

**Environmental Monitoring and Information Systems for Africa:
A Results Package Linked to Strategic Objective 5
and the Special Support Objective of
Africa Bureau's Office of Sustainable Development**

INTRODUCTION

Africa Bureau has had a long experience in promoting policies and approaches which encourage the sustainable use of Africa's rich natural resources and protect its environment. Africa Bureau's Office of Sustainable Environment, through the Agriculture Natural Resources and Enterprise Division seeks to achieve this through two strategic objectives, SO5 and the Special Support Objective for the Environment. The purpose of SO5 is to build the capacity of African governments, private institutions and Africans at the community level to manage their natural resources in a way that increases overall economic welfare and reduces degradation. The program increases the use in Africa of the knowledge, tools, institutions and experience gained from the efforts of African institutions, U.S. and international private voluntary organizations, other donors, and USAID Missions. The Strategic Support Object objective aims to improve the application of environmental procedures and strategies to USAID Mission programs, as well as to improve the development efforts of USAID's partners in Africa. By implementing the Agency's Environmental Procedures (especially 22 CFR 216, Reg. 216, and ADS 204) in an adaptively proactive and analytically-informed fashion, the SSO supports the environmental quality of *all* AFR investments. SSO maintains strong linkages with the natural resources management Strategic Objective (SO5), and together SSO and SO 5 address the Agency goal to manage the environment and natural resources in a sustainable way.

The SO5 and SSO spatial analytical activities seek to strengthen their analytical agenda and develop models with its partners that can be applied in Africa to improve the use of information for policy and management decisions. The following discussion will describe the contextual relationships involved. Then we discuss the relationships among different actors and activities being carried out or proposed during FY 199, FY200 and FY2001.

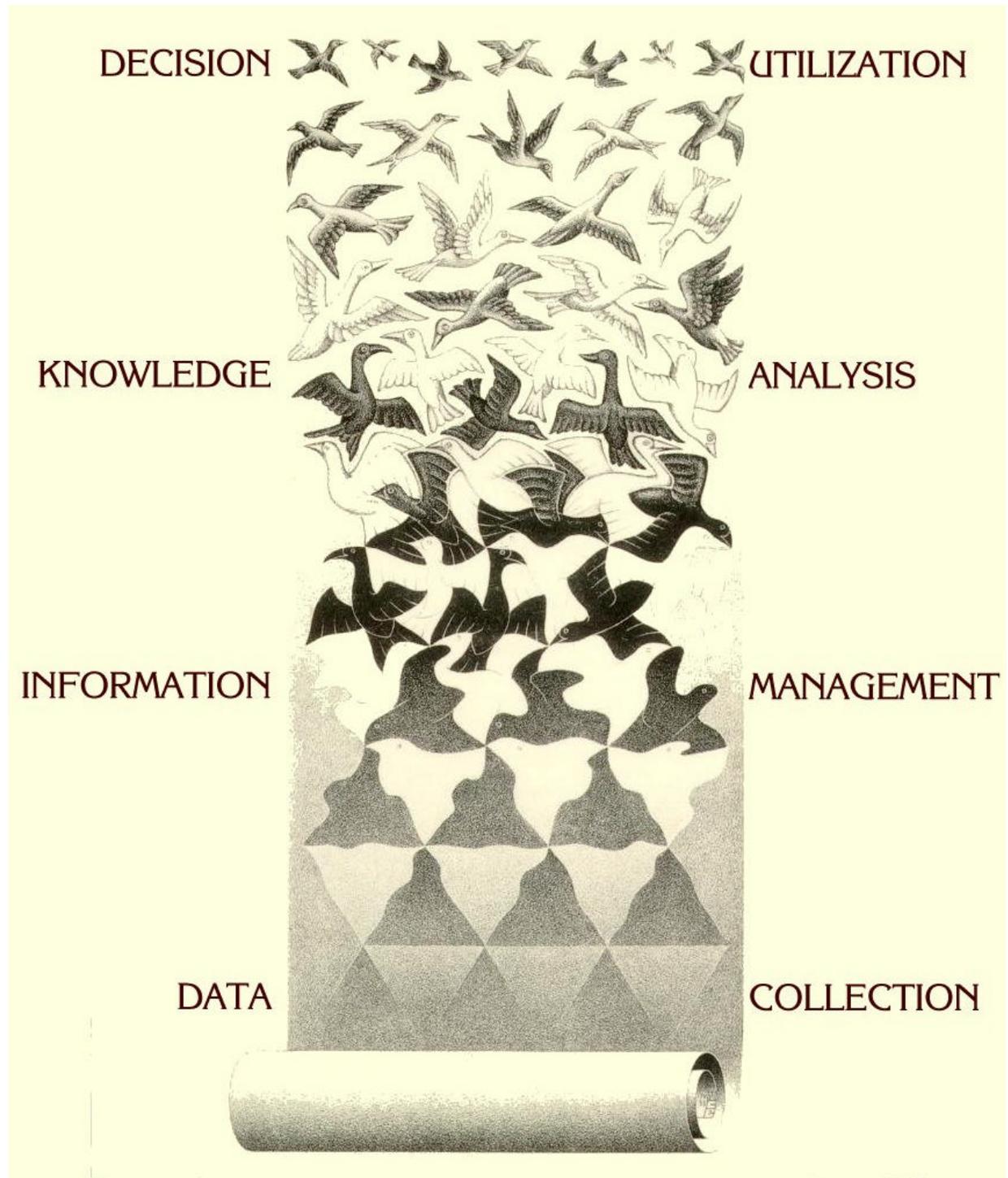
These activities are guided by results which lead to achievement of SO5 and SSO objectives. Among the SO5 results to be achieved is the increased flow and use of environmental and natural resource management (NRM) information, and strengthened analytical capacity of selected partners in Africa to assess and advise on environmental trends and management of the environment. Among SSO results is environmental planning that leads to incorporation of monitoring, assessment and mitigation into host country and mission development programs.

M. C. Escher provides an image of the organization of information in his painting *Liberation*. In general, we seek to promote engineering of knowledge. This may be considered in two ways; as a data to decision-making paradigm and as a data transformation process. Knowledge engineering provides us with a paradigm whereby data is organized as information, which in turn is organized into knowledge, and ultimately results in a decision. This can be visualized in Figure 1.

The data transformation process captures this in a supply and demand function, whereby information/knowledge is produced through a process starting with data collection, management, analysis, and ultimately used in a decision. The decision is defined the demand for relevant information. Factors of information demand include:

- Timeliness which conditions the choice of tool and level of complexity within the decision maker's time frame;
- Sustainability, which conditions the choice of the information system on the human and financial resource constraints of the organization; and
- Reliability, which is generated by growth in demand and results in provision of increased resources to generate greater reliability.

Figure One: Information as Liberation a la MC Escher



Relationship among activities according to their characteristics

AFR/SD has engaged in a number of spatially analytical activities, many of which spring from the SO5 results framework. Relationships among these activities can be shown based on their characteristics and roles. They may be characterized according to their contribution to lessons learned and assessment, characterization, or modeling. Their roles may be defined as management, information exchange, and monitoring. These roles are not linearly discrete, but interact, whereby information exchange leads to management and monitoring is used by management in order to adapt to changing circumstances. Further, monitoring is one means of providing information to exchange among various management units. To be certain, many activities engage in one or all of these parameters, but they can be shown based on their predominant orientation. In Figure 2, these relationships are depicted according to the collaboration involved. Figure 3, lays this out in more detail.

Approaches and Results from the EMIS Results Package:

EMIS will use several approaches to contribute to achieving the intermediate results of SO5 and the SSO (Environment). Progress toward achieving these results will be multi-faceted, with activities taking place along several paths simultaneously. The overall strategy will be to test and refine tools and approaches while building analytical and programmatic capacity among our African colleagues so that future activities will be initiated by them to solve problems defined by them using improved approaches to monitoring and information transfer.

Through re-engineering, USAID has attempted to improve the design of programs to be results-oriented and linked to development hypotheses that motivate the design of activities or projects. The Africa Bureau analytical agenda has accumulated considerable evidence of the effectiveness of natural resources approaches that imply certain hypothetical relationships that lend credence to the strength of the approaches developed and promoted. This activity seeks to build upon this by testing and developing tools and approaches that move from lessons learned to characterization and, ultimately to models that can test hypotheses. Figure [X] is based upon elementary mathematical theory construction. In this, we see that lessons learned and characterization build anecdotal or conjectural evidence of the strength of theory which we will assume to be analogous to the goals established by Missions, Bureaus and the Agency. A more robust approach is to clearly articulate hypotheses that can be suggested by characterization and tested through analytical models. The hypotheses, then lend credence to the theoretical goals established and inform the design of programs and activities. These programs and activities, in turn, provide further cases that feed into the lessons learned, characterization, and modeling continuum. EMIS will address this process by testing approaches to strengthen the characterization and modeling process. Further, a network of African expertise will be promoted in order to inculcate this among practitioners in the field.

Two foci will direct results: meeting USAID Africa Bureau's information and analytical needs, and the promotion of a network of practitioners and institutions in Africa to with client focus to meet information needs of policy makers and natural resource managers. Thus, a core group of partners, largely based in the United States will address the Bureau's information needs. At the same time, a network of practitioners will be developed in order to carry these lessons as well as develop their own approaches to the natural resource management and policy realm in Africa.

Meeting Africa Bureau information and analytical needs

EMIS forms a component of the emerging environment and natural resources analytical agenda for Africa Bureau's Office of Sustainable Development and forms part of the strategic plan of SO5 and the SSO (Environment). The results achieved through EMIS will contribute to other key activities of these strategic objectives, particularly KERP (training), FRAME (strategic planning), and environmental compliance.

KERP Knowledge, Education and Learning Partnerships. The purpose is to catalyze major improvements in African post-secondary institutions through the integration of modern information, communication, and knowledge technologies into the research, teaching, and learning processes; and to increase the flow of knowledge and experience between field activities and centers of learning in both Africa and the United States in strategic objective relevant areas. The EMIS results package, through its focus on networking among EIS practitioners,

FIGURE 2: RELATIONSHIP AMONG ACTIVITIES ACCORDING TO CHARACTERISTICS
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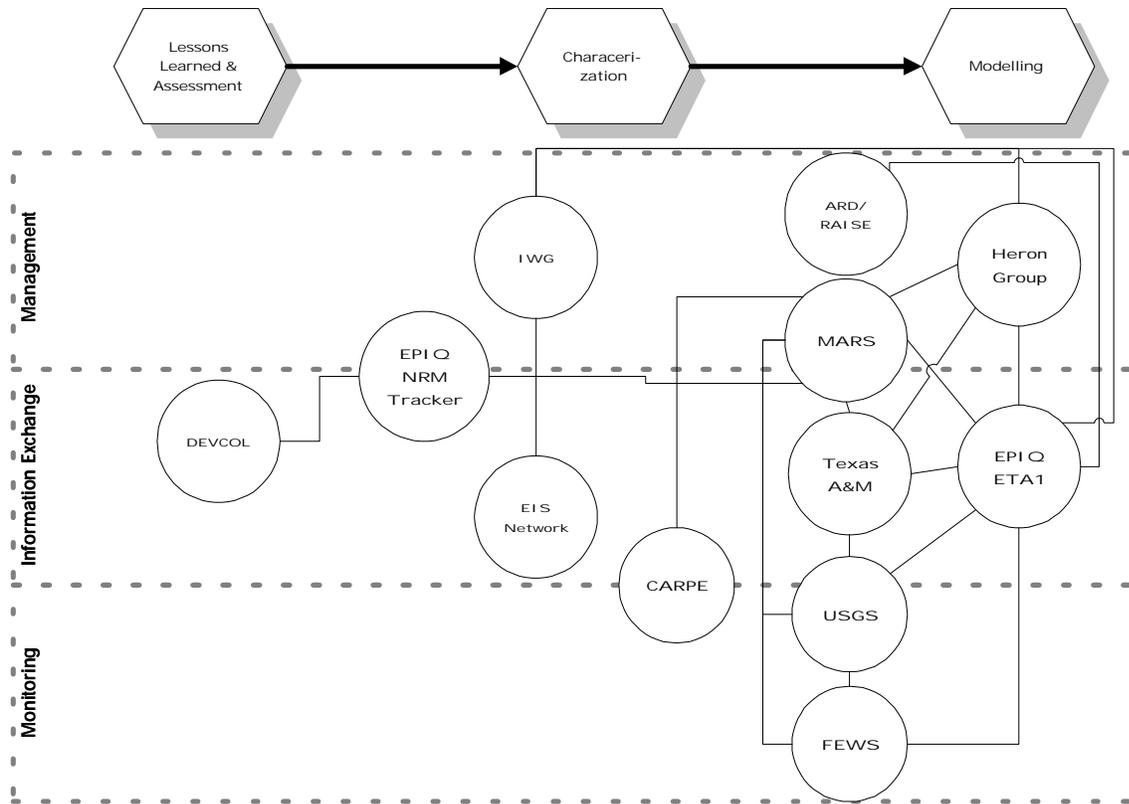
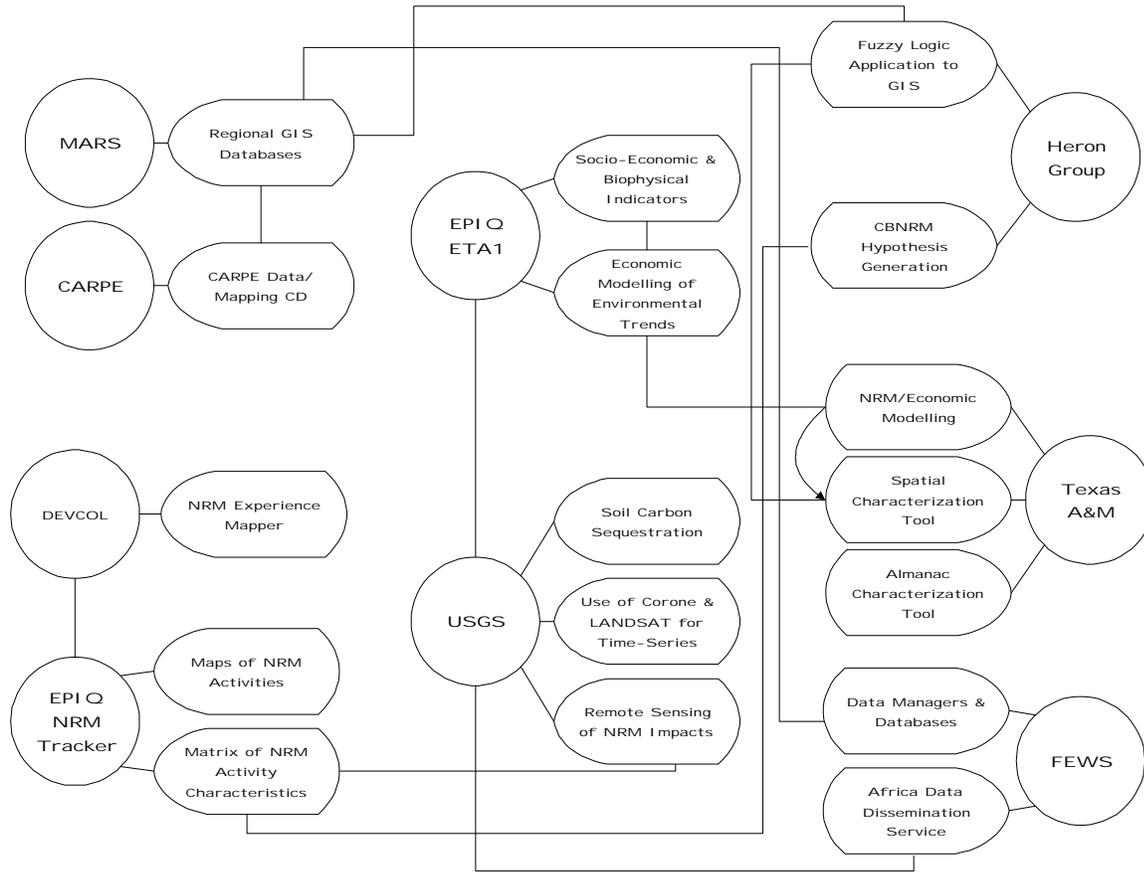


FIGURE 3: RELATIONSHIPS AMONG VARIOUS SPATIAL ANALYTICAL TOOL ACTIVITIES



will form a platform for contacting clients of KELP and channeling discussion, exchange and training offered through KELP partners to practitioners in the field.

FRAME is a FRAMEwork for the strategic analysis of USAID's environmental investments in Africa. Designed and established by AFR/SD under its SO5, FRAME is a tool to help USAID and its partners have access to information needed to improve decision-making in environment and natural resources in Africa. By increasing the effectiveness of already existing information, FRAME provides transparency to decision-makers about the costs and benefits of taking one action over another. FRAME funds a very limited number of core activities — a "FRAMEwork" — which leverages what others have done and are doing. It makes methodologies accessible to decision-makers, puts specialist practitioners in touch with each other and with decision-makers, and provides links that enable people to know what exists and how to get it. EMIS coordinates with FRAME in two ways: by connecting the FRAME activities, particularly in terms of testing and disseminating methodologies for decision-makers, linking EIS practitioners with decision-makers, and using the FRAME Contact Group for "peer review" of analytical products resulting from the EMIS results package.

The Environmental Protection Unit, within AFR/SD (SSO-Environment), in conjunction with the network of regional and Mission environmental officers takes responsibility to promote environmental quality of programs and activities conducted within the Africa region. They encourage Agency environmental regulations to be addressed in letter and spirit, and environmental soundness principles to be incorporated into AFR planning in all sectors. The operational mandate of the ENV Unit is to provide guidance to operating units with respect to environmental provisions of U.S. law and to review, modify and approve Mission and Bureau programs and projects to anticipate environmental consequences and promote environmentally sound development. The Unit also provides for analysis, synthesis and development of technical information, to promote improved understanding of relief and development phenomena. Through the exchange of lessons learned and promotion of enabling conditions, AFR/SD empowers Missions, partners and other donors to incorporate environmental quality considerations into all future programs and activities. Finally, the ENV Unit helps provide the training necessary for all partners to develop the capability necessary to design and implement environmentally sound programs. By assuring that lessons learned are shared with all partners, environmental quality is improved and advanced in the design and implementation of future programs and activities.

EMIS contributes to all of the Environmental Protection Unit functions, particularly in the analysis and exchange of information, capacity building, and incorporating environmental considerations into the strategic planning process. The primary contribution that EMIS will make will be to promote the use of effective analyses in USAID's and its partners' developmental planning processes. EMIS will strengthen existing fora acting as advisory panels to the Bureau, develop and evaluate approaches of its partners, and introduce knowledge engineering in the strategy design process of the Bureau.

Additionally, EMIS activities will be shared with field missions. Field mission input will be essential so that approaches and activities serve their needs. By including their participation, opportunities will be exploited to leverage funding for EMIS and to adapt the EMIS program to further their environmental objectives. Already, cooperation is being promoted in Southern Africa, through the Regional Center for Southern Africa's NRM Strategic Objective team; in Eastern and Southern Africa, through the Regional Economic Development Support Office for East and Southern Africa's Environment Strategic Objective, as well as missions in Malawi, Senegal, and the Western Africa Regional Program based in Mali.

Promotion of Networking with a Client Focus

Fostering a network of qualified professionals to promote the effective use of information for decision-making is essential in USAID's pursuit of promoting sustainable and equitable natural resource management in Africa. EMIS will provide direct support to networks of practitioners and specialists active in environmental monitoring, planning, analysis and natural resources management. As the impact of capacity-building efforts by donors grows in Africa, there is an increasing number of competent and committed professionals to be found. These professionals often work in isolation and there is a need to facilitate the exchange of knowledge among these professionals and offer opportunities to enhance their professional capacity and standing. In order to optimize the value of this capacity, new approaches must be promoted that enable these professionals to understand and define the demand for

information and analysis by country-level actors; government and communities, in developing their analytical products.

EMIS will contribute to the demands and needs by professionals, communities, government and NGOs. The objective of this focus is to identify, link and engage a significant number of environmental management experts in identifying, carrying out, and linking analytical tools to natural resource management decisions, whether at the governmental, international, or community level. Engagement goes beyond networking to include these partners in the conceptualization, realization, and evaluation of analytical activities that meet demands for information by decision-makers. In short, it seeks to establish conditions whereby the dependence upon outside expertise declines and sustainable information systems are developed at the national level without the tutelage of foreign interests. This objective will be furthered through activities falling into the following four categories:

- Sharing of best practices;
- Enhancement of professional capacity and standing;
- Development of demand-driven approaches to spatial analysis and characterization; and
- Promotion of knowledge engineering approaches.

This is a long-term and evolutionary process. During the first year of activities, emphasis will be placed on strengthening existing networks, particularly the EIS Network evolving out of the Program for Environment Information Systems in Sub-Saharan Africa. An intellectual link will be maintained between this organization and the Information Working Group. Further, as approaches and tools are developed by various US partners under EMIS, they will be shared with partners in Africa for their review and ultimately, their adaptation to meet their own demands placed upon them by their clients.

In addition, links will be strengthened between AFR/SD and analytical institutions in Africa, particularly CSE in Senegal, [] in Ghana, INSAH in Mali, SADC EIS center, and others as they are identified. As ties are strengthened, an increasing amount of analytical effort will be channeled through these institutions. AFR/SD is not in a position to provide major institutional capacity support. However, by engaging them through the sharing of best practices and contracting for specific analytical and networking products, their status will be strengthened and capacity generated.

During subsequent years an increasing level of funding will be provided to African professionals to carry out activities. More importantly, they will form the basis for the identification of development needs and refinement of information systems, analytical products, and approaches.

Summary

EMIS will operate with two foci: the Africa Bureau of USAID and a growing network of African practitioners. The approach will be collaborative with a growing team of US and African experts developing and carrying out activities. Though contractual terms will be specific to various corporate and institutional actors, the results and products developed through these arrangements will be shared and contribute to the overall outcome of the effort. Activities will be carried out in the development and testing of proofs of concept for approaches and tools, and the establishment of fora carrying out a dialogue on thematic issues related to EMIS.

- Objective: To test and refine tools and approaches while building analytical and programmatic capacity among our African colleagues so that future activities will be initiated by them to solve problems defined by them using improved approaches to monitoring and information transfer.
- Result: Incorporation of knowledge engineering in development of environmental information systems is evident in at least one institutional setting in Africa and in one operating unit of USAID Africa Bureau;
- Result: Incorporation of effective formulation of hypothesis in planning and strategy development demonstrated in at least three cases;

Result: Increased capacity among African practitioners of environmental monitoring and information systems support as indicated by the incorporation and functioning of one network of practitioners and professionals in Africa;

Result: Improved strategy development demonstrated in three Missions in Africa

SCOPES OF WORK FOR THE VARIOUS ACTORS FOR FY 2000

EPIQ TASK ORDER: ENVIRONMENTAL TRENDS ANALYSIS

A. Introduction and Progress to Date

During FY 1999, AFR/SD, has developed a data set and conducted economic analyses leading to greater understanding of the economic underpinnings of environmental issues and outcomes in Africa. This activity was carried out in conjunction with assessments of Natural Resources Management and analyses of remotely sensed data to identify biophysical responses to human activities. Further, numerous studies have been conducted describing key environmental issues and emerging trends in Africa. As a result, considerable information is available to decision-makers on environmental issues and states facing African development efforts.

In order to optimize the value of these efforts, this valuable information should be converted into knowledge. This conversion requires the development of causal frameworks, or heuristic models, which allow analysts and decision-makers alike to envision possible outcomes or scenarios resulting from changes in key factors in the environment, economy, and society.

B. Key Outputs/Tasks

1. A robust analytical framework that effectively identifies key factors and states (as described in supporting literature) will be developed. This framework will result from reviews of existing literature and reports, and will incorporate findings from previous EPIQ environmental trend analysis efforts, NRM assessments, and analyses carried out by USGS. Key factors will be identified and causal linkages developed through the efforts of a small (5 to 7 member) consultative group coordinated by the contractor and cogniscent AFR/SD advisors.
2. To the extent possible under existing funding, several scenarios will be developed through application of the framework by changing key variables in the underlying causal model. These scenarios will be presented in a geo-spatial format. The objective is not to prescribe solutions so much as to test the robustness of the model.

Methodology/Approach

This activity will largely use existing data and literature to identify key physical, social and economic variables which affect the environment and economic development in Africa today. The consultant should review studies and reports that have been conducted to list key factors. A small contact group should be formed in order to cross-check these factors to identify causal linkages and develop an analytical framework. Having developed the framework, the ability to develop possible scenarios should ensue by tracking changes in factors along the causal linkages contained in the framework. It is not envisioned that these scenarios should be prescriptive in nature, but serve to indicate the utility of the framework as applied by end users.

The analytical framework is intended as a guide or tool to be applied by Missions, non-governmental organizations and inter-governmental organizations to guide their strategic planning or decision-making processes. Rather than providing reports of conclusions, the model should be accessible by these end-users in order for them to conduct their own analyses given information available to them.

This application may come directly, but also through its use in guiding the development of the Strategic Environmental Analysis and Monitoring effort which follows on from the EMEMP process carried out by AFR/SD. It should also be presented for the information of and review by the FRAME Contact Group who will serve as the primary peer review and feedback mechanism to refine this analytical framework.

Resource Requirements

1. Specialist in Strategic Analysis with experience in identifying key factors and issues pertaining to the African natural environment and tracking of trends. Anticipated LOE: 6 weeks.
2. Coordinator for Workshop with African analytical experience. Anticipated LOE: 5 days.
3. Local (3 African Experts) Anticipated LOE: 30 days
4. Timeline

Sep. – Nov: Literature review & Concept paper

Feb. – Mar: Workshop to develop framework

Apr. – May: Test application of framework in developing scenarios

Jun. – Jul: Draft Report and circulate to FRAME contact group

Aug.: Presentation of Report to Africa Bureau

NOTE: Coordination of the workshop could be done by one of the African Experts and budget adjusted accordingly, particularly in terms of expense of follow-up work

Environmental Trends: Penn State & Heron Group Use of Multivariate and Neurological Network Analysis Scope of Work

Introduction:

During FY 1999, AFR/SD, has developed a data set and conducted economic analyses leading to greater understanding of the economic underpinnings of environmental issues and outcomes in Africa. This activity was carried out in conjunction with assessments of Natural Resources Management and analyses of remotely sensed data to identify biophysical responses to human activities. Further, numerous studies have been conducted describing key environmental issues and emerging trends in Africa. As a result, considerable information is available to decision-makers on environmental issues and states facing African development efforts.

In order to optimize the value of these efforts, this valuable information should be converted into knowledge. This conversion requires the development of causal frameworks, or heuristic models, which allow analysts and decision-makers alike to envision possible outcomes or scenarios resulting from changes in key factors in the environment, economy, and society. Use of this causal framework can be enhanced by recent inroads in the use of neurological networks and multivariate logic as a mechanism for incorporating expert knowledge in analyzing outcomes and spatial representations.

The Heron Group, in partnership with Penn. State University, have developed an approach and supporting software to facilitate the introduction of causal relationships in strategic planning and the identification of key indicators. They have made a number of presentations to the Africa Bureau and OFDA on this topic, indicating its promise as a facilitative and analytical tool. This activity will be carried out in a collaborative manner with the EPIQ team.

Key Outputs/Tasks

1. Demonstrate practical application of neurological networks and multivariate logic to environmental and natural resources management analyses.
2. Contribute to development of an heuristic analytical frameworks which establishes causal linkages in the relationship of factors (biophysical and socio-economic) affecting trends in the African environment.
3. Apply neurological network and multivariate analysis to the analytical framework to elucidate possible scenarios given changes in key factors, such as emergence of conflict, implementation of community based natural resource management (CBNRM), onset of drought, and/or implementation of trade policies.
4. Demonstrate how these tools and concepts may be linked with GIS and spatial data.
5. Increase the analytical capacity of mission project and program personnel, mid-level African NRM planners, and governmental economic planners in the application of neurological network and multivariate tools and concepts. This includes the development of training modules and materials, and provision of supporting software.

Methodology/Approach

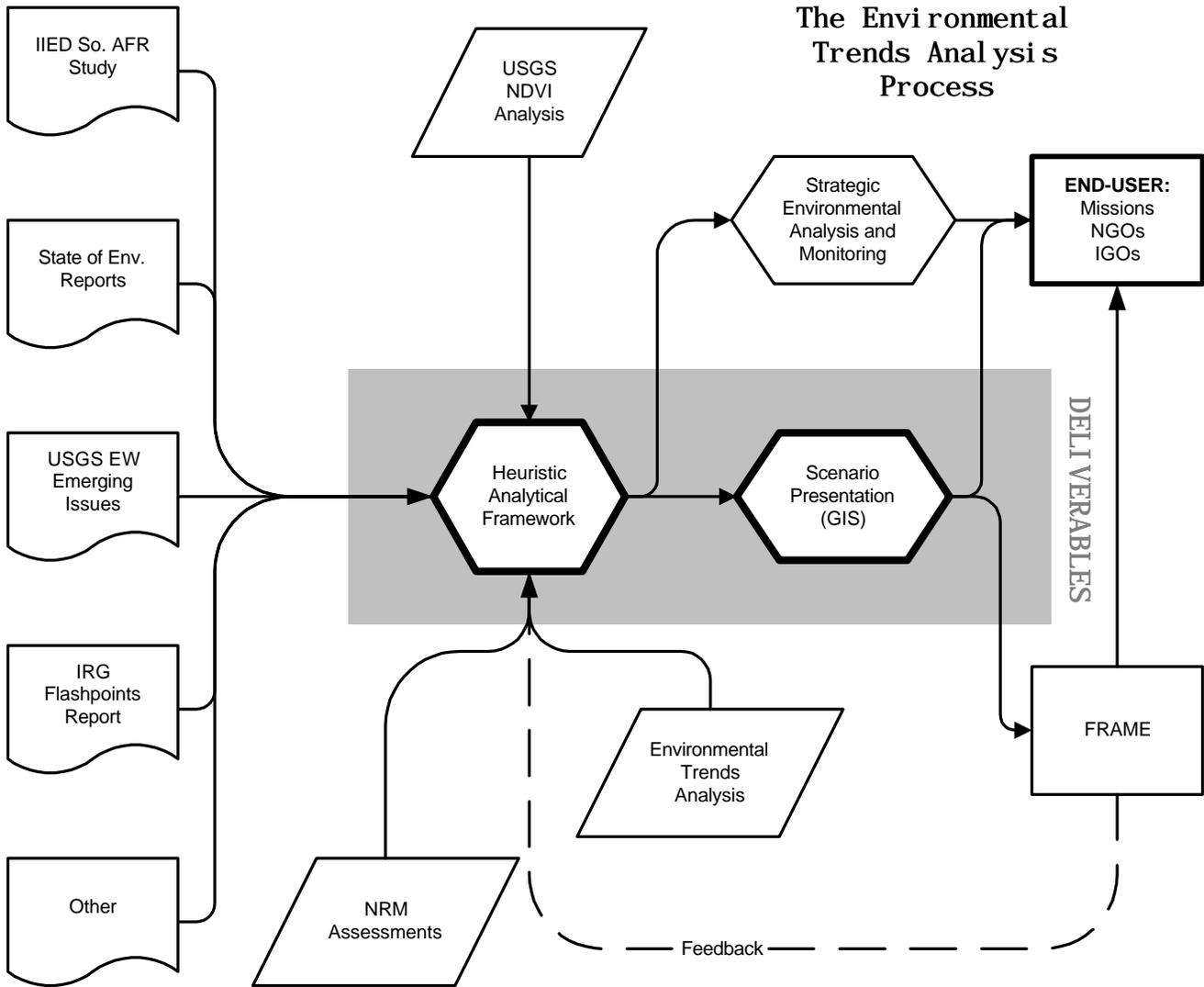
1. Collaborate with EPIQ team in developing the heuristic analytical framework, including participating in the contact group involved in developing the framework.
2. Play lead role in using the analytical framework to elucidate scenarios given changes in key factors as described.
3. Train USAID and partner personnel in the use of these approaches and tools, including writing training modules.
4. Make available software products to USAID and partners given a additional financial resources outside this purchase order and RSSA task order, with opportunities for Mission buy-ins.
5. Contribute to establishment of a database and install NETWEAVER at AFR/SD/ANRE.
6. Create and give a presentation of results to AFR/SD, including provision of documents and PowerPoint presentations.

Resource Requirements

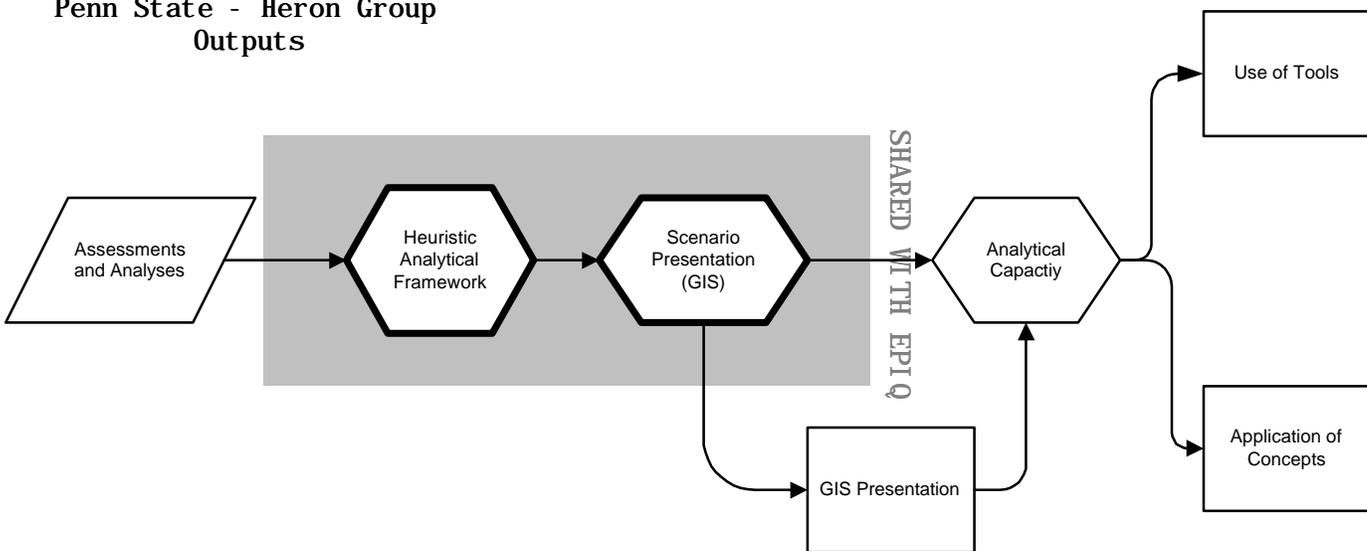
1. Personnel
 - a. Specialist(s) in strategic planning with experience in Africa and USAID programs, particularly in terms of environment and natural resources management (The Heron Group). Anticipated LOE: 40 person-days.
 - b. Specialist in neural network and multivariate logic programming, particularly as it relates to strategic planning, natural resources management and GIS applications (Penn State). Anticipated LOE: 35 person-days.
 - c. [Optional] Research Assistant support to the neural network specialist (Penn State). Anticipated LOE: 15 person-days.
2. Resource (LOE) Allocation Guidelines
 - a. Development of the heuristic framework: 15%
 - b. Conduct Analyses of Scenarios: 40%
 - c. Capacity building: 45%
3. Timeline

Feb. Mar.:	Collaborate with EPIQ Environmental Trends Analysis
Apr. – May:	Test application of framework in developing scenarios
Jun. – Jul:	Develop & conduct training activity to test group of USAID/partner personnel
Aug.:	Presentation of efforts to Africa Bureau

The Environmental Trends Analysis Process



Penn State - Heron Group Outputs



EPIQ Task Order: Strategic Environmental Analysis and Monitoring

A. Introduction and Progress to Date

The Environmental Monitoring Evaluation and Mitigation Planning process began circa 1992 in an attempt to address FAA wording requiring the inclusion of environmental considerations in the use of NPA funding and structural adjustment programs funded by USAID. To date, up to 24 activities were identified for EMEMPs. Reviews of EMEMPs were conducted in 1994 and 1996. An analysis of the effectiveness of EMEMP was done in 1999 under an EPIQ task order. This task order is intended to develop future directions for the concept in light of current needs and the strategic planning process applied by USAID.

B. Key Outputs/Tasks

Purpose:

1. Integrate environmental considerations in USAID Mission strategic planning and program design;
2. Facilitate the Initial Environmental Evaluation process at the strategic objective and results package level;
3. Define sustainability in terms of USAID and other donors. Contribute to sustainable strategy development by USAID missions and units;
4. Link and differentiate this process to existing environmental assessment efforts such as Strategic Environmental Assessments, ENCAP training, and the IEE process.
5. Effectively apply Agency guidelines, Federal regulations, and relevant sections of the Foreign Assistance Act; and
6. Promote effective analytical processes and environmental sustainability in host country development efforts.

Tools:

1. Analytical tools
 - a) Flow diagramming to determine causal linkages
 - b) Decision matrices to aid in testing hypotheses and ranking options
 - c) Utility analysis
2. Monitoring Tools
 - a) Rapid and participatory appraisal techniques
 - b) Data structure and access techniques
 - c) Application of GIS and statistical analytic approaches
 - d) Display of information and reporting techniques

C. Methodology/Approach

1. Develop tools to aid in strategic analysis emphasizing an understanding of causal linkages, systemic approaches to determining sustainability, valuation of environmental services affected by programs, and environmental consequences;
2. Implement training program directed at USAID environment and program officers, their subordinates and partners within the host government and NGO community;
3. Assist missions and their partners in the design, environmental review, implementation, monitoring and evaluation of their strategic plans

Implementation Mechanisms

1. Tools and training module development will occur with the collaboration of the Environmental Monitoring and Information Advisor and two technical experts provided through EPIQ one of which would have EIA/environmental review Strategic EA (SEA) expertise.
3. The first training session should be in conjunction with the proposed ANRE workshop in March 2000.

This activity should be collaborative with a self-identified set of Regional and Mission Environmental Officers and other donors, particularly the World Bank. Their involvement may be via e-mail, but travel to field locations should not be ruled out.

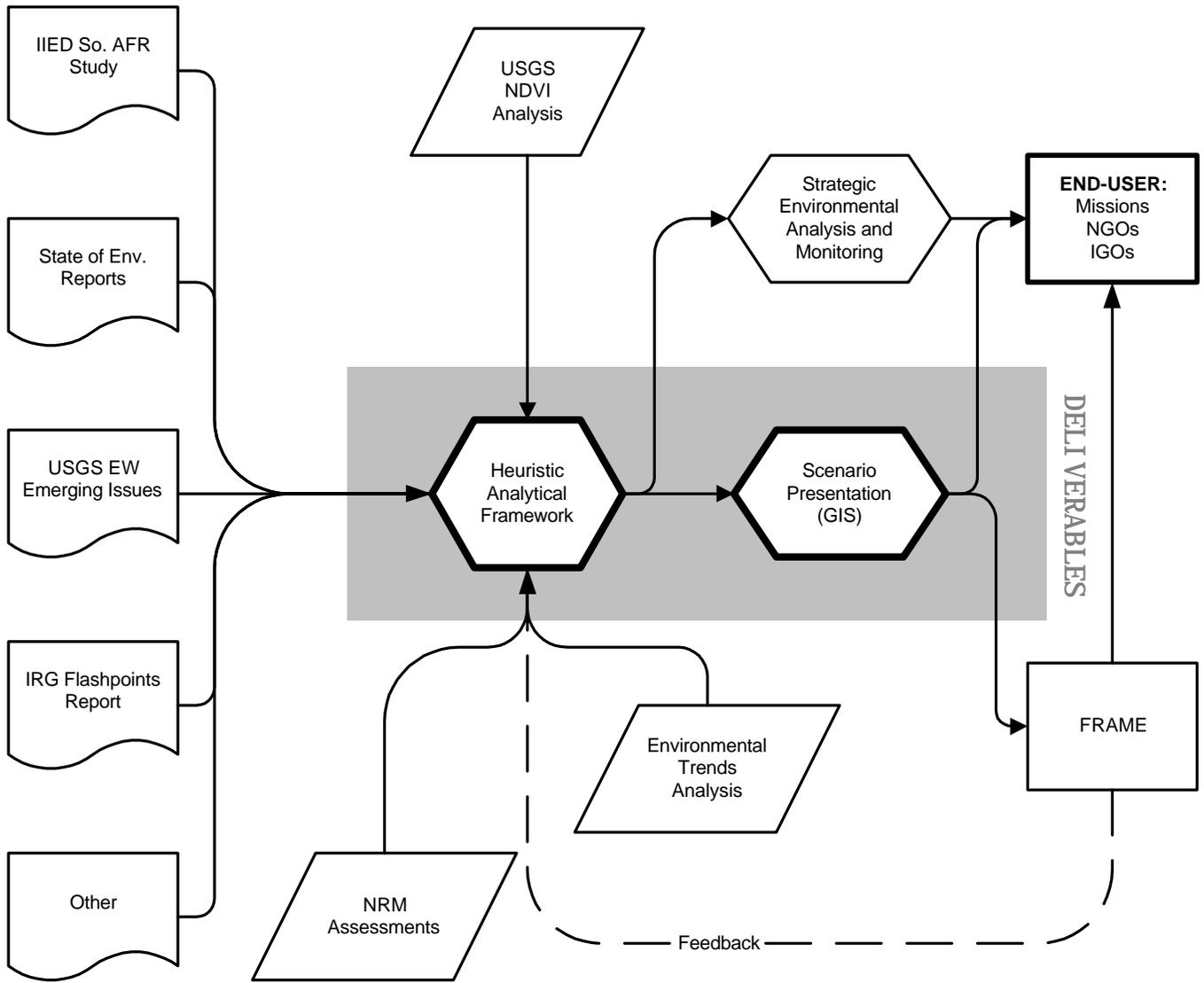
D. Resource Requirements

1. Technical Assistance needed:

- a. Monitoring expert with experience in developing practical and simple field-based approaches as well as training in their use (Phil Decosse)
- b. Training specialist familiar with the development and implementation of practical training modules as well as the presentation of information.
- c. EIA/environmental review and hopefully some Strategic EA (SEA) expertise

2. Timeline

1999	July – Aug :	Develop scope of work and identify technical assistance
	Sept – Oct.:	Consult with key personnel to develop consensus on approach and outline tools and needs assessment of the audience and of SD expectations.
2000	Jan. – Feb.:	Develop training modules on the application of tools
	March:	Carry out first training session
	Apr – June	Apply approach in the field
	July	Evaluate approach and develop revisions
	Oct.	Second training session
	Nov – Dec:	Publish training manual and circulate



Terms of Reference for the SO5 Buy-In to FEWS RSSA with USGS

Introduction

USGS has established itself as a pre-eminent actor in environmental data collection and analysis in Africa, particularly in terms of remotely sensed data and satellite imagery. AFR/SD has collaborated with USGS in numerous areas, and most recently, in conducting an analysis of NDVI vegetative imagery to detect human impacts on vegetative quality and to further dialogue on the potential and nature of soil carbon sequestration. AFR/SD intends to continue and build upon this collaboration through the FEWS RSSA mechanism. Consequently, the Office will transfer \$160,000 of FY 1999 funds and develop a multi-year work plan to achieve this purpose.

The Challenge

The challenge facing the Africa Bureau, its offices and missions, is to identify, organize and develop analytical tools to manipulate data in order to transform it into information, knowledge, and ultimately action. Action, in this context includes local-level natural resources management decisions as well as national-level policy decisions and international collaboration. Although significant gaps exist in data and knowledge, particularly in terms of the quality of data and information, considerable information is available. What remains is the need to organize this knowledge into a cohesive body subject to analysis and to further the African capacity to analyze, present, and act on this knowledge.

Themes

1. *Remote sensing of human impacts:* Test the uses of various remotely sensed data, particularly NDVI and high resolution imagery in identifying and analyzing human impacts on the environment including “hot spots” of degradation and “cold spots” where natural resource management efforts are having a significant impact on the environment. This includes time-series depictions as well as characterizations.
2. *Soil Carbon Sequestration in Africa:* Determine, develop, and promote the methods of using soil carbon sequestration to further market involvement of Africans in carbon offsets as an incentive to improve soil fertility.
3. *Organizing data and regional GIS data access:* Develop a series of regional data coverages in a GIS format that are accessible and useful to mid-level managers among the NGO, governmental and donor communities. These should demonstrate approaches to incorporating GIS in planning and policy efforts that are sustainable in the institutional contexts of the managers.

Objectives

1. Proof of concept demonstration of remotely sensed data use in characterizing environmental trends
2. Further development of approaches to promoting soil carbon sequestration
3. Development of web-based GIS access for decision-makers

Approaches and Methods

Theme 1 – Remote Sensing of Human Impacts

1. Continue efforts carried out through previous collaboration with AFR/SD on the use of NDVI imagery in Senegal and Madagascar.
2. Develop and test new applications, such as the use of CORONA imagery combined with more recent high resolution imagery in tracking land cover change.
3. Develop the capacity among African analysts in the use and development of remote sensing of human activity.
4. Link such approaches to socio-economic data.
5. Create a data set leading to establishing the capacity within AFR/SD and its partners to track key environmental trends and NRM impacts.

Theme 2 – Soil Carbon Sequestration

1. Coordinate a series of workshops in the three regional areas to review the Kyoto Protocol and the scientific understanding of soil carbon sequestration.
2. Assist the development at the regional or national levels of an understanding of the social organizations and financial mechanisms which are needed to secure funding of carbon sequestration projects and to insure the transfer of those funds to the small holder.
3. Mobilize the best African soil science experts, natural resource managers, and economic specialists to identify optimal locations for the location of projects of high potential for successful implementation and large sequestration. Produce maps based on biophysical data and socio-economic considerations that identify areas of high potential.
4. Create one demonstration site to be used by Africans for training in landscape stratification, soil carbon measurement, sampling, GIS systems and other techniques.
5. Create an Internet Clearinghouse in Africa for the tracking of soil carbon projects, the dissemination of information on carbon sequestration, and the publication of field results.
6. Create African-based regional teams to serve as trainers for national projects within each region.
7. Develop nuclei of African specialists in all major disciplinary components required to understand and implement carbon sequestration projects
8. Produce products that display the potential for selected areas of Africa to sequester soil organic carbon and the sampling and monitoring protocols necessary for implementation

Theme 3 - Organizing data and regional GIS data access

1. AFR/SD will engage USGS to develop four sets of consistent map coverages based on those developed for RCSA and the West Africa strategic planning initiatives. USGS would create digital files of the maps generated for these two initiatives and, where necessary modify the coverages to standardize data and technical aspects (projection, scale, etc.). Additionally, the Specialist would create similar sets for Central and Eastern Africa, using to the greatest extent possible, existing coverages such as those contained in the CARPE Data CD-ROM.
2. Depending upon future funding in Phase 2, the analyst would create Theme Layers in ARCVIEW format of the relevant data for each of the four regions. These themes would be consistent and able to be combined in a reasonably simple manner to enable continent-wide presentation. These data layers and products, described in 1 (above) would be made available to AFR/SD and stored on the LAN for use. Additionally, they would be placed on a CD-ROM for distribution to Missions and partners.
3. Depending upon future funding in Phase 2, a dialogue module would be developed which would enable analysts and mid-level managers to conduct simple analyses with the data without requiring significant training in the use of the ARCVIEW program. This module would be created using a core group of AFR/SD and (perhaps) Mission and partner personnel as guides and models for the type of analyses and products which would be generated by this module. If possible, the module should be operational on appropriate AFR/SD websites
4. The resulting package would be distributed to field missions and partners for their review. AFR/SD would provide advisory services to train mission personnel in the use of the product and modifications to more effectively meet local demand.

Implementation:

The basic approach to implementation of these activities requires that USGS develop an annual work plan to AFR/SD outlining tasks to be completed in order to achieve objectives under the three themes within funding allocated during that fiscal year. Periodic reports or meetings will be held between the relevant USGS staff and AFR/SD activity manager to brief on progress achieved to date or on the results of analyses or activities completed. Flexibility in accomplishment of objectives is allowed to USGS based on their reasonable assessment of level of effort allowed within the funding provided. Buy-ins from other operating units to achieve these objectives or results which contribute to these objectives is envisioned.

Task Order for PARTS RSSA to Texas A&M University

Introduction

IN FY 1999, the Sustainable Development Office of the Africa Bureau has engaged Texas A&M University (TAMU), through the PARTS RSSA to provide proofs of concept of the application of GIS and associated modeling tools to natural resource management. This has previously been combined with SO3 impact analyses through their consortium including TAMU, Penn State, IFPRI and others. At the same time, the Office of Foreign Disaster Assistance and the Global Bureau have engaged TAMU in development and application of their Spatial Characterization Tool to agricultural issues. This task order refines the relationship with the AFR/SD's SO5 and seeks to encourage greater cohesiveness of TAMU's efforts with SO5's analytical agenda.

Key Outputs/Tasks

Depending upon the match between financial resources available, outputs will focus on the following areas:

1. Demonstrate the application of spatial (GIS) analysis in conjunction with the Environmental Trends Analysis.
2. Collaborate with USGS, CARPE, and others in developing a client-focused GIS, particularly a set of geo-spatial data sets covering environmental, socio-economic, and infrastructure factors which can be used by mid-level managers with moderate computer literacy. These data sets will eventually be regional in nature and accessible through the World Wide Web and on CD-ROM.
3. Further refine and finalize applications of analytical and GIS tools to demonstrate the impact of NRM in Africa.

Methodology/Approach

1. Collaborate with the EPIQ group, The Penn. State/Heron Group team, CARPE, and others to develop approaches and tools relating to the outputs desired.
2. Meet periodically with a growing team of GIS experts on the needs and structure of geo-spatially defined data for AFR/SD
3. Facilitate market research to determine the type of demands and specifications of a regionally-focused GIS package

Resource Requirements

To be negotiated with TAMU upon acceptance of the task order

Producing a NRM GIS-based Information System for Field People

Proposed SOW for DEVECOL

Background & rationale

This Scope of Work advances the development of a map-based system for accessing and evaluating documentation of local NRM experiences in Africa. With partial support from USAID's Africa Bureau in 1990, a proto type system was created by Peter Freeman, using results of the 1989 NRMS survey of NRM activities in Africa. At the time, lack of digital base maps, expensive memory, low speeds, and limitations in operating systems prevented the full development of the system for desktop or laptop use by development workers. These constraints no longer exist and work on the system was resumed and carried out by Freeman in 1997 and 1998, with support from OFDA, resulting in the assembly of maps of all of Africa and development experience information from many countries.¹ The current system represents a major step as it allows people to integrate several layers of information in various formats (including GIS, relational database, and text). But accessing the current system requires specialized software and expertise. The work to be done under this purchase order will take the system to the next step by making the system accessible to people without special programs or specialized expertise.

As development professionals are aware, there is no lack of information about NRM experiences. But, we are also aware that we are dealing with a body of knowledge that is fragmented and poorly organized. In the absence of a more accessible and organized system, we often pay for the same lessons again and again, and we are stymied in our collective effort to scale up the results of our investments. Ideally, planners, practitioners, and strategists would make use of an array of information, drawing both from personal experience and from the collective body of experiences to find the most appropriate formula for successful innovations or changes in a given situation. This system will help people access relevant information as they focus on several fundamental questions that sooner or later will be posed as an initiative is planned:

“Has this been tried before (or researched)?”

“What were the results?(and how are they explained?)”

“Can we expect the same (or similar) results?”:

If these questions can be answered with some degree of certainty, professionals will have capitalized on past experience, research results, and other antecedents, and, hopefully will increase the effectiveness of their investments. Thus, the value of case studies and site-specific reports or evaluations, which currently constitute a marginalized resource, will be increased .

Small scale successes recorded on farms or community lands have been difficult to manage and evaluate. It is common for successful experiences to generate reactions on two extremes. On the one hand are enthusiastic promoters who would want to “replicate” a successful experience without regard to conditioning factors. On the other are those who view such experiences as of anecdotal interest at best and too unique to transfer elsewhere. The more effective interpretation of a site-specific experience's transferability is one which takes into account the conditions that may occur in combination nearby or farther away and which, with appropriate caveats, indicate the potential for similar outcomes in comparable situations. This is the interpretation that can be made by employing the display and analysis tools of DEVECOL's map-base information system.

Thus, the DEVECOL management system and its site specific documentation will assist workers to better use the record of development by allowing the user to access site-specific records, view them against a map that reveals their location in comparable environments, and assess their relevance by viewing locations on continental soil and agroclimatic maps. In addition the user will be able to call up the full documentation, thereby overcoming the difficulty of accessing the hard copy versions.

¹ Freeman is working closely with Food Aid Management's Food Security Resource Center, a documentation facility that has pooled information from OFDA and its NGO partners concerned with Title II- funded programs in food production, environmental rehabilitation and related efforts.

Present Status of DEVECOL/Africa.

The DEVECOL/Africa information resource presently consist of:

1. Maps:
 - Base map of the African continent, East Africa, West and Central Africa and the SADC countries(derived from the Digital Chart of the World, Conservation Data Center data, and population data/administrative district data from the National Center for Geographic Information Analysis, UC Santa Barbara).
 - Population distribution
 - FAO/UNESCO digital soil map of Africa
 - FAO Agroecological Zones map of Africa
 - Locations and viewable records of over _____ agriculture and NRM projects
 - Locations and viewable records of over 70 case studies in Sahelian, East African and SADC countries
1. Databases
 - Ag and NRM projects operating in Sub-Saharan Africa in 1989
 - Site specific case studies and evaluations records(70+ cases)
 - Full texts of site- specific case studies and evaluations
1. Other
 - explanatory text for FAO maps
 - hypertexted key for FAO soils map

These resources have been assembled and managed using off the shelf software: MapInfo Professional 4.5, Access(database engine), Omnipage Pro (for scanning), and Word Perfect's Envoy(compressed text format similar to Adobe Acrobat). For a user unfamiliar with databases and Geographic Information System, the use of the above resources would require considerable training. However, only a few elements of the above software programs are drawn upon for accessing and viewing the information resources.

The user interface will program a menu of the minimal functions that would be required. The interface will allow a user not trained in GIS but familiar with the Windows environment to quickly learn the menus and access information from the maps and the databases. The programming will be done by Mark Champney, an associate of Peter Freeman. Mark Champney is a licensed representative of MapInfo with offices in Herndon,VA.

The interface will employ MapX, a programming language that is easily converted for internet use, with minimum loss of programming work. Thus, when a web site for DEVECOL/Africa is developed (planned for 2000 or sooner), most of the interface programming will be migrated for that purpose. Among other benefits, a link the Africa-SDs Frame web page will be made.

Results and deliverables

- A custom programmed user interface allowing users to quickly learn the basic functions and access development information of a site-specific nature.
- A user manual
- The data and the user interface will be recorded onto a CD-ROM for use in laptop and desktop computers, equipped with CD-ROM readers and Windows 95 or Windows 98 operating systems. 100 CD-ROM's for initial distribution and testing/feedback will be produced.

Time and resources estimate

Calendar time required is estimated to be 4 months.

Deliverables

One hundred CD-ROMs loaded with the DEVECOL information resources and equipped with a user interface allowing for easy access and viewing of the information.

Epic Task Order: Stock-Taking and Information Dissemination

A. Background

The objective of Component One is to accelerate the spread of better NRM practices through better use of our collective information about Natural Resources Management (NRM) experiences. This builds on the progress to date under Component One funded under FY 98 funds.

Based on information from a range of sources, the number of people using NRM practices that decrease degradation and increase productivity is increasing. This is particularly true over the last five to ten years. We can cite hundreds of cases where people have adopted practices and strategies to conserve soil and water, manage forests, preserve habitats, improve rangelands, and sustain wildlife populations while improving their livelihoods. But, participation and impacts remain localized in most countries. Simply put, the rate of change remains too low for many African countries to win the race against pressures on the environment and standards of living.

One encouraging lesson from the experiences over the last ten to fifteen years is that change is being produced by people who are not specially privileged and who make a living from a natural resources base that is generally representative of their region. Someone once characterized these cases as a thousand points of green. But, to make a difference, we need to see a million points of green.

If we look closely at the thousand points of green, we see people responding to sets of enabling conditions that are being established by changes in policies and institutions, training and education, technical assistance, infrastructure, and by examples of others. Based on the evidence, there is no inherent reason why the thousand points can not become a million. What, then, can be done to accelerate the rate of use of NRM practices and systems?

We think that one brake to more rapid acceleration is the poor general knowledge about the points of green. While we do not propose that there is a set of enabling conditions that, once established, will produce the million points of green, we do think that broader knowledge of the thousand points of green and how they came about will substantially accelerate the rate. And, we know that many people who are in positions to change policy and institutions, to provide training and technical assistance, to build infrastructure and to expose the general population to what their peers have achieved are only partly aware of the points of green and the lessons they offer.

One constraint to broader knowledge is the fragmented and unorganized state of the information about the points of green. A second constraint is the lack of fora for the development community (policy makers, practitioners, donors, private sector, etc.) to engage each other in giving value-added to the knowledge that each has. To address these constraints, Component One will (a) collect and organize NRM information, (b) disseminate it through multimedia (including a web-based system), and (c) support fora to engage members of the NRM development community (primarily Africa-based members) in discussions of critical questions. Illustratively, these questions would include the following: For each subregion, what are the trends in the NRM sector over the last ten to twenty years? Where are promising NRM initiatives? What factors distinguish these initiatives from others? What are the potential biophysical and economic benefits from scaling up these initiatives? What constraints need to be overcome to scale up the results? And, finally, based on the experiential information, what is a plausible development hypothesis for scaling up? (This last question will feed into Component Two.)

As another way of stating the above purpose, this component does not aim to provide definitive answers by outside analysts to development problems. "Who" addresses the questions often is just as important as the answers. Development in the NRM sector is a complex and evolving dynamic for which there are few definitive solutions. Consequently, Component One aims to bring together people who have been part of the dynamic to provide a critical mass of experiential information and to participate in various fora to think through key questions. It is anticipated that many of these people will have decision-making roles and responsibilities.

To complement and extend the "stock-taking" exercise, Component One will continue to develop the NRM Experience "Tracker" (a web-based database). The Tracker will help members of the core group as well as the larger NRM community to post information about their experience, to organize that information, to put people in touch with each other, to identify sites for possible exchange visits, and to post and collect data.

The intended uses of the products of this Component are manifold. Obviously, it is expected that the products will inform decision making by Missions, by the Africa Bureau and the Agency. In addition, this component also aims to provide information and fora which help African governments, NGOs, and the private sector to use their collective experiences more effectively in making NRM decisions.

Progress to date under Component One. Under Component One of the current contract, EPIQ has conducted assessments in Malawi and Senegal and plans one or two more in the late summer or early fall. They have produced several syntheses including one to assist the USAID Regional Strategy Team in Bamako in thinking through their options for a West African Strategy. Other Syntheses are forthcoming. Since the next FRAME (Component Three) meeting is in West Africa, EPIQ conducted surveys of West African specialists and continues to build up a list of contacts. They continue to review relevant literature and organize it in the NRM Tracker. They advised Missions in the development and use of information systems. A beta-version of the NRM Tracker will be out for field testing by mid-summer.

B. Main Tasks.

Since this is a multi-year request, it is anticipated that some of the tasks will be completed in other fiscal years. The tasks are split between stock-taking and the development of the NRM Tracker.

Stock-Taking. For each subregion and starting with West Africa, EPIQ will form a core group of people who have played a role in the NRM dynamic over the last ten to fifteen years. EPIQ will work with this group to (a) pull together a critical mass of information about NRM results and experiences, and (b) provide support to members of the core group as they use the collective body of information to address critical questions.

Illustratively, the questions would include the following: (a) For various agroecological zones, identify promising NRM initiatives by individuals, communities, private sector, or government; (b) identify the biophysical, economic and governance outcomes of those initiatives; (c) identify the factors that contributed to people taking the initiatives; (d) and the activities that established the factors.

In addition, the contractor will engage African-based decision makers in discussions addressed at the following questions: “What are plausible hypotheses which describe the NRM development process?” “Given the hypotheses, what must be changed in order to scale-up the results?” And, “if the results are scaled up, what will be the potential range of impacts on the environment, on economic development and on civil society?” (These will feed into Component Two.)

To help the core group to work collectively, EPIQ will support a number of fora—including email, the Tracker, and workshops. EPIQ will subsequently use the findings to engage a larger group of people who can contribute to the dialogue and knowledge base and/or who are in a position to use the products of this process.

NRM-Tracker. As noted above, EPIQ has initiated work on the Tracker. Under this Task Order, EPIQ will (a) continue to upgrade the programing and format for the tracker and (b) collect and organize information.

I. **Methodology/Approach**

Since the objective of the component is to facilitate collection, organization, and use of field-level information, the tasks are aimed at helping people—especially those based in Africa-- to communicate freely and openly. Consequently, the EPIQ manager will have substantial latitude in using various means to communicate and coordinate the exchange of information and ideas. The manager is expected to be entrepreneurial in this respect. The EPIQ manager will work closely with the ANRE task manager in developing tactics to make best use of the human and financial resources available to this Component.

As illustrative of an approach for organizing information to identify plausible causal associations, EPIQ could convene a working group to organize time-series data into a timeline and discuss which events contributed to others. For example, there are intriguing relationships between the CILSS-sponsored workshops at Segou and Praia and subsequent changes in Rural Codes in most CILSS countries. Going back further, there are apparent relationships between localized “experiments” in various countries and the issues raised at Segou and Praia. A timeline and discussion of these relationships may provide a foundation for one or multiple working hypotheses about what contributed to change and what needs to be further changed to accelerate the rate of impact?

Mapping African Resources for Strategic Planning (MARS)

Introduction

Since its inception, USAID has been involved in the development, promotion and application of Geographic Information Systems (GIS) in its development programs. In Africa, GIS have been incorporated in numerous environment and natural resource management programs at the mission level. Africa Bureau has carried out extensive training programs and funded the development of numerous geo-spatial data sets. Currently, for example, AFR is funding the development of spatial tools with FEWS, Texas A&M, USGS, CAPRE (UVA), Devcol, and EPIQ. These tools are diverse in terms of accessibility, complexity, and purpose. At present, this diversity in approach promotes innovation and refinement of data quality. This is a long-term process worth AFR's investment. In the immediate term, however, AFR needs a tool for its and its partners' immediate use.

GIS remains largely a tool for experts. The complexity of the tool does not allow easy access by management practitioners and planners. Further, it often does not reflect the demands for information by decision-makers. At the same time, the perception by decision-makers is that the data do not exist to allow the incorporation of geo-spatial data in policy and program planning. This perception is strengthened by a continuing claim by GIS experts that we have not achieved the necessary level of resolution or confidence to make effective decisions. Notwithstanding, decisions are being made based on whatever information is on hand in the time frame allowed to the decision-maker. Data do exist and the challenge is to organize, package, and present it in a manner readily accessible to the decision-maker.

In short, the Africa Bureau requires a product based on the demands articulated by practitioners, managers, and policy-makers. This product must be readily accessible by these actors in a format that does not require extensive training or manipulation to produce maps and conduct basic analyses. In particular, AFR requires a data base in-house that allows it to answer information demands it receives from partners in the US and in the field.

Key Outputs and Tasks

1. Develop and carry out a process, based on a target market group of potential users, to determine demands, lines of enquiry, and information products required from the tool. This demand should be determined in terms of timeliness or product delivery, sufficiency in levels of resolution or confidence, and sustainability of the GIS within human resource and financial constraints to the user or manager.
2. Development of GIS data sets based on existing data housed in universities, government institutions and international organizations. The GIS must have a customer focus and should not require more than three hours of training or practice to use by individuals with a moderate level of computer literacy as determined by intermediate fluency in the use of spreadsheets. The GIS should be presented on a CD-ROM with at least the potential to be presented on a web-site. The GIS and front-end program modules should have the flexibility for national and local modifications, incorporation of higher resolution data, and incorporation of other data layers. The immediate products should include regional data sets for West Africa, Southern Africa, Eastern Africa, and Central Africa.
3. The GIS will not be proprietary and should not require additional purchase of software. It should serve to demonstrate the use of GIS as a management tool as well as being a practical analytic tool for decision-makers.
4. Eventually, in a second phase, a capacity development process should be implemented to train African GIS experts in the use of customer-led approaches in GIS design, the application of GIS media used, and the targeting of products to concrete applications.

Approaches/Methodologies

1. This task order will be implemented by a Government institution or Land-Grant college demonstrating the capability and capacity for timely and appropriate implementation.
2. Form a contact group of typical users of the product to define the types of enquiries and information products required to improve the quality of their decisions, the parameters on technical capability defining use by the client, and types of presentation products or media which facilitate its use.
3. Collect, manipulate, organize, and use existing data to formulate the data layers used in the GIS.
4. Develop a beta version for one region and take that product to the field for testing and refinement.
5. Use the field test to develop three other regional GIS tools which combined with the first data set use the same front-end module and architecture.
6. Modify the tool for other locally specific uses through a buy-in by missions or other USAID operating units.
7. Develop a training program to promote the processes developed in this activity among African GIS experts.
8. The developer of the GIS will work in close collaboration and under the supervision of the AFR/SD/ANRE Environmental Monitoring and Information Advisor. He will play a key role in work with the contract group and the field testing process, as well as any future training or modification of the tool.

Resources Required

Technical Assistance:

1. GIS analyst with detailed knowledge and access to existing geo-spatial data who has the ability to effectively organize data layers to be consistent in the architecture designed. The analyst must have demonstrated ability to adopt a customer focus in GIS design. (LOE: 65 days)
2. GIS programmer who understands the technical level of the customers and who can program a GIS tool to meet customer demand in a participatory manner. (LOE: 50 days)

Timeframe:

1999:

- Oct – Nov: Refine initial design parameters
 Nov – Dec: Conduct initial client contacts to finalize design parameters

2000:

- Jan – Mar: Collect and organize data layers for first region.
 Program front-end enquiry component of GIS
 Apr: Deliver and demonstrate beta version
 May: Field test beta version and make modifications to produce version one of first regional GIS.
 Jun – Jul: Produce remaining three regional GIS CDs.
 Sep: Develop training program for GIS experts in Africa
 Obtain funds for training phase.

2001:

- Jan: Carry out first training activity.

**RAISE TASK ORDER:
ANALYSIS OF COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT
EXPERIENCE IN AFRICA**

A. Introduction and Progress to Date

Community-based natural resources management (CBNRM) has emerged as a promising means of sustaining the environment. It achieves this by assigning economic and social values in terms of the local communities who are impacting and being impacted by the natural resources under threat by degradation or extinction. It also builds skills and confidence in managing enterprises and in building local representation and democratic institutions. Considerable documentation and an emerging literature have described, on a case by case, basis, the effectiveness of the approach. However, there is neither a clear consensus on the definition of CBNRM nor is there been an effective characterization of the concept in terms of its application throughout Africa. Now, as many USAID-funded programs are reaching maturity, there is a trend towards disengagement just as the demand for implementation of such approaches is growing. The Africa Bureau needs to be informed, via an analytical framework, of what the pay-off for its investment has been and what the potential is in local (micro-economic) and national (macro-economic) terms, and how the potential for CBNRM may be spatially represented.

AFR/SD has engaged a number of actors involved in describing and characterizing natural resources management in Africa. In particular, we have engaged in a two-year process of describing environmental trends in Africa through a buy-in to the EPIQ project. During FY 2000, this activity will use various studies and databases to develop an heuristic model tracing changes in key variables and their causal relationships. This analysis provides an important context for analysis of CBNRM. Further, AFR/SD's work in developing databases and geographic information systems to support this effort, would provide important formats for studying the potential and spread of CBNRM.

In reviewing the experience and qualifications of the various firms and organizations included in the RAISE IQC, ARD has demonstrated unique and superior qualifications to carry out this task. ARD has had extensive experience in CBNRM and the types of economic and spatial analyses called for within this scope of work. This is particularly the case due to their recent CBNRM analysis for RCSA and by virtue of the work conducted by ARD staff in the use of information with the CER in Senegal.

B. Key Outputs/Tasks

1. Develop a timeline that describes the evolutionary process leading to the establishment of CBNRM in Africa, both in terms of the antecedent approaches which contributed to the emergence of CBNRM as well as discrete steps in the CBNRM process.
2. Provide a cogent definition of CBNRM which, in part, differentiates between those approaches that focus on private versus common property settings.
3. Identify the enabling conditions necessary for effective implementation of CBNRM and determine the relationships among these conditions, particularly whether these relationships are linear or parallel in nature.
4. Conduct an analysis, possibly using econometric techniques, which generalize trends among available data. This may include a formalization of the "uptake curve" that has been presented by AFR/SD in describing the impact of CBNRM over time. This includes definition of the key parameters upon which impact may be measured (adoption, income, area, etc.).
5. Characterize the key variables involved in adoption of CBNRM spatially using bio-physical, socio-economic, land tenure, and population data, as appropriate.
6. Project the potential impact of CBNRM over space and time on a regional or sub-regional basis (ideally throughout Africa, but possibly in given operational regions relevant to USAID).
7. Provide AFR/SD with a report, associated databases, and where appropriate, analytical tools which were developed as part of the analysis.

C. Methodology/Approach

1. This activity is largely a desk-top study in which the analyst will collect documentation and data sets already existent in order to develop the analytical framework. Data may be solicited from the field and collected from AFR/SD SO5 team members.
2. Collaborate with key actors in complementary efforts in order to promote cohesiveness and synergies among efforts.
3. Findings should be presented in a powerpoint format to members of the Africa Bureau staff and others during a session in Washington, DC.

D. Resource Requirements

5. Specialist in natural resources economics, resource valuation, econometric methods, and with natural resources management experience in Africa.. Anticipated LOE: 4 weeks.
6. Task-purchased GIS mapping and data organization.
7. Timeline:

Dec.– Mar: Workshop to develop framework

Apr. – May: Collaboration with Environmental Trends Analysis team

June: Presentation of Report to Africa Bureau

**RAISE TASK ORDER:
ANALYSIS OF COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT
EXPERIENCE IN AFRICA**

A. Introduction and Progress to Date

Community-based natural resources management (CBNRM) has emerged as a promising means of sustaining the environment. It achieves this by assigning economic and social values in terms of the local communities who are impacting and being impacted by the natural resources under threat by degradation or extinction. It also builds skills and confidence in managing enterprises and in building local representation and democratic institutions. Considerable documentation and an emerging literature have described, on a case by case, basis, the effectiveness of the approach. However, there is neither a clear consensus on the definition of CBNRM nor is there has been an effective characterization of the concept in terms of its application throughout Africa. Now, as many USAID-funded programs are reaching maturity, there is a trend towards disengagement just as the demand for implementation of such approaches is growing. The Africa Bureau needs to be informed, via an analytical framework, of what the pay-off for its investment has been and what the potential is in local (micro-economic) and national (macro-economic) terms, and how the potential for CBNRM may be spatially represented.

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4. Conduct an analysis, possibly using econometric techniques, which generalize trends among available data. This may include a formalization of the "uptake curve" that has been presented by AFR/SD in describing the impact of CBNRM over time. This includes definition of the key parameters upon which impact may be measured (adoption, income, area, etc.).
5. Characterize the key variables involved in adoption of CBNRM spatially using bio-physical, socio-economic, land tenure, and population data, as appropriate.
6. Project the potential impact of CBNRM over space and time on a regional or sub-regional basis (ideally throughout Africa, but possibly in given operational regions relevant to USAID).
7. Provide AFR/SD with a report, associated databases, and where appropriate, analytical tools which were developed as part of the analysis.

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2. Collaborate with key actors in complementary efforts in order to promote cohesiveness and synergies among efforts.
3. Findings should be presented in a powerpoint format to members of the Africa Bureau staff and others during a session in Washington, DC.

D. Resource Requirements

1. Specialist in natural resources economics, resource valuation, econometric methods, and with natural resources management experience in Africa.. Anticipated LOE: 4 weeks.
2. Task-purchased GIS mapping and data organization.
3. Timeline:

Dec.– Mar: Workshop to develop framework

Apr. – May: Collaboration with Environmental Trends Analysis team

June: Presentation of Report to Africa Bureau

WRI EPMII: Information Working Group Scope of Work

A. Introduction

USAID's Africa Bureau Office of Sustainable Development, Strategic Objective 5 team has had ongoing collaboration with WRI to establish a working group to guide the Bureau in facilitation of the effective use of information for decision-making. In concert with the Program for Environmental Information Systems Support for Sub-Saharan Africa, IWG represents Africa Bureau's engagement in fostering an effective network of EIS professionals who are engaging in environmental and natural resource management, policy formation, and implementation, and research. In 1997, the IWG was reconstituted to consist of eight members. IWG also engaged in carrying out case studies to demonstrate the use of GIS for policy-making.

B. Key Outputs/Tasks

1. Continuing coordination and secretariat functions for the IWG, including the organization of periodic meetings of the IWG.
2. Completion of planned case studies on the impact of geo-spatial data on policy-making.
3. Coordination with Clark University of a workshop on the interface of participatory rural assessment (PRA) methodologies and geographic information systems (GIS).
4. Further engagement of Clark University's IDRISI Project and International Development Studies Department on IWG issues.
5. In collaboration with PEISS, WRI will facilitate that part of the African Fellows Program to bring at least one Fellow whose purpose is to further PEISS aims and the effective use of information for decision-making.

C. Methodology/Approach

1. All IWG functions and activities will be carried out by WRI based on an approved annual work plan.
2. Though WRI will make use of its analytical capacities when appropriate, emphasis will remain on the engagement of the analytical capabilities of African professionals in carrying out studies and activities.
3. WRI will provide logistical and financial support to PEISS selected African professionals to come to the US for a fellowship program as designed by PEISS working groups and the professional(s) selected.

USAID/AFR/SD Support to The Program on Environmental Information Systems Support to Sub-Saharan Africa (EISS) FY 1999 Grant Through the Multi-Donor Secretariat

A. Introduction and Progress to Date

USAID's Africa Bureau has collaborated with and served on the Advisory committee of the Program for Environmental Information Systems support for sub-Saharan Africa (EISS) for several years. In 1998m AFR/SD lent support, through a grant to the Multi-Donor Secretariat of the world Bank in order for the EISS to continue in its organization of an independent body and to carry out its annual conference in Burkina Faso. The EISS still requires support in its executive functions, organizational process and programs.

B. Key Outputs/Tasks

1. In the year 2000, it is expected that the EISS should have an agreed Articles of Incorporation, constitution, and/or other documentation necessary for the EIS body to become a legally identified non-governmental organization (NGO) capable of operating in Africa. Such documentation should identify the governing body, purpose and operations of the organization, and make it auditable under standard audit procedures.
2. Hold its annual conference in 2000.
3. Select and develop an African Fellow program through the facilitation and funding from World Resources Institute
4. Collaborate with WRI on completion of the West African case studies of the impact of GIS on policy making.

C. Methodology/Approach

1. As agreed upon during the March 1999 meeting in Ouagadougou, the EIS Executive Committee will complete its consideration of organizational options and identify the seat of the organization.
2. The EIS will organize itself into a set of task groups, including education and research, for which it will exercise its responsibility for selecting at least one African Fellow to carry out a fellowship in the United States.
3. AFR/SD strongly supports the concept that the organization carry out dual roles as a professional organization of EIS practitioners as well as a body capable of research or expertise for such studies.
4. EISS represents, for USAID, a key vehicle for building human resource capacity in the development and growth of information systems as well as promoting the free flow of environmental information in Africa. The linkage between USAID's promotion of effective use of information for decision-making through its internal Information Working Group and the EISS, as a collegial African body will be promoted; recognizing that objectives may differ according to institutional needs.
5. Dispersal of funds will be made through an annual workplan and budget which has the concurrence of USAID's Africa Bureau.

FIGURE 5: IMPLEMENTATION TASK PERT CHART 1

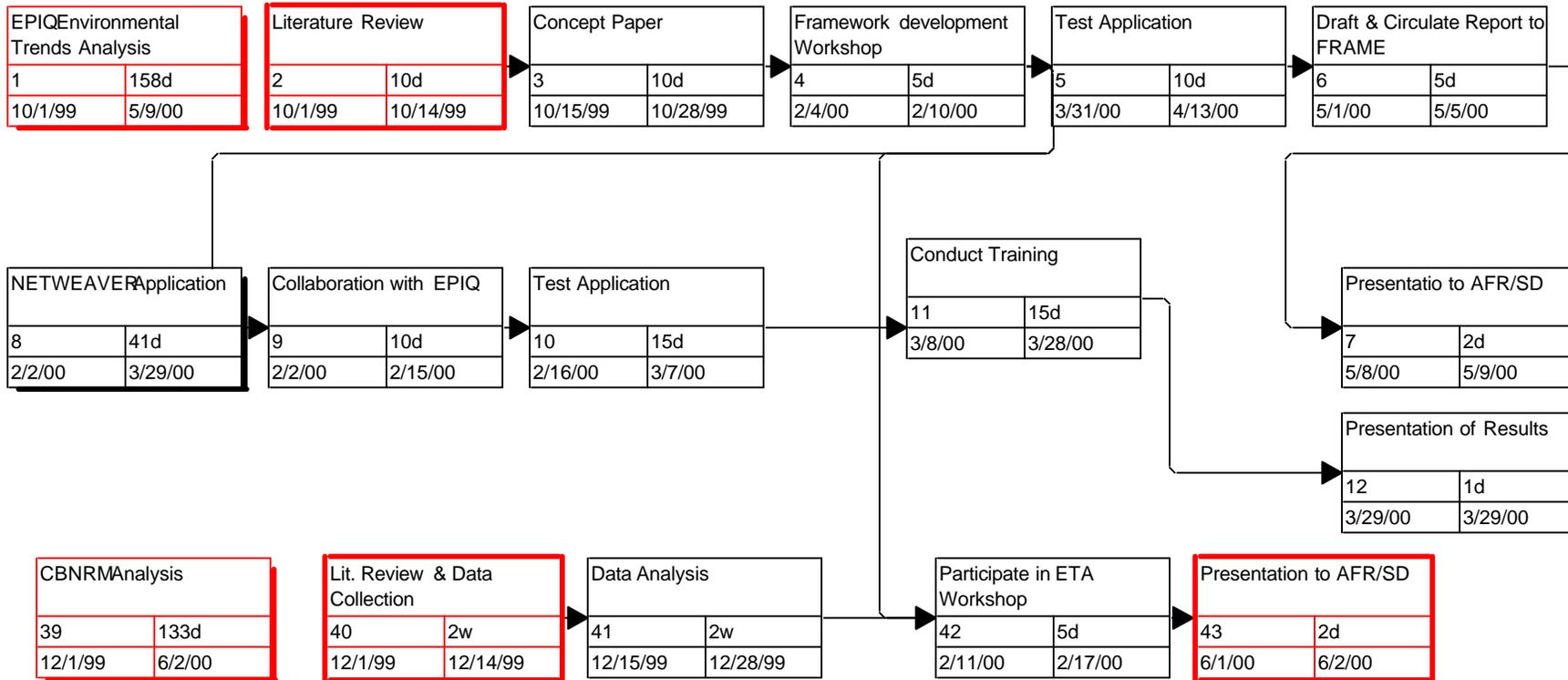


FIGURE 5: IMPLEMENTATION TASK PERT CHART

2

