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NATIONAL URBAN POLICY STUDY INFORMATION SYSTEM: SYSTEM MANUAL AND GENERAL GUIDELINES FOR INTEGRATION INTO BROADER INFORMATION SYSTEMS

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NATIONAL URBAN POLICY STUDY INFORMATION SYSTEM

This report is intended to fulfil the requirements of Task 1.8 of the Scope of Work for the National Urban Policy Study (NUPS). It is organized into four Sections and three Appendices :

Section 1 - How the report meets the requirements of the Scope of Work.

Section 2 - The NUPS information system.

Section 3 - The Ministry of Development information system.

Section 4 - An information system for the broader urban planning environment.

Appendix A - NUPS information system manual, including classification scheme and geographic codes.

Appendix B - Lists of the NUPS Data Bank: author list of library holdings, map list, and list of NUPS reports.

Appendix C - Guidelines for information system (I/S) design.

1. NUPS SCOPE OF WORK

The Scope of Work for NUPS requires that the consultant "will establish and maintain data information files. The consultant shall utilize these files during the project in such a manner as to facilitate the turning over of the files intact at the completion of the study to an appropriate Egyptian agency or institution to be selected."

The Project has of course developed and maintained files necessary to support its operations. The NUPS system is described in Section 2 of this report. The system provides for three major files: an administrative file, a file of NUPS reports, and a library. The administrative materials will largely be retained by the consultant, and Project reports are widely disseminated according to the terms of the consultant's contract. The library will be turned over to an agency of the Government of Egypt.

1.1. Agencies Suitable to Receive NUPS Data Files

The state of development of information systems among planning agencies makes the decision to turn over the library materials a difficult one. What is wanted is a single place for researchers to go for urban planning information, and that this place can be expected to function for a number of years. Further, the information should be accessible and retrievable in a reasonable amount of time. These goals are developed from the effectiveness and efficiency criteria discussed in Appendix C.

The Ministry of Development (throughout this paper referring to the overall Ministry, including its development, housing, new community and land reclamation functions) is the organization with a broad urban planning mission and meets the test of a single place nicely. However, its own system is at present very disorganized. It is scattered among a number of subordinate organizations, including an "Information Center", a library, and library units supporting various subordinate agencies in the Ministry, including the General Organization for Physical Planning and the Advisory Committee for Reconstruction. Of particular importance are the Information Center and the Library. The Information Center is organized around a computer link to CAPMAS, and the Library has 100,000 to 200,000 volumes. Although plans are underway to organize these materials, they are at present irretrievable. The link to CAPMAS does not provide any information to Ministry users yet. As a result, the system fails the test of retrievability.

The Development and Technological Planning Research Center, a Massachusetts Institute of Technology-supported project at Cairo University, has a library that meets access and retrievability tests, but it is only a project. It does not have the likelihood of prolonged, stable funding necessary to maintain the large operation needed to approach the single place criterion. It cetainly does not have the breadth or depth of scope that the Ministry of Development has.

Additional institutional homes for the NUPS materials could include other consulting groups, subordinate units within the Ministry (GOPP or ACR), or the Institute of Regional Planning. Each is unsatisfactory. Consulting group projects are not accessible to all users and cannot support a broad-based system. GOPP and ACR have narrower missions and small information activities. The Institute of Regional Planning is not very accessible, has a narrower mission, and its materials are not particularly retrievable. Cairo University is a possibility, but it has constrained access, and there is inadequate retrievability for researchers in a field such as urban planning.

There is no reason to make an immediate decision. The Ministry of Development is presently working to organize its

library. In addition, there is a United Nations Development Programme (UNDP) consultant report that proposes an Office of Information Systems in the Ministry (See details, Section 3). Because the Ministry is most attractive if its library is adequately functioning, the best course of action would be to assess the viability of the Ministry's library at the time of transferring the material. If the system is viable, the materials should be transferred to the Ministry. If the system is not yet viable but it appears likely that it soon will be, the materials could be transferred to ACR or TAMS (the consulting group retained by the Ministry to assist with selecting firms and monitoring studies), on an interim basis.

The Ministry library would be a suitable location if:

1. It is open to in-library use by bona fide researchers;

2. Retrieval of approximately 80% of reports issued in the last five years is possible;

3. Retrieval by author or correct title is possible within 10 minutes 90% of the time; and

4. Retrieval by subject is possible within 30 minutes 75% of the time.

These guidelines are rough measures and it is not expected that anyone would conduct extensive tests. An intuitive assessment based on the above guidelines is likely to be satisfactory. These guidelines are not ideal standards, but minimal conditions. Overall the following goals and criteria should be used in evaluating potential locations for the NUPS Data Bank:

<u>NUPS Goals and Criteria in Transferring its Data Bank</u>

The Overall Objective -- To provide access to its urban planning materials to subsequent users at a minimum cost.

The Criteria

-- To the extent possible, a single location for the broad range of data and information required for urban planning.

-- A location accessible to researchers (In or near Garden City and entry not constrained).

-- Adequate retrieval (system sufficiently organized that materials are available at a time cost which researchers can and will pay).

Using these criteria the following assessment of six potential recipients of the data files was made:

EXISTING INFORMATION ACTIVITIES AS POSSIBLE LOCATIONS: HOW THEY CURRENTLY MEET THE CRITERIA

ORGANIZATION	CRITERION 1 Single Location	CRITERION 2 Accessible	CRITERION 3 Adequate Retrieval
Ministry of Development	Good	Good	Fails
GOPP	Medium	Good	Poor
ACR	Poor	Good	Medium
Institute of Regional Planning	Medium	Poor	Medium
Development & Planning Technology Center	Medium	Good	Good
Consulting Groups	Fail	Poor	Medium

1.2. Maintaining, Enhancing and Managing the NUPS Data Base

In addition to addressing the question of which agency is to receive the materials, the Scope of Work requires that the consultant "prepare, prior to completing the study, guidelines for:

a) maintaining
b) enhancing
c) managing the data base..."

Section 2 and Appendices A and B fulfil the requirements of (a) and (c) above. However, NUPS intends that the system be integrated into a larger data base, not that it stand alone. Therefore, some emphasis has been placed on (b) above. Considerable enhancement is needed, primarily because significant and important data are not yet in the system. The data base (from this point the report uses the more precise term "Data Bank") is expected to grow substantially over time. It is quite likely that any recipient agency will have other information requirements than those of the NUPS project. Therefore, considerable enhancement of the NUPS data base may

be necessary to (1) meet the broader information needs of the recipient agency and (2) integrate the NUPS data base into its information system. The NUPS Data Bank is not intended to serve as an information system, rather once such a system is established it is hoped that the NUPS data base can be integrated into it with a minimum of change. Therefore, NUPS recommendations are concerned with enhancement of the overall environment for urban planning information systems. Section 3 presents recommendations for the Ministry of Development system and Section 4 for a broader urban planning information systems network.

2. THE NUPS INFORMATION SYSTEM

The NUPS system has three basic files. The administrative file is intended to support the operational aspects of the Project and will be retained by the consultant. The second major file consists of reports of the Project and the materials assembled to make those reports. The output reports are widely distributed and it is not necessary to transfer additional sets. Subject matter materials in the files on which those reports were based either have been or will be placed in the library files.

The last major file is the subject matter materials in the library. It is these that will be turned over to the Government. This file is subdivided into three lesser files based on the format of the materials. Maps and large graphics are stored in the map drawers. Books and reports are kept on the library shelves. Most notes, small reports, newspaper clippings and such "flimsy" or "ephemeral" materials are kept in file cabinets.

Access to the maps is through a listing arranged by geographic coverage. This listing is to be reissued as needed, but at least quarterly. Access to the file cabinet material is by subject only. The materials are filed according to a code comprised of two components, the geographic code and the subject code. These codes are contained in the geographic code scheme and in the subject classification, respectively. (See Appendix A). The geographic code is hierarchical and goes down to the Governorate level. The subject code is hierarchical and permits up to three levels of specificity. The attached manual (Appendix A) contains instructions for coding, for system maintenance, and for filing in various system files. The manual also contains an explanation of why such a simple, informal system was selected and describes its limitations.

The NUPS system was developed to handle a small data bank of selected materials with a wide subject scope. It was to do so

with a simple system at a low resource cost. As a result, the system is not highly flexible. It will support up to about 5 to 6 thousand items with the present range of subjects and geographic breakdowns, but cannot handle a significantly larger Data Bank with the present classification and circulation system.

For this reason, in addition to the compelling "single location" criterion, NUPS intends that its library collection be integrated into a larger collection. If so, it would be accessed using a more general classification system, such as the Dewey Decimal or Library of Congress systems widely used in Egypt. Although changes in the NUPS Data Bank would be required to integrate it into a larger system, the classification system would facilitate its integration. However, the system has been designed so that it can stand alone if it is kept at 5 to 6 thousand items. In addition to the Manual in Appendix A, there are lists of library (but not file cabinet) holdings, map holdings, and NUPS reports included in Appendix B. These facilitate the use of the system as a stand-alone operation, as well as its integration into a larger system.

Access to materials on the library shelves is by subject, as with the file cabinet, but also by author and title. A card catalog with very basic bibliographic information provides author and title access. This catalog will be turned over to the Government agency with the library collection.

The material in the Data Bank should not be considered comprehensive. For a variety of reasons, some data were not available and others could only be borrowed. The emphasis has been on Egypt-wide data and on Egypt's major urban areas as well as proposed new towns. About three-fourths are in English, the remainder in Arabic. There are materials on general planning theories and methods, and on specific Egyptian applications. There is a very useful set of Egyptian laws in Arabic and in English which are relevant to urban planning.

Retrieval from the Data Bank is done by the user, assisted by the librarian. Materials are circulated using the very simple system indicated in the Manual. The circulation system will not support a larger collection or one in a more complex administrative environment. It assumes that users are within a few moments walk from the library, and it further assumes that users will not consciously steal materials. Once the NUPS data bank is integrated into a larger system, that system will have to tailor its circulation system to meet its specific needs.

The NUPS system does not build the materials acquisition function into the library unit. The professional and consulting staff acquire materials using their contacts and enter them into the library for general use. Materials produced by staff are also entered into the system as completed. The library subscribes to no journals, although scattered issues and photocopies of articles have been entered into the data.

There is virtually no processing or analysis done within the library. This is done by the professional and consulting staff. The NUPS information system, then, is a traditional document delivery system with an emphasis on bibliographic level retrieval. Some retrieval at the table level is provided by access to the file cabinet materials. Appendix C explains these terms in some detail.

3. THE MINISTRY OF DEVELOPMENT INFORMATION SYSTEM

NUPS is looking to the Ministry of Development as a location less because of what its information system is than because of what it can be. There is considerable interest within the Ministry in promoting improved information systems. The Ministry of Development is charged with the bulk of the planning responsibilities for urban development. A wide array of agencies at the national and sub-national level have implementing responsibilities and certain planning functions in narrower areas. However, the Ministry of Development is the single agency with the widest scope, especially if it exercises the full powers available under present legislation. It is big enough that if its information system were largely integrated into a single unit, that system could influence information development in other units having urban development planning responsibilities.

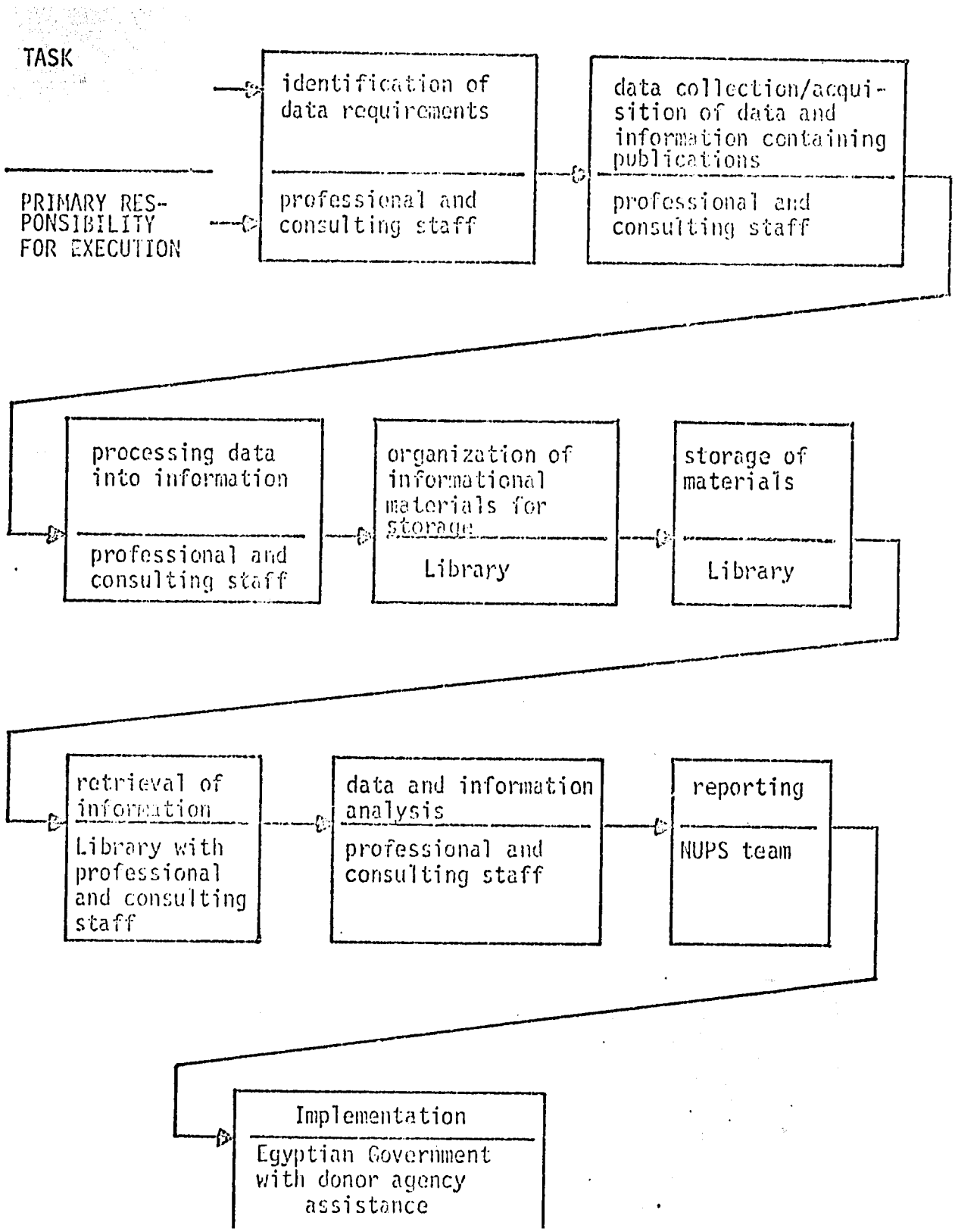
Some progress on information systems has been made in the Ministry of Development. Books and reports have been assembled in a large room and a library is being organized. There is an Information Center designed around a computer link to CAPMAS, Egypt's central statistical agency. The initial objective of this Center is to provide computer support to the Ministry, rather than to provide access to the CAPMAS data bank and particularly to its microdata.

However, there are significant problems still with the flow of information in the Ministry. The Information Center has been so labelled, but in fact it is being used (or will be) as a computing services center. In the case of the library, insufficient resources have been provided to get the library operating. At present, there are between 100 and 200 thousand books and reports stacked on floors and against walls of the library room. No service to users is yet available from the library or the computing center.

FIGURE 1.

NUPS INFORMATION SYSTEM

SYSTEM FLOW



3.1. Current Ministry Proposal

The Ministry is presently pressing for funding to implement the proposal of Dr. William Woods Cotterman of Georgia State University, made to the United Nations Development Program (UNDP).1/ The Cotterman proposal is a good point of departure for discussion of NUPS own recommendations. NUPS is concerned not only with what is recommended, but the basis for recommendations. Attention is directed to the discussion in Appendix A of a set of criteria for the selection of materials for a data bank and for information systems design. These criteria stress efficiency and five aspects of effectiveness.

It is outside the scope of NUPS or this report to make specific recommendations about systems in specific agencies. However, the Ministry of Development should be a key agency in any urban development information system and the information provided by Dr. Cotterman permits somewhat more detailed comments than would otherwise be possible. Even so, it should not be thought that either the Cotterman proposal or NUPS own recommendations are sufficiently specific that they could be implemented without further study and more specific systems design.

Dr. Cotterman's general task was to analyze earlier recommendations to Ministry agencies and to develop his own conclusions and recommendations. Specifically, he reviewed a 1978 report to the Advisory Committee for Reconstruction (ACR) by Sherrod Associates of Rockville, Md. and also a March 1981 review of the Ministry system by John David Livingstone of UNDP. The following are Dr. Cotterman's recommendations:

1. The Ministry should adopt a long-term strategy for the development of a Ministry Information System which will meet the needs of the Ministry of Development, the Ministry of Housing and the New Communities Organization.

2. Implement the following steps as part of the long-term strategy:

   a) Establish a document storage containing a complete set of documents and create a catalog of these documents. This is a continuation of the current activity.

   b) Establish microfilm and indexed document retrieval capability as recommended in the Sherrod Report. Utilize CAPMAS for the necessary computing capability.

   c) Establish an information storage and retrieval capability which includes information from inside the

Ministry, from other ministries and agencies. Efforts should be made to achieve this capability by participation in the National Scientific and Technical Information Project.

d) Develop a computer capability within the Ministry and begin development of operational information systems and management information systems.

e) Integrate all computer capabilities available to the Ministry into a network.

3. Establish training programs for the development of understanding and effective use of information systems by Ministry management and staff.

4. Add personnel to the Information Center staff as described in Section 4.0. [of Cotterman's report. See Figure 2A, p.9.b].

5. Change the name of the Information Center to the Office of Information Systems.

6. Select and retain an outside consulting firm to advise the Office of Information Systems in the execution of the long-term strategy described in this report.

7. Establish a high-level steering committee for the Office of Information Systems. The functions of the committee will be to establish information systems policies and priorities and to oversee the operations of the Office of Information Systems.

3.2. NUPS Recommendations

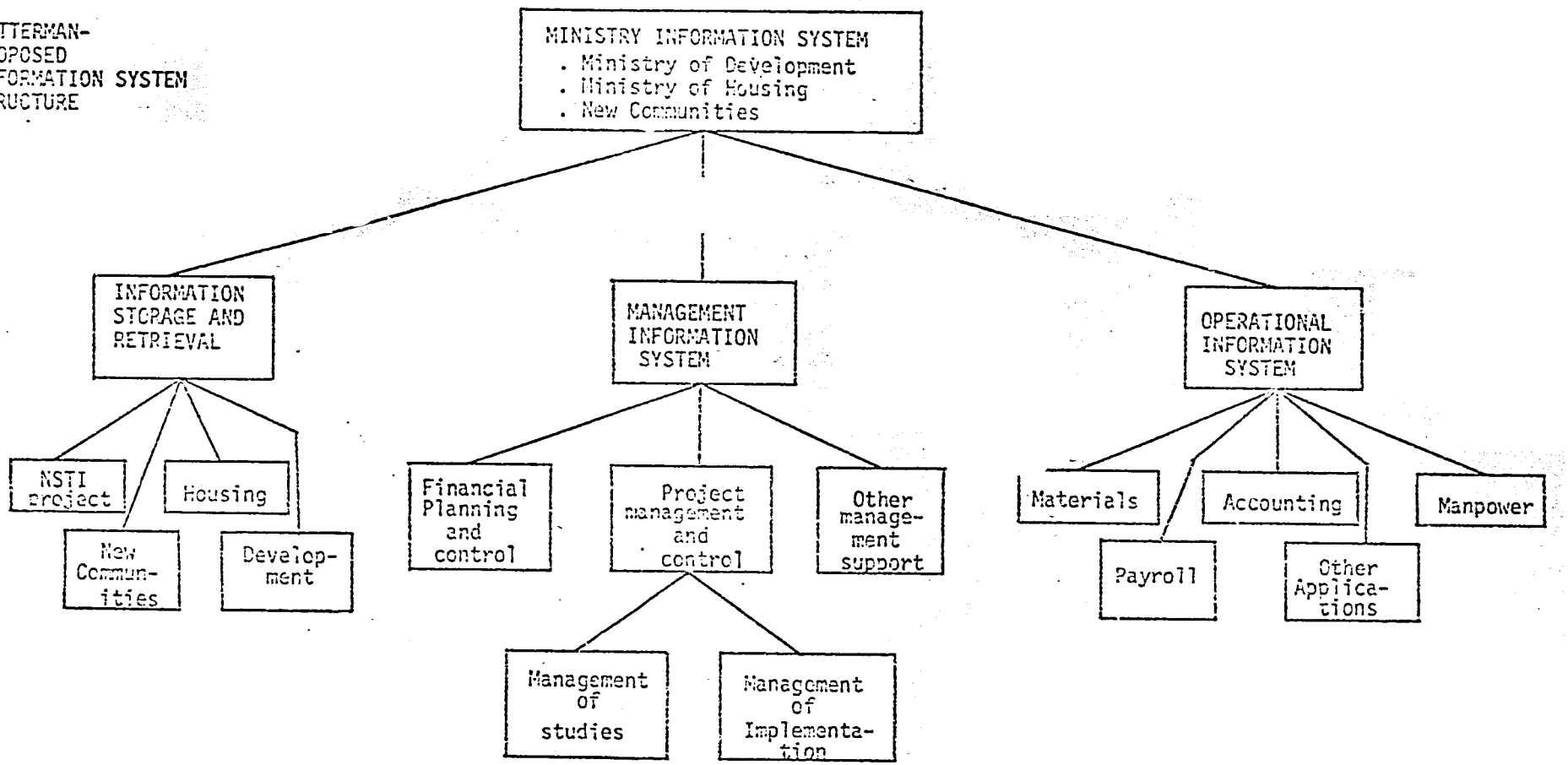
NUPS staff thinks it very important to get a system in place in the Ministry and not engage in prolonged discussion and repeated and possibly conflicting studies. Therefore the Project recommends that key elements of the Cotterman plan be accepted and implemented as soon as possible. Those relating to the use of computers would be adopted, but their implementation would for the most part be postponed.

Before specific suggestions are made, three general points should be stressed:

1. Dr. Cotterman's report is concerned with information handling systems, not with the content of those systems. Before proceeding very far, attention will have to be paid to what data are entered into the system and why. Appendix C to this report presents some discussion of this point and offers a set of criteria for deciding what data to include.

FIGURE 2

COTTERMAN-PROPOSED INFORMATION SYSTEM STRUCTURE



SOURCE: Cotterman, William Woods.
"Consultation and Plan for a Ministry of Development Information' System."

FIGURE 2 A
COTTERMAN REPORT

APPROX. START DATE	OFFICE OF INFORMATION SYSTEMS TECHNICAL CAPABILITY	FUNCTION	STAFF	STAFF DEVELOPMENT	USER DEVELOPMENT
June 1981	Document storage and computer link to CAPMAS	Manpower (training application)	1. Director 4. Programmer/ Analysts + 1. Information Specialist	Systems analysis training	Publication of document lists and training course "Introduction to Computer-Based Information Systems
Sept. 1981	Add to above microforms, with reader/printer	Indexed document retrieval and OIS 1st application	+ Al-Ahram Service + Contractor + General Consultant	Continue	Identification of potential users; establishment of user group; continue training course from above
June 1982	Add to above Link with NSTI computer	OIS application 2 and information retrieval	+ NSTI + Contractor + General Consultant + Information Specialist + Al-Ahram	Continue	Continue
Jan. 1983	Add to above Ministry computer	MIS 1st application α OIS application 3	+ NSTI + Contractor + General Consultant + Systems Analyst + Systems Programmer + Al-Ahram	Training on new computer (includes programming)	Continue
Jan. 1984	Link NSTI, Ministry and CAPMAS computers and microform unit	Expanded information retrieval, OIS additional applications, and MIS additional applications	+ NSTI + Contractor + General Consultant + 2 Systems Analysts + Al-Ahram	Continue	Continue

← NEW PLAN →

OIS = Operations Information System MIS = Management Information System

2. Dr. Cotterman's report does not say why he chooses a particular system. Presumably there are more alternatives than the two advanced in the Sherrod and Livingstone Reports. In particular, the criteria he used in making his choices are not stated.

3. Though Dr. Cotterman makes references to two systems outside the Ministry (the National Scientific and Technical Information Project [NSTI] and the computer link to CAPMAS), NUPS staff feel that the overall environment for urban development planning should be considered. Urban planning is a broad policy area. It is a multi-sectoral and multi-agency task. Links between the Ministry of Development's Office of Information Systems and information activities in other agencies with development planning functions should be specified. One approach is that recommended by NUPS in Section 4 of this report.

In addition to these general points the following specific recommendations are offered:

1. Dr. Cotterman provides for three major components to his Office of Information Systems. Each is designed to reduce uncertainty in management decision-making, but the class of decision is different:

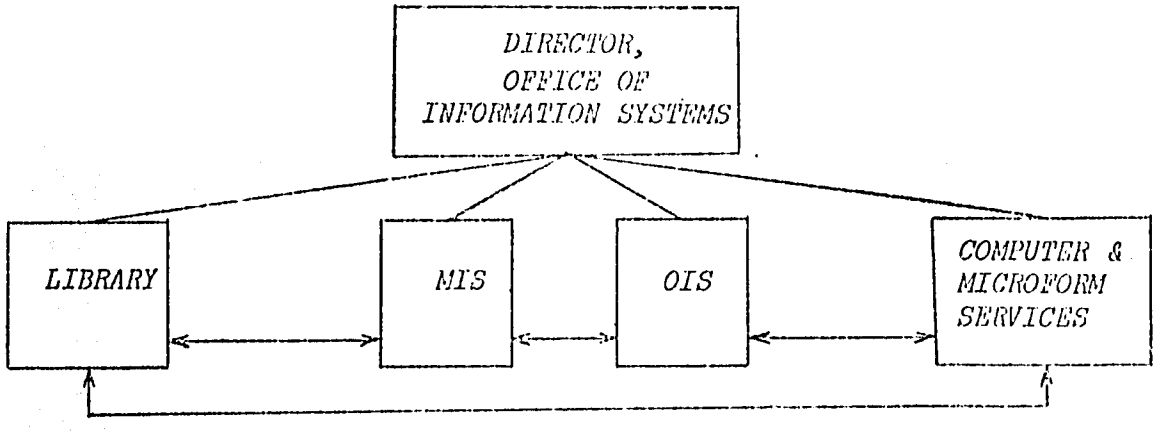
   a) Information Storage and Retrieval
   b) Management Information System (MIS)
   c) Operational Information System (OIS)

   (See Figure 2, p.9.a)

   Presumably the Information Storage and Retrieval component is concerned with policy-making as the substantive mission of the Ministry. Dr. Cotterman is not clear about where the document retrieval/archival operation is to be located. NUPS recommends that document retrieval and archival operations be placed in the Information Storage and Retrieval unit. Further, that this unit explicitly be charged with providing access to materials in all formats which provide information support to the policy-making decision process. This component would be a library. It would provide service to, as well as be served by, the Management Information System and the Operational Information System.

2. A fourth unit would be a Computer and Microfilm Services unit, designed to serve the library, the MIS and the OIS as well as other clients in the Ministry.

   A revised diagram might be:



This arrangement recognizes the different classes of information needed for management decision-making. It takes into account the frequently different techniques for gathering and processing data and reporting the resulting information. The computer and microform services are separated out as a set of support services not to be confused with information services. Computer development can be orderly, taking into account all agency requirements and acquiring equipment, software and personnel resources relevant to the general need. Machines would not be acquired for specific projects or programmes unless they were an explicit part of an overall integrated strategy.

3. The library, MIS and OIS should be developed simultaneously and in parallel. Specifically, the library would be necessary to provide support for those designing the project monitoring and financial planning components of the MIS. The OIS is already functioning, though perhaps not efficiently, and requires less immediate attention.

4. Most aspects of computer development should be postponed. They do not meet the effectiveness or efficiency criteria discussed in Appendix C. However, the training of managers in information systems and in efficient use of computers should be encouraged. Indeed, this should be one of the initial tasks of the computer and microform services unit. Others would include the development of a computer support strategy and the procurement of microform equipment and services to support the library's archival function.

5. Resources diverted by the postponement of computer development should go into organizing the library. A functioning library has immediate payoffs in terms of information provided to policy-makers. Most assistance from foreign donor agencies in the next two to three years should go into developing the library/archives quickly.

6. The Ministry should immediately adopt the following recommendations of Dr. Cotterman, except, as noted: (Refer to the sequence of recommendations, p. 8 - 9)

1. Ministry long-term strategy, per Cotterman.

2. Elements of the long-term strategy:

   a) Per Cotterman.

   b) Except indexing and retrieval to be manual for first three years.

   c) But specify additional links. Orient links to substantive aspects of agency missions rather than to hardware.

   d) Confine computer development in first 3 years to:

      - management sensitization to effective and efficient information systems, including computer-based systems;
      - development of a computer services strategy;
      - design of specific system applications;
      - training, as with the existing manpower application.

   e) As part of the overall strategy.

3. Per Cotterman.

4. The Cotterman report is not clear about which information specialists and systems analysts are foreign consultants. NUPS recommends that a single information generalist be brought in to consult for the first two years (1982-1983). This consultant would be responsible for guiding the organization and development of the library and the implementation of the microform project. The consultant would conduct training for managers in information concepts and computer-based applications. A systems analyst would be brought in, in early 1984.

5. Per Cotterman.

6. Per Cotterman.

7. Per Cotterman.

To summarize, it is important to give priority to substantive aspects of the Ministry's mission over the operational aspects. Data content of systems should receive as much

attention as data handling aspects. The Ministry does need to address urgently those tasks Dr. Cotterman labels "management": financial planning and control and project management and control. However, the problems in these tasks are less how the data are processed than which data are processed. These data requirements are closely linked to those needed in the library/archives. Attention for the first 2-3 years should be given to specifying the data needed, trying to acquire it, and controlling its retrieval with manual means.

The library should get the greatest attention in these first 2-3 years, so that it can get control over that large mass of data that already exists, in print. The emphasis should be on organizing these materials for retrieval. It will require an Egyptian staff of 10 to 20 full time for 2 years, depending on training and experience. It is important that the documents be made retrievable quickly. One of the reasons information systems are not used is that the resources committed in the early stages are insufficient to reach a threshhold at which users find it in their own interest to use the data bank.

The Ministry information system should establish links to other information organizations with planning responsibilities. The nature of these links is discussed in Section 4 of this report.

4. AN INFORMATION SYSTEM FOR THE BROADER URBAN PLANNING ENVIRONMENT

Urban planning and development, the particular concern of NUPS, is a multi-sectoral and multi-agency policy area. No single governmental organization has as its mission all the tasks required for urban planning and development. At the national level, in addition to the Ministry of Development, there is a Ministry of Planning with important financial planning responsibilities in their sector. At the sub-national level, there are Planning Regions and Governorates, each legally responsible for planning and implementation tasks. Major cities also have significant responsibilities. In addition to Egyptian Government agencies, there are quasi-governmental agencies and multi-national and bilateral donor agencies which affect planning.

NUPS recommends that organizations which have urban planning responsibilities each create formal information units or expand those already in existence. These units would be linked together in a network, to be called the Urban Development Information Network. This network is to be loosely organized, and at least at first the links between agency units would be weak ones. Despite the wide range and considerable number of potential participants, this network is

not envisaged as being another bureaucracy requiring complex administrative structures and staff. Instead, information units would primarily serve their own agencies, most of which also have responsibilities that are not urban planning. Links to the Urban Development Network would not preclude links with other organizations over other aspects of their agency missions.

The Ministry of Development, being the agency with the broadest range of urban planning and development tasks, would be a key agency, providing leadership in the organization of the Network. Its Office of Information Systems would coordinate (through yet unspecified mechanisms) the collection of primary data and would function as a channel to CAPMAS. The Office would serve as an archives; two copies of all formal reports from each agency and consulting group would be filed either in paper or in microform, or both. Access to these archival materials would be carefully specified, but would include at least staff of other participating organizations and consulting groups registered with the Ministry. Participation in the Network by consulting groups would be required by their contracts.

Links to other organizations would include exchange of lists of holdings (contents of their data banks) updated at specified intervals. This would be required of the Office of Information Systems, and encouraged for other organizations. Meetings of principals would be held at specified intervals to deal with specific agendas on common problems. Topics might include coordinated requests to CAPMAS for national data collection products, or standardized data collection efforts, or standardized report formats, or standardized formats for bibliographic citations, or perhaps even shared cataloging of materials by some participating units. The service of most immediate value to urban planners would perhaps be the inter-library loan of documents.

The above proposal is too preliminary and too general to justify presenting a detailed implementation strategy. However, the improvement or construction of systems within each agency can proceed without regard to progress on the larger system. Information units in various agencies would be created or upgraded as a result of pressure and assistance originating at first from the Ministry of Development's Office of Information Systems and then from other participant organizations. Several are already sufficiently organized to participate meaningfully, including several ongoing consulting projects, the Institute of Regional Planning, the Development and Planning Technology Centre, the Cairo University and the Cairo American University. In addition, assistance would come from donor agencies. As part of an information systems program, they would include an I/S component in each project funded.

Donor agencies, particularly those with a large enough impact in Egypt to be able to affect policy formation in an area as broad as urban planning, should develop strategies for information systems development including the programme indicated above. UNDP has shown some interest in information systems, but may or may not be able to provide funding for a continuing development effort. U.S. AID has a very large presence in Egypt. Its present program is somewhat ad hoc and very much project-oriented, though there is some current interest in a more integrated program. Specifically, most projects and studies have an information component similar to that contained in NUPS Scope of Work. A few information-related projects are funded 2/ but these are very narrowly construed. There is no sense of an information systems strategy having been used in developing these projects.

NUPS recommends that AID/Egypt develop a general information systems development strategy as a progam which would affect individual projects. This strategy would include:

1. Promoting the development of information systems in each Egyptian agency as they become the recipients of American assistance. Normally, these would be traditional libraries. For urban planning, assistance to the Ministry of Development would have highest priority.

2. Assisting in developing links between information activities in agencies which share common mission goals.

3. Improving the AID/Egypt library operation by:

   a) Making it accessible to the public. At present, researchers may enter, but this fact is not widely known. The security system, although necessary, puts off all but the most aggressive researcher.

   b) Making sure all AID-supported report outputs get into the system. It is inappropriate for the librarian to beg for the reports from Project Managers. AID contractors should be required by the contract to turn copies over to the library.

   c) Including in its mission the support of information activities in Egyptian agencies to the extent of knowing where they are, and what services are available to whom. The library would obtain, where possible, lists of the holdings of these facilities.

4. Requiring that AID-published reports and AID-funded project reports be entered into the U.S. National Technical Information Service data base. This would provide a single location where a researcher or consultant could acquire previous reports at very little cost to AID (or

to the consultant). Reports are generally available in microfiche or paper copy.

5. Where AID is responsible for developing Terms of Reference or the Scope of Work for a project, AID should define explicitly what kinds of information outputs are required. Where these are developed elsewhere, AID should participate in the formulation and review the resulting document. Such specifications would be developed with reference to the overall information systems strategies of AID/Egypt and the Ministry of Development.

6. AID should consider developing and if necessary funding a course at the Library School at Cairo University which would teach systems analysis and computer-based systems to library students. Objectives would include teaching when and how to use computers in an overall information systems context, and how to introduce information systems to administrators and managers.

There are a number of constraints operating against the development of an integrated approach to information systems in Egypt. Some of these are cultural and some administrative. These are interrelated, since the administrative structure is very much tied to cultural and historical developments. The following observed characteristics are particularly relevant:

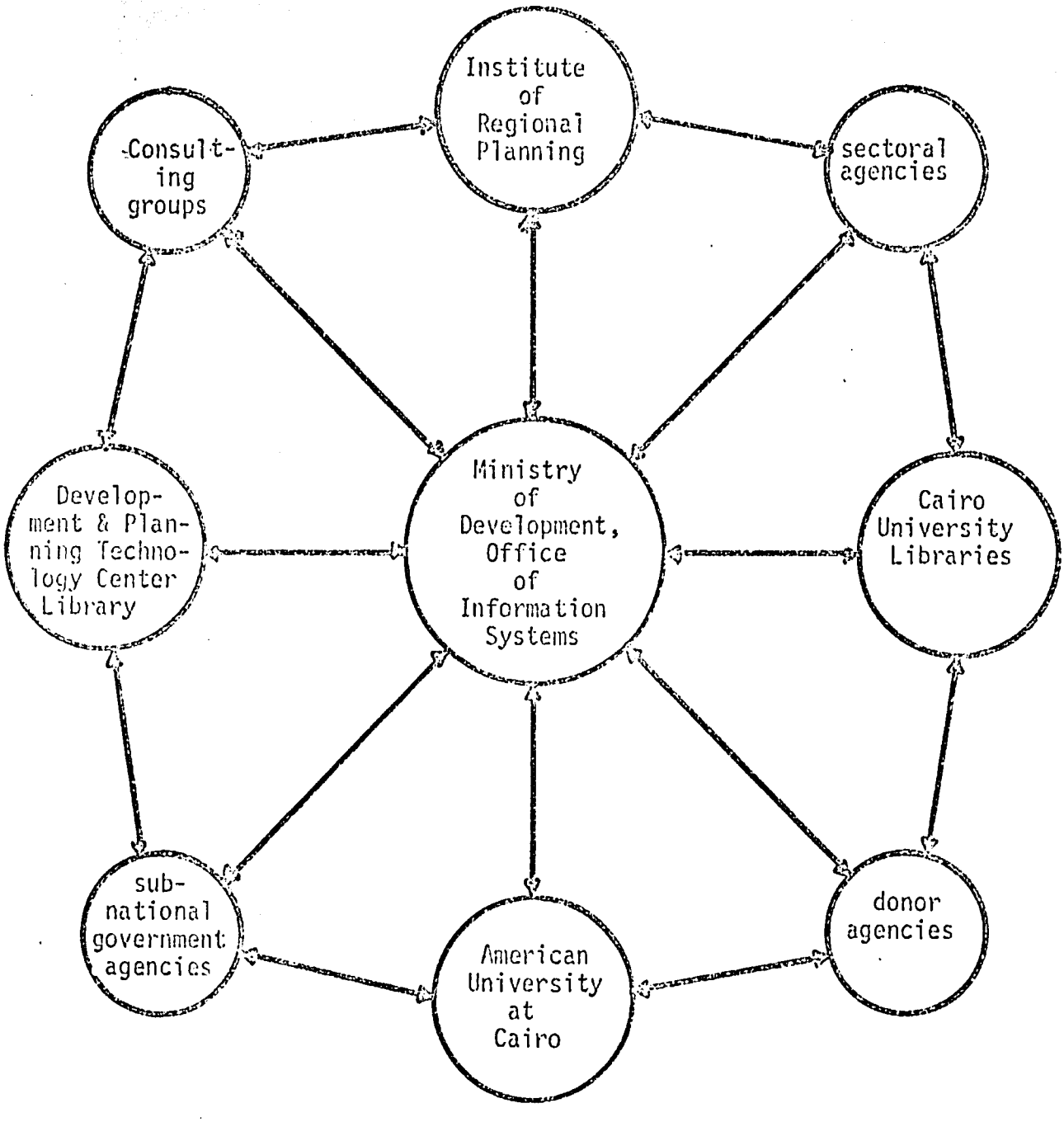
1. Responsibility in the bureaucratic structure has become diffused. The relationship between performance and either reward or punishment is unclear, and managers have little reason to invest resources and energy in something with as little inherent appeal as information systems. Solid information systems are unlikely to be developed when the payoff to the individual manager is not tied to performance.

2. Reorganizations, which are very frequent, generally consist in layering new organizations rather than restructuring the junctions and information flows of existing organizations. Often, therefore, the flow of information, and particularly the upward flow, is greatly obstructed.

3. The current fiscal philosophy of many in government does not stress least cost considerations. There is a mix of reasons for this -- administrative traditions do not emphasize efficiency of the delivery of government services, subsidy structures make identification of true costs difficult, and the effort to develop cost data may seem to be more than the result is worth. There is little reason to improve information flow unless additional efficiency is sought. Those measures that are taken tend to be dramatic rather than necessarily effec-

FIGURE 3

URBAN DEVELOPMENT INFORMATION NETWORK



Classes of potential participants, with some of the links indicated

SOURCE: NUPS Analysis.

tive or efficient, and are based on attractive hardware rather than improved performance.

4. Administrative practices and the incentives of individual managers do not encourage formal links among agencies and non-government organizations. Links between sub-national and national level agencies are not yet well developed, and this appears to be particularly true of the movement of information upward.

5. Egypt has had for many years an official and unofficial policy of constraining information dissemination. These strictures are being relaxed, but many managers would rather the public did not know some aspects of their operations. CAPMAS releases very little data and constrains the use of non-CAPMAS data in official publications. Data on budget expenditure of agencies is not generally published and is extremely difficult to acquire.

NUPS recognizes that this environment makes the development of information systems in individual agencies difficult, and the creation of an inter-agency network even more so. The NUPS proposals address this serious problem by:

1. Choosing low-cost and hence low-risk information systems. Document delivery and traditional library structures are emphasized.

2. Designing a network which, while attacking urban planning information problems as a whole, avoids a complex structure. Individual agency sub-systems can grow at their own pace without significantly reducing the effectiveness of the overall network. The system will not collapse if one link is weak.

3. Emphasizing the training of managers and decision-makers; sensitizing them to information systems and the potential benefits and costs of computer-based systems.

4. Promoting an active role for foreign donor agencies. In addition to financial inputs, foreign agencies have the advantage of being outside the bureaucratic structure. Thus they can broadly view information requirements across bureaucratic structures and initially provide access to inter-agency information which is available, but not widely disseminated, outside individual agencies. Then, as a longer term goal once the value of broader based information systems are more widely recognized, foreign donor agencies can assist in reducing the constraints to disseminating other information which is not restricted.

Manpower constraints are not severe, except in the case of managers sensitized to the value of information systems. Professionally qualified librarians are moderately scarce, but available in Cairo. People with broader information training are less available but in the early stages it is the document handling aspects that are to be stressed. A program is presently underway at the University of Cairo for upgrading its Library School, and it is beginning to produce more and better qualified people. Egypt is fortunate in that many of its professionals are able to use English, as many development reports are available only in English and English is normally used for computers and computer software. Thus, language is not likely to be a major problem.

NATIONAL URBAN POLICY STUDY INFORMATION SYSTEM

FOOTNOTES

1/ Cotterman, William Woods "Consultation and Plan for a Ministry of Development Information System", prepared for the Ministry of Development, Arab Republic of Egypt and United Nations Development Program, Office for Projects Execution. June 1981.

2/ The March 9, 1981 USAID/CAIRO Historical Project List has only one project that is clearly designed to promote information systems in general (0063, Development Information Systems, not implemented). None are scheduled for 1981 or 1982, though many projects have data collection implications.

APPENDIX A

NUPS INFORMATION SYSTEM MANUAL AND RELATED DOCUMENTS

FILING SYSTEM FOR NUPS MATERIALS

DESCRIPTION

The NUPS filing system has been designed for rapid start-up and low costs (particularly in terms of professional staff time), but with sufficient intellectual coherence that it can be actually used by Project staff and at the same time provide an organization for Project materials when they are turned over to the Ministry on completion of the Project.

There are two major files, each with sub-components:

I. Administrative files
   Routine administration
   Report production and reports

II. Subject files
   File cabinets
   Library
   Map files

The administrative files include routine administrative materials as well as Project outputs. The goals include immediate administrative control as well as some long-term "memory" -- a record of Project activity.

Subject files basically contain inputs for analysis, though of course Project outputs also serve as inputs for later work. These are arranged by subject. They come in three formats:

1. Softbound and flimsy materials amenable to filing in steel cabinets;

2. More substantial and hardbound books and reports; and

3. Maps and large charts

Filing cabinet materials are filed in steel cabinets now located in the library. Books and reports are filed in the library on shelves. Maps and charts are normally filed in the map cabinet. Second (and additional) copies may be folded and filed in the file cabinets, but one original and a first copy is to be filed in the map cabinet

ACCESS

Intellectual access to all subject materials in the library is through the subject classification scheme and the author and title cards. The

subject classification will provide access to the file cabinet, which will contain either the item sought, a reference to its location in the library or map file, or both. A copy of the subject classification is attached, as Annex A of the Manual.

Physical access to copies of reports and to subject materials is through the librarian, as indicated in the circulation system of the Manual.

The MANUAL indicated here is for the substantive (or subject file) component of the system, generally referred to as the Library.

FILING SYSTEM: REPORT PRODUCTION AND REPORTS

A Chronological list of output reports
- 01 Formal reports (those submitted to the Ministry)
- 02 Other reports, consultant papers

B Work schedules

C Pre-start activities

D Status Report on the National Urban Policy Study

E Working Paper on Urban Development Standards and Costs

F Interim Action Report on the National Urban Policy Study

G First Round of National Urban Policy Alternatives

H Second Round of National Urban Policy Refinement

I Formulation of Preferred Strategy

J Urban Management Handbook

K Identification of Illustrative Development Projects

L Immediate Action Memoranda

M Information System

N Monthly Progress Reports (Filed with correspondence materials in the secretarial section)

LIBRARY MANUAL

NUPS LIBRARY/FILING SYSTEM MANUAL

FOR THE SUBSTANTIVE MATERIALS COMPONENT

INTRODUCTION

The NUPS Library/file system was designed with several specific objectives in mind:

1. It was to meet the ongoing information requirements of NUPS staff;

2. It was to be turned over to a Government agency in organized and retrievable forms;

3. Start-up and operating costs were to be minimal; particularly costs to professionals who used the system were to be minimized.

The system was designed to fit within certain resource limits:

1. A single room of $24m^2$ which was to double as a meeting room for small groups;

2. A staff of one person, able to work in Arabic and in English but unlikely to have library training;

3. No sophisticated equipment but no serious constraints on routine library/office supplies; and

4. Most materials in English and most users English-speaking.

The information system which was designed, while it is hoped that it meets the above objectives within the above resource limits, has certain limitations.

1. It is not usable by non-English speakers;

2. The classification scheme is very much specific to the NUPS task. It is not very flexible and it is not generalizable. It is designed for a small-scale operation and would be inadequate for a large collection;

3. Access to materials is at the bibliographic level. Users must scan identified books and reports to find specific data tables or individual data items;

4. The circulation mechanism is simple, providing a minimum level of control and only this in a small office environment. It is not usable in a normal library environment or in an operation of any scale; and

5. The system does not specify an active "acquisition of materials" process. The library staff is not expected to be involved in the identification and specification of information requirements, or in the locating and acquisition of materials containing the required information. These functions are undertaken by the professional staff of the Project. Library staff passively accepts what is brought to it. This would be inappropriate in a larger environment with a longer time horizon.

These limitations do not prevent the NUPS data bank from being integrated into a larger collection of the recipient agency. When the agency receives the NUPS materials, it will have to make the decision whether to use the materials as they are or modify the classification system to integrate the NUPS collection into the broader framework of the agency's special information requirements.

A DOCUMENT RETRIEVAL SYSTEM

Document retrieval systems are subsets of larger information systems. They are oriented to information packaged in a specific class of formats. Formerly, this was a paper format, including books and reports; but recently this has been expanded to include microforms, cassette tapes, slides, video-cassettes, etc. It is now more useful to class systems by the method of retrieval or by the level of disaggregation of the information retrieved. Document retrieval is at the bibliographic level -- a thing is retrieved, but the retrieval tools do not tell the user very much about what is in the thing. For a wide set of reasons mostly tied to considerations of cost-effectiveness, most small libraries operate at the biliographic level of retrieval, including this one.

The materials contained in the system are those used for the substantive work of the Project. Administrative files are maintained separately in the secretarial pool and team leader offices. Copies of NUPS reports fit both categories, and a set a filed in the library.

The library consists of two classes of files: object materials (the books, reports, maps and file folders containing the information and data used for analysis) and references to these object materials. Object materials are separated into three files based on major differences in format, rather than any significant differences in content:

Object materials files:

1. Library shelves, containing books and substantial reports.

2. File cabinets, containing data sheets, ephemera, and smaller reports.

3. Map cabinets, containing maps and Project-produced graphics.

Reference files:

1. Author and title card files providing access to materials stored on library shelves only.

2. File cabinet (same as containing object materials) containing subject access to materials on library shelves (as see references).

3. Map listing.

4. Project reports listing.

THE ACQUISITIONS PROCESS

All document retrieval systems consist of at least an acquisitions process, a coding (cataloging) process, a storing process, and a retrieving process. The acquisitions process in the NUPS library is particularly simple: the system accepts passively whatever is brought to it and discards nothing except perhaps duplicate copies. Judgements about what should be in the system are left to the professional staff.

To avoid unwanted duplication, filing in two locations, and unnecessary work, check items which have been received against the author/title card file. If it is already in the system, decide whether additional copies are appropriate. If not, discard the item. If so, label it with the indicated code as in the instructions for cataloging, below.

THE CATALOGING PROCESS

Documents are cataloged for one reason only -- to permit the retrieval of the information contained in them. The speed of retrieval is a trade-off between system operating costs and the time of user professionals. System operating costs include, among other elements, the availability of staff trained in library practices. The NUPS system assumes one person not necessarily having any formal library training is adequate for the cataloging process. If staff does have such skills, service to users can be improved through additional points of access and with more formal catalog cards.

Materials are cataloged and filed first by their geographic scope, than by their subject. The geographic code and the subject classification scheme are made available to each library user and are also attached to the file cabinet.

Annex A and B to this manual contain copies of both codes up-to-date as of the issuance of the manual.

Geographic Code

The geographic scope of the item in hand must be determined. It may be about a particular settlement, governorate or planning region. It may be about Egypt in general, or about whole sections (Upper or Lower Egypt, for example). It may be about Egypt within an international region (Africa, North Africa, the Middle East, or Arab countries). It may be about Egyptian links to one or more specific countries, or to international organizations. The item may not be about Egypt at all, but contain theoretical, methodological or technical information which might be applicable to the NUPS task.

The following guidelines should help:

1. If it is about a settlement or a specific place within a Governorate, file it under the relevant governorate, with its two-digit code.

2. If it is about a governorate, file it under that governorate.

3. If it is about more than one governorate but within a single planning region, file it under the single-digit code for the planning region.

4. If it is about more than one planning region, use "1" which is the code for Egypt at large.

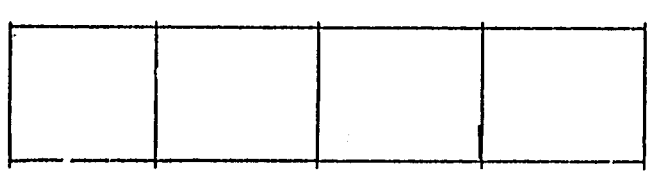
5. If it is about Egypt at large, use "1". At least half of the materials will receive this code.

6. If it is about Egypt in a larger regional context, use the code "1".

7. If it is about Egyptian links to one or more other countries, or to international agencies, use the code "1".

8. If the item is not about Egypt, or if a geographic code is not relevant, use the code "0".

The item is then stamped with a four compartment box:



If it is felt in particular cases that this might be damaging to the appearance of an item, the code can be typed on a gummed label or

written by hand. Use the slash to separate the code elements: 1/E/09/1 for example. The remaining references to specific codes in this manual will use this format.

The geographic code is then entered into the first box. Use dark blue or black ink, as pencil smears and other colors fade rapidly in sunlight.

example	21				(Cairo Governorate)

Subject Code

The subject code is selected from the classification scheme. This code has three levels of hierarchy. The most general is an alphabetic letter, and is entered into the second box. The next level, if appropriate, is entered into the third box. It will be a two-digit number. The final level, if appropriate, will also be a two-digit number and is entered into the remaining box.

Examples	1	E			Economic development in Egypt
	1	E	08		Domestic trade and commerce in Egypt
	1	E	08	05	Real estate policies & problems in Egypt

It is important to select the most specific relevant subject; otherwise the general files will grow too rapidly with too little differentiation. Materials will take too long to retrieve.

The hierarchical nature of the scheme must be stressed. It is not permitted to take pieces or words from various parts of the system and glue them together. You cannot, for example, take the phrase "finance mechanisms" found in F/096/05 and stick it with "energy sources" in A/07 to get "financing of energy". You may not skip steps in the hierarchy. An item about "budget expenditures" in D/06/03 requires all four boxes:

3	D	06	03	Budget expenditures in the Delta region

Updating

The classification scheme is not very flexible. The classifier may add to it, but cannot economically change a code once it has been used. One cannot add new categories within a number stream and just shift codes surrounding it, because documents already coded will have to be recoded and relabelled. For this reason, new codes should not be added unless the case is convincing. It is better to put an item into a more general subject and construct "see references".

All information systems which rely on a large number of documents suffer from this inherent constraint, particularly as their collections grow larger. However, when it becomes apparant that a new code is necessary, additions should be made to subcodes first to minimize the number of documents which must be recoded. Generally, it would be better to cross reference items to other similar codes rather than create new letter subject codes or geographic codes.

See References

Because there is normally only a single place in which to store a document, and because it is inappropriate to make numerous adjustments to the coding scheme, "see" references are necessary. Both in selecting codes and providing additional see references, it is important to try to anticipate how a document is likely to be used on the Project. This is difficult unless the classifier is familiar with urban planning in the Egyptian context. It is better to err on the side of excessive references, at least in a small scale system.

There are two kinds of see references in the file cabinet. The first is a reference to materials that are stored outside the file cabinets, on library shelves. The second is to provide additional access points to materials about several subjects. At the same time subject classification is undertaken, the classifier must anticipate where the item will be stored. If on the library shelves, a sheet of blank paper is stamped with the code near the top. The title, author and date (at least) of the item are typed or hand-written below the stamp and the phrase "SEE LIBRARY" prominently indicated below this. (See example, Annex C).

A subject-related see reference is the same, except that the code in the stamp at the top is the access point that is <u>not</u> the actual location. A second stamp below the bibliographic citation indicates the actual location. (See Annex C). The location may be another subject file in the file cabinet, or it may be another subject on the library shelves. Normally a single subject-related see reference is sufficient, but two may occasionally be needed.

If the item is to be filed in the file cabinet, it is enough to stamp the item, apply the code, and prepare relevant subject-related see references. The item can then be filed.

Card Catalog for Materials on Library Shelves

Author Cards: The Author Entry

If the item is to be stored on library shelves, a cardset providing author and title access is to be prepared. Author cards have the personal or corporate (institutional) author entered at the top. Personal authors are preferred where they are obvious; if not, use the corporate. The correct corporate author should be selected using standard library practices such as in the Anglo-American Cataloging Code widely used in Egypt. This means that in a complex hierarchy of organizations, choose the lowest level of unique hierarchy. Correctness in choosing the author according to detailed rules and guidelines is important in large systems, but much less so in a small system such as NUPS. Do not dwell overlong on the decision.

Personal authors are entered last name first, followed by a comma and all remaining names and initials. Titles (such as Doctor) are omitted. Companies which have personal names are entered in inverted form also, though it is recognized that this is not standard library practice: Little, Arthur D.

Author Cards: Remaining Entries

On the author card, the title follows below the author. Use the full title, as shortcuts are often confusing to the user.

Below the title, add the publisher. This is necessary only if it is different from the author. This step can be omitted if it is not available.

Below the publisher (or below the title if the publisher has been omitted) put in the date of publication. This is normally quite important to the user in evaluating the potential usefulness of information, so look hard for it. If you cannot find a date but can estimate one, do so and place a question mark after it.

Add any notes that might assist the user in deciding whether to continue his search for this item. Such information as edition, number of volumes, relationships to other materials are often helpful, and do not take long to add.

For sets of books, do not prepare a cardset (pair of author/title cards) for each volume. Normally, one cardset will do, with the number of volumes indicated. For examples of cards, see Annex C.

Title cards

Title cards are exactly the same as author cards except that the position of the two items is reversed on the card.

FILING

1. Filing in the file cabinets and on the library shelves:

In both, materials are filed by the geographic/subject code first. All zeros are filed before all ones. Twos are filed after ones, while 21's are filed after twos, but before 22's, 23's and threes.

FILING

1. Filing in the file cabinets and on the library shelves:

In both, materials are filed by the geographic/subject code first. All zeros are filed before all ones. Twos are filed after ones, while 21's are filed after twos, but before 22's, 23's and threes.

The subject code follows the hierarchy. For example, the following are listed in their correct filing order:

0/E	1/E/09/01
0/I	2/A/02
1/A	21/A/01
1/A/03	22/J/01/01
1/A/03/01	3/B
1/A/05	31/A/07
1/E ... to next column	4/F/06/05

2. Filing author cards in the card catalog:

Author cards are filed alphabetically, word-by-word. Arabic personal names beginning Al or El are filed under "A" or "EL" respectively. The country name is normally omitted from publications from Egyptian agencies. For U.S. agencies (and others) it is added in parentheses after the entry. This non-standard practice is to prevent splitting groups of cards by staff who cannot often know the bureaucratic structure of other countries. The following examples should help:

Agency for International Development (U.S.)
El-Hifnawi, Mostafa
Elmendorf, Mary
Environmental Planning Consultants
Environmental Sciences-Parsons
Hensley-Schmidt, Inc.
Herbert, John
Institute of National Planning
Ministry of Development and New Communities

3. Filing the title cards:

This is straightforward word-by-word filing.

CIRCULATION

The purpose of this circulation system is to let other staff members know where materials are. It is very simple and requires only a modest effort on the part of the library users.

The circulation system is very basic: The user who wants to remove files or books and reports from the library room should stop by the librarian's desk. The librarian will add an accession code and the date to a sheet which has listed the materials each staff member has borrowed. If the librarian is not available, please locate your sheet, write in the red code number on your sheet, and write in the date.

To return materials, simply place them on the librarian's desk. The librarian will check off the serial code, showing that the item has been returned.

MAPS/GRAPHICS

Maps and graphics are separated into two classes:

- Project outputs
- Inputs

The first class is further subdivided into originals and copies. These are stored in separate drawers of the map file, appropriately labelled.

The second class consists entirely of maps. These are arranged by geographic scope and marked with the same geographic code as other library materials. Then an accession number within the geographic code is applied. The map is entered on the map listing, from which the next accession number can be derived.

For example, a physical map of Egypt is 1/047, being the 47th map of all-Egypt scope. A map of Helwan is 21/008, being the 8th map in the Governorate of Cairo. A map of Cairo and Qalyubia Governorates is 2/013, being the 13th map of the Cairo Planning Region. The numbers are written in red on the lower right hand corner of the map and filed sequentially in the appropriate drawer of the map file.

Because map are so clumsy to handle, it is important that the map listing be kept absolutely current by the librarian. Updated copies should be made from time to time and distributed to the staff.

ANNEX A

SUBJECT CLASSIFICATION SCHEME

FILING SYSTEM: SUBJECT CLASSIFICATION

A. Natural characteristics and resources

B. Human resources and social characteristics

C. Administrative and legal environment

D. Economic environment

E. Economic activities (sectoral)

F. Social activities

G. National security

H. Techniques and methodologies

I. Reference and bibliographical

J. Files on specific organizations and agencies

K. Plans for specific places

L. International linkages

A. NATURAL CHARACTERISTICS AND RESOURCES

01 Physical features

02 Climatic characteristics

03 Geological characteristics

01 Mineral resources

02 Fossil fuel energy resources (coal, oil, gas etc.)

03 Soils

04 Forest resources

05 Water resources (See E/07/02 for delivery systems)

06 Plant and animal resources (flora and fauna)

07 Energy sources other than fossil fuel; general topics on energy (See also A/03/02

08 Conservation, multi-resource. Enter conservation of a single resource under that resource.

B. HUMAN RESOURCES AND SOCIAL CHARACTERISTICS

01 Population aggregates (quantitative)

02 Population characteristics (qualitative)

01 Ethnicity

02 Education characteristics

03 Health characteristics

04 Religion

05 Cultural aspects, values, attitudes

06 Age composition

07 Household composition

08 Urban/rural composition

03 Additional characteristics

01 Women

02 Youth

03 Elderly

04 Income groupings (See also D/01)

05 Migration characteristics

06 Family planning (Here as a social characteristic and as a social programme)

07 Housing characteristics of the population (for housing policies and programs, see F/06)

C. ADMINISTRATIVE AND LEGAL ENVIRONMENT

01 Overall government structure

02 Planning regions structure (for central government, governorates, and places within governorates, use appropriate geographic code)

03 Legislation

01 Development standards and regulations

02 Land tenure

04 Admnistrative policies and strategies

D. ECONOMIC ENVIRONMENT

01 Wealth and income distribution (See also B/03/04)

02 Banking, credit and insurance

03 Consumption patterns; pricing; subsidy policies

04 Employment patterns

05 National accounts (For individual setoral contribution, see Economic Activities, below)

01 Output

02 Input

03 Investment and saving (Include here foreign investment)

06 Public finance

01 Budget; procedural and general aspects

02 Budget; revenues, including taxation and tariff policies (But see also subsidy policies, D/03)

03 Budget; expenditures

07 Wages and salaries (See also D/01)

E. ECONOMIC ACTIVITIES (At this general level enter materials on general development program choices and projects)

01 Overall policies and strategies

01 Land use patterns

02 Land reclamation

03 Urbanization choices, multi-topic

02 Agriculture (Including processing industries, irrigation)

03 Mining and quarries

04 Petroleum

05 Manufacturing industries (Enter here materials labelled simply "industry")

06 Construction and building

07 Power, water and sanitation; general materials

01 Power delivery systems

02 Water, potable

03 Sanitation

08 Domestic trade and commerce (For foreign trade, see L/02)

01 Wholesale trade

02 Retail trade

03 Banks and financial. (See also D/02).

04 Insurance. (See also D/02).

05 Real estate

09 Transportation, storage and communication

01 Transportation

02 Storage and warehousing

03 Communication

10 Service industries

01 Government services

02 Social services. (See also F/03)

03 Business services

04 Entertainment services

05 Personal services

06 Tourism

F. SOCIAL ACTIVITIES

01 Education services

02 Health services

03 Social welfare services. (Include welfare, recreation)

04 Culture

05 Religion

06 Housing. (See also B/07)

01 Policies

02 Supply, quantitative

03 Supply, qualitative

04 Proposals and programs

05 Finance mechanisms

G. NATIONAL SECURITY

H. TECHNIQUES, METHODOLOGIES AND THEORIES

01 Mathematics/Statistics

02 Planning

03 Cartography

04 Demography

05 Information systems

06 Survey methods and survey instruments

I. REFERENCE AND BIBLIOGRAPHICAL

01 Dictionaries, single language

02 Dictionaries, translators

03 General information, multi-topic materials, statistical compilations

04 Bibliographies

05 Negotiating the system

01 Expatriates living in Egypt

02 Office practices/procedures

J. FILES ON SPECIFIC ORGANIZATIONS AND AGENCIES

01 Egypt government agencies

01 Ministries

02 Planning regions (File alphabetically)

03 Other government agencies (File alphabetically)

02 Egypt non-government organizations

03 Donor agencies

01 World Bank, IMF and affiliates

02 UN and related agencies

03 US AID

04 ODM

05 All others (File alphabetically)

K. PLANS FOR SPECIFIC PLACES (Especially master plans)

L. INTERNATIONAL LINKAGES (Political and economic ties)

01 Political

01 Egypt with U.S.

02 Egypt with all others (Including multi-national)

02 Economic

01 Egypt with U.S.

02 Egypt with all others (Including multi-national)

ANNEX B

GEOGRAPHIC CODE SCHEME

0 International in scope or geographic code not relevant

1 Egypt

2 Greater Cairo Region

21 Cairo Governorate

- Abdine
- Bab El Shaaria
- Boulak
- Daher
- El Darb El Ahmar
- Ezbekia
- El Gamalia
- El Obour
- Heliopolis
- Helwan
- Kasr El Nil
- El Khalifa
- Maadi
- Mataria
- Mouski
- Nasr City
- Nouzha
- Old Cairo
- Rod El Farag
- El Sahel
- El Sayeda Zeinab
- Shoubra
- 10th of Ramadan
- Wayli
- Zeitoun

22 Giza Governorate

- El Ahram
- El Ayat
- El Badrashin
- Dokki

- Giza
- Hawamdiah
- Imbaba
- El Saff
- Usiim
- El Wahat El Bahariyah

23 Qalyubia Governorate

- Bandar Qaha
- Bandar Shoubra El Kheima
- Barrage
- Benha
- Kafr Shukr
- El Khanka
- Qalyub
- Shebin El Kanater
- Toukh

3 Delta Region

31 Dakahlia Governorate

- Aga
- Bandar El Mataria
- Belkas
- Dikirnis
- Mansoura (1st Division
- Mansoura (2nd Division
- Manzala
- Mit Ghamr
- Sherbin
- Sinbellaween
- Talkha

32 Damietta Governorate

- Damietta
- Faraskour
- Kafr Saad
- Medinet El Zorga

33 Gharbia Governorate

- Basyoun
- Kafr El Zayar
- Mahalla El Kubra
- Qotour
- Samanour
- El Santa
- Tanta (1st Division)
- Tanta (2nd Division)
- Zefta

34 Kafr El Sheikh Governorate

- Baltim
- Beyla
- Dessouk
- Fouah
- Kafr El Sheikh
- Metoubas
- Qallein
- Sidi Salem

35 Menoufia Governorate

- Ashmoun
- El Bagour
- Berket El Sabei
- Menouf
- Quweisna
- Shebin El Kom
- El Shohada
- Tala

4 Assiut Region

41 Assiut Governorate

- Abnoub
- Abu Tig
- Assiut (1st Division)
- Assiut (2nd Division)
- Badari
- Dayrout
- El Ghanayem
- Manfalout
- Quseya
- Sahel Selim
- Sedfa

42 New Valley Governorate

- El Kharga Oases Division

5 Alexandria

51 Alexandria Governorate

- Ameriya
- Attarin
- Bab Sharq
- Dekheila
- El Gomruk
- El Labban
- Karmouz
- Mena El Basal
- Moharram Bey
- Montaza
- Ramleh

52 Beheira Governorate

- Abu El Matamir
- Abu Hommos
- Damanhour
- El Delengat
- Edku
- Hosh Eissa
- Kafr El Dawar
- Kom Hamada
- El Mahmoudieh
- El Rabmanieh
- Rosetta
- Sadat City
- Shabrakheit
- Itay El Baroud
- Wadi El Natroun

6. Suez Canal Region

61 Ismailia Governorate

- El Tel El Kebir
- Fayed
- Ismailia
- Qantara Gharb

62 Red Sea Governorate

- Aswan Boundaries Division
- Hager Qena Division
- Hurgada
- Qusseir Division
- Ras Ghaleb Division

63 Port Said Governorate

- El Arab Division
- El Manab Division
- El Mena Division
- El Sharq Division

64 Sharkia Governorate

- Abu Hamad
- Abu Kebir
- Belbeis
- Diarab Nigm
- Faqous
- Hihya
- El Huseynuyah
- Kafr Sakr
- Minia El Qamh
- Zagazig

65 Sinai Governorate

66 Suez Governorate

- El Arabaein
- Attaqa
- Suez

North Upper Egypt Region

71 Beni Suef Governorate

- Beba
- Beni Suef
- Bo sh (Nasser)
- El Fashn
- Ihnasya
- Somosta
- El Wasta

72 El Fayoum Governorate

- Abshwoy
- El Fayoum
- Itso
- Senouris

73 Minia Governorate

- Mallawi
- Abu Qurqas
- Beni Mazar
- Der Muwass
- Malsur
- Matai
- Maghagha
- Samalut

8 South Upper Egypt

81 Aswan Governorate

- Aswan
- Edfu
- Kom Ombo
- Nasr

82 Qena Governorate

- Abu Tisht
- Armant
- Dishna
- Esna
- Farshout
- Luxor
- Naga Hamadi
- Qena
- Oous

83 Sohag Governorate

- Awlad Touk Shark
- El Balyana
- F mim
- Geheina El Gharibiya
- Gerga
- El Maragha

- El Mensha
- Saqalta
- Sohag
- Tahta
- Tema

9 Matruh

91 Matruh Governorate

- Bourg El Arab
- El Dabaa
- El Hammam
- Marsa Matruh
- El Seloum
- Sewa

ANNEX C

SAMPLE FORMS

SAMPLE CARDS

NOTE: Many cards in the files use formats developed at an earlier date. Some lack one or more of the information elements, while others contain unneccessary information.

Author Card

21/E/07/02

Engineering Sciences/Parsons with ECG-Cairo

Waterworks master plan; final report, Greater Cairo Waterworks Development Programs

1979

Title Card

21/E/07/02

Waterworks master plan; final report, Greater Cairo Waterworks Development Programs. 1979.

Engineering Sciences/Parsons with ECG-Cairo

SAMPLE SEE REFERENCE

1	D	04	

Clatanoff, William and Mamdouh Saleh

Manpower projections for planning education and training

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1979

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SAMPLE SEE REFERENCE

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Council on Environmental Quality, U.S. Dept. of State

Global future: time to act. Report to the President on global resources, environment and population

1981

SEE

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SAMPLE SEE REFERENCE

2	E	07	01

Engineering Sciences/Parsons in Association with ECG

Socio-economic report on proposed service areas

Prepared for the General Organization, Greater Cairo Water Supply

Undated

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APPENDIX B

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1/002 Egypt, settlements 50,000 and over, Publication dates vary. Published by Supt. of Survey and Mines/ Survey of Egypt. 1:25,000. Contours, roads, railroads, etc. 75 sheets. Filed within set alphabetically by place name. Some sheets on office walls.

1/003 Egypt, general geological map, 1929. Survey of Egypt. 1:2,000,000.

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1/005 Egypt, lower; transportation network. 1962. Survey of Egypt. 1:300,000. Arabic.

1/006 Egypt, topographical. 1966. Survey of Egypt. 1:2,000,000. Arabic

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21/004 Cairo, Helwan New Community, Land use map. 1980. Basil-WBTL-Nassar. 1:2,000.

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APPENDIX C

GUIDELINES FOR INFORMATION SYSTEM (I/S) DESIGN

GUIDELINES FOR INFORMATION SYSTEM DESIGN

A part of the problem in developing information systems is that potential users have very different concepts of what information systems are. The term "information system" has been used in so many ways that each view is likely to be correct in some context. The following guidelines contain two major parts. The first is designed to provide a framework for discussion of data and information within systems in general and within an urban planning system in particular. A fair amount of attention is devoted to the vocabulary of information systems, because the terms are used popularly as well as technically, and frequently simply misused.

The second part of this appendix is concerned with criteria for selection and design of the system for processing the information. The information literature no longer lacks detailed "how to" manuals on system design and implementation. Of specific interest are Romagna, 1979 1/ and Armillars and Coiner, 1981 2/. However, each of these (and other) books have areas that are emphasized and other areas that receive less attention. Vocabulary is not standardized and is often confusing. The following guidelines do not overcome these defects by any means, but it is hoped the vocabulary and areas of emphasis will lead to a better understanding of the specific problem of urban planning in Egypt.

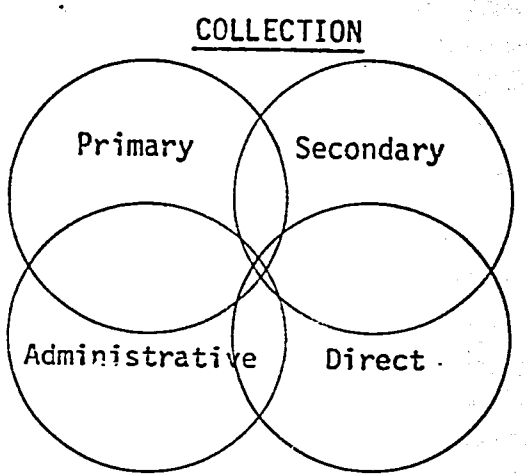
PART I: DATA AND INFORMATION PROCESSED BY THE SYSTEM

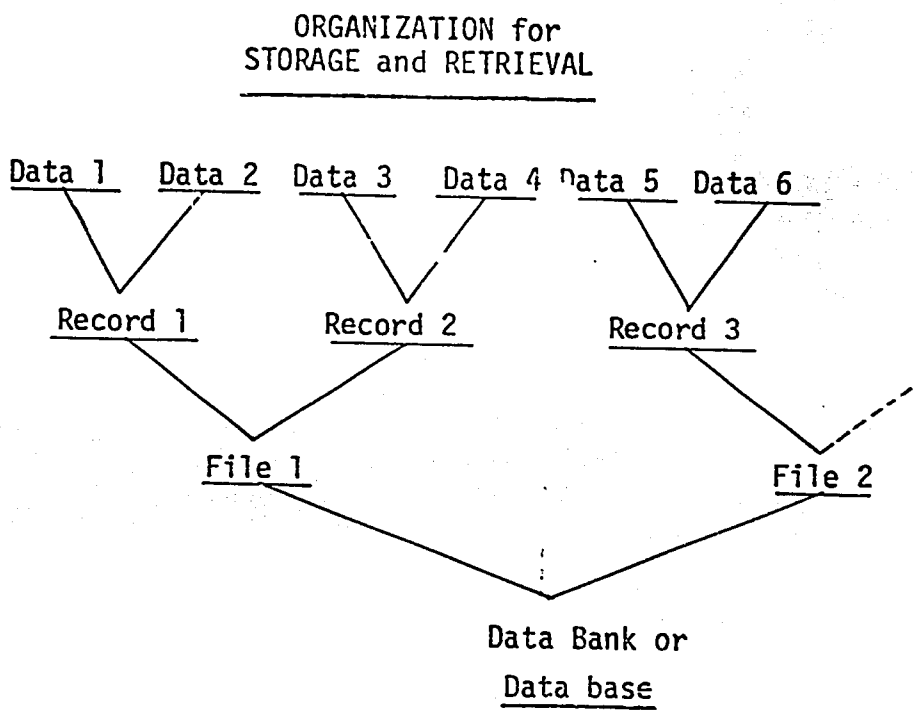
System theory is the construct normally used to describe information processes, as is implied in the term "information systems". Systems theory concepts and vocabulary are in widespread use and will be used here. The problems arise in that every system is a subset of a larger system, which in turn is a part of a "very large" system. There is not widespread agreement on the appropriate parameters for any one piece of the system. These will be developed in Part II of this appendix when centralization/decentralization is discussed, but it should be made clear that attempts to make major alterations in the governmental structure should be minimized. Governments rarely adapt their structure around their information support systems.

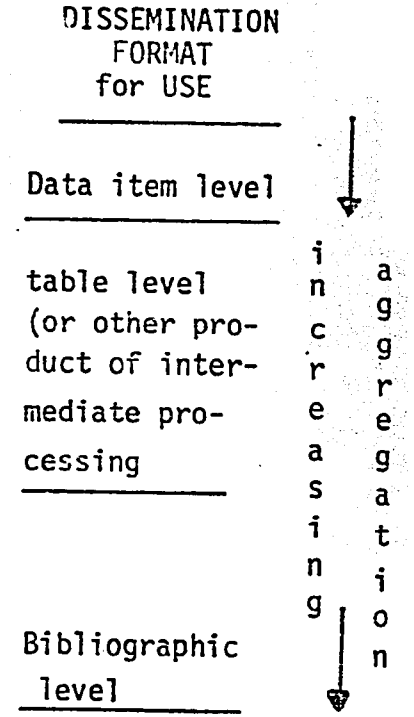
It is often useful to distinguish between data and information. "Data" is the larger class. Data are individual acts of sensing the environment - the input into the system in its most disaggregate form. "Information" is data that have been processed or manipulated in such a way as to have been given meaning. Usually this is done by adding a datum to other data or by comparing a datum with other data. Recognizing the distinction as useful for some purposes,

FIGURE 4

A TYPOLOGY FOR INFORMATION SYSTEMS TERMS







this report will use the terms in their more popular way, and consider them to be synonymous.

Information can be classed according to how it is collected, how it is organized and stored, or how it is to be used. In terms of collection, a distinction can be drawn between "primary" and "secondary" -- depending on whether the data are original records or whether they have been processed and packaged by other than the original "primary" source. Data can be "administrative" or "operational" in that the data are operational records produced for one purpose - an administrative control - but used by the analyst for another purpose. Customs records, for example, are produced for the purpose of controlling the entry of some goods or for collecting a tax. However, they are fruitful sources of data on international flows of goods, and on one of the components of the national accounts. Data which are collected explicity for the present analytical purpose, such as censuses, surveys, or direct observations are yet a fourth class. These have been termed "direct" data. These classes are not discrete. Administrative data can be primary or secondary, as can census, survey or direct observation data.

Data and information can also be typed according to the way they are organized, both for purposes of storage and retrieval and for purposes of dissemination to users. A common classification in this first case distinguishes between "data", "records", "files", "data banks" and "data bases". "Data" are the most disaggregate items, and are linked according to some basic organizational device into "records". These in turn are further aggregated into "files" on a larger topic. Multi-topic files are collected into "data banks", which are assembled independent of concern for data formats. This term is frequently used in this report to represent the collections of materials in various libraries and information centers. Highly organized (and normally computerized) data banks that are constructed from disaggregate data, linked into increasingly general records and files are called "data bases". These are carefully and rationally constructed with great concern for data formats, in order to achieve efficient retrieval at any of several levels of aggregation.

Data and information can also be classed according to the format in which they are organized for dissemination. They can be presented as single data items, as individual records, as statistical "tables", or as collections of any or all of these. For the most part, the more disaggregated the format in which they are presented, the narrower the purpose for which they can be used. The following types of information are examples of data that have meaning and can be used in relatively disaggregate formats: rainfall records for a particular station, intelligence reports on a particular place or event, stock exchange transactions for a particular place and time, a census form that has been filled out, a custom record, etc.

Disaggregate data can also be packaged into more aggregate formats. Traditional libraries, for example, tend to confine their data banks to books, reports, journals, maps, microfiche cards,

cassette tapes and so on. In these formats, data have been aggregated into more general packages. Retrieval of the information is at the bibliographic level; that is, it is the package which can be retrieved, rather than the specific sets of information or data within the package. The user must then take the data and information from a number of such sources and manipulate them for his specific purpose.

Recent developments in computer technology permit the user to design his own packages of data and information in an "on-line" mode, at the computer terminal. Data are stored in a data base in disaggregate formats. Whole records or files can be accessed, or parts of them. These can be mixed or matched, as the user wishes.

The final classification of data and information that will be considered here is according to how it is to be used. Because there are a great many uses for information, there are a great many possibly relevant typologies. Generally, however, data are collected and stored for a particular purpose. We are not concerned at this point about the organization of information within a particular system, though this is most important and also directly tied to the end use. We are concerned about identifying classes of data which support particular end uses.

The literature is very fuzzy on this point. Nobody has quite come to grasp a way of classing information or system according to generic types of end uses. Armillas and Coiner (1981) distinguish between administrative systems, management information systems, and policy-oriented systems. Some writers in this area view the term "management" more broadly, and divide it into two classes. One would be "operations" systems, which would include administration of a particular agency or organization. Data and information included would consist of personnel records, finance and budget, equipment and building inventory, and the like. The second class would be the management aspects of policy, program and project selection - the subject matter of the organization's mission.

It is not particularly important to try to resolve this fuzziness. The systems NUPS is recommending are policy-oriented, but are also intended to provide operational support for individual agencies. They are intended to provide information support for management decision-making in the full array of activities essential for the urban planning and development process. It is useful at this point to consider the nature of the planning process and the general types of information needed to support decision-making in this process at various points. The process consists of the following steps:

1. Sensing the environment;

2. Comparing what is perceived in the environment against a standard of what the environment should or could be;

3. Developing policies, programs and projects designed to modify the environment in order to achieve the standard;

FIGURE 5.

TYPES OF INFORMATION REQUIRED TO SUPPORT THE PLANNING PROCESS

STEP IN PLANNING PROCESS	1. Sensing the environment	2. Standards development	3. Development of policies, programs and projects
CLASSES OF INFORMATION SUPPORT REQUIRED (Indicative)	Statistical data; data on legal, financial, fiscal environment; data on social and cultural patterns	experience and training in particular policy area; techniques and methods	much the same as step 1, but more detailed and targeted to specific groups in specific places

	4. Implementation of policies, programs and projects	5. Project monitoring	6. Impact analysis (project evaluation)
	same as step 3, but also more operational data	mainly administrative data; financial and personnel control, inventory; data collection for project evaluation	same classes as step 1, but greater need for highly targeted data, including direct collection of primary data.

4. Implementing policies, programmes and projects;

5. Monitoring performance of programmes and projects; and

6. Evaluating the impact of programmes and projects on the environment.

Information of various types is required to support rational decision-making at each step on the process, and the type of information required will vary with the nature of the decision to be made. The following section indicates the nature of information required to support decisions at various points in the planning/development process. The list is not exhaustive.

Depending on how broadly construed the terms "information" and "system" are, any of the following steps could be executed by the information system as an active participant in the process (with the exception of the development and implementation of policies, programs and projects). The information system organization could perform any or all of these tasks with the noted exceptions. However, many I/S tasks are performed outside the I/S unit for a variety of reasons which will be developed at a later point. Typically, scarce planning and analytic skills are not structured into the information units. Certainly the systems described in this report (for NUPS, the Ministry of Development, and the Urban Development Information Network) would provide information support, rather than function as an active participant.

Step 1, sensing the environment, requires data that are often labelled "statistical data". These include such items as population totals, distribution and characteristics; physical resource characteristics and distribution: legal, financial and administrative environment; and the social and cultural patterns.

Step 2, requires the development of standards. These may be implicit or explicit, they may be general or specific. Typically, they are developed from experience outside of the particular environment to be affected - possible from a mix of previous experience by staff, academic training, and the planning (and other) literatures.

Step 3 involves the identification and development of policies, programs and and projects. These require a wide range of information on law, politics, the characteristics of affected populations, on the technical and financial aspects needed for feasibility analysis, on management and operations techniques.

Step 4 is similar to Step 3, but it requires more specific information on management on operation techniques since it is concerned with implementation.

Step 5, is project monitoring. The monitoring of projects is essentially a part of both system design and implementation. However, the data items are normally much more specific, and more amenable to control. They contribute to personnel, financial and inventory control as well as to progress toward the policy aspects of the mission objective.

Step 6, is impact analysis, also called evaluation. Basically, the same sorts of data are required as for Step 1. Impact evaluation is actually a special case of sensing the environment. The analyst is normally concerned with human populations, and specifically with target groups among these populations. The data needed are typically sociological and are collected by interview and observation techniques. Secondary data are rarely adequate for the specific purpose of impact analysis.

The bulk of the comments made so far in this section are concerned with the data and information required by end users as outputs of the information system. This is often referred to as the content of the system. Little has been said about the means of collecting, organizing, storing or retrieving information. The system for handling information is designed around the information requirements of users, and cannot proceed effectively until the parameters of these requirements are known. Data quality is another aspect of system content which must be considered, but it is not crucial to resolve all data quality issues before designing system handling mechanisms. The section which follows is concerned with aspects of data quality.

Many information systems, particularly traditional libraries, include publications in the system without being particularly critical or evaluative of data quality. This is not an inherent characteristic of libraries, but an accident of their historical development and of the level at which they are staffed and funded. Computer-based systems must normally be very concerned with the quality of data being put into the system, but for reasons of cost, they very often strip away any means for the end user to evaluate the data in the data base for himself. Information systems that are comprehensive in that they include all qualities of data are not very efficient and run the risk of unsophisticated users making decisions based on poor quality data.

The problem, of course, is that data and information for the system must be selected by persons who are specialists in the various particular areas needed for planning. People who are generalists in the overall policy area are also needed. At the same time, libraries are normally staffed, where professionals are available at all, by people skilled in handling information but not necessarily well-informed about the subject matter itself. Such staff are very scare indeed. In the case of computer-based system, which require high quality data at the point of input, these skilled planners with information/computer skills are absolutely essential.

In the case of document systems, they would make the system more efficient but are not required to make it effective. The evaluation of information in the data bank can take place at the point of output, by the end user who is in the decision making role. This is in fact how most document delivery systems work; and while sectoral expertise should be added as the system develops, the urban development system can live with the traditional approach despite the burden it puts on the planning.

Both the end user and the information system staff should be aware of the criteria available for assessing data quality. The following criteria are taken directly from Romagna (1979, p. 109-152). Romagna stresses the need for useful data, meaning they must be relevant and they must be usable. This report has been concerned so far with aspects of relevance, but "usable" is a term which reflects a series of qualitative aspects, including:

1. Validity - the extent to which data in fact measure the concept or categories of things they are supposed to measure. Validity is particularly a problem with "indicators".

2. Reliability - the accuracy or consistency in the measurement process by which data are obtained.

3. Integrability - the extent to which data sources can be combined in analysis, either vertically (increased levels of aggregation), horizontally (different aspects compared at the same level of aggregation) or temporally (time series data).

4. Deducibility - the extent to which information lends itself to making inferences (causality).

5 Representativeness - the extent to which partial or complete data reflects the whole from which it is drawn.

Timeliness of information presented to the end user is another aspect either of relevance, quality, or an outcome of adequate system design and implementation. Users cannot use data which are too old.

PART II: SYSTEM DESIGN CRITERIA

An information system for urban planning and development has the objective of reducing uncertainty in decision-making. It would be ineffective if it did not reduce any uncertainty. It would be inefficient if either the cost of the system were greater than the risk resulting from uncertain decisions, or if the means chosen were more expensive than another alternative for reducing the same amount of uncertainty.

The previous section considered criteria for the information which constitutes the content of the system. The criteria in the following section are selected to assist in the design of the information handling apparatus that is normally thought of when the term "system" is used. The range of possible criteria is very wide, and the criteria have been selected for their applicability to the specific problem of a system for urban planning in Egypt:

1. Effectiveness factors:

   a. Stability
   b. Flexibility
   c. Support for coordination
   d. Timeliness
   e. Usability of formats

2. Efficiency

Stability

Stability may seem to be a strange criterion to stress, but good information systems are a very considerable investment. In order to derive full value, a large initial investment in space, equipment, design costs and initial materials acquisition must be amortized over a number of years of service. In addition, system maintenance costs - the costs of keeping the materials in order and up-to-date - must be predictable. Resources cannot come through one year and be withheld the next. Stability has efficiency aspects, but it is also true that a system which is not maintained will at some point fail to be effective. The information it provides will be of poor quality, slow, and possibly false.

Stability for the information system requires an administrative environment that is stable. It should not be tied too much to the political fortunes of a single agency or a narrow set of persons in that agency. It should provide quality data to a wide range of users, and to the extent possible should not be highly responsive to one set of users while ignoring others. This is not to say that classes of users should not be selected for priority treatment based on mission objectives and priorities.

The system should be carefully designed for many years of services. The "systems" aspect should be carefully thought through and attention paid to the interaction with users at all points. Particularly, their input should be sought in determining what the content of the system should be in terms both of scope and quality. Each information unit should actively and aggressively seek the evaluative input of users on the performance of the system. This input should be put to use to affect daily operations, but also to making basic decisions about how and in what ways the system will grow and provide additional service.

The system should provide a usable product early on and grow incrementally to provide additional service. It should not engage in flashy hardware-oriented delivery systems until it can be shown that these are not risky in terms either of the service provided or the stability of funds required to make them work over the years.

Flexibility

Flexibility is related to stability in that a flexible system permits adding service incrementally and requires a stable administra-

tive environment. Added service can be in terms of growth in the size of the data bank due to wider subject coverage, or increased depth of coverage, or increased detail in the information contained. Added service can also be in terms of additional levels of disaggregation of the data or in terms of additional processing or packaging of the system outputs.

Flexibility also is needed for information systems within specific organizations. They must be able to shift to accommodate changes in the agency mission. In the NUPS proposal, each agency sub-system has obligations both to the individual agency and to the larger urban planning network. There is no present structural arrangement which provides an administrative "home" for the larger system. Therefore it would be unlikely that the links between planning agencies could be very strong at first. However, the need for flexibility requires that an effort be made to construct these links and to strengthen them over time. While it is true that overall administrative structure cannot be designed around an information system, it is also true that the need for information in a multi-sectoral, multi-agency environment has a force of its own. The strength of that force varies with the perception of the need for coordinated, rational planning. It should be possible to construct a system with at least weak links in the early stages of the urban development information network.

Timeliness

Timelenesss is an obvious criterion. Many information systems fail because they cannot provide information when it is needed. This has systems design implications as well as data selection implications. Documents which are unorganized cannot be retrieved, and the organizational arrangement will become increasingly complex as the data bank grows in size and scope. For most "operational" information requirements, the delivery system is sufficiently timely. Organizations have a way of making sure the employees are paid on time, for example. But broad-based information such as required for urban planning frequently suffers from slow collection of input data and the slow delivery of what rapidly becomes outdated information.

The system design must provide for sufficiently rapid delivery given an acceptable range of costs. Many computer-based systems are proposed in order to speed up the delivery of information, but in fact they may not be faster when the time comes to try to use them. It is certainly not yet feasible to computerize the full array of data capture, processing and delivery functions necessary for an urban planning system. Certain narrow information outputs can be automated, especially those involving highly repetitive number crunching or extremely complex operations like linear programming. But very often efforts to introduce computer hardware and software are not so targetted and they often fail. Computer systems, like any other system, can fail for a wide range of additional reasons. These would include inadequate software, mechanical problems, poor design, inadequate administrative support, or inadequate technically-trained personnel. Very often those who promote computers downplay the time it

requires to key-in (input) highly detailed data in highly specific and unyielding formats. They also neglect to consider the time required to develop appropriate input forms, and to write computer programmes. Computer systems normally should be faster than manual systems, but this is true only if everything works.

Another element of timeliness is the speed with which a new system can begin to deliver useful outputs. As suggested above, a computer system has to work exactly right from top to bottom before it can deliver any outputs. This is why they are normally implemented in stages, starting with very narrow and relatively simple operations - usually operations data. Manual document delivery systems can deliver a fairly wide range of outputs in a much shorter time, and have much lower start-up costs. The number of functioning computer systems, especially those that can delivery policy supporting outputs, is very low in developing countries. There are also many unpleasant experiences with manual systems, but their success rate is much higher. Further, without a functioning manual system, these can not be a functioning computer system. NUPS has by no means examined all the manual or computer-based systems in Egypt; but the Planning and Development Technology library, though still in its infancy, is a smoothly operating manual system open to examination by those interested in starting their own systems.

Usability of formats

The formats in which information is delivered to the user are also important design considerations. One consideration is user acceptibility, but evidence on format preferences of users is very mixed and undergoing rapid change. It is not appropriate to attempt to specify formats without knowing the specific requirements of specific sets of users. Formats of output can reflect stylistic preferences of users, or can be matters of convenience. However, format can also be a reflection of the point at which system processing is done. This is essentially a question of organization that affects many design choices, and will be enlarged on at this point.

Up to this point, this report has not distinguished between the overall information system and the organizational units formally (or informally) charged with information tasks in a particular administrative structure. Inevitably the information unit - whether it be called an information centre, a library, a computer centre or whatever - performs some core portion of the overall information system set of tasks. It is important to recognize that systems are larger than organizations and at the same time basic system functions take place within organizations. In other words, the formal organizational structure is rarely precisely matched with a particular system flow. Sometimes the deviations are explicit, sometimes implicit; sometimes planned, sometimes accidental.

The question for the designer of the information system is which tasks to put in the information unit (or units). In terms of output formats in a library, for example, a book is normally provided

to a user by the formal system. The user must then perform additional processing to make the content usable for his purpose, perhaps by reading portions, extracting tables and relating the information to other similar sources. Though the library may be the formal information unit, additional information processing functions are undertaken outside the formal unit. Similarly at the point of input to the system, the information unit may itself capture "primary" data and process these into information within the formal unit. Or it may collect only books in which that data has been assembled (secondary data). In this second case, the task of primary data capture, though a part of the conceptual system, is carried on outside of the organization, perhaps by another organization such as CAPMAS.

It is quite unlikely that all the formal and informal data collection, organization, storing, retrieving, analysis and packing for use by decision-makers would take place within a single unit in a single organization. The design question becomes which tasks should be performed by which units of which organizations for what reasons. These questions will be pursued in more detail in the following section on efficiency.

In terms of deciding the organizational location of formal packaging tasks, there are very basic implications for technological and equipment aspects of the choices. These revolve primarly around the level of aggregation of the output of the information unit. Materials presented at high levels of aggregation require users to disaggregate, analyze, integrate and repackage into a more immediately relevant format. Data provided in disaggregate formats simplify the integration and packaging on the part of the user, but require vast resources on the part of the information unit. The former is the traditional format - the book, journal, microfiche card, etc. - referred to as the "bibliographic" entity. Computers may be useful in handling these materials, but normally only at very large volumes. For the more disaggregate formats, computers are normaly essential.

NUPS strongly recommends that any urban planning information system devote its initial efforts to traditional document delivery systems, both for reasons of efficiency discussed in the next section and because there is not yet sufficient control over relevant, usable data to make inputting storage and retrieval at all effective. Exceptions would (in a few cases) be the operational activities of individual agencies.

Efficiency

Every system design decision must take into account efficency - the amount of effectiveness per unit of cost - whether this is explicit or implicit. This is implied in the term "rational" decision-making. However, it must be recognized that non-rational elements are present in most decisions made by real people, and that it is sometimes more costly to develop explicit cost-benefit ratios than they are worth.

It is important to conceive of the system as a whole, independent of the organizational location of components of the system. The larger or more critical components should be identified. These normally include the scope of the system content, data collection methods, level of aggregation, organizational location for component sub-systems, data organization and retrieval mechanisms, and dissemination formats. Alternative means of implementing these aspects should be delineated, their benefits identified and a value (at least in order of magnitude) indicated where possible. Then the cost of each alternative should be specified in whatever detail is possible. Costs include money and non-money costs, and they include the costs of inputs as well as the costs incurred by negative impacts.

It is frequently quite difficult to assess the value of a benefit, though it is sometimes possible to show the impact of not having a relevant piece of information. Input costs are frequently quantifiable, while negative or positive impacts of a decision can often be stated only in qualitative terms. Indeed, one of the problems with information systems is that their costs are often quite visible, while their benefits are quite difficult to quantify. The result is that many systems are underfunded, while others cost far more than the impact they might have on decision-making justifies.

One of the main organizational decisions to be made is determining what tasks in the overall system are to be put into what organizational units. Often, this becomes a question of the degree of centralization. An organization can have one or more information units. Where there is more than one, they may be differentiated for any of several reasons. The units may support different subordinate organizations in a larger organization. The Ministry of Development has several such units, in GOPP and ACR for example. Information units may support specific operational tasks within an organization, such as personnel, budget preparation, accounting, or inventory. Multiple units may be created in a vertical pattern, with one unit responsible for primary data collection, another one for computing, another one for document storage, and another one for publishing, for example. In large organizations, there is often a mix of patterns. These often develop as accidents of history, rather than as the result of an explicit administrative organizational strategy. In Egypt, it appears to be the case that organizations respond to change by layering in new organizational units, rather than by discarding those that are no longer relevant. While this technique may meet the immediate need of particular agency managers, it cannot be considered especially efficient.

Typically, resource costs are minimized when information activities are centralized. Economies of scale are numerous and generally of high magnitude in information processing. The costs for classification systems are a good illustration.

For U.S. libraries (and similarly for European libraries), the classification of books, etc. has undergone substantial change since Melville Dewey introduced his system in 1876. Very little of this

change has to do with the content of the various classification systems. Instead, the dramatic changes have occurred over the sharing of classification tasks among libraries - and the resulting economies of scale. In 1978 it cost one U.S. Government library approximately $12.00 per volume to classify on its own, and this included staff costs only.3/ At the same time, the U.S. Library of Congress could recover the bulk of its costs by selling catalogue cards at $.35 per set. By distributing its cost among hundreds and even thousands of libraries who no longer had to do the classification themselves, immense savings were had by the overall system. In recent years, even this cost has been sharply reduced for most books. The integration of the majority of U.S. libraries into a shared computer cataloging system means that a book need be catalogued in the U.S. only once - and the particular classification scheme used by the library is no longer a constraint. This is not to argue for computers, though they were highly appropriate for the U.S. environment, but to argue for the often dramatic savings available from doing things on a big scale.

In the 1979 Statistical Abstract of the United States,4/ Federal Government library workers showed the highest rise in productivity of all Federal workers - about four times higher than for all American workers. This statistic for 1978 was only moderately higher than the annual rate for the previous five years for the Federal librarians. The rise is due almost entirely to shared cataloguing and other shared bibliographic countrols.

As an aside, but an important one, it should be pointed out that both of these shared cataloging phenomena took place without benefit of a large administrative structure. All participation of information activities was voluntary, much of the service was based on the commercial products of private companies, and most links were informal ones which mainly took place in the meetings of the various professional organizations of tha U.S. library community.

The two examples of economies of scale above are indicative of a number of other classes of library and information processes which benefit from economies of scale. Such economies are only diminished signficantly by higher costs of administering big organizations (largely avoided with the NUPS proposal for an Urban Development Information Network) and slower retrieval times in manual systems that grow to be very large. Again, NUPS expects to avoid this to a large extent by developing smaller agency sub-systems linked together.

The NUPS proposals for the Ministry of Development and for the broader urban system do not attempt to consider each of the design aspects in detail or the cost-benefit ratios associated with them. That would have to be done as part of a more substantial effort at a later date. It is, however, proposing a system which it is hoped will take advantage of many economies of scale at the agency level without incurring the very high costs of a complex administrative machinery, and without requiring a complex and uniform classification scheme. Efficiency is an extremely important factor in designing and main-

taining an information system. It must be sought not only at the general level indicated in this report, but in the design of every aspect of each specific system.

FIGURE 6.

INFORMATION SYSTEMS

RANGE OF POSSIBLE COSTS AND POSSIBLE BENEFITS

COSTS	BENEFITS
Inputs-- - Staff: professional, technical, clerical, etc.* - Equipment and supplies* - Space (office space)* - Utilities* - Published materials* - Stability of incremental financing* - Demands on managers - Good will used	
Impacts-- (Risks) - failure to deliver any outputs - delivery of information too slow - delivery of false information Can lead to-- - dangerous and misguided policies, programs and projects - use of scarce resources that could have been better used elsewhere - damaged reputations - administrative disruption - political instability * Usually quantifiable with sufficient precision as to be usable.	Delivery of more information, faster delivery, or more accurate information will normally lead to improved policies, programs and projects to improve quality of life at a lower cost. By-products of successful information systems could include: - enhanced reputations - improved administrative performance - increased political stability

APPENDIX C

FOOTNOTES

1/ Romagna, John R. Data, Decision and Development: Strategy and Issues of Information Management in the Public Sector. Washington, D.C.: U.S.AID. 1979.

2/ Armillas, I. and J. Coiner. Data Management Systems in Human Settlements Planning. Nairobi: UNCHS (Habitat). 1981.

3/ Derived from the Monthly reports of the Library and Information Services Branch, U.S. Bureau of the Census.

4/ U.S. Bureau of the Census. Statistical Abstract of the United States. Washington D.C.: U.S. Government Printing Office. 1980.