EGYPT ENVIRONMENTAL STATISTICS SYSTEM

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Abstract

In this paper it is applied the concept of a statistical system in general to the Egypt environmental statistics system. This system is one piece within the larger national statistics system. Therefore some of the high-level management issues regarding data access and dissemination may be resolved by others outside of the agencies specifically responsible for environmental information. The broad questions of how the overall Egyptian statistical system is or should be designed go beyond the focus of this study; they are the subject of another report being prepared concurrently with this one.1

This article considers the institutions that make up the environmental statistics system, the roles they play, and how effectively the system is working. The next chapter discusses the data themselves, identifying strengths and gaps in the data collected and in the systems for making them available to users.

Key words: statistics, environmental statistics

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1. Major Institutional Player and Their Roles

Three Egyptian institutions are playing or could play cross-cutting roles in the Egyptian environmental statistics system; the Egyptian Environmental Affairs Authority (EEAA), CAPMAS, and the Integrated Decision Support Center (IDSC).

Egyptian Environmental Affairs Agency

EEAA, an arm of the Ministry of Environment, has basic responsibility for managing environmental statistics for the country. Law 4 of 1994, which created the agency, gives it the following duties (among others):

1 Forthcoming studies on Egyptian statistical policy by Donald Eldridge, Consultant to the DATA Project, Ministry of Planning.

a. Gather national and international information on the environmental situation and the changes affecting it on a periodical basis in cooperation with the information centers of other agencies, publish such information and evaluate and utilize it in environmental management and planning.
b. Participate in the preparation and implementation of the national programme for environmental monitoring and make use of the data provided thereby.
c. Compile and publish periodic reports on the main environmental indicators.
d. Prepare an annual report on the environmental situation to be submitted to the President of the Republic and the Cabinet, a copy of which shall be deposited at the People's Assembly.

This mandate gives EEAA a central role in compiling data collected by other agencies, processing them, and disseminating them. No other agency has this explicit responsibility for environmental data.

EEAA has been able to compile some of the key environmental data produced by other ministries. They are using the public data of other ministries, such as the Office of Energy Planning's work on energy use and greenhouse gas emissions. More importantly, they use some data that are not public, such as information on solid waste management from the Ministry of Local Development and the governorates. However they have not been able to negotiate arrangements with some other key data producers, notably MWRI and MOHP, to receive their environmental monitoring data. While EEAA is mandated to compile such data, they do not have the authority to compel other ministries to share them.

EEAA is disseminating a great deal of information about the environment and about Egyptian environmental management issues through its website, http://www.eeaa.gov.eg. They are using the web to streamline many activities, including environmental impact assessment, management of hazardous materials, identification of donor projects, development of cleaner production technologies, and many other activities and information sources. The development of their website has clearly been a priority within EEAA, and it is an excellent source of information about their activities.

They agency has also invested considerable resources in environmental quality monitoring, with the support of several donor projects. This has led to the development of a number of well-structured databases on specific environmental quality issues, notably air and coastal water quality. Information systems development has also been a clear focus of attention within EEAA, and they have well-designed systems to manage data on solid waste, environmental impact assessments, industrial inspections, and other activities within their mandate.

A broader perspective on environmental monitoring could strengthen this system. This would involve broad strategic thinking about the information needed to effectively manage Egypt's environment, and a systematic effort to ensure that those data are being collected, disseminated, and used. EEAA is well aware of the data being produced in other ministries, and of their inability to access some of them. They do not have a clear sense of which data are not being produced at all, or of any substantive policy need for additional raw materials. If an overall information system plan exists, we did not hear about it. The focus of EEAA's work seems to be at a more detailed level, with more emphasis on developing the software for data management than on ensuring that the data themselves are available and are used.

EEAA's dissemination of statistical data is also modest in scope. The only information readily available to the public is the series of monthly reports on air and coastal water quality, disseminated on the Agency's website.2 The Agency prepares reports on greenhouse gas emissions, industrial inspections, and other environmental issues, but they are for internal use and are available to other government agencies or outsiders only upon special request. Some raw data are also made available upon request; for example, we were told that researchers could access the raw data on air and water quality if they demonstrated that they would use them for legitimate purposes. The reason for requiring that each request be individually approved was, according to EEAA staff, to minimize the chance of the information being misused.

Aside from the air and water quality monitoring reports, we did not see any documentation of the data being collected. We requested and received lists of the variables stored in the databases on solid waste, industrial inspections, and environmental impact assessments (EIAs), but these included little or no descriptive information beyond the variable names, and were not intended to serve as data documentation for people outside the information systems group in EEAA.

EEAA has contracted with the Center for Environment and Development for the Arab Region and Europe (CEDARE) to prepare the 2004 state of the environment report. In the past these reports have been made available to the cabinet of ministers, but so far none has been published. Several reasons have been suggested for why these reports have not been made public – that the data on which they were based were not good enough, that EEAA and CEDARE could not access the data needed to prepare the reports, that they do not reflect well on the country – but we do not know which of these

2 Available at http://www.eeaa.gov.eg/eimp/airreports.html (air) and http://www.eeaa.gov.eg/eimp/ cwreports.html (water).

reasons is accurate. Both CEDARE and EEAA expressed hope that the 2004 report, which has been circulated in draft, will be approved by the new Minister of Environment and published by the end of the summer.

CAPMAS

CAPMAS is Egypt's national statistical agency, with basic responsibility for primary data collection and dissemination. They are the agency with legal authority to compel citizens and businesses to provide information for public use, and they conduct the census of population, the census of manufacturing, and many other basic data collection activities. They also have the authority to issue permits to other governmental and private agencies to collect primary data.3

Presidential Decree No. 2915 of 1964, which created CAPMAS in its current form, gives the agency several key responsibilities in the national statistical system:

> **Article 9:** CAPMAS shall develop an annual program for statistical publications, bulletins, indicators and data required for the sectors of the state through coordination with the authorities concerned. CAPMAS itself may take up issuing all publications, indicators and statistical data produced by the state's authorities or part of them. In such case, publication process shall be deducted from the budget of the agency concerned.
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> **Article 10:** Any ministry, authority or agency or any individual, individuals in the government, public sector or private sector may - through any of the publication media or mass media - not publish any publications, results or statistical data or information from any source except from the reality of statistics of CAPMAS. The statistics that are not included in the programs of CAPMAS may not be published without an approval of CAPMAS.

In practice, CAPMAS plays some, but not all of these roles. They do a lot of census and survey work, and provide the base data used for other purposes, such as the construction of the national income accounts. They have an annual program of statistical publications and bulletins. However their data dissemination system is not strong. Among prospective users of data, one of the major complaints is that CAPMAS data are issued too late to be of use, or are not available at all. Routine statistical publications are available to

3 For additional discussion of CAPMAS's role in the Egyptian statistical system, please see the reports produced concurrently with this one by two other consultant to the DATA Project, Frank Cajthaml and Donald Eldridge.

other government agencies but not to the public. Moreover, despite their authority to disseminate the data of other ministries, they do not have the authority to compel those ministries to share information. Like EEAA, they must negotiate with other ministries for access to information, and frequently CAPMAS is not in a strong enough position to succeed in those negotiations.

CAPMAS is involved, along with a number of other government agencies (IDSC, Ministry of Local Development, Ministry of Housing, and so on) with an elaborate hierarchical network of data collectors throughout Egypt. This network was initially conceived as a way to create jobs for educated young people at the local level. One person in each satellite community – the lowest level in the hierarchy of settlements and local governments in the country – has been hired to collect information about his or her community. The data collectors are all high school graduates, and many have completed university. They are responsible for gathering information about their villages as needed by the government agencies involved with this system. Nationwide some thirty-two thousand people are part of this data collection network, including individuals at all levels in the hierarchy of settlements and local governments. They have provided data to donors and to IDSC, and are apparently a source of information needed by the Ministries of Housing, Local Development, and perhaps others. They collect social and demographic information about households, but do not collect physical measurements about the environment4 this network might play a role in future development of environmental statistics.

CAPMAS created an environmental statistics department in 2003. Because it is new, the department does not yet have strong connections in EEAA and the ministries collecting environmental data, and they do not have access to most of the environmental information.5 The DATA Project works closely with CAPMAS, and this consultancy was used in part to help the new department build its ties to other ministries. Mrs. Nadia Idrees, Director of Environmental Statistics, accompanied Dr. Hecht to most of her meetings, as did some of the other department staff.

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4 For additional information about this network, please see the report produced by Frank Cajthaml for the DATA Project.

5 Interestingly, they have been able to obtain the Ministry of Health and Population reports that EEAA has trouble accessing; it is not clear how they accessed those documents.

The department staff is working to define its role in the environmental statistics arena and to identify needs for survey work and for an environmental statistics bulletin. If the bulletin is available to the public, it should play a useful role in data dissemination. If additional surveys are developed in the environmental arena, as suggested in the recommendations in this report, CAPMAS may be involved in conducting them. This report also recommends development of a comprehensive system of environmental metadata. If this is pursued, CAPMAS could be a key player in surveying projects and agencies to locate data sources.

Integrated Decision Support Center (IDSC)

IDSC exists to provide information and decision support to the Office of the Prime Minister. They also have a broader role as an information center for the country as a whole. They have built a website through which they hope to provide a wide range of statistical information about the country, called the Egypt Information Portal.6 Based on a cursory review of the information on the site, it appears to be too general to meet most serious statistical needs. IDSC expects to expand this portal over time. As statistical information becomes available on the websites of other ministries, they also expect to link to those sites to lead users to more data.

IDSC is also seeking a role as a creator of metadata about Egyptian statistics and as a clearinghouse for information. They have built a National Data Directory, in which they hope to document databases in and about Egypt.7 Like their information portal, it is in the early stages of development. Although it has a place-holder for environmental statistics, right now there is almost nothing there. Neither the statistics themselves nor the information about available data includes specific details about exactly where data come from, how they have been calculated, or how the user can access them.8

IDSC is currently developing metadata about the databases maintained by the MWRI, which are to go up on their site as soon as they have received ministerial approval. The willingness of MWRI to make their metadata public and to rely on IDSC to publish it suggests that IDSC could come to be a major player in accessing information about sources of Egyptian statistics in the future. Unfortunately we could not access the MWRI metadata during this consultancy to assess their completeness; MWRI staff

6 http://www.eip.gov.eg/sources/international_dalel.asp.

7 http://unstats.un.org/unsd/environment/indicators.htm.

8 For a detailed discussion of the IDSC website, see the report produced by Frank Cajthaml, on a DATA Project consultancy carried out concurrently with this one.

said that IDSC had to authorize us to see them in advance of their inclusion on the website, and we were not able to contact the appropriate IDSC staff about the matter.

If the additional work on environmental metadata recommended in this report is implemented, IDSC may play a major role in the effort. Their existing relationship with MWRI may be helpful in encouraging other ministries to join the effort, and their website and data documentation expertise will be essential. This is discussed further in the final chapter of this report.

2. Collectors of Primary Data

Many government ministries and donor projects collect data related to the environment. Some of the key players in the data collection arena are described below. This is by no means a comprehensive list; it will be expanded if additional work is pursued on the development of environmental metadata. The next chapter of this report presents more detailed information about specific databases whenever we have it.

Ministry of Water and Irrigation: Collects data on flows of water in the Nile, the networks of canals flowing off the river, the networks of drainage systems into which water runs off the fields, and groundwater. MWRI also maintains a network of water quality monitoring stations throughout the country. The Ministry is major player in the collection of primary data on the environment.

Ministry of Agriculture and Land Reclamation: Conducts the census of agriculture, which provides data about each crop cultivated. If anyone has data on use of agrochemicals, it will be this ministry. They should also have spatial information on arable land, soil characteristics, and other land-related data. They have collaborated with MWRI on the development of spatial data systems.

Ministry of Health and Population: Maintains ambient data on air and surface water quality. Tests drinking water and should have data on its quality. Maintains health statistics, some of which can be used to address environmental health issues.

Ministry of Local Development (MLD): Responsible for solid waste management. They obtain data on trash collection from the governorates, and pass some of the information on to EEAA, although we could not determine exactly where those data come from or on what they are based. They also are involved with the network of thirty-two thousand data collectors, from which they obtain data on village characteristics such as access to sanitation and drinking water; these are managed in a GIS within MLD.

Ministry of Housing: The Ministry is responsible for sanitation and drinking water. They maintain information on access to sanitation and drinking water at the local level, though we were not able to determine the exact nature or source of those data.

Ministry of Petroleum and Natural Gas: Data on types of fuel used by sector, stocks of oil and natural gas, extractions, and other data on energy sources. In the past, some of these data were readily made available to the Office of Energy Policy (OEP) for analytical use and publication of reports, including "Energy in Egypt," an annual statistical survey of the sector. Since OEP was moved from the Ministry of Petroleum to the Ministry of Planning, they have had trouble accessing data on energy sources.

Ministry of Electricity: Data on electricity generation and use and thus on energy use. These are made available to OEP for use in its analytical work and inclusion in "Energy in Egypt."

Cairo General Organization for Sewage and Drainage (GOSD): GOSD manages the sewage collection and treatment system for Greater Cairo. They collect operational data on their system, data on the quality of industrial discharges into the system, and data on the quality of treated water discharged from the sewage treatment plants into the Nile. They produce reports on these data for internal use, though some of the information also has broader environmental implications.

3. Data users

Identifying the users of environmental data is difficult, but essential to ensure that the statistical system meets its needs. When data are made available only to a restricted set of users, as is the case with most Egyptian data, the users are identified as those who receive the reports. Thus EEAA, MWRI, GOSD, and other agencies reported that their reports are produced for their managers and technical staff, their ministers, and the Cabinet of Ministers, and they identify these people as the users of their information.

When the data are public, as in the case of the EIMP environmental quality monitoring data, the data producing agencies often report that they are used by "everyone." They do not track who downloads their data, so in fact they do not know who uses the information or for what purpose. This is quite easy to find out, however, especially when data are distributed through the web. By requiring those who download reports to identify themselves and indicate how they will use the information, EEAA or other ministries will have some understanding of the demand for their data. Such information could also be used to identify those who should participate in data user groups, which should be formed to advice on additional data needs.

The formation of data user groups may be an effective way to fill the most difficult gap, the identification of unmet information needs. By bringing together data producers, those already known to use the available data, and those whom we might expect should be interested in the data, discussion can be initiated that helps ensure that each group understands the others' needs and constraints, and the products produced will be more likely to meet the consumers' needs. For the Egyptian environmental statistics system, user groups (probably more than one, focusing on different subject areas within the statistical system) should include:

- Ministries that produce data
- Government agencies playing a cross-cutting role in the system, i.e. EEAA, CAPMAS, and IDSC
- Consulting firms working on environmental issues
- Non-profit organizations working on environmental issues
- Trade associations working in relevant fields
- Donor agencies
- Academic researchers

4. System for disseminating environmental information

An environmental statistics system should include an effectively implemented strategy for dissemination of statistics, based on an understanding of the users and their information needs. For the most part this does not exist in Egypt. The only information regularly made public includes summary reports of the air and coastal water measurements carried out by EEAA's Environmental Information and Monitoring Program (EIMP). This system was set up by DANIDA and has been continued by EEAA with the end of foreign funding. Beyond this, the default approach in all of the ministries contacted is that the data are for internal use within the ministry, or for carefully arranged exchange with other ministries, but are not for public use.

The EEPP-Air paper "Air Quality Information Dissemination Plan" is the only attempt to think strategically about data dissemination that we identified. It identifies how specific data products would be used. Its focus is on air quality early warning, so it calls for:

- A daily air quality index used by individuals to modify their own behavior, to reduce either their exposure or their contribution to air pollution.
- Daily weather and pollution data used to anticipate possible "black cloud" incidents, so that EEAA and the Ministry of Environment can coordinate with the MALR to prevent them.

It then recommends how the data used to create these indicators should be accessed:

- The wealth of air pollution studies produced by CAIP, EEPP, and other projects should be made available on the web so that any interested stakeholders can make use of them.
- Monthly air quality reports should be produced and put on the web for public access.

An information dissemination system – or several plans, in different areas – for the broader environmental statistics system will address similar questions, but with regard to a much broader range of information needs. It will be the outcome of discussions between data suppliers and users. Such plans must identify information products needed, how they are likely to be used, and the dissemination methods needed to ensure that they are used. They must also identify needs for interagency collaboration and data sharing. Whenever there is not a compelling security argument for doing otherwise, the full databases should be made available on line for use by the public, in the most detailed format that will protect the identities of individual survey respondents.

Available Environmental Statistics

This chapter describes the environmental statistics that could be identified within the relatively short time frame of this mission. The information presented here comes from a variety of sources, including personal visits to many ministries and agencies (listed in Appendix B), other documents consulted during the mission, and prior work in Egypt by the author of this report while consulting to EEPP on environmental indicators.

This list is by no means complete. We were not able to visit all ministries that might have comprehensive data pertaining to the environment, often because the importance of certain agencies or types of data did not become apparent until it was too late in the mission to pursue them. Moreover in the ministries we did visit, we surely have not identified all of the available information sources. In particular, more information on agricultural pollution and land use/ land cover is surely available from the Ministry of Agriculture, and more information on sanitation and drinking water supply should be available from the Ministry of Housing. Other data are certainly available from EEAA, MWRI, and MOPH. Additional data on industrial pollution may be available from the Ministries of Industry and Interior. We have not been able to systematically determine the extent of collaboration

on spatial data, particularly whether standardized base maps of Egypt are shared among all developers of geographic information systems.9
Nevertheless, this compilation provides a good point of departure for a more systematic effort to identify and document sources of environmental information in Egypt. One of the key recommendations of this study is that the key organizations involved with environmental statistics work together with the DATA Project over the next year to carry out that identification and documentation, to produce comprehensive metadata on environmental information sources. Additional information from readers of this study about other data sources will be welcomed by the DATA Project.

Data Frameworks

Actors within the Egyptian environmental statistics system have not agreed on which data should be part of their system, or on a general framework for organizing statistics. Such a framework would be useful, because it would define the universe of information to consider in allocating roles within the statistical system and make it easier to identify gaps in the system. For this reason, before reviewing the specific data sources, we will consider several data or indicator frameworks suggested by other organizations, to see whether any of them would be useful in describing the environmental statistics system.

UN Statistics Division Framework

This framework for environmental indicators was developed through the UN Statistics Division in the 1990s.10 Like many indicator frameworks, it is based on the pressure-state-response (PSR) framework. The PSR framework differentiates pressures that affect environmental quality, the state of the environment (before the pressure, once it has occurred, and after society responds to changes in state due to the pressure), and societal responses to changes in environmental quality. This is useful because it makes clear the differences between ambient quality of air, water, or other media, on the one hand, and the human pollution, population growth, or other activities that can affect environmental quality, on the other hand.

9 A consultant will be coming to Cairo through the DATA Project early in the fall to consider this issue in particular.

10 Details on this framework may be found on the web at http://unstats.un.org/unsd/environment/ indicators.htm.