

Developing a National EIS Strategy

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What is an Environmental Information System (EIS)

Given the significant pressures on natural resources in Malawi, the dynamic state of the environment demands information that is both timely and accurate. The proliferation of information technologies has allowed for greater access and dissemination of environmental information. A sustainable EIS is used to describe the institutional and technical infrastructure that routinely produces and uses environmental information to improve environmental and natural resource management. Geographic Information Systems (GIS) and Remote Sensing are information technologies that can be viewed as a driving forces behind this process.

As shown in the Middle Shire Report, such routine environmental monitoring and the use of information technologies can focus on obtaining information on environmental “hot spots” in which more intensive investigation may be carried out (Snel et. al., 1998 and Haan, 1998). As will be described in more detail below, a sustainable NEIS includes in-country capacity to address four components : 1) to develop an environmental data infrastructure, 2) conduct routine environmental analysis, 3) establish an environmental decision support network, and 4) provide for EIS oversight (Figure 1).

Effective decision making and the development of environmental management strategies must be demand-driven and participatory in nature in order to include the many local to national environmental decision makers and stakeholders. As a consequence, environmental information development must be distributed ensuring that capacities are developed at many different levels. In the end, success of an environmental information system will be judged according to the type and quality of environmental decisions that result.

Key Issues for Developing a NEIS

In order to replicate the analyses found in the Middle Shire Report and to develop a sustainable National Environmental Information System (NEIS) strategy, four areas need to be developed by the Government of Malawi: 1) environmental data infrastructure, 2) environmental data analysis, 3) environmental decision support network, and 4) EIS oversight. To develop each of these areas and the questions they pose, institutional, human resource, technical, and financial issues must be addressed and resolved.

1. Developing a National Environmental Data Infrastructure

The development of an in-country environmental data infrastructure entails the routine collection of core environmental data sets. It is important that such environmental data sets are managed adequately to ensure that they are easily retrievable and interoperable as environmental concerns arise. The ability to supply

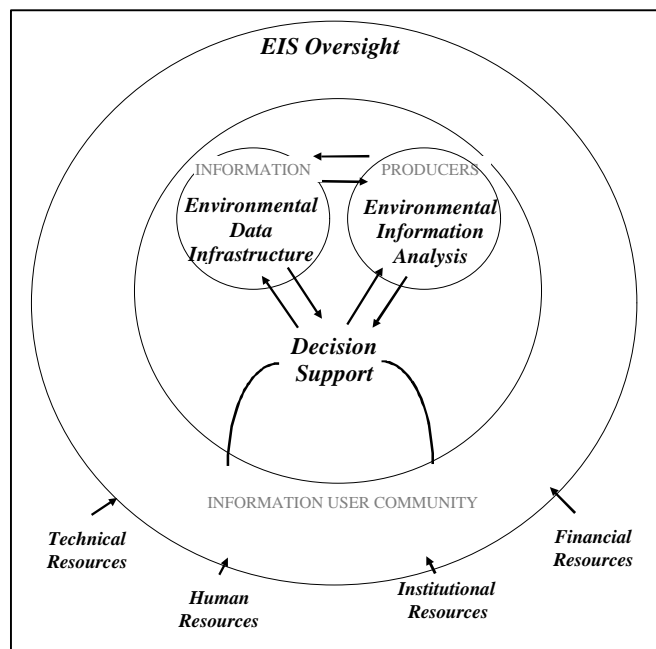


Figure 1: Components of an Environmental Information System (EIS).

environmental data from a variety of sources is facilitated through the development of data standards and an environmental data infrastructure that allows for proper archiving and regulated accessibility. This ensures that environmental data used for environmental decision making is of the highest accuracy and integrity.

Objective: Identify environmental data needs how they should it be compiled to ensure good quality and routine collection.

Key Institutional Issues to Resolve

- Identify departments to be involved in routine collection of environmental data.
- Encourage routine environmental data collection.
- Identify mechanism for coordinating the collection of environmental data catalogues.
- Establish national environmental data standards
- Identify coordinating department for coordinating national standards.

Key Human Resource Issues to Resolve

- Acquire skilled staff to routinely collect environmental data.
- Develop mechanism to retain skilled staff.

Key Technical Issues to Resolve

- Identify technical capacities to routinely environmental data.

Key Financial Issues to Resolve

- Identify financial resources to support routine collection of national environmental data.

2. Conducting National Level Environmental Data Analysis

Multidisciplinary environmental analysis is required to routinely address environmental concerns as they arise. Such environmental analysis may be conducted to help identify environmental “hot spots” (e.g., as done in the Middle Shire assessment) or to carry out elaborate analyses within specific areas of environmental concern. Highly trained technical staff are required to conduct routine multidisciplinary environmental analysis. Such multidisciplinary analysis may span biophysical and social explanations of environmental change and result in recommendations on mitigation strategies as needed by environmental decision makers.

Objective: Build capacity and infrastructure to conduct routine environmental analysis.

Key Institutional Issues to Resolve

- Identify institution and individuals to conduct routine environmental analysis.

Key Human Resource Issues to Resolve

- Acquire skilled staff to analyze environmental data.
- Develop mechanism to retain technically skilled staff.

Key Technical Issues to Resolve

- Identify technical analyses required.

Key Financial Issues to Resolve

- Identify required financial resources to support routine national environmental analysis.

3. Establishing a National Level Environmental Decision Support Network

An EIS is intended solely for the support of environmental decision making and to improve environmental conditions and management. It is critical that national to local environmental information users and providers are adequately linked such that: 1) environmental information is collected with respect to user demands; 2) environmental information is adequately disseminated to all relevant environmental decision makers and stakeholders; and 3) adequate support is given for environmental information usage. An EIS needs to accomplish these tasks on a routine basis.

Objective: Identify infrastructure to ensure that national to local environmental information users and producers are adequately linked.

Key Institutional Issues to Resolve

- Identify individuals and institutions to coordinate routine environmental information forums to routinely assess environmental information needs and disseminate environmental information.
- Identify frequency of environmental information forums.

Key Human Resource Issues to Resolve

- Develop capacity to conduct environmental information forums.

Key Technical Issues to Resolve

- Develop technical resources to link environmental information producers and stakeholders.

Key Financial Issues to Resolve

- Identify financial resources needed to conduct effective environmental information forums.
- Identify financial resources needed to support environmental information usage to improve natural resource management.

4. Developing EIS Oversight

This is the most important component of an EIS. An effective EIS implies that all activities are coordinated and integrated. EIS oversight requires that a committee, forum, or institution is mandated to oversee and coordinate that: 1) environmental data are routinely collected according to standards and user demand within respective institutions; 2) environmental analysis draws from multidisciplinary expertise and is routinely conducted to satisfy user demands; 3) environmental information needs are routinely assessed and information routinely disseminated, and 4) environmental support are routinely reviewed to encourage environmental information usage (e.g., review of extension, environmental support funds, and policy).

Question : Develop infrastructure to oversee the development and implementation of a National EIS.

Key Institutional Issues to Resolve

- Identify activities required oversee and coordinate the development of the EIS.
- Identify institution to coordinate national EIS activities.

Key Human Resource Issues to Resolve

- Identify capacities needed to develop an effective EIS oversight.

Key Technical Issues to Resolve

- Identify technical resources needed to ensure EIS oversight.

Key Financial Issues to Resolve

- Identify financial resources required to support the oversight of the national EIS.

EIS-Related Activities in Malawi

The following capacity presently exists in Malawi to routinely monitor the environment towards improving its management.

Development of an environmental data infrastructure in Malawi

The development of an environmental data infrastructure in Malawi has to date focused specifically on building technical capacity in the following institutions (where technical assistance has been provided by Clark University and the University of Arizona¹): the Department of Forestry to routinely monitor land cover change;

¹ Technical assistance by Clark University and the University of Arizona through the Environmental Monitoring and Assessment Program (MEMP) activity. The MEMP activity has been funded by the World Bank since 1993 to the present. Local currency funds for EIS related activities are provided by the Government of Malawi.

<p>[VERSION] MALAWI DIGITAL STANDARD METADATA FORMAT PROVISIONAL VERSION 1.0 [DESCRIPTION] Machinga, YU2500 (TD) Malawi 1:50,000 Metric Edition tile. [STATUS] Provisional [COPYRIGHT] (C) of original digitised data: Department of Surveys, 1998 Government of Malawi [FILE ORGANISATION] [File Structure] [transfer level] Level 1 [format] Arc/Info Export (.E00) File IDRISI Vector (.VEC, .DVC) File DXF (.DXF) File [version] Arc/Info 3.1 IDRISI 2.0 [Number of Files]</p>

the Ministry of Agriculture to routinely monitor agricultural yields and soil loss; the Meteorology Department to routinely monitor rainfall and rainfall energy, and the Department of Surveys to provide core mapped environmental data sets. Furthermore, to ensure the future management and interoperability of in-country environmental data, technical assistance was provided to the Department of Surveys in developing environmental data standards (Figure 2). Many other in-country efforts exist contributing to an in-country environmental data infrastructure but have not yet been coordinated. These include, for example, data collection efforts at the National Statistical Office, Famine Early Warning System (FEWS) project, Department of Fisheries, and National Parks and Wildlife Department.

Conducting environmental data analysis

The development of in-country environmental data analysis capacity has included: 1) four annual training cycles (including an introductory, intermediate, and advanced course) in environmental monitoring using Geographic Information Systems, Remote Sensing, and Global Positioning System (GPS) - to date approximately seventy individuals have been trained; 2) specialized courses in environmental monitoring including ground truthing and participatory rural assessment within various GOM agencies; 3) development of a University curriculum in the Environmental Studies program; and 4) completion of select environmental analysis case studies such as the Middle Shire and Public Land Utilization Study (PLUS). Other in-country environmental analysis capacities exist, for example, training in social analysis in the National Statistical Office, the Center for Social Research, Agricultural Policy Research Unit, and various NGO's and training in natural resource management in Natural Resources College, Malawi College of Forestry and Mpwepe College for respectively agriculture, forestry, and fisheries extension staff.

Development of in-country Decision Support

The development of in-country decision support includes the development of environmental legislation/policy initiative (e.g., the Environmental Management Act, National Environmental Policy, NEAP, Fisheries Conservation and Management Act, Forestry Act, and Biodiversity Act); in-country environmental support funds (e.g., Environmental Support Fund and Malawi Social Action Fund); in-country extension services (e.g., agricultural extension, forestry extension, NGO project, various other environmental related initiatives); and environmental awareness programs.

Development of in-country EIS Oversight

Technical assistance has been provided on the development of a national EIS. This has included Eastman, Toledano, and Hutchinson (1994) initial proposal on the development of a national EIS and technical assistance to the EIS Design team (1997), USAID's Strategic Objective assessment (Eastman, Snel, and Haan, 1998), and EIS task force (1998).

Requirements for the Continued Development of a National EIS in Malawi

The development of a National EIS in Malawi has to date focused on primarily technical capacity building. The next phase in developing a National EIS will require focusing on institutional capacity building ranging from addressing and reviewing institutional mandates and job descriptions with respect to environmental data, collection, analysis, dissemination, and usage to legislating and regulating environmental data collection, analysis, dissemination, and usage. It is recommended that a National EIS Policy is developed to address and regulate these institutional issues.

Requirements for the Development of an Environmental Data Infrastructure in Malawi

A national environmental data standard policy – such as presently being developed by the Department of Surveys - needs to be legislated and regulated. In addition, as part of the National EIS Policy (see section below on “EIS Oversight”), institutional mandates need to be reviewed with specific regard to routine environmental data collection. This will include addressing such institutional issues as the development of specific job descriptions in routine environmental data collection, development of strategies to acquire and retain skilled staff, and development of environmental data sharing and pricing strategies (e.g., cost-sharing environment for data providers).

Requirements for the Development of In-Country Environmental Analysis in Malawi

As a part of the National EIS Policy (see section below on “EIS Oversight”) a section that specifically addresses institutional issues related to routine environmental analysis will need to be developed and regulated. This will focus on such institutional issues as: who will routinely coordinate environmental

analysis forums; how often will these forums will be coordinated; who will be involved in routine multidisciplinary environmental analysis; how may such skilled environmental analysts be retained; how will these forums be funded; and who will coordinate capacity building initiatives to strengthen in-country environmental analysis (e.g., development of university and extension environmental curricula).

Requirements for the Development of In-Country Environmental Decision Support Network

As a part of the National EIS Policy (see section below on “EIS Oversight”) a section specifically addressing the institutionalization of an environmental decision support network will need to be addressed. This will include institutionalizing: who will be responsible to coordinate environmental information needs and dissemination forums; who will funds these environmental information forums; and who will review existing environmental decision support structures and make recommendations towards strengthening these structures (e.g. routine review environmental support funds and extension).

Requirements for the Development of In-Country EIS Oversight

A National EIS Policy needs to be developed and regulated. A National EIS Policy should specifically focus on institution building for the development of an in-country environmental data infrastructure, environmental analysis, and environmental decision support network. Furthermore, the National EIS Policy will need to address who will be responsible for overseeing and coordinating all national EIS activities spanning environmental data infrastructure, information analysis, and decision support.

The Way Forward to Implementing a Sustainable National EIS

A number of sessions with senior staff and the technical level EIS task force are being conducted in November/December, 1998 and will culminate in a draft on: 1) the state of EIS in Malawi (including accomplishments and constraints) and 2) recommendations towards its further development. The draft report will be distributed during a session in March/April to a senior level EIS think tank. The March session will focus on discussing alternative strategies in developing a National EIS. It is envisioned this session will result in a draft report on recommendations to further develop a National EIS Policy that will help pave the way forward to develop a sustainable Malawian EIS that routinely and collaboratively produces and uses environmental information to improve the management of Malawi’s natural resources and environment.

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