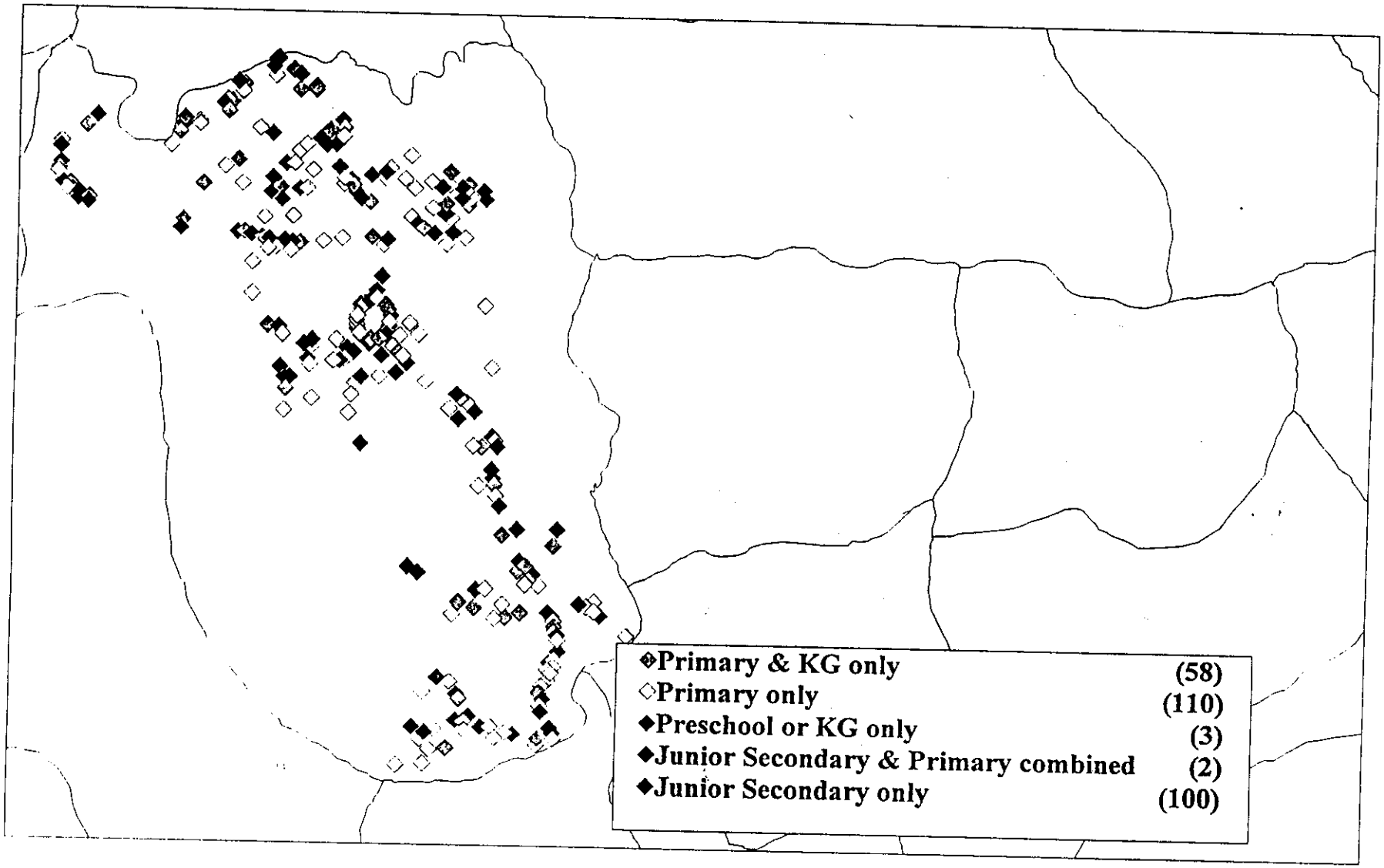



Data Needs Assessment
Data Definitions
Define Output Formats
Forms Design
Database Design
Forms Printing
Database Development
Design Reports
Data Collection
Annual Reports
Special Reports
Executive Info Sys
Geographic Info Sys
Ad Hoc Data Queries
Data Entry
Data Cleaning

- Demo Census Application
- Demo GIS

Ministry of Education

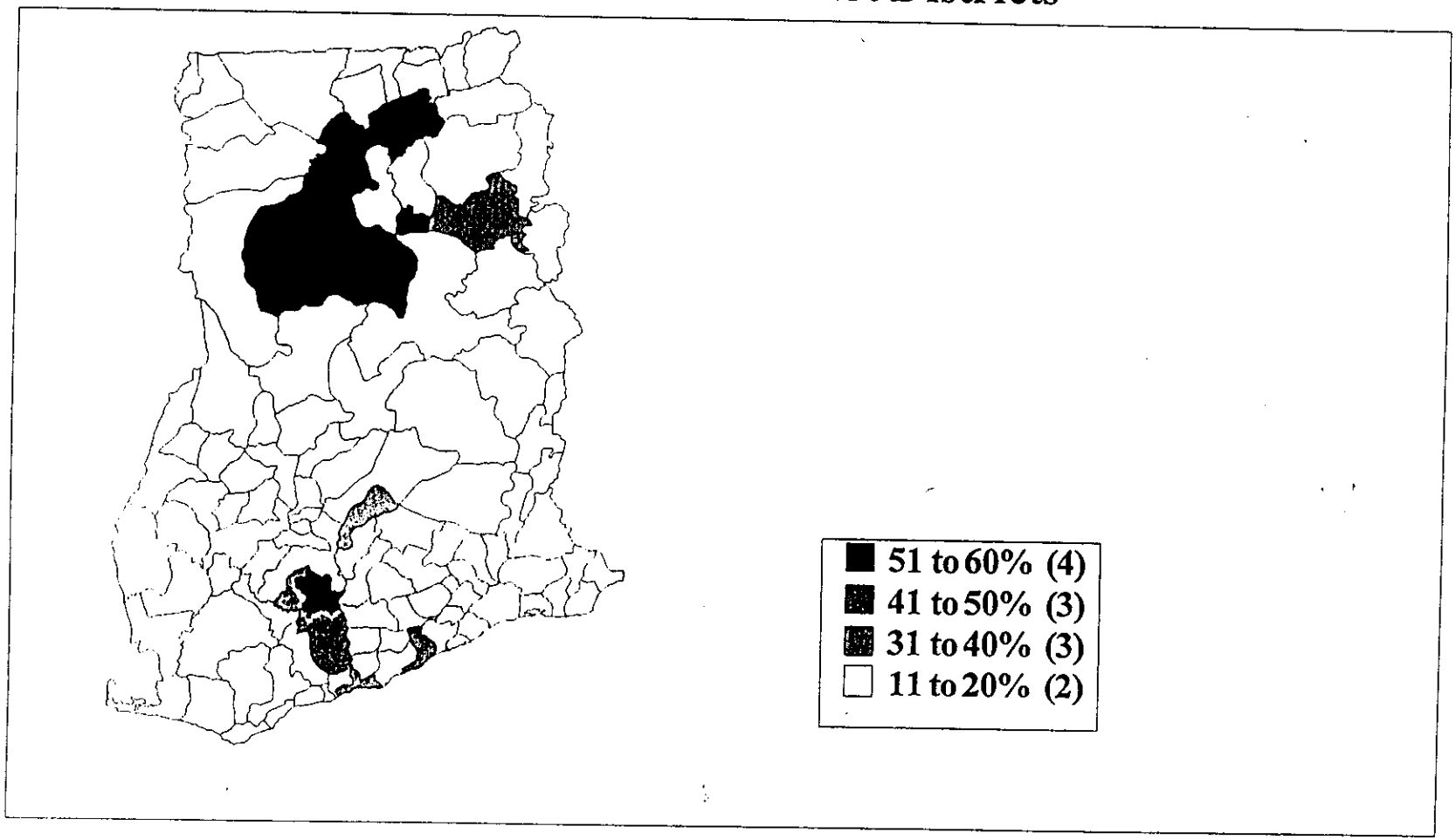
Assin-Foso District Schools by Level



Source: MOE, EMIS Project

Ministry of Education

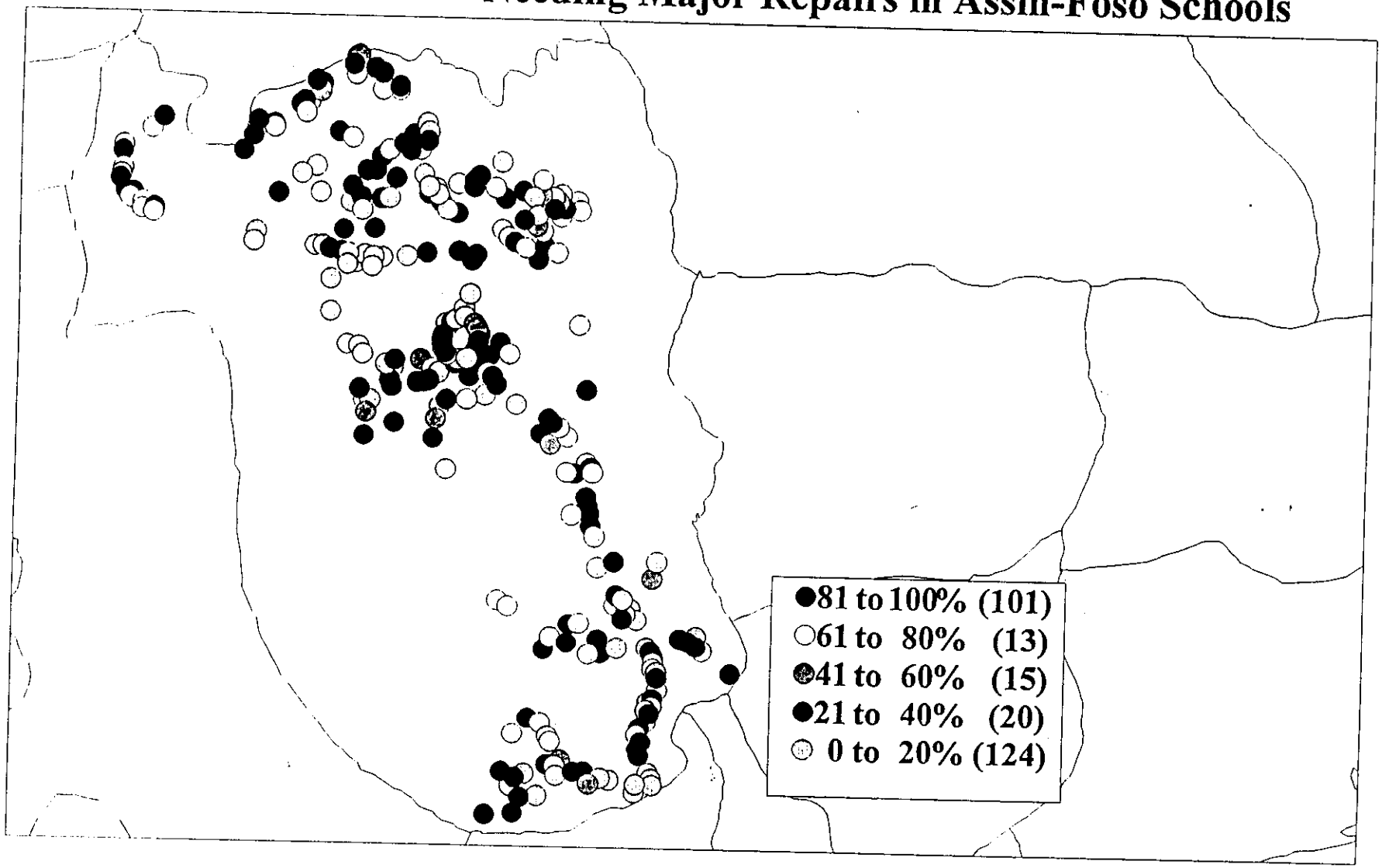
Percentage of Classrooms Needing Major Repairs in Pilot Districts



Source: MOE, EMIS Project

Ministry of Education

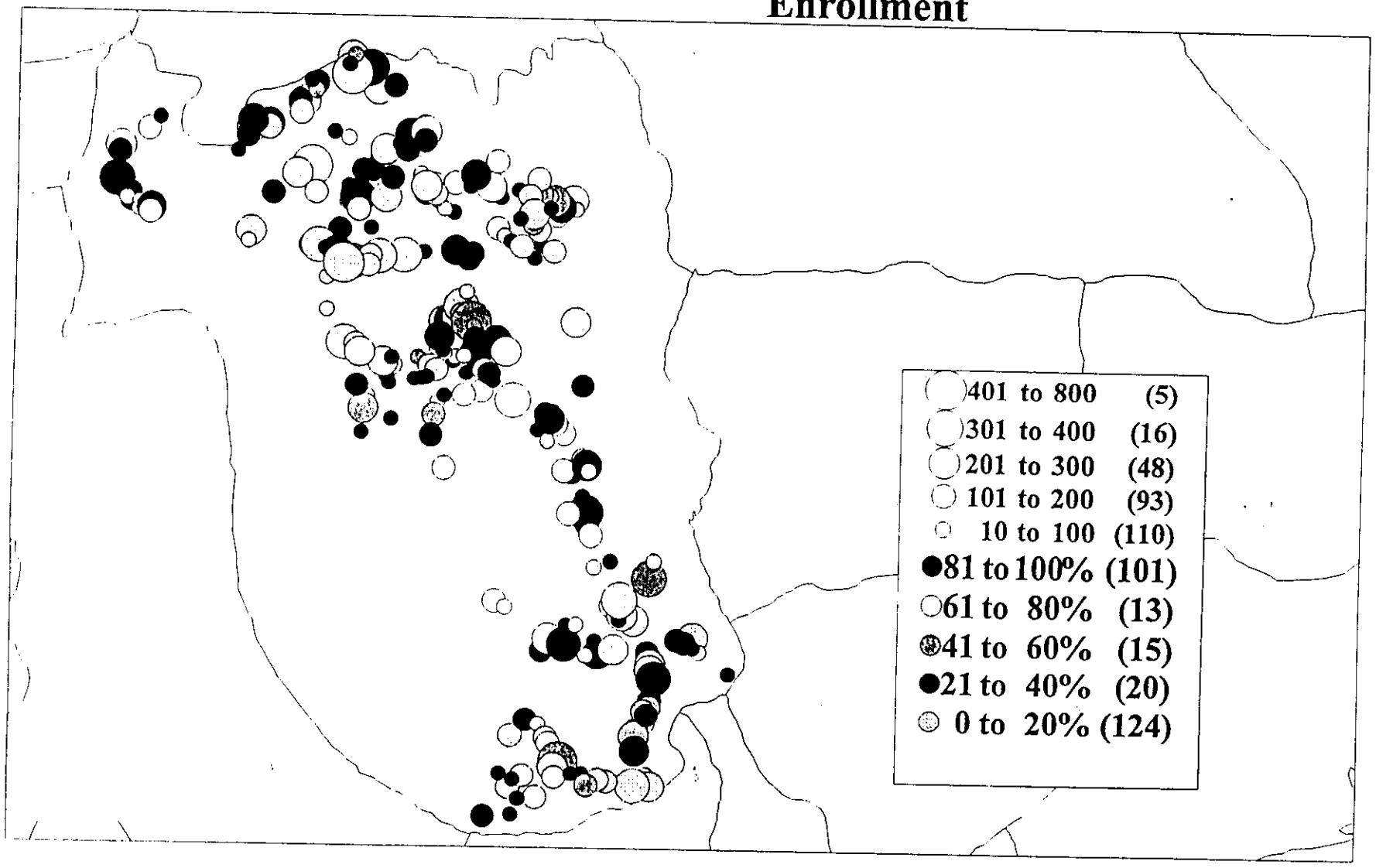
Percentage of Classrooms Needing Major Repairs in Assin-Foso Schools



Source: MOE, EMIS Project

Ministry of Education

Assin-Foso District Schools by Percentage of Classrooms Needing Major Repairs and Enrollment



Source: MOE, EMIS Project

Elements of More Successful EMIS Interventions

- Demand for better data and information.
- Clearly perceived utility.
- Clearly defined, realistic expectations.
- Sustained high-level support.
- Adequate capacity (Tech-Pers-Org-Instit)
- Broad-based involvement in system design and development.

Elements of More Successful EMIS Interventions

- Balanced emphasis on organizational-institutional and technical issues.
- Open, flexible system design.
- Outputs in easily understood formats.
- More relevant, reliable, and timely data and information than before.

Strategies to Support EMIS Development

- A series of broad-reaching assessments
  - Data needs
  - Organizational structures and processes
  - Organizational strengths and constraints
- Focus on "demands"
- On-going, broad-based outreach
- Face-to-face encounters
- Follow-up and feedback

Strategies to Support EMIS Development

- Intensive emphasis on knowledge and skill development
- Identify resistance and use it as a guide.
- Co-opt potential opposition early.
- Negotiate alliances and cooperative agreements.
- Negotiate "contracts for change."
- Manage stratgically, not technically.

Capacity-building

- Education and training
  - Knowledge and skills across all functional areas and at all levels
  - Infrastructure, computers and technical systems
- Organizational issues
  - Sustained managerial support (Epiphany)
  - Adequate staffing
  - Paradigm / Culture
  - Effective structures: authority and responsibilities clearly defined

Capacity-building

- Organizational issues (continued)
  - Effective systems: personnel, budgeting, evaluation, etc.
  - Effective processes (work tasks and task webs)
  - *Organization Culture*
- Institutional issues
  - Effective legal/governance frameworks
  - Effective regulatory frameworks
  - Effective mission
  - Adequate terms of service
  - Adequate funding

Capacity-building

- Institutional issues
  - Effective relationships with other relevant ministries, agencies, etc.
  - Effective standing in the broader social-political-economic environment.
  - Effective use of available resources in the broader environment.

A Framework for Organizing Information System Interventions

Recap

- Great expectations of technology.
- Tremendous amount of resources to EMIS
- MIS history that can not be ignored.
- High number of failures.
- Overemphasis on technical issues.
- Dominance of technicians in MIS design and development.
- MIS as fundamentally an organizational-institutional development intervention.

Recap

- Importance of understanding the sector to be served by the MIS.
- Importance of understanding the organizational-institutional setting/context:
  - Complex, multi-layered
  - Layered, multiple users and decision points
  - Dynamic, loosely-coupled
  - Homeostatic, self-equilibrating (inertia)
  - Intensely political
  - Under-funded, under-resourced

Recap

- 4-7-10 years required to institutionalize EMIS.
- Importance of institutionalizing change as a living process.
- One size rarely fits all variants.
- Initially computerization tends to complicate rather than simplify and to increase rather decrease anxiety.

Recap

- Data base applications can be quite useful and not terribly difficult to use.
- They are, however, culturally loaded in some significant ways:
  - belief in the utility of information
  - an understanding of information as a political commodity
  - an understanding of set theory
  - the ability to think systemically
  - limited formats and layouts provided

Recap

- Capacity-building requirements, defined as education and training, are significant and essential.

Annex 2 – An Outline of a Proposed EMIS Master Workplan

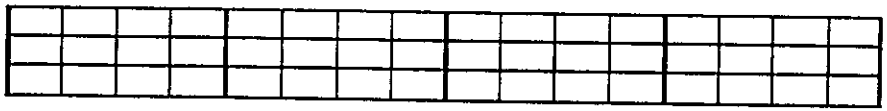
EMIS Project
Outline of a Proposed Master Workplan

START UP
- Agreement on overall EMIS objectives w/MOE & CERD Sr. Mgt.
- Agreement on initial activities
- Assignment of CERD staff
- Assignment of MOE staff
- Organizational-Institutional Assessments
  - First identification of stakeholders (MOE, CERD, Regions, others)
  - Negotiation of involvement of initial EMIS players (MOE, CERD, Regions)
  - Negotiate alliances and cooperative agreements & understandings
- First, broad assessment of data and information needs
- Definition of technical assistance required
- TA Mobilization
- Initial orientation and professional development activities for the EMIS Core Team
  - EMIS concepts
  - Elements of successful EMIS interventions
  - Recent thinking on organizational development
- Development of a plan for development of a Master Plan (MP)
  - Principles governing EMIS development
  - Detailed project plan
  - Workbreakdown structure
- Second identification of stakeholder analysis (in light of the MP)
- Negotiation of involvement of critical stakeholders
  - Negotiate alliances and cooperative agreements & understandings
- Orientation and professional development for the extended EMIS Team
  - EMIS concepts
  - Elements of successful EMIS interventions
  - Recent thinking on organizational development
  - Training:powerpoint, spreadsheets, proj. planning, and diagrammatic software.
- Study Tour for selected members of the EMIS management team

FOUNDATION BUILDING
- Definition of EMIS project communication strategy (keeping everyone informed)
- Inventory of data and information needs and demands (Relevance).
  - Identification of national education goals and objectives
  - Identification of the functional needs of selected MOE divisions.
  - Identification of the functional needs of selected CERD divisions.
  - Identification of the funcitional needs of regional offices.
  - Identification of the functional reeds of school directors.
- Training in the development of educational indicators.
- Review of annual education system business cylcles (Timeliness)
  - Budget & decision-making
  - Planning

YEAR 1				YEAR 2				YEAR 3				YEAR 4			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

Schooling
Training in organizational analysis
Training in the use of diagrammatic software



- Analysis of existing data sources and flows
  - To/from schools
  - To/from regional offices
  - To/from MOE divisions
  - Within CERD
  - To/from other relevant govt ministries and agencies
- Recommendations for strengthening data flows
  - To/from schools
  - To/from regional offices
  - To/from MOE divisions
  - Within CERD
  - To/from other relevant govt ministries and agencies
- Review of informatica and the Research Divisions in NCERD
  - Review of the distibution of functions and tasks
- Recommendations for redistribution of responsibilities and tasks in CERD, if any.
- Recommendations for the establishment of new services
  - Establishment of a technical support unit in NCERD
    - To assist with development of administrative & other applications
    - To provide hardware support for regional offices
      - Telephone support
      - Field visits
    - To provide software and application support for regional offices
      - Telephone support
      - Field visits

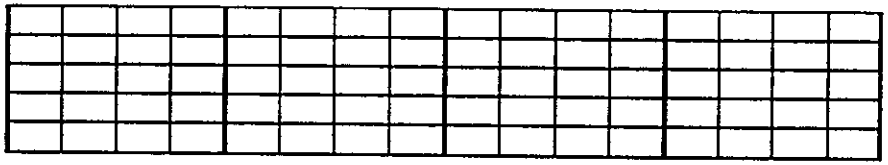
- Develop capacity for institutionalizing professional development and training
  - Develop standards for all professional development and training activities
  - Coordination for development of training programs
  - Logistical support
  - Identification & negotiation with external training providers
  - Training program for trainers (coordinated with actual training programs)
    - Identify trainers
    - Development training materials

STRENGTHEN THE EXISTING ANNUAL SCHOOL CENSUS (Pilot Project)

- School-based Data Collections
  - Review and assessment of existing data collection questionnaires
    - Against identified data and information needs
    - In terms of ease of use
    - In terms of facilitation of data enty
  - Redesign of existing questionnaires
  - Development of strategy and process for data collection
  - Field testing of the strategy and process for data collection
  - Field testing of redesigned questionnaires in a cross-section of schools
    - Training for directors of test schools in use of the questionnaire

YEAR 1				YEAR 2				YEAR 3				YEAR 4			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

Develop training program and materials
Use of the questionnaire by school directors in test schools
Modification of the new questionnaire, in light of field tests
Modification of the stratgey and process for data collection
Second field test of questionnaire and collection process



Application Development
- Training in EMIS design and development
  - Elements of successful EMIS
  - Experience from other countries
- Training in use of selected application development tool
- Design and develop prototype EMIS application, using new questionnaire
  - Data entry module
  - Initial data verification and validation module
  - Report generator module
    - To meet selected regional office needs
    - To meet selected school director needs
    - To meet selected MOE needs
    - To meet selected CERD needs
- Define procedures for merging data from regions
- Define procedures for maintaining and backing up data.

Strengthen Data Entry (reduce time required)
- Develop strategy and negotiate agreements for data entry at regional level
  - Training for regional staff in use
    - Understanding the entire data collection process
    - Understanding and completion of the school questionnaire
    - Basic computer literacy
    - Use of the EMIS application for data entry
- Field test data entry at the regional level, using forms from sample schools.

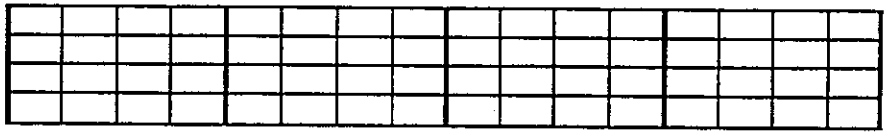
Full Pilot test of the new questionnaire, collection and data entry processes.
- Training for all school directors
  - Understanding the entire EMIS project
  - Understanding and completion of the school questionnaire
- Training for regional staff
  - Understanding the entire data collection process
  - Understanding and completion of the school questionnaire
  - Basic computer literacy
  - Use of the EMIS application for data entry
  - Verification and validation procedures
  - Use of spreadsheets
- Data collection
- Initial verification and validation
- Data entry in by regional staff
- Merging of data from pilot regions at NCERD
- Review of all aspects of the pilot test (Lessons learned)
  - Recommendations for changing data collections
  - Recommendations for revision in questionnaires
  - Recommendations for revision in verification and validation procedures
  - Recommendations for revision in training programs.

YEAR 1				YEAR 2				YEAR 3				YEAR 4			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

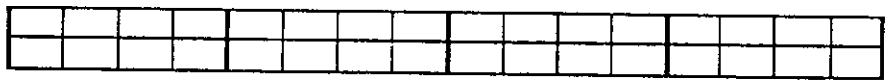
IMPLEMENTATION OF THE NEW SCHOOL CENSUS SYSTEM IN ALL REGIONS

Training for all school directors

Understanding the entire EMIS project



Negotiate provisions for consumables and maintenance

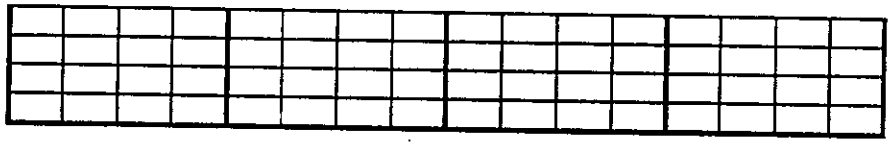


INTEGRATE DATA FROM OTHER SOURCES (See diagram on primary sources)
- Identification of sources of relevant data
- Inventory of data available from other sources
- Negotiation of cooperative agreements and alliances for data collection and use
- Development of data collection forms as required
- Development of data collection and gathering procedures as required
- Standardization of coding schemes across MOE, CERD, and regional offices

DATA UTILIZATION
- Production of annual statistical reports
  - Design of report formats and layouts
  - Definition and development of educational indicators
  - Training in the definition and development of educational indicators
  - Training in use of selected database software
  - Training in the use of statistical analysis software
- Development of GIS for thematic mapping
  - Training in spatial analysis techniques and use in education
  - Digitize or scan base maps
  - Integrate with school statistics, exam data, etc.
  - Produce initial GIS thematic maps
- Strengthen Capacity for Educational Planning
  - Identification of priority planning needs
    - School facilities
    - Equipment
    - Teacher training
  - Training in methods and techniques of planning
    - Population and enrollment projection
    - Development of efficiency indicators
    - Development of planning and resource allocation models
  - Training in systems dynamics modeling
  - Training in the use of database software
  - Training in the use of spreadsheet software
  - Training in the use of statistical analysis software
  - Training in the use of "business" diagraming software
- Strengthen Capacity for Policy Analysis and Research in Education
  - Training in methods and techniques of policy analysis and research
    - Definition and development of educational indicators
    - Quantitative methods
      - Policy analysis techniques and methods
      - Survey design
    - Qualitative methods
  - Selection of priority topics for development of policy briefs

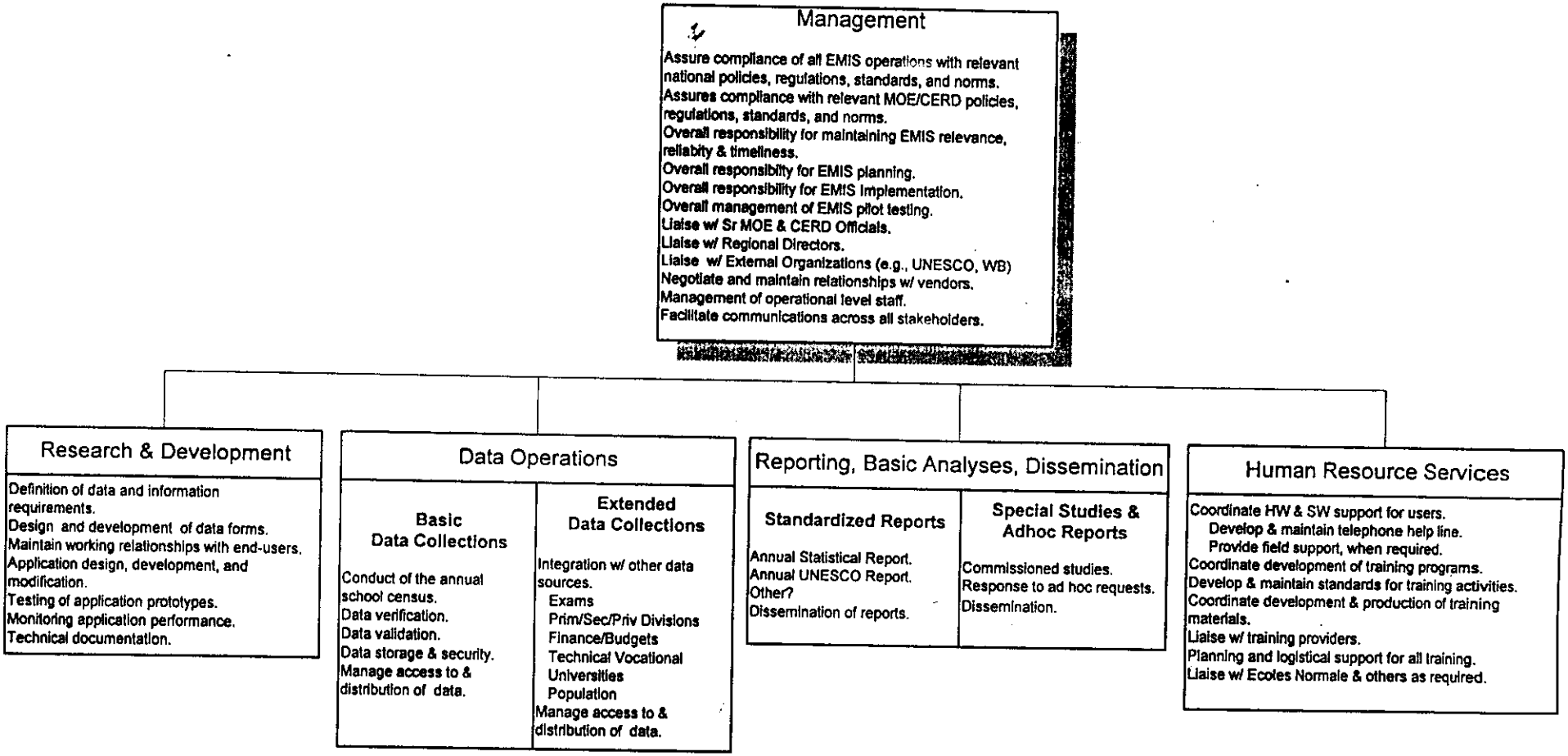
YEAR 1				YEAR 2				YEAR 3				YEAR 4			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

Development of policy briefs
Training in the use of database software
Training in the use of spreadshee software
Training in the use of statistical analysis software



Annex 3 – Distribution and Relationship of EMIS Functional Tasks

Proposed Distribution of EMIS Functional Tasks



Annex 4 – Outline of Proposed Professional Development and Training Activities

OUTLINE OF PROPOSED PROFESSIONAL DEVELOPMENT AND TRAINING ACTIVITIES

Professional Development Seminars/Workshops		Target Group	Each Sem/wrkshp # Part	Each Sem/wrkshp Duration	YEAR 1 Q1	YEAR 1 Q2	YEAR 1 Q3	YEAR 1 Q4	YEAR 2 Q1	YEAR 2 Q2	YEAR 2 Q3	YEAR 2 Q4	YEAR 3 Q1	YEAR 3 Q2	YEAR 3 Q3	YEAR 3 Q4
1 Start up and Foundation Building - organizing for EMIS development																
Seminar	EMIS Concepts Elements of Successful EMIS Issues in Organizational Development and Change	MOE, CERD, Sr. Staff		1 day												
Seminar	EMIS Concepts Elements of Successful EMIS Issues in Organizational Development and Change	EMIS Core Team Pilot Regional Office Directors		3 days												
Study Tours	Counterpart EMIS operations in selected other countries	CERD & MOE Sr. Staff EMIS Core Sr. Staff		10 days												
Seminar	Definition and development of indicators	EMIS Core Team Pilot Regional Office Directors		3 days												
Workshops	Powerpoint Presentation Software	EMIS Core & Support Staff		2 days												
	Visio or other Diagramatic Software Tool	EMIS Core & Support Staff		3 days												
	Intro to Excel Spreadsheet Software	EMIS Core & Support Staff		3 days												
	Intermed Excel Software	EMIS Core & Support Staff		3 days												
	Intro to Acess Database Software	EMIS Core & Support Staff		5 days												
	IntermedAccess Software	EMIS Core & Support Staff		5 days												
	Advanced Access Software	EMIS Core & Support Staff		5 days												
2 Strengthening Existing Annual School Census (Pilot Project)																
Seminars	Issues in Questionnaire Design			1day												
Seminars	Issues in Data Validation and Verification	EMIS Team & Support Staff Pilot Regions Staff														
Seminars	EMIS Concepts Use of Census Questionnaires Issues in Data Validation and Verification	School Directors		1 day												
Workshops	EMIS Application Design and Development	EMIS Applications Team(s)		5 days												

Professional Development Seminars/Workshops		Target Group	Each Sem/wrkshp # Part.	Each Sem/wrkshp Duration	YEAR 1				YEAR 2				YEAR 3			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Workshops	Use of the New Census Application	Pilot Regions Staff		1 day												
	Use of the New Census Application	EMIS Data Entry Staff		.5 day												
	Powerpoint Presentation Software	Pilot Regions Staff		2 days												
	Word Wordprocessing Software	Pilot Regions Staff		2 days												
	Visio or other Diagramatic Software Tool	Pilot Regions Staff		3 days												
	Intro to Excel Spreadsheet Software	Pilot Regions Staff		3 days												
	Intermed Excel Software	Pilot Regions Staff		3 days												
	Intro to Acess Database Software	Pilot Regions Staff		5 days												
	IntermedAccess Software	Pilot Regions Staff		5 days												
3 Implementation of Revised School Census in All Regions																
Seminars	EMIS Concepts	School Directors		1 day												
	Use of Census Questionnaires															
	Issues in Data Validation and Verification															
Workshops	Use of the New Census Application	Pilot Regions Staff		1 day												
	Powerpoint Presentation Software	Pilot Regions Staff		2 days												
	Word Wordprocessing Software	Pilot Regions Staff		2 days												
	Visio or other Diagramatic Software Tool	Pilot Regions Staff		3 days												
	Intro to Excel Spreadsheet Software	Pilot Regions Staff		3 days												
	Intermed Excel Software	Pilot Regions Staff		3 days												
	Intro to Acess Database Software	Pilot Regions Staff		5 days												
	IntermedAccess Software	Pilot Regions Staff		5 days												
4 Integration of Data from Other Source																
Seminar	EMIS Concepts	Selected Div. & Unit Directors in MOE & CERD		1 day												
	Elements of Successful EMIS															
	Issues in Organizational Development and Change															
	Data Integration Issues															
Workshops	Use of the New Census Application	Selected Div. & Unit Staff in MOE & CERD		1 day												
5 Data Utilization – Strengthening Use and Serving and Sustaining Demand																
Seminars	EMIS Concepts	Selected Div. & Unit Directors in MOE & CERD		1 day												
	Elements of Successful EMIS															
	Issues in Organizational Development and Change															
Workshops	Use of the New Census Application	Selected Div. & Unit Staff in MOE & CERD		1 day												

Professional Development Seminars/Workshops		Target Group	Each Sem/wrkshp # Part.	Duration	YEAR 1				YEAR 2				YEAR 3			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Seminars	Definition and development of indicators	Selected Div. & Unit Staff in MOE & CERD Appropriate Regional Office Staff		3 days												
Seminars	Models and Methods for Educational Planning Systems Dynamic Models Resource Allocation Modeling	Selected Div. & Unit Staff in MOE & CERD Appropriate Regional Office Staff		15 days												
Seminar	Spatial Anlysis Using Geographic Information Systems GIS use for Thematic Mapping	Selected Div. & Unit Staff in MOE & CERD Appropriate Regional Office Staff		5 days												
Seminars	Models and Methods for Policy Analysis and Research Program Monitoring and Evaluation	Selected Div. & Unit Staff in MOE & CERD Appropriate Regional Office Staff		15 days												
Workshops	Use of the New Census Application	Selected Div. & Unit Staff in MOE & CERD Appropriate Regional Office Staff		1 day												
	Powerpoint Presentation Software			2 days												
	Word Wordprocessing Software			2 days												
	Visio or other Diagramatic Software Tool			3 days												
	Intro to Excel Spreadsheet Software			3 days												
	Intermed Excel Software			3 days												
	Intro to SPSS Statistical Analysis software			5 days												
	Intermed/advanced SPSS			5 days												
	Intro to Acess Database Software			5 days												
	IntermedAccess Software			5 days												

Annex 5 – Knowledge and Skills Required to Support EMIS Development and Utilization: A Guide for Development of EMIS-Related Training Programs in Lebanon

KNOWLEDGE AND SKILLS REQUIRED TO SUPPORT EMIS DEVELOPMENT & UTILIZATION: A GUIDE FOR DEVELOPMENT OF EMIS-RELATED TRAINING PROGRAMS IN LEBANON

	Operational Needs	Knowledge Required	Skills Required	MOE	CERD	REG	SCHL
	Management of EMIS activities. (Includes the person responsible for overall management of EMIS and also other members of the management team from the MOE, NCERD, and regional offices.)	Broad understanding of organizational development and current thinking on the elements of successful and sustainable organizational interventions. Broad understanding of EMIS concepts & issues. Detailed knowledge of how the education bureaucracy works. Detailed knowledge of current educational initiatives and familiarity National Education Plan documents. Knowledge of data & information requirements of selected divisions in the Ministry, the NCERD, and in the regional offices and schools. (Relevance) Detailed current knowledge of MOE annual 'business' cycles (e.g., decision-making, budgeting, planning, etc.) in the MOE, NCERD, the regional offices and schools. (Timeliness) Knowledge of evolving GOL policies, laws, regulations, & procedures and their implications for changing data and information requirements and/or operational procedures. Knowledge of protocols for working with other GOL ministries and agencies. Knowledge of current Govt. and MOE budgeting systems and conventions. Knowledge of Govt., MOE, and NCERD protocols, regulations, and norms for working with private sector firms. Knowledge of the documentation required to institutionalize EMIS procedures. Familiarity with technical (HW & SW) issues and conversant on technical matters. Broad understanding of the threats to the quality of data in complex information systems.	Leadership and the ability to manage a range of professional staff (educators and technicians) in a moderately complex, multi-dimensional development project. Interpersonal – communication skills. Ability to work with groups of diverse stakeholders, educators, and technical staff across divisions and levels of the education system. Ability to mobilize and negotiate the support and cooperation of stakeholders, educators, and technical staff. Stakeholder analysis. Outreach/presentation/marketing skills. Organizational & institutional assessment skills. Ability to develop clear workplans and schedules. Ability to develop & manage project budgets. Understanding of the utility of database, spreadsheet, and GIS software to support educational decision-making, management, administration, planning, and analysis. Business cycle assessment. The ability to development visual models of structural and process components of the EMIS implementation plan. Use of word processing software. Use of spreadsheet software. Use of "business" diagramming software. [Use of project planning software.]				
	Monitoring & Assessment of EMIS Activities	Broad & detailed knowledge of EMIS objectives, plans, and current operations. Knowledge of data & information requirements of selected divisions in the Ministry, the NCERD, and in the regional offices and schools. (Relevance) Knowledge of the relevant 'business' cycles. Evaluation methods & techniques.	Qualitative and quantitative methods. Survey design. Survey-based data collection. Interviewing skills. Statistical analysis skills. Use of a statistical analysis software package. Outreach/presentation/marketing skills.				

	Operational Needs	Knowledge Required	Skills Required	MOE	CERD	REG	SCHL
	Definition of data & information needs.	Detailed knowledge of current educational initiatives and familiarity with the National Education Plan and other relevant national reconstruction documents. Knowledge of evolving GOL policies, laws, regulations, & procedures and their implications for changing data and information requirements and/or operational procedures. Knowledge of data & information requirements of selected divisions in the Ministry, the NCERD, and in the regional offices and schools. (Relevance) Knowledge of the goals & objectives of education systems. Broad understanding of the needs of policy analysts, planners, & managers. Understanding of changing social, economic, & political environment in Lebanon. Knowledge of internationally accepted standards, methods, and procedures for assessing effectiveness, efficiency, quality, and equity in educational systems.	Ability to work with groups of diverse stakeholders, educators, and technical staff. Skilled interviewer. Survey design and analysis. Interpersonal skills. Presentation/marketing skills. Use of word-processing software. Use of spreadsheet software. Use of "business"diagramming software. Familiarity with database concepts and structures.				
	Design of data collection questionnaires. (Including the standard annual statistical questionnaire and other questionnaires as required.)	Detailed knowledge of data & information requirements of selected divisions in the Ministry, the NCERD, and in the regional offices and schools. Knowledge of the "reporting" needs of users at the central, regional, and school levels. Knowledge of current data management forms and procedures in schools, e.g., school registers.	Ability to work with groups of diverse stakeholders, educators, and technical staff. Ability to design questionnaires that can be easily understand and used by non-technical staff. Ability to write clear and detailed user guides for those who will complete the questionnaires. Use of word-processing software. Use of spreadsheet software. Familiarity with database concepts and structures.				
	Design of a process for data collection from schools.	Detailed knowledge of the education system and how it "really" works. Knowledge of standard verification and validation procedures. Broad understanding of the threats to the quality of data in complex information systems.	Ability to work with groups of diverse stakeholders, educators, and technical staff across divisions and levels. Ability to negotiate broad-based participation in the process. Ability to develop data entry and error logs that can be easily understand and used by non-technical staff. Writing skills sufficient to document all activities and procedures. The ability to "model" the proposed processes. Use of word-processing software. Use of spreadsheet software. Use of "business" diagramming software.				

	Operational Needs	Knowledge Required	Skills Required	MOE	CERD	REG	SCHL
	EMIS application development. (This includes modules for data entry, importing data, automated verification and validation routines, and the production of standard reports.) (Develop of specific-purpose	Detailed knowledge of the structure and contents of questionnaires & information requirements of selected divisions in the Ministry, the NCERD, and in the regional offices and schools. Knowledge of the "reporting" needs of users at the central, regional, and school levels. Knowledge Familiarity with standard sequential and logical verification and validation procedures. Knowledge of relevant "context" validations required. Relational database concepts and methods.	Ability to work with groups of diverse stakeholders, educators, and technical staff across divisions and levels. Ability to write and maintain required technical documentation. Ability to write clear and detailed user guides for those who will use the application. Advanced knowledge of the selected relational database package.				
	Support for application users.	Detailed knowledge of the structure and operation of the application.	Communication - training skills				
	Dissemination, gathering, and monitoring of data questionnaires.	Broad knowledge of the EMIS goals and objectives and the development and implementation process. Working knowledge of the data collection forms. Accurate knowledge of the meanings of all variables.	Communication - training skills. Outreach/presentation/marketing skills. Record-keeping skills.				
	Data entry on the forms.	Working knowledge of the data collection forms. Accurate knowledge of the meanings of all variables. Acceto the available data.	Ability to attend to details.				
	Data entry on computers.	Basic computer literacy. How to save and backup data.	Data entry using computer-based applications. Typing.				
	Data verification & validation.	Broad understanding of the threats to the quality of data in complex information systems. Methods of sequential, logical, and contextual data validation techniques.	Ability to run program validation procedures that have been built into the application. Ability to "program/create" additional validations when suggested. Use of database software.				
	Integration of data from independent ministry databases.	Data & information sources in MOE. Understanding of technical issues involved.	Use of database software. Programming.				

	Operational Needs	Knowledge Required	Skills Required	MOE	CERD	REG	SCHL
	Installation and the basic care & maintenance of PCs.	Basic computer hardware literacy.	Able to identify causes of common hardware problems. Able to solve common problems.				
	Installation and maintenance of Local Area Networks.	Knowledge of LAN systems architecture. Knowledge of LAN hardware components.	Able to install LAN cable. Able to install LAN software. Able to identify and solve common hardware problems.				
	Management of LANs.	Knowledge of LAN systems architecture. Knowledge of LAN hardware & software components and resources.	Able to use LAN management software. Able to identify causes of common LAN HW & SW problems.				
	Use of database applications.	Basic computer literacy.	Use of EMIS special applications. e.g., the annual school census.				

	Operational Needs	Knowledge Required	Skills Required	MOE	CERD	REG	SCHL
	Computer-based report generation.	Data presentation techniques.	Use of application report generator(s). Use of database report generator. Use of word-processing software. Use of spreadsheet software.				
	Development of geographic information system (GIS).	The utility of GIS for supporting analysis, planning, & management in education. Detailed knowledge of data base structures, data elements, and data structures.	The use of GIS software for digitizing base maps. Importing and merging data across databases and applications.				
	Development of executive information system (EIS).	Detailed knowledge of the needs of senior education officials. Detailed knowledge of data base structures, data elements, and data structures.	Interpersonal skills - specifically, ability to work with senior managers. Application development using selected database software. Importing and merging data across databases and applications.				
	Development of early learning/early warning system.	Detailed knowledge of education goals & objectives, emerging program and policy initiatives & priorities. Detailed knowledge of data base structures, data elements, and data structures.	Application development using selected database software. Importing and merging data across dataases and applications.				
	Managing and monitoring training activities.	Detailed knowledge of GOL, MOE, NCERD training & HRD regulations and procedures. Detailed understanding of EMIS goals, objectives, and activities. Models and methods of effective training. Knowledge of effective training materials. Program evaluation methods and techniques.	Leadership. HRD skills. Interpersonal communications: writing & public speaking. Writing of statistical reports. Planning and scheduling. Management. Conducting program evaluation.				
	Training trainers. Detailed knowledge of all aspects of EMIS development activities	Models & methods of effective training. Development of effective training materials.	Teaching ability. Use of relevant database software & applications. Use of presentation software. Use of destop publishing software for training materials production. Public speaking.				

	Operational Needs	Knowledge Required	Skills Required	MOE	CERD	REG	SCHL
	Conducting training.	Models & methods of effective training.	Teaching ability. Self-assessment skills.				
	Installation and maintenance of computer training laboratory.	Knowledge of the proposed EMIS system architecture. Knowledge of data collections and trasfer procedures. LAN systems architecture, software, and management.	Use of LAN management. Able to troubleshoot & correct common software & hardware problems.				
	Policy analysis using EMIS data.	Detailed knowledge of data base structures, data elements, and data structures. Models & methods statistical analysis Developing & using educational indicators. Techniques and models for data presentation & communication. Techniques for making effective public presentations.	Use of statistical analysis software. Use of word-processing software. Use of presentation software Use of GIS software for analysis and presentation of data.				
	Planning using EMIS data.	Detailed knowledge of data base structures, data elements, and data structures. Enrollment projection & forecasting models & methods. School mapping techniques. Design of resource allocation models.	Use of database applications. Use of spreadsheet software. Use of statistical analysis software. Use of word-processing software. Use of presentation software Use of GIS software.				
	Administration & management using EMIS data.	Detailed knowledge of data base structures, data elements, and data structures. Detailed knowledge of GOL reporting systems and procedures.	Use of database applications. Use of spreadsheet applications. Use of statistical analysis software. Use of word-processing software.				

Annex 6– Outline of a Presentation to Staff of NCERD, the WB, and UNESCO

الجمهورية اللبنانية
مكتب وزير الدولة لشؤون التنمية الإدارية
مركز مشاريع ودراسات القطاع العام

Annex 7 – EMIS Indicators for Monitoring Development of Basic and Secondary Education in Jordan

Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)