Quarterly Report for January to March 1998

Malawi Environmental Monitoring Programme
Prototype Environmental Information System (EIS)
Middle Shire Analysis

Contribution of the Arizona Remote Sensing Center (ARSC), University of Arizona, Tucson

Transition: PLUS to the Prototype EIS

ARSC began 1998 by initiating the transition of all Public Lands Utilization Study (PLUS) data layers to the prototype EIS. All PLUS data and associated ArcView projects (for spatial data presentation) were reviewed according to the standards requested by Malawian agencies currently developing the prototype EIS. A beta version of the spatial dataset was delivered to Malawi and tested during an ArcView training conducted by two University of Arizona graduate students in March1998. Revisions recommended by participants in the training and other Malawian experts interested in EIS development were documented and should be incorporated in the final dataset scheduled for delivery during the next quarter.

Metadata Development

The core of the data transition involved the creation of a dynamic operating environment for metadata, based on the theoretical design developed by the Department of Surveys in conjunction with Clark University. As depicted below, metadata forms and reports were developed in Microsoft Access and documentation concerning all PLUS data layers was added. Following the March ArcView training, the metadata structure was improved to make it more accessible to the end user.

Training

The March ArcView training involved participants from four of the six MEMP agencies, UNIMA, and several other agencies directly interested in using the PLUS dataset. Theoretical and practical aspects of data presentation were addressed. Candidates for the Tucson-based participant training in GIS and Remote Sensing, tentatively scheduled for May 1998, were proposed.

Middle Shire Analysis

ARSC has been working in conjunction with the Department of Surveys, the Land Resources Conservation Department, and Forestry to capture the spatial data necessary for analysis of erosion hazard in the Middle Shire. The primary sources of the data are hard copy Survey Sheets, LREP Agroclimate and Soils & Physiography maps, and digital Satellitbild land cover maps. In all but the latter it has been necessary to digitize these base materials before attempting to model erosion hazard. Data capture and Quality Control/Quality Assurance (QA/QC) procedures developed for PLUS are being applied to all prototype EIS efforts, however local capacity and some difficulties in communication have hindered efforts. In an attempt to consolidate the work completed to data, Surveys has requested that ARSC perform QA/QC on all data layers including those developed in Malawi. Metadata has been initiated for new EIS layers, but will not be completed until all PLUS metadata have been entered and reviewed.

Summary of Prototype EIS Spatial Data Development

Data Layer	Blantyre ADD			Machinga ADD			Rivi-Rivi*		
	Capture	QA/QC	Metadata	Capture	QA/QC	Metadata	Capture	QA/QC	Metadata
Base Data									
Survey Sheets (1:250,000)									
Contours (100m)	√			√					
Streams	√	√		√	√				
Roads	√	√		√	√				
Boundary	√	√		√	√				
LREP (1:250,000)									
Agroclimate	√			√					
Soils	√			√					
Satellitbild (1:250,000)									
1991 Land Cover									
Analysis									
DEM									
Shaded Relief									
Erosion Hazard									

*Rivi-Rivi watershed was added to the area originally considered for Middle Shire analysis. It includes parts of Lilongwe and Salima ADDs, including Nsipe EPA, which is under consideration for collaborative intervention between MEMP, MAFI, and the Smallholder-Agribusiness Development Project.

Image processing activities for south central Malawi

All of Malawi is covered by 11 Landsat Thematic Images. The south-central region, including the Middle Shire, is captured by the four images covering territory physically north of Ngabu ADD. Using Landsat imagery nomenclature, these are named by satellite path/row as follows:

P168/R070   P167/R070
P168/R071   P167/R071

The raw imagery must undergo a series of preprocessing steps before it can be used in the development of products such as land cover maps. These steps (noted in the table below) have been completed for the 1984 images and the 1994 images are underway.

Image Processing Step	P169/R067		P168/R071		P167/R070		P167/R171	
	84'	94'	84'	94'	84'	94'	84'	94'
Atmospheric /Radiometric Correction	√		√		√		√	
Geometric Rectification	√		√		√		√	
Corrected/Rectified Images added to EIS								

These steps will be completed by May 1998 in preparation for the participant training anticipated for that time. The participants will deliver the finished products along with any produced by them during the training to their respective agencies in Malawi.